APPENDIX P

CLASS III ARCHAEOLOGICAL SURVEY REPORT

(see PDF files on enclosed CD)

Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California

Edited by Michael K. Lerch, Patrick B. Stanton, and Karen K. Swope

Contributions by Dean M. Duryea, Jr., Scott H. Kremkau, Michael K. Lerch, Tim M. Mills, Patrick B. Stanton, Mark Q. Sutton, Karen K. Swope, Carly Whelan, and Jason D. Windingstad

Screen check final report prepared for
George E. Kline, Archaeologist
Bureau of Land Management
Palm Springs–South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262

Technical Report 15-36
Statistical Research, Inc.
Redlands, California

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January 2016

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ABSTRACT

Project: Desert Quartzite Solar Project, BLM Project Number CACA 049397

Applicant: Desert Quartzite, LLC, A Wholly Owned Subsidiary of First Solar Development, Inc.

Agency: Bureau of Land Management (BLM), Palm Springs–South Coast Field Office

Permits: BLM Permit for Archaeological Investigations CA-13-06, Fieldwork Authorization 66.66-15-02

Project location:

USGS 7.5-minute Quadrangle	Township/Range (BM)	Sections
Ripley, California	7 South/21 East (SBBM)	11, 12, 13, 14, 23, 24
Roosevelt Mine, California	7 South/21 East (SBBM)	3, 4, 5, 6, 9, 10, 11, 14, 15, 22, 23

Key: BM = baseline and meridian; SBBM = San Bernardino Baseline and Meridian; USGS = U.S. Geological Survey.

Dates of Fieldwork: October 13–December 11, 2014; February 3, 2015

Acreage of Direct Area of Potential Effects (APE): 5,010

Total Acreage Surveyed: 5,010

Total Acreage Surveyed on Bureau of Land Management Land: 4,850; **Private Land:** 160

Acreage of Indirect APE: 18,060

Results—Direct APE: In total, 278 sites were recorded within the direct APE, including 181 historical-period sites, 89 prehistoric sites, and 8 multicomponent sites. In addition, 620 isolated artifacts were recorded (Appendix B).

Results—Indirect APE: Based on the results of the records search completed prior to the survey fieldwork and reported in the research design (Kremkau, Stanton, et al. 2014:3.5, Tables 3.2 and 3.3), 220 sites are located within the indirect APE, defined as a 1-mile radius around the direct APE and a travel corridor into the Mule Mountains, including 89 historical-period sites, 95 prehistoric sites, and 36 multicomponent sites.

Sites Recommended Eligible for Listing in the National Register of Historic Places (NRHP): Within the direct APE, 7 prehistoric sites and the prehistoric component of 1 multicomponent site are recommended eligible for listing in the NRHP on the basis of available information. An additional 9 prehistoric sites are possibly eligible for listing in the NRHP, pending additional research and formal evaluation.

Two sites recommended NRHP eligible, P-33-000343 and P-33-001821, are within the direct APE and also extend into the indirect APE. Two additional sites, P-33-000733 and P-33-000504, are listed in the NRHP as the Mule Tank Discontiguous Rock Art District and are situated within the indirect APE.

Sites Recommended Not Eligible for Listing in the NRHP: The remaining 261 sites and all 620 isolates within the direct APE are recommended not eligible for listing in the NRHP.

Management Recommendations: Sites that are listed in or recommended eligible for listing in the NRHP should be avoided. Until the possibly eligible sites are formally evaluated, they should be assumed NRHP eligible for planning purposes.

ACKNOWLEDGMENTS

Many people deserve thanks for their help in organizing and conducting this project. Director of Project Execution Roy Skinner and Director of Project Development James F. Cook of First Solar Development, Inc. (First Solar), along with David Watkins, assisted us throughout the course of the study and kept us apprised of changes in the project configuration and schedule. Laura Abram and Ashley Hudgens, First Solar public-relations staff, helped to coordinate Native American outreach for the project. We appreciate the assistance of Attorney General Rebecca A. Loudbear, Deputy Attorney General Nancy H. Jasculca, and Law Clerk Douglas Bonamici of the Office of the Attorney General, Colorado River Indian Tribes (CRIT); Director Wilene Fisher-Holt and Coordinators Lisa Swick and Jessica Yazzie of the CRIT Museum; as well as tribal monitors Derrick Ameelyenah, Jr.; Noah Charles; Coy Eddy; Galen Fisher; Kyle Humeumptewa; Lawton Humeumptewa; Allan McCabe; Keith Nopah, Sr.; Alton Paddock; and Robert Pintor.

George Kline, Palm Springs Field Office archaeologist, and Tiffany Arend, California Desert District and former Renewable Energy Coordination Office archaeologist, Bureau of Land Management (BLM), assisted with review of the research design and area of potential effects definition, joined us in the field for a review of selected portions of the project, and provided ongoing feedback regarding the information needs and policies of their agency. We thank Mr. Kline and Ms. Arend, as well as Roderic N. McLean of LSA Associates, who served as BLM's third-party reviewer, for their comments and suggestions on the draft report. Dr. M. C. Hall, Rachel L. Jacobus, and Shaina Ho of the California Historical Resources Information System, Eastern Information Center, at the University of California, Riverside, assisted in the archaeological and historical records searches, reviewed site records, and assigned primary and trinomial designations. John Arreoloa, County of Riverside Transportation Department Survey Division, helped us obtain surveyor's field notes from the 1917 General Land Office survey of Township 7 South, Range 21 East, San Bernardino Baseline and Meridian. We are also indebted to Robert Ray, Senior Project Manager with AECOM, for sharing archival data related to wells and irrigation on the project site.

At Statistical Research, Inc., the research design and ethnographic overview were prepared by the senior editor and Dr. Scott H. Kremkau, assisted by Patrick B. Stanton; Dean Duryea, Jr.; Carly Whelan; and Dr. Mark Q. Sutton. The project director for the archaeological field survey was Patrick B. Stanton. Field crewmembers included Dean Duryea and Matthew Hyland, who served as crew chiefs and also led the prehistoric and historical-period site recording crews, respectively. Robert Foster, Elizabeth Gonzalez-Negrete, Devin Johnson, Melanie Lerman, Dr. Justin Lev-Tov, Garnett Smith, Joseph Woods, and Kevin Wright served as crewmembers for the survey and site recording portions of the project.

Dr. Tim M. Mills prepared the ethnobotanical review; Dr. Karen K. Swope prepared the historical-period portions of the background, research design, results, and evaluations; and Jason D. Windingstad prepared the geoarchaeological background and buried-site sensitivity model in the report. Stephen Norris and Matthew Hyland did the site and project location mapping and geographic information system analysis. Luke Wisner prepared the graphics for the report and site records. Grant Klein edited and produced the report under the direction of Maria Molina. James J. Clark served as project manager and coordinated all staff logistics and scheduling. Janet C. Grenda managed the contracts. Thank you all.

Michael K. Lerch
Patrick B. Stanton
Karen K. Swope

January 20, 2016

CHAPTER 1

Introduction

Michael K. Lerch and Scott H. Kremkau

Desert Quartzite, LLC, a wholly owned subsidiary of First Solar Development, Inc. (First Solar), is proposing to develop, construct, and operate a 300-megawatt (MW) power generating solar photovoltaic (PV) facility in eastern Riverside County, California—the Desert Quartzite Solar Project (DQSP). At the request of First Solar, Statistical Research, Inc. (SRI), conducted a Class III archaeological survey of the project site to provide information for the Bureau of Land Management (BLM) and County of Riverside (County) to comply with federal and state environmental and historic-preservation laws and regulations.

The purpose of the study was to identify and evaluate archaeological resources within the project's area of potential effects (APE) regarding their eligibility for inclusion in the National Register of Historic Places (NRHP) and, for a portion of the project site, the California Register of Historical Resources (CRHR). The field survey was preceded by a records search and literature review, which were documented in a research design/work plan and an ethnographic literature review that served as the basis for initial consultation by the BLM with the State Historic Preservation Officer (SHPO) and interested Native American tribes.

Project Location

The proposed project area is located 0.8 km (1/2 mile) south of Interstate 10 and the community of Mesa Verde and about 13 km (8 miles) west of the city of Blythe (Figure 1.1). The DQSP area is located in Sections 11–14, 23, and 24, Township 7 South, Range 21 East (San Bernardino Baseline and Meridian [SBBM]), on the Ripley, California, 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle and in Sections 3–6, 9–11, 14, 15, 22, and 23, Township 7 South, Range 21 East (SBBM), on the Roosevelt Mine, California, 7.5-minute USGS topographic quadrangle (Figure 1.2). The project site is situated on Palo Verde Mesa in eastern Riverside County, California. The study area is located in the Colorado Desert, with the McCoy Mountains to the north, the Mule Mountains to the southwest, Chuckwalla Valley to the west, and Palo Verde Valley and the Colorado River to the east.

The DQSP area is bounded on the southwest and southeast by existing transmission lines and access roads, including the Devers–Palo Verde Transmission Lines No. 1 (DPV1) and No. 2 (DPV2). An existing 7.5-MW solar PV project, the NRG Blythe Solar Power Plant, is located on 200 acres adjacent to the northern boundary of the DQSP site. A portion of the Blythe Mesa Solar Project, a 485-MW, 3,660-acre PV project approved by the County in 2014 and by the BLM in 2015, is located on a parcel of land that is surrounded on three sides (the north, west, and south) by the DQSP site. The DQSP is located within the Riverside East Solar Energy Zone (SEZ), identified as part of BLM's comprehensive Solar Energy Program (the Western Solar Plan) for utility-scale solar energy development on BLM-administered lands in six southwestern states, including California.

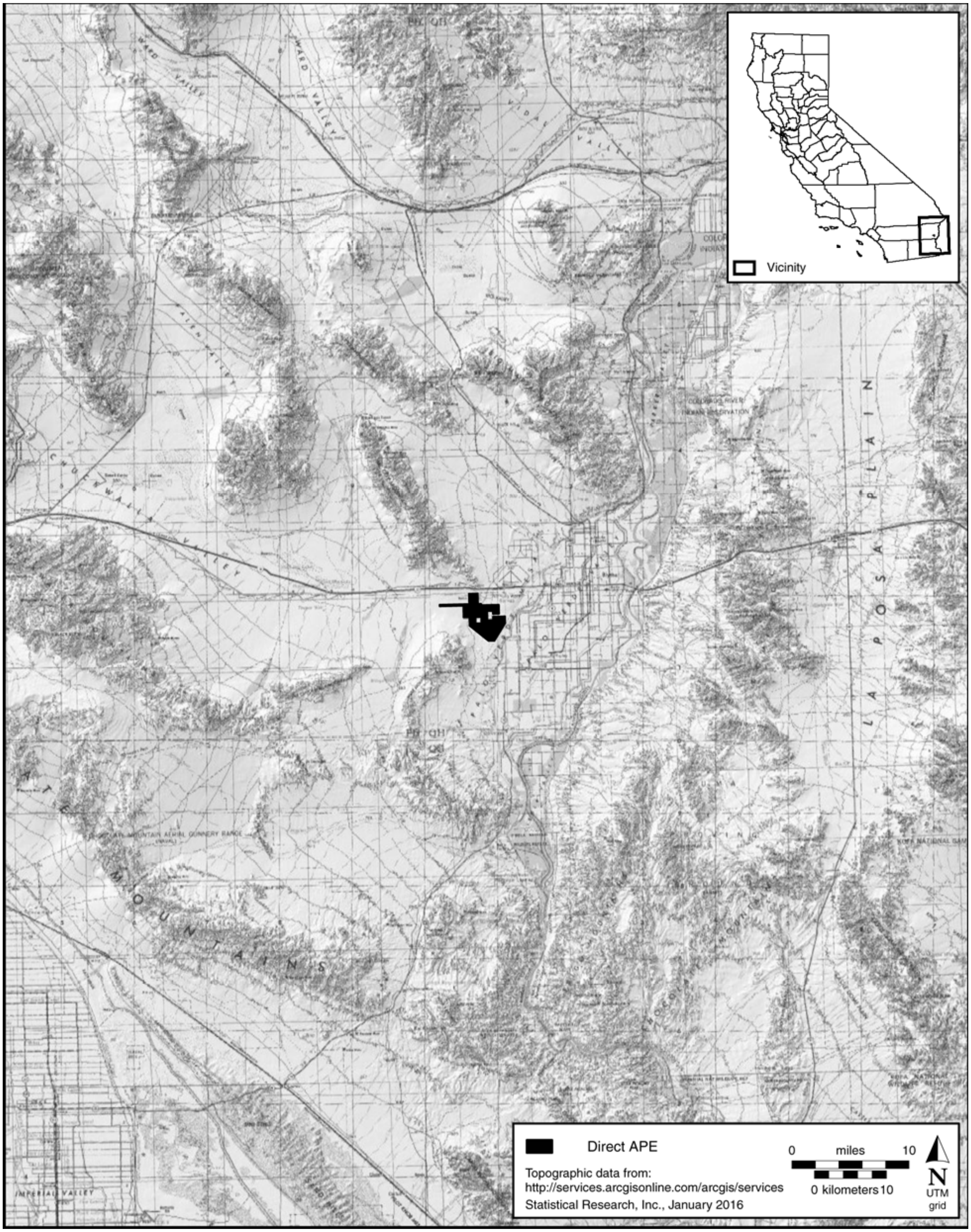

Figure 1.1. Vicinity map of the DQSP.

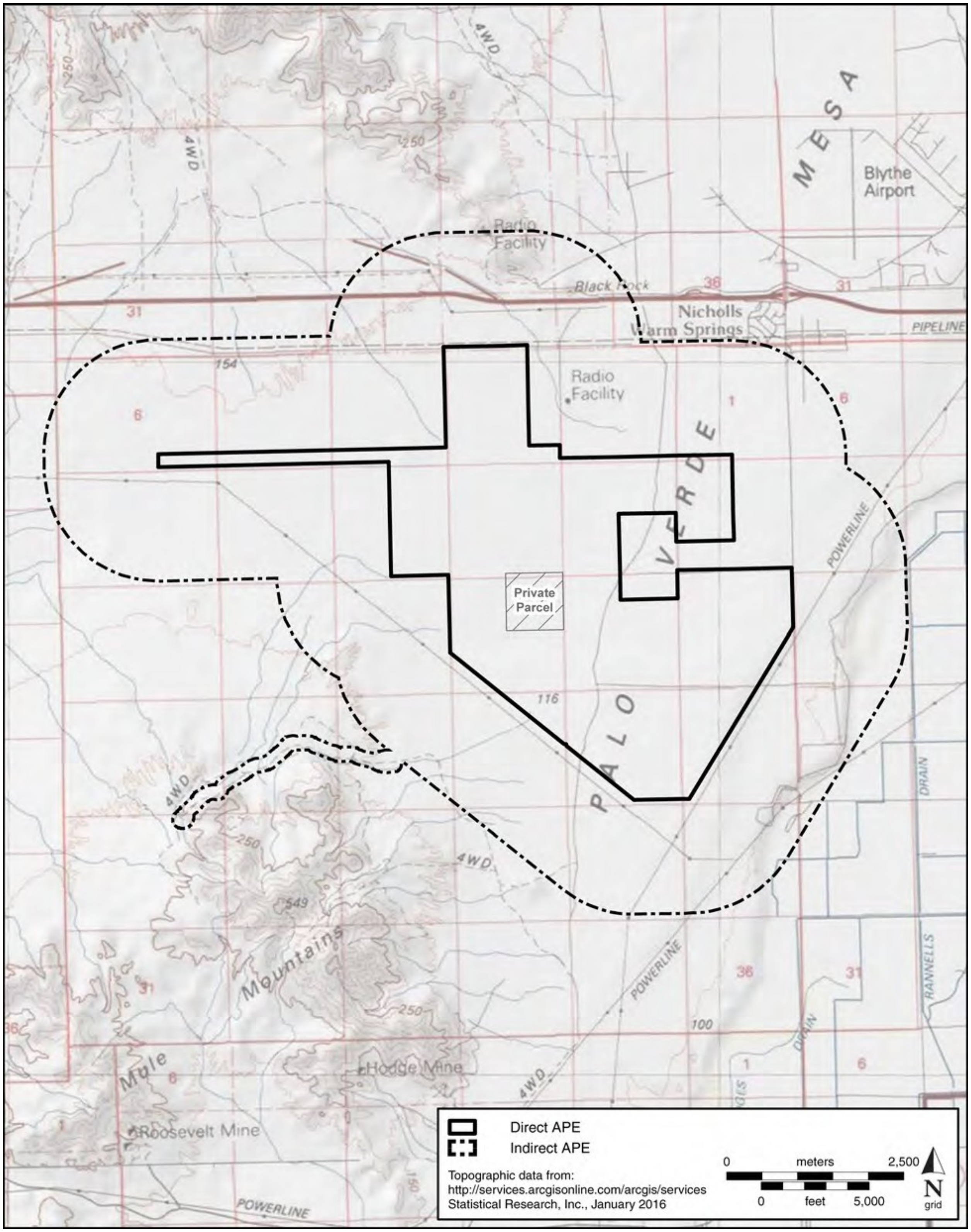

Figure 1.2. Project location map of the DQSP.

Project Description

The DQSP includes a PV solar-facility site of approximately 3,560 acres on BLM land and 160 acres of private land, along with a corridor for generator tie lines (gen-tie lines) that extends for 3 miles and covers an area of 58 acres; this is all situated within a total project area of 5,010 acres. The total project area was initially defined on the basis of the right-of-way (ROW) grant application for a somewhat larger project footprint and associated buffer areas proposed in earlier versions of the DQSP Plan of Development (Desert Quartzite, LLC 2014).

The DQSP would consist of a single unit with a generating capacity of 300 MW. The proposed facilities on BLM-managed public land would include PV solar arrays, a gen-tie line, a 120-by-50 foot operations and maintenance building, an on-site substation, and ancillary facilities. The only facilities to be placed on the private land parcel would be solar arrays. The only linear facility extending out of the solar plant site would be the gen-tie line. The DQSP would use existing access roads.

The DQSP would involve the installation of thin-film solar modules made by First Solar, or other PV technology, mounted on either single-axis horizontal tracker structures, fixed-tilt mounting systems, or a combination of these two mounting systems. The mounting system for the PV modules would consist of steel posts driven into the ground to a depth of between 1.2 and 2.1 m (4 and 7 feet), and posts for single-axis tracking structures would need to be driven up to 3.7 m (12 feet) into the ground. The solar module assemblies would be organized into arrays. Each array would be approximately 800 feet long and 500 feet wide. The exact placement of the arrays within the DQSP area would be based on topography, hydrology, and geotechnical conditions and could also be modified to avoid cultural resources.

Applicable Regulations

Because most of the project area is on public land managed by the BLM, the project will require a BLM ROW grant (ROW No. CACA 049397). Issuance of a ROW grant for the project is considered an *undertaking* as defined by the National Historic Preservation Act (NHPA), and therefore, the project must comply with Section 106 of the NHPA, as amended (54 *U.S. Code* 300101), and its implementing regulations, 36 *Code of Federal Regulations* (CFR) 800, as well as BLM policies regarding cultural resources (BLM 2004). The BLM also must comply with the requirements of the National Environmental Policy Act (NEPA). The portion of the project on private land will require a Conditional Use Permit (CUP) from the County (Riverside County CUP No. 3721), along with review under the California Environmental Quality Act (CEQA), with the County as the lead CEQA agency. The BLM and the County will prepare a joint Environmental Impact Statement/Environmental Impact Report to meet the NEPA and CEQA requirements for the DQSP.

As part of data collection and analysis for compliance with Section 106 of the NHPA and the NEPA/CEQA review, First Solar contracted SRI to conduct a Class III archaeological resource inventory and evaluation for the APE. The purpose of the archaeological resource inventory was to identify, record, and evaluate historic properties and historical resources (cultural resources that are listed in or eligible for listing in the NRHP or CRHR) that may be affected by the project.

APE Definitions

Studies to identify and evaluate cultural resources must carefully establish the impact area, referred to in federal regulations as the APE, for the undertaking. We refer to the regulations implementing the NHPA for the following definition of APE:

> *Area of potential effects* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking [36 CFR 800.16(d)].

The APE considered for this study consists of the direct APE and the indirect APE, which are defined below. When the term "APE" is not defined as "direct" or "indirect," it refers to both together.

Direct APE

The direct APE is defined as the entire 5,010-acre area containing the ROW grant application area and gen-tie corridor. The direct APE includes 4,850 acres of BLM land and 160 acres of private land. It is the area where direct effects due to the implementation of the proposed development are possible (36 CFR 800.5[a][2][i]). Such direct effects to archaeological resources evaluated as NRHP eligible may include construction of perimeter fences and staging areas, grading for interior access roads, mowing and tilling to prepare the ground surface for installation of solar panels, trenching and excavation for electrical conduits and vaults, and construction of the gen-tie pylons and access road.

Within the direct APE, ground-disturbing activities would range in depths from 12–18 cm (5–7 inches) for the site surface preparation to 3.7 m (12 feet) for the solar-panel-support posts to 1.2 m (4 feet) for electrical-conduit trenches and to approximately 3 m (10 feet) for electrical vaults (Desert Quartzite, LLC 2014:35–38). These depths of disturbance, or the vertical APE, will be distributed across the project site at various locations within the direct APE. No mass grading is proposed for the DQSP.

Indirect APE

The indirect APE includes those areas outside of the direct APE that may contain historic properties that could be affected by the proposed project. The indirect APE takes into consideration the introduction of visual, atmospheric, or audible elements that could diminish the integrity of significant historic features of resources listed in, or eligible for listing in, the NRHP (36 CFR 800.5[a][2][v]). Based on the results of the literature review and archaeological records search presented in the research design and work plan (Kremkau, Stanton, et al. 2014), the indirect APE was defined initially as a 1-mile area extending around all sides of the direct APE that contained approximately 13,000 acres. This definition was included by the BLM in its initial consultation letter to the SHPO dated August 21, 2014 (Wakefield 2014), and the SHPO concurred (Roland-Nawi 2014). However, during subsequent government-to-government consultation between BLM archaeologists and interested tribal representatives, concerns were expressed over potential effects of the DQSP on two sites containing rock art and ceremonial features that are listed in the NRHP (George Kline, personal communication 2015), and the indirect APE was expanded to 18,060 acres to include those resources (see Figure 1.2).

No resources listed in or eligible for listing in the NRHP were located within the indirect APE as defined initially; however, two NRHP-listed resources, P-33-000504 and P-33-000773,[1] listed in the NRHP as the

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[1]Resources mentioned in this report are identified by several numbering systems. Generally, previously recorded sites are depicted on maps and listed in text and tables by their primary numbers, which consist of the letter P (for the Primary Record of the California Department of Parks and Recreation (DPR) recordation forms (DPR 523 series), the two-digit code for the relevant county, and sequentially assigned six-digit numbers (e.g., P-33-000010 refers to the tenth primary number assigned in Riverside County). Archaeological sites may also be listed by a trinomial designation. The trinomial consists of the two-letter code CA (for California), the three-letter code for the relevant county, and a sequentially assigned number (e.g., CA-RIV-3 refers to the third trinomial assigned in Riverside County). In addition, a suffix that indicates the presence of "prehistoric" or "historical-period" materials at a recorded property may be included. The lack of a suffix on a trinomial indicates the presence of exclusively prehistoric materials, the suffix H indicates the presence of exclusively historical-period materials, and the suffix /H indicates the presence of

Mule Tank Discontiguous Rock Art District, are located within the revised indirect APE, both located more than 1 mile from the DQSP boundary and the direct APE. Potential cumulative effects of the DQSP and other previous projects in the region on these resources are considered in this study.

Personnel Qualifications

All SRI personnel who worked on the project, including prehistoric and historical archaeologists, ethnographers, and geoarchaeologists, meet the Secretary of the Interior's Professional Qualifications Standards in their respective disciplines. The personnel involved with the implementation of this project have extensive experience in the region and have worked on a number of large renewable-energy projects across the western United States. SRI staff who contributed to the study are listed in Table 1.1, along with their qualifications, experience, and contributions to the study.

The professional staff responsible for conducting and reporting the archaeological field survey was assisted by specialists in SRI's Cartography and Geospatial Technologies department and support staff in its Publications and Accounting departments.

Table 1.1. Project Personnel and Qualifications

Name and Qualifications	Years of Experience	Role	Contribution to the Study
Michael K. Lerch, M.A., RPA	36	research director; senior principal investigator (archaeology and ethnography)	senior editor and coauthor of all chapters and appendixes
Mark Q. Sutton, Ph.D., RPA	48	principal investigator (prehistoric archaeology)	coauthor of Chapters 2 and 3
Karen K. Swope, Ph.D., RPA	31	principal investigator (historical archaeology)	coeditor and coauthor of Chapters 2–5
Scott H. Kremkau, Ph.D., RPA	20	principal investigator	coauthor of Chapters 1–3 and 5
Patrick B. Stanton, M.A., RPA	14	project director	field director of field survey, coeditor and coauthor of Chapters 4 and 5 and Appendixes B–E
Dean M. Duryea, Jr., M.A., RPA	9	crew chief	crew chief for field survey, coauthor of Chapter 4
Jason D. Windingstad, M.S.	15	geoarchaeologist	coauthor of Chapters 2 and 4 and Appendix A
Carly Whelan, Ph.D.	10	project director	coauthor of Chapter 2
Tim M. Mills, Ph.D., RPA	12	ethnobotanist	coauthor of Chapter 2
James J. Clark, M.A., RPA	19	project manager	coordinator of all staffing and field logistics

Key: RPA = Registered Professional Archaeologist.

prehistoric and historical-period materials. Some archaeologists also use the suffix T to denote trail sites. Isolated archaeological resources and architectural resources are listed by primary number only. Finally, newly recorded sites are listed by their field numbers, which are indicated in this report as "SRI-*nnnn*." Primary numbers and trinomials for the newly recorded sites and isolates have been added to the master table of sites shown in Appendix B.

Organization of the Report

Prior to conducting the field survey reported here, SRI prepared an ethnographic literature review of the project area and the surrounding region (Kremkau, Whelan, et al. 2014) and a research design and work plan (Kremkau, Stanton, et al. 2014). The purpose of the ethnographic literature review, presented here in Chapter 2, was to identify Native American groups that might have traditional cultural properties (TCPs) in or near the project area, places of cultural or spiritual significance to Native American tribes, and/or important Native American resource-gathering locations that might be affected by the proposed project. The research design and work plan document included an overview of the natural and cultural setting of the project area, also presented here in Chapter 2, and contained a research design, presented here in Chapter 3, which serves as the theoretical and methodological foundation for the Class III archaeological inventory.

The results of a records search conducted at the California Historical Resources Information System (CHRIS) Eastern Information Center (EIC) at the University of California, Riverside, are contained in Chapter 4, followed by the results of the current archaeological survey and a geoarchaeological buried-site sensitivity model. The fieldwork was conducted pursuant to fieldwork authorization 66.66-15-02 issued by the BLM Palm Springs Field Office under SRI's BLM Permit No. CA-13-06.

The report concludes with an evaluation of the identified archaeological resources found within the direct APE for their eligibility for listing in the NRHP. Following the body of the report are appendixes containing detailed soil descriptions (Appendix A) and a table of evaluations for NRHP eligibility (Appendix B), along with a list of references cited. A compact disc contains a separate, confidential, volume with appendixes for archaeological site location maps (Appendix C) and California Department of Parks and Recreation (DPR) 523 forms for all identified archaeological sites and isolates (Appendixes D and E, respectively). The confidential appendixes contain sensitive information and are not intended for public distribution.

CHAPTER 2

Background Information

Scott H. Kremkau, Tim M. Mills, Mark Q. Sutton, Carly Whelan, Karen K. Swope, Jason D. Windingstad, and Michael K. Lerch

In this chapter, we provide background information on the environmental and cultural settings of the study area, followed by a summary of ethnographic literature pertaining to the Native American groups who have lived in the area and used its resources, including the Cahuilla, Chemehuevi, Mojave, Halchidhoma, and Quechan. We also review the historical-period uses of the area, with a focus on mining, transportation, settlement and agriculture, and military activities.

Environmental Setting

The DQSP is located on the western side of the Colorado River, above the Palo Verde Valley (see Figure 1.1). The region is part of the Colorado Desert geomorphic province, an area that includes both sides of the lower Colorado River and Coachella and Imperial Valleys of California (Jenkins 1980).

High temperatures during the summer months average between 38°C (100°F) and 43°C (109°F). During the winter, the mean temperature falls to about 21°C (70°F) during the day, with lows reaching near 4°C (40°F) at night. However, summer temperatures may reach as high as 46°C–49°C (115°F–120°F) for short durations. Average annual precipitation in the area is 9.1 cm (3.6 inches); most of this falls between December and March (WorldClimate.com 2012), but there are occasional summer thunderstorms in August and September. Such single-event thunderstorms can result up to 15.2 cm (6 inches) of rainfall in a short period of time and result in flash floods that can alter normal drainage patterns.

Geology

The DQSP is located in the Colorado Desert, west of the Colorado River—more specifically, on Palo Verde Mesa, along the western edge of the Palo Verde Valley (see Figure 1.2). Elevations on the project site range from 110 to 145 m (330 to 475 feet) above mean sea level. The Colorado Desert lies mostly within southeastern California but extends into western Arizona and northern Mexico. It is characterized by low elevations, hot summers, warm winters, and low precipitation. The Palo Verde Mesa is one of a number of ancient river terraces associated with the Pleistocene course of the Colorado River. Several steep-sided ridges are located just above the floodplain and provide sources of lithic materials, including both igneous and metamorphic rocks. Because of the nature of the geology and soils within the project area, there is potential for buried resources to be present. Buried resources may be found in distal alluvial-fan deposits and beneath aeolian sand deposits and dunes. Further information regarding buried-site sensitivity can be found in Chapter 4.

The Colorado River, which forms the border between California and Arizona, originates in the Rocky Mountains and flows generally south through the southwestern Unites States and into the Gulf of California, in Mexico. As the river flows south from the Colorado Plateau, it enters a shallow valley where it forms a broad floodplain (Jahns 1954) that can reach up to 18 km in width. Much of the floodplain has been converted to farmland, but before recent development, the area formed a large wetland that would have been home to a variety of flora and fauna. The river bottom also was used by the late prehistoric and ethnographic inhabitants of the region to practice floodplain agriculture that focused on maize, beans, squash and gourds, and melons, among other plants (Castetter and Bell 1951:97–130).

Flora

The Colorado Desert is generally considered the western extension of the Sonoran Desert and corresponds to the Lower Colorado Valley subdivision of the Sonoran Desert (Shreve 1951). Overall, the vegetation of the Colorado Desert is considerably more diverse than in the Mojave Desert to the north. This is, in part, a result of the lack of freezing temperatures, which allows frost-sensitive and arboreal species to survive. A bimodal rainfall pattern, which produces summer precipitation, is also responsible for elevated levels of seasonal annuals. Summer precipitation varies significantly from west to east, with Shreve having reported that summer rainfall increases from approximately 5 percent of the total on the western edge to 43 percent at the Colorado River and 50 percent at Tucson, Arizona.

An interrelationship with the westerly sections of the Sonoran Desert is obvious, although large succulent species of Arizona are conspicuously absent. The most widespread vegetation community is Desert Scrub. The southern version typically includes a wider range of other plants, in addition to creosote bush. More than half of the desert's plant species are herbaceous annuals, and appropriately timed winter rains produce abundant early spring wildflowers. In the southern portion of the region, the additional moisture supplied by summer rainfall promotes the germination of summer annuals. Schoenherr and Burk (2007) proposed seven distinct plant communities within the Colorado Desert: (1) Creosote Bush Scrub; (2) Cactus Scrub; (3) Saltbush Scrub; (4) Alkali Sink; (5) Microphyll Woodland; (6) Palm Oasis; and (7) Psammophyte Scrub. These are based on assemblages of species with similar adaptive strategies, but they basically delineate microclimatic boundaries and soil types, with soil salinity also being a major contributor.

Much of the region's flora evolved out of Madro-Tertiary sclerophyllous and microphyllous shrub (Raven and Axelrod 1978; Brown 1982). Subsequent to the Eocene, dry climates expanded, culminating in the greatest severity during the Pliocene. By the close of the Tertiary period, the major families, genera, and species of the Colorado Desert were in place; however, there have been significant biogeographic shifts in terms of both elevation and latitude. Pleistocene winter climates were prohibitive for much of the subtropical taxa characteristic of the southern Sonoran Desert, and during the early Holocene, xeric pinyon-juniper woodlands expanded into areas presently under a dominant summer monsoon rainfall pattern. Further reductions in annual and summer rainfall resulted in the present assemblages of diverse subtropical and warm-temperature scrub communities in the middle–late Holocene.

Brown (1982:12) delineated a lower Colorado River Valley subdivision to the Sonoran Desert that is functionally equivalent to the Colorado Desert, stating that the subdivision plays a central role in the overall Sonoran Desert, because it alone is in contact with all of the various subdivisions of the desert, as well as Mohave and California coastal scrub. Plant growth in this region is typically open and broken as a result of intense competition for scarce water resources. Vegetation patterns are frequently tied to closed or dendric drainageways offset by contravening interfluves. A high percentage of arboreal species within these drainages are aphyllous or microphyllous or carry the chlorophyll in or beneath the bark or stems. In more-arid areas, perennial plants are often absent, having been replaced by ephemeral species that survive by taking advantage of summer rainfall.

Table 2.1 shows a list of 125 taxa that have been previously identified within the project area. Many of these plants were used for food or were considered medicinal or therapeutic by the prehistoric inhabitants of the area (Lerch et al. 2013; for a more detailed discussion, see sources such as Bean and Saubel 1972; Castetter and Bell 1951; Forde 1931; Lawlor 1995). In total, 27 families are represented on the list. Particularly noteworthy are relatively large numbers of species in the Asteraceae, Boraginaceae, Chenopodiaceae, and Fabaceae families. Asteraceae are generally herbaceous, with a distribution mainly within arid and semiarid regions of subtropical and lower temperate latitudes and, from an economic perspective, Asteraceae is an economically important family. Members provide products such as cooking oils, greens, seeds, sweetening agents, and herbal infusions. Chenopodiaceae provide edible seeds. Boraginaceae hold astringent properties, whereas others are mucilaginous and useful for their emollient properties. Many contain volatile oils and may serve as an antidote to poisons by functioning as diaphoretics. Fabaceae is a large and economically important family that includes trees, shrubs, and herbaceous perennials or annuals, including the desert staple of honey mesquite (*Prosopis glandulosa*). Their preference for semiarid to arid habitats is closely correlated with their ability to colonize barren and marginal lands and fix atmospheric nitrogen via a symbiotic association with nodulating bacteria. Many species are used as staple foods, and their use, in general, is closely tied to the development of late agricultural societies in both the Old and New Worlds. Also important in this area are members of the Agavaceae and Cactaceae families, which provide geophytes, such as desert lily (*Hesperocallis undulata*), and edible cactus and cholla buds. Conspicuously absent are large numbers of families of annual monocots. Although the reasons for this remain unclear (Raven and Axelrod 1978:7), California does not typically have a high proportion of monocot species, with only about 85 species present (9 *Juncus*, 13 Cyperaceae, and 63 Poaceae) (Raven and Axelrod 1978:7). This stands in sharp contrast to the desert regions farther east, where in many areas, annual and perennial grasses either dominate or are closely integrated with desert scrub (Burgess 1995).

Fauna

A number of desert animals inhabit the greater Colorado Desert, including mammals, such as desert bighorn sheep (*Ovis canadensis nelsoni*), desert mule deer or burro deer (*Odocoileus hemionus eremicus*), coyotes (*Canis latrans*), gray foxes (*Urocyon cinereoargenteus*), kit foxes (*Vulpes macrotis*), various mouse species (*Peromyscus* spp. and *Perognathus* spp.), squirrels (*Citellus* spp. and *Spermophilus* spp.), and lagomorphs (*Lepus californicus* and *Sylvilagus audubonii*); reptiles, including rattlesnakes (*Crotalus* spp.), desert tortoise (*Gopherus agassizii)* and a variety of lizards (*Crotaphytus* spp., *Dipsosaurus* spp., *Sceloporus* spp., *Streptosaurus* spp., and *Urosaurus* spp.); and birds, such as turkey vultures (*Cathartes aura*), red-tailed hawks (*Buteo jamaicensis*), mourning doves (*Zenaida macroura*), and ravens (*Corvus corax*). From prehistory through the early twentieth century, pronghorn (*Antilocapra americana*) were present in parts of the desert, such as the Coachella Valley, but they have since been pushed out by modern development (Jaeger 1965).

The presence of the Colorado River also provided people with access to additional aquatic species not available elsewhere in the deserts. These include shellfish, such as the freshwater mussel (*Anodonta dejecta*), and a variety of other fish species, such as the humpback sucker (*Xyrauchen texanus*), the Colorado River bonytail chub (*Gila elegans*), the Colorado pikeminnow (*Ptychocheilus lucius*), the striped mullet (*Mugil cephalus*), and the desert pupfish (*Cyprinodon macularius*). Waterfowl include the great blue heron (*Ardea herodias*) and American coot (*Fulica americana*), as well as a variety of ducks and geese (Schoenherr 1992).

Table 2.1. Plant Taxa Identified within the Project Area

Scientific Name	Family	Abundance
Abronia villosa	Nyctaginaceae	common
Achyronychia cooperi	Caryophyllaceae	occasional
Acmispon strigosus	Fabaceae	common
Allionia incarnata	Nyctaginaceae	occasional
Ambrosia dumosa	Asteraceae	common
Ambrosia salsola	Asteraceae	scarce
Aristida adscensionis	Poaceae	occasional
Aristida oligantha	Poaceae	scarce
Asclepias subulata	Apocynaceae	scarce
Astragalus aridus	Fabaceae	locally common
Astragalus didymocarpus	Fabaceae	occasional
Astragalus insularis var. *harwoodii*	Fabaceae	locally common
Astragalus nuttallianus var. *imperfectus*	Fabaceae	locally abundant
Atriplex canescens	Chenopodiaceae	scarce
Atriplex polycarpa	Chenopodiaceae	scarce
Baileya pauciradiata	Asteraceae	occasional
Bebbia juncea	Asteraceae	scarce
Boerhavia triquetra var. *intermedia*	Nyctaginaceae	locally common
Boerhavia wrightii	Nyctaginaceae	common
Bouteloua aristidoides	Poaceae	occasional
Bouteloua barbata	Poaceae	occasional
Brassica tournefortii[a]	Brassicaceae	common/locally abundant
Calycoseris wrightii	Asteraceae	occasional
Caulanthus lasiophyllus	Brassicaceae	occasional
Chaenactis carphoclinia	Asteraceae	occasional
Chaenactis stevioides	Asteraceae	abundant
Chenopodium album[a]	Chenopodiaceae	scarce
Chenopodium murale[a]	Chenopodiaceae	scarce
Chorizanthe brevicornu	Polygonaceae	occasional
Chorizanthe corrugata	Polygonaceae	occasional
Chorizanthe rigida	Polygonaceae	occasional
Chylismia brevipes	Onagraceae	scarce
Chylismia claviformis ssp. *aurantiaca*	Onagraceae	common
Croton californicus	Euphorbiaceae	scarce
Cryptantha angustifolia	Boraginaceae	abundant
Cryptantha costata	Boraginaceae	occasional
Cryptantha maritima	Boraginaceae	occasional
Cryptantha micrantha	Boraginaceae	occasional
Cryptantha nevadensis	Boraginaceae	scarce
Cryptantha pterocarya var. *pterocarya*	Boraginaceae	scarce
Cylindropuntia echinocarpa	Cactaceae	scarce
Cynodon dactylon[a]	Poaceae	scarce

Scientific Name	Family	Abundance
Dalea mollis	Fabaceae	occasional
Dalea mollissima	Fabaceae	occasional
Dicoria canescens	Asteraceae	occasional
Ditaxis neomexicana	Euphorbiaceae	scarce
Dithyrea californica	Brassicaceae	occasional
Encelia farinosa	Asteraceae	scarce
Encelia frutescens	Asteraceae	scarce
Eremalche exilis	Malvaceae	occasional
Eremalche rotundifolia	Malvaceae	scarce
Eremothera boothii	Onagraceae	occasional
Eriastrum harwoodii	Polemoniaceae	scarce
Eriogonum inflatum	Polygonaceae	scarce
Eriogonum pusillum	Polygonaceae	scarce
Eriogonum reniforme	Polygonaceae	scarce
Eriogonum thomasii	Polygonaceae	occasional
Eriogonum trichopes	Polygonaceae	occasional
Erodium texanum	Geraniaceae	common
Eschscholzia minutiflora	Papaveraceae	scarce
Eschscholzia parishii	Papaveraceae	scarce
Eucalyptus sp.[a]	Myrtaceae	scarce
Euphorbia abramsiana	Euphorbiaceae	scarce
Euphorbia micromera	Euphorbiaceae	common
Euphorbia polycarpa	Euphorbiaceae	common
Euphorbia setiloba	Euphorbiaceae	occasional
Ferocactus cylindraceus	Cactaceae	scarce
Funastrum cynanchoides	Apocynaceae	scarce
Funastrum hirtellum	Apocynaceae	scarce
Funastrum utahense	Apocynaceae	scarce
Geraea canescens	Asteraceae	common
Hesperocallis undulata	Agavaceae	common
Hilaria rigida	Poaceae	locally common
Kallstroemia californica	Zygophyllaceae	common/locally abundant
Krameria bicolor	Krameriaceae	occasional
Larrea tridentata	Zygophyllaceae	common/dominant shrub
Langloisia setosissima ssp. *setosissima*	Polemoniaceae	scarce
Lepidium lasiocarpum var. *lasiocarpum*	Brassicaceae	common
Loeseliastrum schottii	Polemoniaceae	occasional
Lupinus arizonicus	Fabaceae	scarce
Malacothrix glabrata	Asteraceae	occasional
Mammillaria tetrancistra	Cactaceae	scarce
Marina parryi	Fabaceae	occasional
Mentzelia albicaulis	Loasaceae	occasional

continued on next page

Scientific Name	Family	Abundance
Mentzelia longiloba	Loasaceae	occasional
Monoptilon bellioides	Asteraceae	occasional
Nama demissum	Boraginaceae	scarce
Oenothera deltoides	Onagraceae	common/locally abundant
Oenothera primiveris	Onagraceae	scarce
Oligomeris linifolia	Resedaceae	occasional
Olneya tesota	Fabaceae	scarce
Palafoxia arida	Asteraceae	occasional
Parkinsonia florida	Fabaceae	scarce
Pectis papposa	Asteraceae	common/locally abundant
Pectocarya heterocarpa	Boraginaceae	common
Pectocarya platycarpa	Boraginaceae	common
Pectocarya recurvata	Boraginaceae	scarce
Perityle emoryi	Asteraceae	scarce
Phacelia crenulata var. *ambigua*	Boraginaceae	occasional
Phacelia crenulata var. *crenulata*	Boraginaceae	occasional
Phacelia crenulata var. *minutiflora*	Boraginaceae	occasional
Phacelia ivesiana	Boraginaceae	scarce
Plagiobothrys jonesii	Boraginaceae	scarce
Plantago ovata	Plantaginaceae	common
Proboscidea althaeifolia	Martyniaceae	occasional
Prenanthella exigua	Asteraceae	scarce
Polygonum aviculare ssp. *depressum*[a]	Polygonaceae	scarce
Prosopis glandulosa	Fabaceae	scarce
Psathyrotes ramosissima	Asteraceae	scarce
Psorothamnus emoryi	Fabaceae	occasional
Rafinesquia neomexicana	Asteraceae	common
Salsola tragus[a]	Chenopodiaceae	occasional/locally abundant
Schismus barbatus[a]	Poaceae	common/widespread
Sphaeralcea angustifolia	Malvaceae	scarce
Stephanomeria exigua	Asteraceae	occasional
Stephanomeria pauciflora	Asteraceae	occasional
Stillingia spinulosa	Euphorbiaceae	scarce
Stipa hymenoides	Poaceae	occasional
Streptanthella longirostris	Brassicaceae	occasional
Tamarix ramosissima[a]	Tamaricaceae	scarce
Tidestromia suffruticosa var. *oblongifolia*	Amaranthaceae	scarce
Tiquilia palmeri	Boraginaceae	scarce
Tiquilia plicata	Boraginaceae	locally common
Tribulus terrestris[a]	Zygophyllaceae	scarce

Sources: Quartzite Fall 2012 and Spring 2013 Plant List. In: Draft Biological Resources Technical Report, Desert Quartzite Solar Project, Riverside County, California, Appendix F (January 2014). BLM Case File CACA-43937. Prepared by Ironwood Consulting, Inc. On file, First Solar, Inc.
Note: All nomenclature conforms to Baldwin et al. 2012.
[a] Nonnative taxa.

Cultural Setting

The cultural setting of the study area included three prehistoric periods, which culminated in the ethnographic cultures of the lower Colorado River region at the time of historic contact. Following a review of the Native American cultures of the study area, we summarize historical-period land uses.

Prehistoric Background

The prehistory of the Colorado Desert is poorly understood, although a number of recent studies have greatly improved our knowledge. Treatments of the region include the classic works of Rogers (1939, 1945, 1966), von Till Warren et al. (1981), Warren (1984), and more-recent studies by Schaefer (1994a), Love and Dahdul (2002), and Schaefer and Laylander (2007). Schaefer (1994a) defined three principal prehistoric periods: the Paleoindian, Archaic, and Patayan (see also Love and Dahdul 2002); this sequence is generally followed below.

The Paleoindian Period (12,000–8500 B.P.)

Paleoindian groups, probably with Clovis complex technology, occupied much of California beginning about 12,000 B.P. There is very little evidence of a Paleoindian occupation of the Colorado Desert, although there are notable exceptions, such as a Paleoindian fluted point found recently at CA-RIV-11733 near Ford Dry Lake in Chuckwalla Valley (George E. Kline, personal communication 2015) and another fluted point discovered at CA-RIV-23891 north of the project area in the McCoy Mountains (Kline 2014). The reasons for this are unclear but may be related to a lack of habitat for the large game hunted by Clovis people. More evidence of occupation of the desert region during this early period is coming to light, however. Very recent surveys for solar development in the project region have identified fluted and stemmed points and artifact assemblages mirroring those of the Pinto Basin in Joshua Tree National Park (George E. Kline, personal communication 2015; Newland 2013:39–40).

Across much of western North America, the Clovis complex developed into the Western Stemmed Point tradition or Western Pluvial Lakes tradition after 10,000 B.P. (Bedwell 1973), probably in response to the warming and drying climate of the early Holocene. This transition marked the beginning of the Archaic period, the post-Paleoindian/pre-farming period in the Colorado River region.

The Archaic Period (8500–1500 B.P.)

The Archaic period is associated with western Arizona and the Colorado River region and begins about 8500 B.C. and lasts until ca. A.D. 500, when agriculture became the dominant subsistence system along the Colorado River. The Archaic period has been called the San Dieguito tradition (Cordell 1997:93), although this term should only be applied to specific early Archaic period materials from southern California (e.g., Sutton 2013; Sutton et al. 2007). The basic early–middle Archaic period chronology used for portions of California and much of the Great Basin (Sutton et al. 2007; Warren 1984) is used here, divided into three sequential complexes: Lake Mojave, Pinto, and Gypsum; none of these is well represented in the project area. However, recent investigations at the Genesis Solar Power Project near Ford Dry Lake west of the project area have yielded projectile points characteristic of the both Lake Mojave and Pinto complexes (George E. Kline, personal communication 2015).

The earliest of the Archaic period complexes was originally called San Dieguito (Rogers 1939, 1958, 1966) but is now commonly called the Lake Mojave complex for the southern California deserts (Sutton 2013; Warren 1984). The Lake Mojave complex (ca. 10,000–8000 B.P.) is associated with late Pleistocene/early Holocene lakeshores and is characterized by crescents and large stemmed, shouldered, and lanceolate points (Sutton et al. 2007), with an economy presumably based on the exploitation of lacustrine resources plus terrestrial plants and animals (see Warren 1984). There is little evidence of a Lake Mojave complex presence near the project area, as Lake Mojave complex groups were probably just a few "small, mobile bands exploiting small and large game and collecting seasonally available wild plants" (Schaefer 1994a:63; see also Schaefer and Laylander 2007). However, two examples of Lake Mojave points have recently been identified at the Genesis Solar Power Project near Ford Dry Lake (George E. Kline, personal communication 2015).

The Pinto complex (ca. 8500–5000 B.P.) seems to have developed from, and with, the Lake Mojave complex, but it appears to have had a different subsistence focus, perhaps on large game (e.g., mountain sheep) rather than lacustrine resources. There may be an occupational hiatus between the Pinto complex and the later Gypsum complex, perhaps between ca. 5000 and 4000 B.P., when conditions became hotter and drier in the region (Sutton et al. 2007). The Pinto complex is poorly known in the region, as it is elsewhere in the West.

After ca. 4000 B.P., the Gypsum complex begins, as environmental conditions in the deserts improved and the Colorado Desert apparently was reoccupied (Love and Dahdul 2002; Schaefer 1994a:64). The new occupants brought with them a new settlement system (sites near streams) and new point types (Gypsum and Elko). Subsistence strategies included the exploitation of deer, mountain sheep, rabbits, and rodents, and there is evidence of increases in trade and social complexity. The Gypsum complex was followed by the Patayan period, when agriculture became the dominant subsistence activity.

One of the best-documented Archaic period sites in the Colorado Desert is the Indian Hill Rockshelter, located near Anza-Borrego State Park (McDonald 1992; Wilke et al. 1986), approximately 150 km southwest of the project area. Excavators found a number of rock-lined storage pits, as well as hearths and Elko Eared projectile points. Radiocarbon dates indicated that the site was occupied approximately 4,000 years ago. McDonald (1992) postulated that this was a base camp for hunter-gatherers who likely roamed over a large area in search of food. A rockshelter from Tahquitz Canyon also contained rock-lined pits and similar artifacts, but no radiocarbon dates were obtained at the site, so its true age remains unknown (Schaefer 2002). Taken together, these sites suggest that people lived in highly mobile bands and took advantage of a variety of resources in the area.

The Patayan Period (1500-200 B.P.)

The groups that occupied the lower Colorado River region during late prehistory were the direct ancestors of the ethnographic Mojave, Quechan, and Halchidhoma, known collectively as the River Yumans (Stewart 1983a). Most researchers believe that these prehistoric people, called the Patayan (also known as Yuman [Rogers 1945] or Hakataya [Schroeder 1957, 1979; see also Warren 1984]), formed from relatively small hunting and gathering bands living along the edges of the Colorado River beginning ca. 1500 B.P. (Bee 1983; Stewart 1983a). The Patayan chronology includes a preceramic period (Rogers 1945:170; Warren 1984; Waters 1982a, 1982b) and three ceramic periods, Patayan I, II, and III. Patayan I (ca. 1500–1000 B.P.) is marked by the introduction of both pottery and agriculture, although hunting and gathering remained important. During Patayan II (ca. 1000–500 B.P.), farming had become central, although hunting, gathering, and fishing remained important. Patayan III (ca. 500–100 B.P.) is generally the time after European contact.

After ca. 1000 B.P. (Patayan II), the long-distance trade networks that connected the Patayan and their neighbors to the east and west were firmly established. The tribes that lived in and near the project area had a complex system of trails. Some of these trails, such as the Coco-Maricopa Trail, were part of long-distance exchange networks that connected the tribes within the project area with the wider world. Other trails led to mountains, canyons, or other important or sacred sites (Bean and Vane 1978:6-40).

During the late prehistoric period, there was a significant increase in human occupation of the region, supported by the increase in agriculture. It is during this time that the intaglios, or geoglyphs, found throughout the Lower Colorado River area were probably built (Ezzo 1994; Ezzo and Altschul 1993). Intaglios are images created on the ground surface by the removal of the darker-colored surface layer to expose a lighter-colored soil layer beneath (von Werlhof 1995). Several groupings of intaglios are known between Blythe and the mouth of the Gila River (Ezzo 1994; Ezzo and Altschul 1993), and others are present at CA-RIV-773 located within the indirect APE of the DQSP on the northern Mule Mountains *bajada* (George E. Kline, personal communication 2015). Often, these intaglios mark sacred locations. Ceremonies were conducted at these places to commemorate mythic events and the beings and ancestors who took part in them (Bourke 1889; Johnson n.d.). Intaglio locations often also contain dance circles and dance paths (Kroeber 1925).

Ethnographic Background

The area along the Colorado River has been home to a number of Native American groups for thousands of years. Five main groups, belonging to two different language families, were present in or near the project area at the time of European contact: the Cahuilla and Chemehuevi of the Northern Uto-Aztecan (NUA) language family and the Mojave, Halchidhoma, and Quechan of the Yuman language family (Goddard 1996:Table 3; Golla 2011:117–122, 178–183) (Figure 2.1). The three Yuman-speaking groups—the Mojave, Halchidhoma, and Quechan—are sometimes collectively referred to as the River Yumans, as they share a number of cultural elements. The following section discusses each of the five tribes, presenting information on settlement and subsistence practices, sociopolitical organization, material culture, trade, conflict, and worldview and ritual practice.

Ethnographic Sources from the Colorado Desert

The ethnographic literature review builds on a large volume of data. A number of ethnographic studies have been conducted along the Colorado River and in the Colorado Desert and southwestern Arizona. These studies can broadly be divided into two types: (1) academic studies of Native American tribes and (2) studies used to provide assistance to state and federal agencies in developing land-management regulations and programs.

Academic Studies

Several academic studies of the five Native American tribes that live, or lived, near the project area—the Cahuilla, the Chemehuevi, the Mojave, the Halchidhoma, and the Quechan—were undertaken during the late nineteenth and early twentieth centuries, as well as more recently. Descriptions of Cahuilla culture from the early twentieth century include Barrows (1900) and Hooper (1920). Barrows was an ethnobotanist and explored the Cahuilla's extensive use of plants, whereas Hooper provided a broad ethnographic overview. More recently, Bean and his colleagues have presented a number of studies tackling a variety of subjects related to the Cahuilla. Bean (1972, 1978) provided summaries of Cahuilla lifeways and explored various aspects of leadership (Bean 1964). Bean and Saubel (1972) built upon the groundbreaking work of Barrows and provided additional information on Cahuilla plant use.

A number of ethnographic studies provide information on the Chemehuevi, the most thorough of which are by Euler (1966), Kelly (1934, 1936), Laird (1976), Powell (Fowler and Fowler 1971), and Roth (1976). Powell described some of the tribes he encountered during his exploration of the Grand Canyon area (Fowler and Fowler 1971). Laird was married to a Chemehuevi man, George Laird, and her memoirs (Laird 1976) provide an insider's view of many aspects of Chemehuevi society. She also published papers on the oral tradition and religious beliefs of the Chemehuevi (Laird 1974, 1980, 1984).

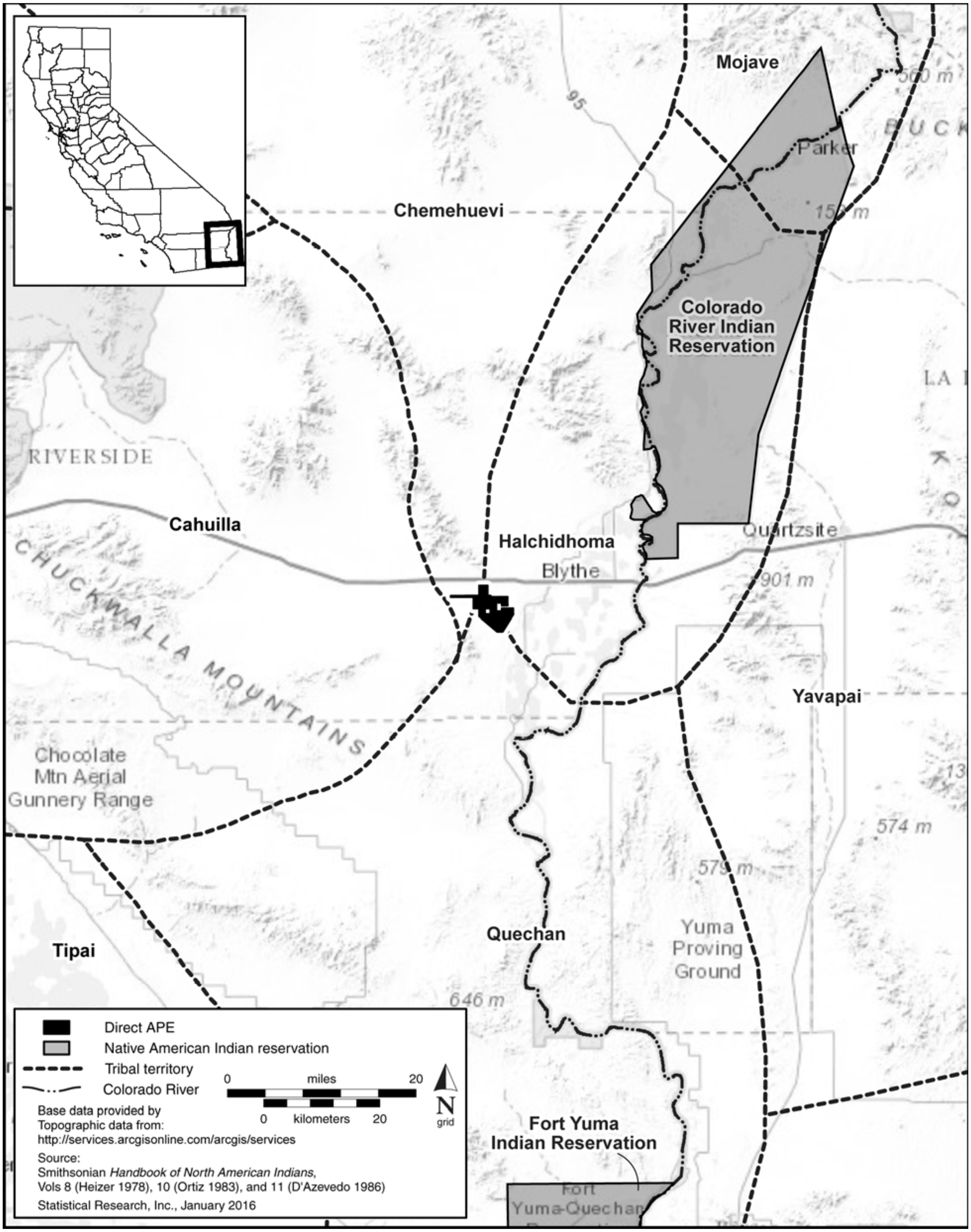

Figure 2.1. Territories of Native American groups living in the project region, ca. 1825, before the Halchidhoma were expelled in 1826.

Several ethnographic studies exploring a wide variety of topics have been published on the Mojave, including overviews by Kroeber (1920, 1943, 1948, 1972, 1974), Spier (1933, 1936, 1953, 1955), and Stewart (1968a), studies of belief systems (Devereux 1937, 1941, 1948, 1950, 1951, 1956, 1957, 1961; Stewart 1970, 1973, 1974a, 1974b, 1977; Wallace 1947a, 1947b, 1948), political organization and territoriality (Sherer 1965, 1966, 1967; Stewart 1947a, 1947b, 1969) and subsistence (Stewart 1947c, 1957, 1965, 1966, 1968b; Wallace 1953, 1955).

There is relatively little direct information on the Halchidhoma. One of the most authoritative discussions is from Spier (1933), based on interviews with a man named Kutox, who was of Halchidhoma ancestry. Kutox was born approximately 25 years after the Halchidhoma were forced from their lands along the Colorado River and was living on the Maricopa reservation in Arizona.

The earliest studies of the Quechan date to the late nineteenth century (Trippel 1889), but Forde's (1931) study provides the most in-depth descriptions of Quechan lifeways at the time of European contact. More-recent studies by Bee (1963, 1967, 1970, 1981, 1982) and Castetter and Bell (1951) examined elements of Quechan social organization and ethnobotany, respectively. Important information also has been provided by Forbes (1965).

In addition to specific studies of individual tribes, regional overviews have also been published. One of the most detailed is Kroeber's (1925) *Handbook of the Indians of California*, which devoted several sections to River Yuman groups and their neighbors. Strong (1929) reviewed many aspects of tribes across southern California, but except for the Cahuilla, none of those is discussed here. The Smithsonian's *Handbook of North American Indians* has volumes devoted to the American Southwest (Ortiz 1983), California (Heizer 1978), and the Great Basin (d'Azevedo 1986), and the studies in all volumes have provided excellent summaries of all of the tribes in and near the project area (see Bean 1978; Bee 1983; Harwell and Kelly 1983; Stewart 1983a, 1983b). Laylander (2001) explored two oral stories that were common across much of southern California and southwestern Arizona.

Land Management Studies

In addition to the academic studies described above, ethnographic overviews of extensive areas of southern California and southwestern Arizona have been undertaken as parts of large, interstate construction projects and to assist government agencies with managing public land resources. Several such studies have examined the area around the project area. Bean and Vane (1978) provided ethnographic overviews for all of the tribes in and around the project area for the construction of the Devers–Palo Verde High Voltage Transmission Line. In addition to the overview, Bean and Vane interviewed members of the tribes in the project area regarding concerns over impacts by the project, including threats to sensitive areas. As Cultural Systems Research, Inc. (CSRI), Bean and Vane completed a similar study for the California Low-Level Radioactive Waste Disposal Project (CSRI 1987). Two potential disposal locations, at Palen and Ford dry lakes, are located northwest of the project area. As with Bean and Vane's Devers–Palo Verde ethnographic study, the CSRI study was based on interviews with members of several tribes in southern California to understand tribal concerns about the impact of the project.

The BLM California Desert District prepared a cultural resource overview of areas then defined as the Colorado Desert Planning Units for California Desert Plan (von Till Warren et al. 1981). The BLM Yuma District, which administers the land along the Colorado River, including the portion of the Colorado River floodplain in California, has developed guidelines for managing cultural resources along the river (Stone 1991). This includes land just east of the project area. More recently, SWCA Environmental, Inc., completed a cultural resource overview of the Riverside East SEZ (Millington et al. 2013). The Riverside East SEZ contains approximately 202,000 acres of BLM land within Riverside County that has been designated as land approved for solar-energy development. The overview provides a summary of the prehistoric and historical-period cultural resources within the SEZ.

The Cahuilla

The Cahuilla occupied much of the region west of the project area, including the western Colorado Desert and the northern Peninsula Ranges. The aboriginal group that occupied the western Colorado Desert during the historical period was the Desert Cahuilla, who along with the Mountain and Pass Cahuilla, constituted the ethnographic Cahuilla. They spoke Cahuilla, a language of the Takic branch of NUA, and the Desert Cahuilla spoke a distinct dialect of Cahuilla. The precontact population size of the Cahuilla was approximately 6,000 to 10,000 individuals, based on an estimate of 80 lineages. Today, people of Cahuilla descent with possible ties to the project area are members of the Agua Caliente Band of Cahuilla Indians in Palm Springs, the Augustine Band of Cahuilla Indians in Coachella, the Cabazon Band of Mission Indians in Indio, the Cahuilla Band of Mission Indians in Anza, the Morongo Band of Mission Indians in Banning, the San Manuel Band of Mission Indians in Highland, the Soboba Band of Luiseño Indians in San Jacinto, and the Torres-Martinez Desert Cahuilla Indians in Thermal; all of which are in California (Eargle 2008; Kremkau, Whelan, et al. 2014:Appendix A; Lerch 2013).

Settlement and Subsistence

The Desert Cahuilla exploited a large number of plant species (Barrows 1900; Bean and Saubel 1972), mesquite (*Prosopis* spp.) on the valley floor being the primary staple. Other important resources, such as agave (*Agave desertii*), pinyon (*Pinus* spp.), and acorns (*Quercus* spp.) were obtained in the mountains to the west. More than 150 species of plants were used for food, fibers, medicine, manufactures, and dyes. The Cahuilla exploited a variety of animals, including deer (*Odocoileus* sp.) and mountain sheep (*Ovis canadensis*) from mountain habitats, and smaller animals, such as rabbits and rodents, from desert habitats. Deer, pronghorn antelope, rabbit, small rodents, and birds were available throughout Cahuilla territory.

Large game was typically hunted with bow-and-arrow, sometimes with the aid of blinds or deer-head decoys (Bean 1972:64, 1978:578). Small game was shot with bow-and-arrow, stunned or killed by throwing sticks, or captured with snare, trap, or deadfall. Fishing was carried out with hook and line, nets, basketry traps, spears, bow-and-arrow, and vegetal poisons. Hunting could be an individual or group pursuit, and large groups of people occasionally came together to participate in communal hunts for deer, pronghorn, or rabbits. The Desert Cahuilla also grew a few agricultural crops—corn, beans, and squash—that were probably obtained from native peoples along the Colorado River to the east; crops were irrigated from springs (Wilke and Lawton 1975). With the arrival of Europeans, wheat, melons, barley, and fruit trees were added (Bean and Mason 1962; Lawton and Bean 1968).

The Cahuilla lived in semipermanent villages (Bean 1978:575), but the location and size of villages varied across environmental zones. Availability of water was the most important determinant of settlement, and their villages were usually located next to streams in the foothills, near permanent water sources on the desert floor, or in areas where walk-in wells could be easily dug (Bean 1978:575; Kroeber 1925:617). Thus, most desert villages relied on hand-excavated walk-in wells for water. These wells were dug to a depth of about 6 m to reach the water table. Villages were loose clusters of houses over an area up to 1 km across. Some of the houses were large (e.g., 6 m [20 feet] in length), others were smaller; at least one large ceremonial structure was present in each village (Bean 1972:72). Once established, villages were considered permanent (Bean 1972:74) and were occupied by lineages. Villages were connected to each other by a complex system of trails.

Sociopolitical Organization

The Cahuilla were organized into moieties, clans, and lineages (Bean 1972). The lineages were land-holding groups, each occupying its own village. The adjacent lineage, with its own village, would generally belong to the other moiety. This arrangement served to ensure access to different habitats. Each village was economically independent. Lineages were grouped together to form clans or lineage sets that cooperated in defense, large subsistence undertakings, and ritual activities. The lineage in each village was led by a hereditary village chief. The chief acted as both religious and political leader and was responsible for conducting ceremonial affairs, determining where and when to hunt and gather, collecting goods for communal use, arbitrating disputes, and leading war parties. The chief had an assistant in ceremonial matters who organized rituals and made sure proper protocol was followed. Cahuilla society had no other hereditary positions, although individuals could become diviners, healers, or shamans if they demonstrated skill in these arenas.

Material Culture

Houses and Other Structures

Cahuilla houses were typically dome-shaped structures set over shallow depressions (Bean 1972:72). In coastal and desert areas, houses were thatched with reeds and brush; in the mountains, cedar bark was used, and houses were usually covered with earth. Houses ranged in diameter from 4.5 to 18 m (15 to 60 feet), depending on the number of people living inside. They were primarily used for sleeping and storage, and most daily activities took place outdoors, in the shade of ramadas.

All villages contained a sweathouse, which served as a gathering place for men (Bean 1972:72). They were constructed in the same manner as houses but were typically smaller and oval-shaped. Cahuilla villages contained a large ceremonial house where rituals, curing, and recreation took place. Villages also contained several granaries for storing acorns or mesquite.

Hunting and Gathering Implements

Large game was hunted primarily with bow-and-arrow, whereas small game was taken with curved, flat rabbit sticks; snares; traps; and deadfalls (Bean 1972:64, 1978:578). Fishing was done with hooks, nets, basketry traps, spears, and bow-and-arrow. Cahuilla arrow-shaft straighteners were made from steatite and incised with linear designs having magical connotations and indicating ownership.

Bedrock mortars were used to pound acorns in places with suitable bedrock outcroppings (Bean and Saubel 1972). Where bedrock was not available, portable stone mortars and pestles were used. Hoppers were only used on new, shallow mortars until they became deep enough. The Cahuilla also used portable stone mortars and pestles for grinding acorns and deep wooden mortars and long, slender stone pestles to pound mesquite beans. Seed beaters were used to collect seeds from grasses and other plants, and milling slabs and hand stones were used to grind them. Pinyon nuts were also ground on milling slabs, whereas fruits were pounded in stone or wooden mortars. Desert Cahuilla groups baked agave, yucca, and bulbs in stone-lined, earth-covered ovens.

Baskets, Pottery, and Steatite Vessels

Cahuilla basketry varied in size and shape, depending on its purpose. Small handheld baskets were used for gathering berries and bird eggs; large, round-bottomed baskets for carrying bulkier items; shallow trays for winnowing or parching seeds; large baskets for storage; and globular flat-bottomed baskets for keeping utensils and trinkets.

Pottery was introduced to the Cahuilla by Yuman groups sometime after A.D. 1000 (Rogers 1945:170; Warren 1984; Waters 1982a, 1982b). Cahuilla pottery was an unslipped ware occasionally decorated with linear red or black designs. Vessel forms include cooking pots, small-mouthed jars, bowls, dishes, and pipes.

Miscellaneous Implements

In addition to the implements described above, the Cahuilla used bird-bone and cane whistles; wood rasps; cane flutes; split-stick clappers; rattles of turtle shell, gourd, or deer hooves; and bull-roarers. The Cahuilla also used charmstones, which appear as small, amorphous stones or sometimes as animal effigies.

Trade and Conflict

The Cahuilla were avid traders and exchanged food, utilitarian items, and ceremonial items with their neighbors (Bean 1972:68–70; Bean et al. 1995). Generally, obsidian, furs, hides, nuts, and seeds moved west, whereas shell beads, tourmaline, steatite, asphaltum, sea-otter pelts, and dried fish moved east. The Coco-Maricopa Trail, which passed just north of the direct APE, connected southern California with the Southwest, bringing turquoise, Southwestern pottery, grooved axes, and agricultural products to the region (Bean 1972:74; Bean et al. 1995). Some Cahuilla specialized as traders and traveled as far as Santa Catalina to the west and the Gila River to the east. *Olivella* shell beads were used as a general medium of exchange throughout the region, but barter was also common.

Armed conflict was less frequent among the Cahuilla than their neighbors. Although disputes arose over trespass, theft, sorcery, abduction of women, personal insults, and failure to fulfill ritual obligations, these rarely escalated to the point of violence. In the event of potential conflict, a war council was called to determine whether to go to war. When war occurred, the village chief led the party, followed by warriors and old men, then by women and children who carried food and supplies. Villages allied through marriage ties usually supported one another in such conflicts. Gifts were often sent to neutral villages to enlist their support or entice them to remain neutral.

Worldview and Ritual Practice

The Cahuilla held ceremonies for birth, naming, puberty, marriage, and death, as well as for rainmaking, increasing food crops or animals, and peace making between individuals and groups (Bean 1972; Strong 1929). The most important ceremonies were the annual mourning ceremony, the eagle ceremony, and rites of passage and ceremonies marking changes in status (birth, puberty, marriage, etc.). Young girls typically participated in puberty rituals in which they were “roasted” in warm sand and taught the proper rules of behavior and necessary skills for married life.

The Cahuilla practiced cremation, including destruction of the deceased’s possessions, after several days of ritual wailing and dancing (Kroeber 1925:641−642; Strong 1929). The most significant ceremony, however, was the annual mourning ceremony held in the fall, after the acorn harvest. For the Cahuilla, the ceremony lasted 7 days. On the first day, the ceremonial enclosure was consecrated; this was followed by feasting. Over the next 6 days, men and boys danced in the enclosure while women sat in a circle and sang. The children born during the previous year were given names by the chief. Effigies of the dead were made and decorated with bows and arrows or baskets, depending on their gender. At the end of the ceremonies, the effigies were burned in the ceremonial enclosure along with personal items belonging to the dead (Strong 1929).

In Cahuilla society, shamans were both revered and feared for their ability to cure illness, divine, control natural phenomena, create food, and bewitch others (Bean 1978:581). Shamans acted as guardians during ceremonies and, together with chiefs, exercised political authority over the community at large.

The Chemehuevi

The Chemehuevi are the southernmost group of the Southern Paiute. Prior to the arrival of Europeans, they occupied a large expanse of the Mojave Desert stretching from the Colorado River westward to the Kingston Range, through the Providence Mountains, to about the present boundary of Riverside and Imperial Counties. The Chemehuevi numbered about 350 in 1883; Kroeber (1925:595) estimated that their precontact population size was somewhere between 500 and 800 people, but Bean and Vane (1978:5-20) suggested a much larger population for the Chemehuevi and Las Vegas bands of Southern Paiute combined, at least 13,000. The Chemehuevi stand out from other Southern Paiute groups in that they borrowed many linguistic and cultural elements from their neighbors, particularly the Mojave. People of Chemehuevi descent are affiliated with the Chemehuevi Indian Tribe at Havasu Lake, California, and the Colorado River Indian

Tribes (CRIT), Parker, Arizona, both located along the Colorado River north of the project area (see Figure 2.1), as well as the Twenty-Nine Palms Band of Mission Indians in Coachella, California (Eargle 2008; Kremkau, Whelan, et al. 2014:Appendix A; Lerch 2013).

Settlement and Subsistence

The Chemehuevi lived in an arid environment with marked seasonal variability in the availability of food. Consequently, storage was an essential strategy for surviving the winter and early spring months (Kelly and Fowler 1986:370). The Chemehuevi utilized a wide variety of plant and animal resources, including deer; rabbits; reptiles; seeds from pinyon, honey mesquite, and screwbean; and cacti and other succulents. Most of these resources were available seasonally, and to access them, the Chemehuevi traveled from one area to another during the year, covering a huge, diverse territory. Some resources, like agave, were available year-round (Laird 1976). The base of the agave stalk was cut with a wooden chisel, the leaves removed with a stone knife, and the "head" of the plant was baked in an earth oven. Prickly pear joints were steam-cooked in earth-covered pits to preserve them or were sun-dried and boiled when wanted.

The Chemehuevi supplemented their diets with greens, seeds, and fruits. After winter stores ran out in spring, people turned to edible greens in the lowlands. Desert greens had to be boiled, washed, and squeezed to remove the bitter salts. Seeds and berries began to ripen in the valleys and low foothills by early summer. Seeds were swept into baskets with beaters. They could then be winnowed and parched with coals in flat basketry trays and ground on metates, or they could be ground before parching. Fruits and seeds became available in the uplands during summer and fall.

During the historical period, the Chemehuevi began growing cultigens that were introduced to them by the River Yumans (Fowler and Fowler 1971; Stewart 1966:9). They planted yellow maize, squash, melons, gourds, sunflower, amaranth, and winter wheat. They also adopted the semicultivated grasses used by the Mojave and encouraged tobacco to grow by burning plots. The Chemehuevi used the flood-plain agriculture techniques practiced by the Mojave.

Large game was scarce in the region and was not a major component of the Chemehuevi diet. The Chemehuevi had access to deer and mountain sheep. Animals were stalked by one or several men, sometimes under direction of a hunt leader. Marksmen often hid behind blinds and shot game with bow-and-arrow as other men drove the animals past them. Small game was the main source of protein in their diet. Rabbits were hunted individually and in communal drives. Cottontails were taken with snares and deadfalls. Burrowing rodents were dug out with rodent skewers, flooded and smoked out, or taken with traps and deadfalls. Dove, mockingbird, sage hen, and quail were commonly hunted. Chuckwalla were captured with reptile hooks. Bee eggs, larvae, grasshoppers, and crickets were also consumed, and swarms of large black Mormon crickets provided an important food source (Kelly and Fowler 1986:370; Laird 1976:46–47; Sutton 1988).

Seasonal mobility was essential to the Chemehuevi way of life, because the plant foods they relied on were temporally and spatially variable in abundance. From spring through fall, individual families or small family clusters foraged in groups, moving according to the availability of plant foods. Chemehuevi farmers planted their crops in spring and either tended them until the danger from birds had passed or moved on and left the elderly behind to watch the fields. They returned to their fields in fall to harvest the crops. Some left before the harvest was complete to collect pinyon nuts from the mountains, whereas others stayed behind to finish collecting and storing crops. During winter, the Chemehuevi aggregated into villages of several families, located near their caches of stored food (Kelly and Fowler 1986:371). Their houses were closely grouped, and occupants were usually related by blood or marriage. Settlement size varied from 1 or 2 houses to 10. Chemehuevi groups who lived in areas with abundant pinyon spent the winter in the pinyon groves.

Sociopolitical Organization

Sociopolitical organization for the Chemehuevi was limited but did include a hierarchy of leaders: high chiefs and chiefs (Kelly 1932–1933; Laird 1976:24). During the late nineteenth century, these chiefs controlled several distinct Chemehuevi groups, and their positions carried a great deal of prestige, as well as economic power (Fowler and Fowler 1971:104). The position of chief was hereditary, with the eldest son the favored successor (Kelly 1932–1933; Kelly and Fowler 1986), but a candidate also had to have "proper dreams" to obtain this position. According to Laird, who wrote from a Chemehuevi perspective, chiefs also spoke a special language to one another at gatherings (Laird 1976:24).

Because resources were widely scattered across the landscape, families had to travel to distant resource patches, and group composition in any given year was dependent on who chose which patch. Related families tended to dwell in proximity, however, and cooperated in hunting and gathering tasks. These groups were not territorial. Among the Chemehuevi, springs were considered private property and usually owned and inherited by males, although women occasionally owned springs. Married siblings (usually brothers) tended to camp at the same spring with one brother regarded as owner. Chemehuevi men could also inherit rights to hunt large game within certain tracts of territory. These tracts were defined in songs, and one had to have the proper song, or be with one who did, in order to hunt in these areas (Laird 1976).

The Chemehuevi did not have rigid descent or kinship structures. Most marriages were monogamous, but good hunters could have more than one wife (Kelly and Fowler 1986:380). Polygyny was usually sororal. Brothers in one family frequently married sisters in another, or a brother and a sister in one family might marry a brother and sister in another. Divorce was common, and many adults remarried several times. For the Chemehuevi, residence was temporarily matrilocal at marriage but typically became patrilocal later on.

Material Culture

Houses and Other Structures

For the Chemehuevi, summer houses were ephemeral. They created domed, temporary shades adjacent to cultivated fields and often slept under trees in hot weather. Chemehuevi winter houses were built in the Mojave style but without a front wall. They were rectangular structures made with a framework of poles, covered with willow and arrowweed, and usually capped with earth (Watkins 1945). To house their stored food, the Chemehuevi built granaries in the Mojave style—a four-post frame covered by willow and arrowweed.

Hunting, Gathering, and Farming Implements

Hunting tools used by the Chemehuevi included bows, arrows, nets, snares, rodent skewers, and reptile hooks. Seed beaters, threshing sticks and paddles, and parching trays were used by Chemehuevi groups to collect and process seeds. A long, hooked pole was used to pull down pinyon cones, and digging sticks were used for roots. Both seeds and pinyon nuts were ground with manos and metates. Portable mortars and bedrock metates were also used but were of comparatively minor importance. Chemehuevi farming technology was simple, requiring only the dibble and a "flat stick" or "spade."

Baskets and Pottery

The Chemehuevi used both basketry and pottery, but they relied more heavily on basketry (Kelly and Fowler 1986:375). Basket forms included conical burden baskets, fan-shaped trays for winnowing and parching, seed beaters, water jugs sealed with various resins, cradles, and women's hats. The Chemehuevi only occasionally made pottery. They tempered the clay with sand, formed vessels using a paddle and a small stone as an anvil, and painted the finished product. Vessel forms included cooking pots, a similar vessel for preplanting germination of seeds, a spoon or scoop, a water jar (often used for seed storage), and a large vessel used for ferrying children across the river. Women usually made pots, whereas men made tubular clay pipes and children made their own toys.

Trade and Conflict

The Chemehuevi traveled widely and had friendly relations with other Paiute groups, as well as the Kawaiisu, Serrano, Cahuilla, and Ipai (Kelly and Fowler 1986:375). Men routinely hunted in Yavapai, Walapai, Quechan, Serrano, and Kawaiisu territory and reportedly traveled to the Pacific coast (Laird 1976). On rare occasions, 8–10 men from several Southern Paiute groups might travel to Hopi villages together. The Chemehuevi were heavily influenced by the Mojave in many aspects of their material culture and ritual life. From the Mojave, they received domesticates and techniques for floodplain farming; techniques for making pottery, earth-covered houses, boats, and hair dye; vocabulary; an emphasis on dreaming; basic features of the song series; and a complex of elements related to warfare. Chemehuevi who lived along the Colorado River made log rafts and reed balsas like those of the Mojave, which were used with poles to cross the river.

There is good evidence for the practice of organized warfare by the Chemehuevi in the recent past. Although still united with the Las Vegas group of Southern Paiute in the late eighteenth century, the Chemehuevi moved south, exterminated the Desert Mojave, and took possession of their territory (Kroeber 1959; Roth 1976; Sutton 1986). In the early 1800s, the Chemehuevi joined the remaining Mojave and Quechan to drive the Halchidhoma off the Colorado River (Heizer and Hester 1970:111; Kelly and Fowler 1986:370, 381−382; Kroeber 1959; Roth 1976). Afterward, they settled along the river next to the Mojave. War broke out between the Chemehuevi and Mojave around 1867, and the Chemehuevi retreated from the river (Heizer and Hester 1970:111; Kelly and Fowler 1986:370, 381−382; Kroeber 1925:594–595; Roth 1976). Warfare for the Chemehuevi primarily consisted of predawn raids in which sleeping victims were clubbed. No one was spared, and no captives were taken. Scouts surveyed at night, and women served as lookouts. When a battle did occur between two opposing groups, a "peacemaker," who was usually related to both sides in the conflict, accompanied the war party and halted combat after one or two people had been killed. Chemehuevi warriors were selected from those who had favorable dreams of traveling to the east, of the Pleiades, Orion's belt, the morning star, the sunrise, or of riding on the moon. War leaders used sharpened, wooden pikes that were hurled as spears, whereas other war dreamers used wooden or stone clubs. Those without promising dreams served as archers.

Worldview and Ritual Practice

The Chemehuevi have a rich tradition of songs and oral histories. Their creation story describes the birth of the world and their emergence from *nuvant*, near Mt. Charleston just outside the modern city of Las Vegas (Kelly and Fowler 1986:385). Coyote is the principal being, and he is credited with a number of deeds, such as bringing agriculture, starting many customs, and naming the other animals of the desert. The Chemehuevi believed that shamans had the power to cure and cause disease and that they received their power through dreams. Shamans typically cured illness by pursuing and restoring lost souls and removing disease-causing objects through sucking. Some Chemehuevi shamans were considered specialists who could cure rattlesnake bites, control the weather, and aid in childbirth.

Songs were, and still are, an important part of Chemehuevi ritual and belief. Songs were taught to shamans by guardians during dreams. The Chemehuevi had four main songs—Bird, Salt, Deer, and Mountain Sheep—but others, such as Quail and Funeral, were also sung (Laird 1976:38). The songs include descriptions of territories claimed by the Chemehuevi, including place names, and resources available in each area. Many of these songs are still recited by the Chemehuevi today and are an important part of storytelling and history.

Cremation was traditional for the Chemehuevi after death, although Kroeber (1925:599) claimed that burial was more common. All property of the deceased was burned, including animals, and their gardens were taken over by others. Following a death, the family, or sometimes the entire camp, moved, at least temporarily.

The Chemehuevi held a mourning ceremony at irregular intervals, usually to commemorate the death of several people. Among the Chemehuevi, buckskins, eagle feathers, rabbit-skin blankets, weapons, nets, and baskets were accumulated over a period of time by the hosts for destruction during the ceremony. Because of the enormous cost in food and goods, ceremonies occurred infrequently and were usually sponsored by a particularly prosperous family or a group of several families who had lost relatives (Kroeber 1959).

The Mojave

The Mojave, along with the Halchidhoma and Quechan, are one of the three Yuman tribes that lived along the lower Colorado River in the project area. The Mojave were the northernmost of the three groups, and during the nineteenth century, they occupied an area stretching from 24 km (15 miles) north of present-day Davis Dam to the Bill Williams River (Kroeber 1943:21; Stewart 1983a:1); they may have occupied an even wider area in the past (Stewart 1969:257). In 1776, Spanish chronicler Father Francisco Garcés estimated the population size of the Mojave at around 3,000 (Coues 1900). The Mojave were divided into three bands organized north–south along the river: the Matha Layathum (northernmost), the Hutto-pah, and the Kavi Layathum (southernmost). Mojave people today are members of the Fort Mojave Indian Tribe in Needles, California, and the Colorado River Indian Tribes, Parker, Arizona (see Figure 2.1), both located along the Colorado River north of the project area (Eargle 2008; Kremkau, Whelan, et al. 2014:Appendix A; Lerch 2013).

Subsistence and Settlement

Like all the Yuman groups along the Colorado River, the Mojave were sedentary farmers, whose livelihood was made possible by the annual flooding of the Colorado River during the spring. Snowmelt in the Rocky Mountains caused the lower Colorado River to overflow its banks in May or June and inundate the bottomlands along the river. When the floodwaters receded in June, they left behind a rich silt that required no fertilization or irrigation. Beans and corn were planted first, followed by pumpkins and melons (Stewart 1983b:58). Grass seeds were planted on less-fertile parts of the land. The fields were occasionally weeded, and the crop was harvested in late September and early October. Corn was husked in the field and either roasted and eaten immediately or sun-dried and stored in granaries. Men typically cleared and burned the land before flooding began, whereas women did most of the harvesting and storage, and both participated in planting. A man typically used a planting stick to punch holes in the soil and then a woman dropped several seeds in each hole and covered them up.

Wild plants also contributed an important part of the diet, particularly in times of famine (Castetter and Bell 1951; Stewart 1983b:59). Mesquite and screwbean were the most important wild-plant foods. Mesquite pods were pounded in mortars to remove the pulp, which was dried and ground into flour. Screwbean was prepared the same way, or fresh beans were “cooked” by being stored in large pits lined with arrowweed for about 1 month, which caused the beans to turn brown and sweet.

Game was scarce in the bottomlands, thus fish provided the principal source of meat in the Mojave diet. Fish were taken with seines or dragnets, in traps or weirs, or with dip nets, as well as driven up shallow sloughs into large basketry scoops. The fish were eaten either broiled or in a stew with corn (Stewart 1957; Wallace 1955).

Although deer occasionally strayed to the thickets along the river, large game was, for the most part, absent in the area. The Mojave sometimes undertook special excursions to the mountains east of the river to hunt deer. For the most part, however, they relied on the rodents and rabbits that lived in the bottomlands. Rabbits were shot with bow-and-arrow, caught in snares or nets, or knocked down with curved rabbit sticks. Communal rabbit drives were sometimes held.

The Mojave lived in sprawling settlements, scattered throughout the valleys on low rises above the floodplain (Stewart 1983b:57). A settlement might extend from 1.5 to 3 km, with houses separated from one another by 100 m, and be separated from the next settlement by 6–8 km. Each household was composed of an extended family and related, unmarried adults. Several extended families occupied each settlement. These settlements were only occupied during the winter and spring flooding seasons. During the summer and fall, family groups dispersed to the bottomlands to live in temporary camps. Patrilocality was preferred after marriage, but in practice, residence was bilocal. This flexibility, along with marital instability, often led to unrelated individuals sharing farming camps. The extended family formed the basic cooperative unit of subsistence, although several families might pool labor to clear land, weed, or harvest.

Only cultivated land was considered private property among the Mojave. Any tract of land that was not in use could be cleared and planted, becoming the property of the man who performed the labor (Stewart 1983b:59). These plots were not inherited by the man's relatives after death but were abandoned to be used by others. Fields were typically 1–2 acres in size, and their boundaries were marked by ridges of dirt or arrowweed branches. Disputes over boundaries that arose when floods washed these landmarks away were settled by violent shoving matches that sometimes escalated to stick fights. Mesquite trees were not owned in the same way as cultivated fields, but families tended to return to the same groves every year and might claim their yields in advance by hanging arrowweed from their branches.

Sociopolitical Organization

The Mojave were loosely divided into northern, central, and southern bands and further divided into local groups occupying particular settlements. However, they had a strong sense of tribal unity and thought of themselves as one people living in a well-defined territory that was prepared to unite in warfare against an enemy (Stewart 1983b:62). Locality of residence was unimportant, and families or individuals could move freely from place to place within tribal territory. Although the Mojave had patrilineal clans, their importance and function remains unclear.

There were no marked gradations in wealth in Mojave society, because goods and property could not be inherited and food sharing was strongly encouraged. With the exception of tribal chief, no leadership positions were inherited. The men who filled these roles (as well as orators, singers, and shamans) received their power from dreams. Those with the "right" dreams, however, had to continually demonstrate their success in practical matters to retain their positions. Positions of power could remain in prominent families, so long as the candidates were capable of performing the duties they required.

The position of tribal chief may have developed after extensive contact with Euroamericans. Although the chief could convene prominent men from each settlement to meet with him for informal discussions, he wielded little real authority and was largely expected to look after tribal welfare. Each settlement had at least one headman who handled the bulk of the leadership responsibilities for the settlement and met in a council with other headmen to discuss tribal concerns. The Mojave also had several subchiefs from each of the bands. These leaders were expected to be skillful orators, and their authority was dependent upon public support. They held their statuses only as long as they proved competent. In addition to these positions, Mojave society had religious leaders who performed ritual functions and served as festival chiefs and orators who addressed people at funerals.

Material Culture

Houses and Other Structures

For most of the year, the Mojave slept under ramadas or in dome-shaped arrowweed structures near their fields. During the winter, they lived in similar structures in the settlements. The leaders of the settlements had larger, rectangular houses made of four cottonwood posts supporting a sloping roof of poles. This was thatched with arrowweed and covered with a thick layer of sand and earth or river mud. When the weather was very cold, settlement leaders invited their neighbors to sleep in their houses. The only other structures in Mojave settlements were corn granaries. They were made of coarsely woven arrowweed branches (with the leaves still on) and resembled giant bird nests. The Mojave did not have sweathouses.

Hunting, Fishing, Farming, and Gathering Implements

Because game did not feature largely in their diet, the Mojave had only a few hunting implements, including bows and untipped arrows for shooting rabbits, wooden rabbit sticks, and nets. Fishing implements included nets, traps, weirs, and basketry scoops (Wallace 1955). Crude rafts were made of bundles of rushes lashed with willows and used with long poles for crossing the river. Farming technology was simple and included only the sharpened digging stick. Metates and manos were used to grind corn and beans. During the historical period, metates were rectangular blocks of volcanic stone and manos were cylindrical, both created in the Southwestern style (Castetter and Bell 1951). Before the advent of steel axes, metates may have been the oval type typical in California. Mesquite beans were crushed in wooden mortars with long wooden or stone pestles.

Baskets and Pottery

River Yuman basketry was not as finely woven as that made in other parts of California, likely because pottery was used to fulfill most cooking, serving, and storage functions. Basketry was used primarily to create flat receptacles, fish traps or scoops, wicker hoods for cradles, and carrying frames. Pottery vessel types are more diverse, and include water jars, cook pots, ladles or spoons, flat bowls, oval platters, open bowls, and parchers for corn. Very large pots were sometimes created to help ferry small children back and forth across the river. Pottery was tempered with sandstone and painted with yellow ochre, which turned red after firing. In the late nineteenth century, pottery was painted with geometric designs.

Trade and Conflict

The Mojave, in particular, were great travelers and were widely known for the trading expeditions to the Pacific Coast and the Southwest (Davis 1961; Farmer 1935; Kroeber 1925). An important commodity for this trade was *Olivella* shells, obtained on the Pacific Coast and then widely traded. Glass trade beads, salt, and tobacco were also popular trade items (Kroeber 1925:727, 739–740).

The Mojave and Quechan were allied with one another and had friendly relations with the Sand Papago, Tipai-Ipai, Chemehuevi, and the Chumash along the southern California coast (Bean and Vane 1978:5-4). The Cocopa, Maricopa, and Halchidhoma were considered enemies. The Mojave participated in two types of conflict: raids and campaigns. Raids were surprise attacks launched by groups of 10–12 young men from the same settlement. They were not intended to kill the enemy, but to harass enemy groups and possibly take captives or horses. Campaigns were conducted in the fall, after the harvest, and were tribal affairs launched for revenge against losses suffered at the hands of the enemy. War parties were well-structured, with a leader in front followed by spearmen and clubmen, then by archers, then by horsemen with spears. Women were also included in war parties, following the main lines to battle to finish off the wounded with large clubs (Stewart 1947a). The time and place for combat, as well as the types of weapons to be used, were often prearranged. Fighting was preceded by insults and did not begin until both sides were in formation. Once it commenced, hand-to-hand combat was the norm, as no man was considered brave in River Yuman society until he had distinguished himself in this way.

Worldview and Ritual Practice

Dreaming was a pivotal concept in Mojave culture (Kroeber 1925; Devereux 1957). Dreams were thought to be an entry into the supernatural world, the realm of myths and ancestors and the period and events before the world as we know it was created. Entry into the supernatural through dreams was therefore believed to constitute a reexperiencing of the mythical past (Kroeber 1925; Devereux 1961). Shamanistic power, bravery and fortune in war, success with women or at gaming, and every other special ability was believed to be dreamed (Kroeber 1925:754). Myths and songs were also said to have been dreamed. Ordinary dreams were regarded as “omen dreams,” and could foretell coming events when interpreted properly. “Great dreams” came only to a select few who served as leaders in society.

Shamans had the most elaborate great dreams. They were believed to have the power to cure arrow wounds, rattlesnake bites, and sickness attributed to contact with outsiders, “bad dreaming,” loss of one’s soul, witchcraft, and ghosts. Each shaman was a specialist and could only cure certain ailments, depending on what he dreamed. Shamans were also believed to cause disease, and might be killed by warriors if they were suspected of witchcraft. Gifford (1926) related several stories retold by a Mojave man named Joe Homer, who discussed different types of dreams and how dreams functioned in Mojave society.

As for the Chemehuevi, song cycles were an important part of ritual life for the Mojave. Kroeber (1925:755) noted at least 20–30 different song cycles, each with 100–200 songs. The songs generally follow elements of myths and histories, such as creation myths, old battles, and territorial boundaries. However, the songs are usually quite short and are very stylized, with distorted words.

The only public ceremonies conducted by the Mojave were funerals and mourning ceremonies. The dead were cremated in pits dug near their houses. Their houses, ramadas, and granaries were also burned, along with all of their contents. Funeral orators made speeches and song cycles were sung while mourners wailed and some cast their own belongings into the fire. A tribal mourning ceremony was performed after a prominent man died or when there had been an accumulation of deaths which the families of the deceased wished to commemorate them with a ceremony. It lasted for a day and a night and featured a ritual enactment of warfare. Ten men in war regalia ran back and forth carrying ceremonial replicas of weapons while a funeral orator told the mythological story of the first cremation, and mourners cried and sang. At dawn on the second day, a shade that had been specially constructed for the spectators was set on fire and the weapons were thrown into the blaze. The participants in the ritual then purified themselves in the river.

The Halchidhoma

Compared to the other three River Yuman groups that lived in or near the project area, there is comparatively little information on the Halchidhoma. Also called the Panya (Bean and Vane 1978:5-37), the Halchidhoma originally occupied the territory between the Mojave and Quechan but were ousted from the Colorado River Valley by their neighbors after ca. 1825. They had joined the Maricopa in south-central Arizona by 1840 (Golla 2011:122; Stewart 1983b:55), leaving the Mojave and Quechan as the only two River Yuman groups to be documented ethnographically during the early twentieth century. A handful of studies of the Maricopa in the early to mid-twentieth century have provided some information (Harwell and Kelly 1983; Spier 1933; see also Bean and Vane 1978). In 1776, Spanish chronicler Father Francisco Garcés estimated the population of the Halchidhoma to be about 2,500 (Coues 1900).

Subsistence and Settlement

Like the other River Yumans, the Halchidhoma were sedentary farmers who planted beans, corn, pumpkins, and melons and supplemented their diets with wild plants and animals. These were relied on more heavily during drought years, when the river failed to rise enough to sufficiently flood the fields (Stewart 1983b:58). Agricultural plots were generally 2–3 acres in size.

The Halchidhoma lived along the Colorado River floodplain, from approximately the location of modern day Needles, California, to Blythe, California. When Juan de Oñate passed through the area in 1604, he noted eight villages, the largest of which contained at least 160 houses and 2,000 people (Kroeber 1925:802). When they were ousted by the Mojave and Quechan after about 1825, they first moved to the west with the Cahuilla and Chemehuevi before finally settling with their allies the Maricopa along the Gila River on the east side of the Colorado. The Mojave and Quechan briefly occupied the land of the Halchidhoma before abandoning it a few years later.

Sociopolitical Organization

Because the Halchidhoma were forced from their land in the early nineteenth century and later moved in with the Maricopa, relatively little is known about their sociopolitical organization. Like other River Yuman tribes, however, they lived in dispersed communities led by local headmen who derived their power from competent leadership and dreaming proper dreams. River Yuman tribes in general did not have extensive social hierarchies.

Material Culture

Houses and Other Structures

Halchidhoma houses were similar to other River Yuman residences. Most houses were made from arrowweed branches and consisted of small, domed structures. Larger structures included ramadas, which were rectangular structures with thatch roofing. Most roofs were further covered in earth and mud as additional protection. Granaries were also made of arrowweed and were built like large bird nests, which helped to keep the grain off of the ground (Bee 1983).

Hunting, Fishing, Farming, and Gathering Implements

Hunting implements included bows and untipped arrows for hunting rabbits, wooden rabbit sticks, and nets. Fishing implements consisted of nets, traps, weirs, and basketry scoops. Rafts were made from bundles of rushes lashed with willows. Long poles were used as paddles. Rafts were used for both fishing and for carrying people and trade goods across the river.

Agricultural technology for all Yuman groups was fairly simple. Canals and other irrigation systems were not used, and sowing and weeding was done with a sharpened digging stick. During harvest time, corn, beans, and other seeds were collected in baskets. Either wooden or stone grinding stones were used to mill seeds into flour.

Baskets and Pottery

River Yuman basketry was not as finely woven as in other parts of California, likely because pottery was used to fulfill most cooking, serving, and storage functions. Basketry was used primarily to create flat receptacles, fish traps or scoops, wicker hoods for cradles, and carrying frames. Pottery vessel types are more diverse; they include water jars, cook pots, ladles or spoons, flat bowls, oval platters, open bowls, and parchers for corn. Very large pots were sometimes created to help ferry small children back and forth across the river. Pottery was tempered with sandstone and painted with yellow ochre, which turned red after firing. In the late nineteenth century, it was painted with geometric designs.

Trade and Conflict

The Halchidhoma were avid traders and participated in long-distance trade and travel. A system of trails crisscrossed the Colorado Desert and connected the people along the Colorado River with other tribes to the east and west. The Halchidhoma traded with the Cahuilla and Gabrielino to the west and brought goods to the Sand Papago and Gila River Pima to the east (Bean and Vane 1978:5-3). They used reed rafts to ferry goods across the river but, apparently, swimmers were also used to transport goods. The Coco-Maricopa Trail—one of the major east–west trails through the region—ran just north of the direct APE.

Conflict and warfare were ever present among the River Yumans. The different tribes along the Colorado River, and to its east and west, participated in what is called the Northern Sonoran Amity-Enmity System (Bean and Vane 1978). The Halchidhoma were allied with the Gabrielino and Cahuilla to the west and the Cocopa and Maricopa to the east. Their enemies were the Mojave and Quechan, who were allied with the Chemehuevi and other Yuman groups to the east.

Worldview and Ritual Practice

Much of what we know about Halchidhoma ritual life comes from interviews conducted by Spier (1933) of a Halchidhoma man named Kutox, who lived with the Maricopa during the early twentieth century. More recently, Laylander (2001) summarized some of the stories that were shared throughout southern California and southwestern Arizona. In the creation story, humans were created through a sexual union of the earth and sky. Following this, one or two "heroes," usually brothers, emerged from a place of creation. Among the Yumans, this was usually a prominent mountaintop in or near the home territory. The two hero brothers are often depicted as rivals, with one tricking the other and causing him to go blind. In most versions of the story, one of the heroes is killed by Frog, who is usually described as a female. Her motivations for killing the hero vary, sometimes because the hero has acted poorly, or because others were jealous of him.

Another story shared among the Yuman tribes was the Flute Lure Myth (Laylander 2001:161). In this story, two boys are mysteriously born to an unwed mother. The two brothers go on a series of journeys and when they return home, they begin playing flutes. Two sisters from a far-away land hear the music and travel to find the boys. Upon meeting them, one of the girls sleeps with one of the brothers and becomes pregnant, and the four journey back to the girls' village. The two brothers are killed and eaten by the girls' father, but the child born by one of the sisters avenges their death, eventually killing all of the members of his mother's family, including his mother and aunt.

One of the repeated themes in both of these stories is the relationship between the different tribes and linguistic groups in southern California. In many versions of the creation story, multiple tribes are described as emerging from the same origin place, all of which were part of the sphere of interaction in the region. Also present in many versions of the stories are the military alliances that make up the Northern Sonoran Amity-Enmity System, indicating the importance of these relationships.

The Quechan

The southernmost of the three River Yuman groups discussed here, the Quechan occupied the land around the Gila River. Beginning in about 1825, the Quechan, along with their Mojave allies, ousted the Halchidhoma from their territory and occupied the land up to the area around Blythe, California. In 1776, Spanish chronicler Father Francisco Garcés estimated the Quechan population at around 3,000 (Coues 1900), although the prehistoric population was likely larger. The Quechan today are affiliated with the Fort Yuma Quechan Tribe in Yuma, Arizona, located along the Colorado River south of the project area (see Figure 2.1).

Subsistence and Settlement

Like the other River Yuman groups, the Quechan were floodplain horticulturists. The annual flooding of the Colorado River deposited rich soils along the margins of the river. The Quechan grew corn and several varieties of beans, squash, and melons throughout the year; wheat was probably introduced during the early eighteenth century. The Quechan probably relied heavily on wild plants and animals to supplement their diet. Estimates of the diets of other Yuman groups suggest that agricultural products made up 30–50 percent of the Quechan diet (Castetter and Bell 1951:238).

Wild foods included a variety of seeds, including mesquite and screwbean (Castetter and Bell 1951:179), but ironwood seeds and wild grasses and cacti were also eaten. The seeds and seed pods were usually crushed into a flour and used to make cakes or a porridge. Wild animals were another important part of the diet; however, the extreme aridity of the area made large game such as deer and mountain sheep rare. Rabbits and other small game were hunted with rabbit sticks or snares. Fishing was also important. Fish were caught with lures or forced into weirs along the banks of the river. Most fish were either broiled or eaten in a stew.

Quechan settlements were separated into a series of dispersed villages, or *rancherías*, scattered across the floodplain of the Colorado River (Bee 1983:87–88). These *rancherías* were very dynamic, and the boundaries and sizes of each changed throughout the year. During the winter months, people congregated on the high points of the floodplain while the river was in flood stage. When the river subsided and planting season began, people dispersed into bottomlands to tend to their crops. During harvest time, people once again aggregated into denser concentrations. Because the landscape of the floodplain also changed year to year, the locations of the *rancherías* could also vary through time.

Several hundred people lived in each *ranchería* (Bee 1983:88). Although tribal identity was strong, local identity was also important. Each *ranchería* was composed of several extended family groups. Marriage was in practice bilocal, although moving in with the male's family was the preferred alternative. Marriage was also exogamous—people married outside their *rancherías*.

Sociopolitical Organization

Like all River Yuman groups, the Quechan had a strong sense of tribal unity and saw themselves as living in a well-defined territory. Quechan society was composed of patrilineal clan groups. Membership in a particular clan was not necessarily tied to membership in a specific *ranchería*, although at some of the more isolated *ranchería*s, everyone was like part of the same clan (Bee 1983:91).

At the time of European contact, there were two main leadership positions within Quechan tribes: civil leaders and war leaders (Bee 1983:92; Forde 1931:133). It is unclear what exact roles these two positions played, and there is some evidence that their power may have been exaggerated or misunderstood by early ethnographers. Within each *ranchería*, there was also at least one headman, who likely did most of the day-to-day administration and met in councils with other headmen to discuss larger issues.

Although leadership positions were, in theory, achieved through good judgment and proper dreaming, in practice, some lineages were more prestigious than others, with many inherited positions. Furthermore, having the "right" dreams was essential if a person was to be selected for a leadership position (Forde 1931:136). A group of elders listened to a candidate describe their dreams, and they judged whether or not these dreams were "good" dreams. If a person was selected for a position, they still had to show good judgment and have success at handling affairs.

Material Culture

Houses and Other Structures

Quechan houses and other structures were generally simple ramadas or dome-shaped structures made with arrowweed and other bushes. Higher-status households were larger, rectangular structures with a pitched, thatched roof. Most roofs were also covered with a layer of earth and mud for insulation and protection from the occasionally violent summer rainstorms.

Hunting, Fishing, Farming, and Gathering Implements

Because hunting was not a major subsistence activity, the Quechan used relatively simple hunting implements, such as rabbit sticks and the bow-and-arrow. The bows were fairly weak, and often the arrows had no stone projectile point at the tip. Fishing implements include nets, traps, weirs, and basketry scoops. Grain was ground with stone or wooden metates.

Baskets and Pottery

Baskets were less-finely woven than in other parts of California. This is likely due in part to the role pottery played in food preparation and storage—tightly woven baskets were not needed. Basketry was used primarily for fishing, but also as carrying devices.

Yuman ceramics are common at late prehistoric period sites in the Colorado Desert—the technology was likely adopted around A.D. 1000. Pottery vessels came in a variety of types and included water jars, cook pots, ladles or spoons, flat bowls, oval platters, open bowls, and parchers for corn. Pottery was tempered with sandstone and painted with yellow ochre, which turned red after firing. By the late nineteenth century, geometric designs were incorporated into surface treatments.

Trade and Conflict

Warfare was an important component of Quechan life (Forbes 1965). Battle reenactments and stories of heroic deeds were part of many Quechan ceremonies (Bee 1983:93). The Quechan were allied with the Mojave and Chemehuevi, and often fought with other Yuman groups, particularly the Cocopa and Maricopa. Beginning at about 1825, the Mojave and Quechan allied and forced the Halchidhoma out of their traditional lands.

In contrast to the relatively low degree of sociopolitical organization, warfare in Quechan society was a highly organized affair. As with the Mojave, there were two types of battles, raids and war parties. Raids were conducted by small numbers of men, usually from one *ranchería*. These were usually surprise attacks, aimed at stealing horses or obtaining captives (Forde 1931:161–162), and generally stirring up trouble. War parties were more formal affairs, with battles taking place at specific locations during agreed-upon times. War parties were structured with several lines of battle. In front was the war leader, along with spearmen and clubmen. Archers made up the second line, followed by spearmen on horses. A fourth line often included women, who would finish off any wounded warriors they came upon (Bee 1967:16; Forde 1931:167). Combat was usually called off before too many warriors were killed, but in some cases entire war parties were destroyed (Bee 1983:93).

Worldview and Ritual Practice

The Quechan believe their ancestors came from Spirit Mountain, also known as Newberry Mountain, located in southern Nevada. They, along with the ancestors of the Mojave, Cocopa, Maricopa, and eastern Tipai were created by Kwikamat, who later was murdered by his daughter, the sorceress Frog Woman (Bee 1983:86). The main ceremony for the tribe was the mourning ceremony, usually held following the death of an important leader, or sponsored by families wishing to commemorate their dead (Halpern 1997). During the ceremony, accounts of battles were retold, and the original mourning ceremony for Kwikamat was reenacted (Halpern 1984).

Dreaming was a pivotal concept to all River Yuman groups. It was through dreams that stories and songs were passed down to shamans, success in future endeavors could be divined, and individuals could secure success with women or in gaming. As noted above, having the correct dreams helped a candidate win a leadership office; it was also important for singers, dancers, and others to maintain their positions (Bee 1983:92–93).

Historical-Period Background

The historical period in the study area began in the sixteenth century with the earliest European explorers, followed by a disruption of Native American lifeways in the following centuries, and continued into the late nineteenth and early twentieth centuries with American land uses.

Exploration

At the time of European contact, the Native American tribes along the lower Colorado River were connected with coastal tribes to the west and pueblo tribes to the east by extensive trade networks. Two of the most important were the Yuma and Coco-Maricopa Trails (Farmer 1935:155–157; Johnston 1983; McCarthy 1982; Stewart 1983b). These trails merged with the equally important Mojave Trail that traversed the Mojave Desert and the Cajon Pass, where it entered the San Bernardino Valley (Robinson 2005:7–8; Walker 1986). The Halchidhoma Trail crossed the Colorado Desert from the Palo Verde Valley area near today's

Blythe, passing water sources such as Mule Spring (located midway between Wiley's Well and Chuckwalla Spring [Gunther 1984:341–343]), Chuckwalla Spring, Tabaseca Tank, and Canyon Spring, then continuing on through the Coachella Valley and the San Gorgonio Pass (Robinson 2005:9). The Spanish built missions along the coast of California but none in the Colorado Desert area, thus much of the chaotic demographic disruptions suffered by the groups along the coast were not felt immediately by the tribes farther inland.

The extreme aridity of the Colorado Desert acted as a deterrent to many early explorers. The earliest known European traveler to enter the lower Colorado River region was Hernando de Alarcón, who sailed up the Colorado River in 1540, penetrating at least as far north as Yuma, Arizona (Forbes 1965:83–111; Sherer and Stillman 1994:1–8; Smith 1977:55–56). In 1604, Juan de Oñate visited several of the tribes along the river and made notes about the inhabitants of the villages he passed (Kroeber 1925:802). Other notable Spanish explorers passed through the region, including de Anza, Garcés, and Romero (Bean and Mason 1962; Bolton 1930; Coues 1900). Many of these early travelers wrote detailed descriptions of their journeys, providing a unique glimpse of early southern California.

The lower Colorado River was of strategic importance to the Spanish, Mexicans, and Americans during the eighteenth and nineteenth centuries. The confluence of the Gila and Colorado Rivers, in Quechan territory, was particularly important, as it provided an easy crossing of the Colorado River. Not surprisingly, the Spanish government made friendly overtures to the Quechan in order to attain safe passage through the region. In the late 1770s, however, the Spanish built two small settlements near the confluence of the two rivers as a way to secure more-direct control over the territory. The Quechan rebelled and destroyed both settlements. The Quechan effectively closed off the Yuma Trail to Spanish travelers from 1781 to the 1820s (Phillips 2010:82). Spanish military expeditions were sent to punish the Quechan immediately following the rebellion, including one commanded by Pedro Fages in 1781–1782 (Bee 1983:94), but these were unsuccessful, and the Quechan remained relatively free from Euroamerican ingress until the mid-nineteenth century.

Within the inland deserts, the situation was similar. Garcés passed through Chemehuevi territory in 1776 and noted little evidence of European contact (Bolton 1950; Coues 1900). The earliest recorded European visit to the Coachella Valley, west of the study area, was by José Romero, the leader of an expedition attempting to reach the Colorado River by a new route, in the winter of 1823–1824 (Bean and Mason 1962); the route was determined impractical for overland use (Bean and Mason 1962; Lech 2004:29–30).

European–Native American Relations

By the early nineteenth century, Native American groups along the Colorado River were dealing with pressures from expanding Mexican and American frontiers. Slave trading in the Southwest and California had serious impacts on Native American groups. The Chemehuevi and other Southern Paiute groups saw their populations fall steeply, and already endemic warfare among Yuman groups was further fueled by the trade of captives to the Spanish (Bean and Vane 1978:5-25; Brugge 1968).

The fur trade also brought increasing numbers of Euroamericans into the area. Jedediah Smith came through the area in 1826 and again in 1827. The first visit passed without incident, but during the second trip, 10 of his men were killed in a confrontation with the Mojave, brought about by an earlier slaughter of Mojave men by the Ewing Young expedition (Casebier 1975:23–27; Earle 2005:24; Morgan 1953:240).

By the mid-nineteenth century, the Southwest and California had come under the control of the United States with the U.S. Army taking up positions along the Colorado River. Following a series of battles, approximately 800 Mojave were taken to the Colorado River Indian Reservation, which was established in 1865. In 1890, Fort Mohave was converted to an Indian school, and young children were taken from their families to be instructed by Euroamerican teachers.

By the late 1800s, Yuma was a thriving center of trade (CSRI 1987:69), and Euroamerican settlement was rapidly increasing, creating conflicts with the Quechan. In 1884, the Fort Yuma Reservation was established, and the Quechan were relocated and granted 10 acres of land per person (Bee 1983:94). Between 1893 and 1912, a large portion of the reservation was taken back and allotted to Euroamerican farmers and ranchers. It was not until 1978 that the land was fully restored to the reservation (Swope et al. 2013:55).

Yuman people who had not been taken to reservations found work in the expanding Euroamerican settlements of Fort Mohave, Needles, and Fort Yuma. By the 1880s, the railroad had come through southern California. The tracks of the Atlantic and Pacific Railroad line had been laid to Needles, California, and from there south to connect with Yuma by 1893. The Parker Spur—connecting Cadiz, California, and Topock, Arizona, and crossing the Colorado River at Parker, north of Blythe—was built in 1883. By the early twentieth century, most of the Native Americans living along the Colorado River were no longer farming; instead, they worked as wage laborers on the railroad and other developing industries.

Mining

The history of mining in Riverside County is characterized by sporadic, small-scale mining of precious metals, and later, large-scale exploitation of quarry products such as sand, gravel, and clay (Pabst 1938; Vredenburgh et al. 1981:24). In general, precious metals were mined in the region from the 1860s to the 1930s; recovery of iron ore and other commodities followed during the second half of the twentieth century.

The first discoveries of gold in the desert portion of Riverside County were in the Mule Mountains (just southwest of the project area) and at Picacho (about 48 km [30 miles] south of the project area) in 1861 (Love 1974:57). Famed trapper, scout, and guide Paulino Weaver (Gunther 1984:562) made the Mule Mountains discovery (Merrill 1919:81), and copper was also recovered in that location (Clark 1970:161). Copper ores were discovered in the Palen Mountains (approximately 29 km [18 miles] northwest of the project area) in the 1880s (Vredenburgh et al. 1981:24). The late-1880s gold-silver discovery in the Chuckwalla Mountains (about 40 km [25 miles] west of the project area) led to the largest gold rush in Riverside County history (Vredenburgh et al. 1981:24). Work in the Mule Mountains Mining District continued into the 1940s (Tucker and Sampson 1945:142–143; Vredenburgh et al. 1981:24–25). Local uranium discoveries in the 1950s led to additional mining development and a veritable “uranium fever” in the Blythe area (Vredenburgh et al. 1981:26–27).

Transportation

The project area is situated between important travel corridors and on the terrace above the critical Colorado River waterway corridor. None of the important, historical-period transportation routes in the region crossed the project APE, but they are discussed below, as they provide context for regional land use and other historical-period activities. We also review the circumstances related to the construction of historical-period roads and trails within the project area.

The Bradshaw Road (also known as the Bradshaw Trail and the Gold Road to La Paz) was established ca. 1863 and carried stagecoaches and freight wagons from the Colorado River crossing at present-day Ehrenberg, Arizona, westerly through Indio and San Bernardino to Los Angeles, largely following old Native American trails shared with William Bradshaw by Cahuilla Chief Cabazon (Johnston 1987; Love 1974). The trail figured prominently in supplying the gold mines at La Paz, Arizona, between ca. 1862 and 1877. The route passed through the project vicinity in an east–west alignment (Figure 2.2), passing stagecoach stations and water sources in varying alignments over time (Johnston 1987:113–126). Modern local governments have designated an alignment approximately 6.0 km (3.75 miles) south of the project area as the Bradshaw Trail (Johnston 1987:116); it is labeled on modern maps, and the BLM recognizes it for off-highway vehicle (OHV) visitor activities (BLM 2012). During the early years of the twentieth century, the Glamis Road ran from that town to Blythe, stopping at Midway Well on the 10-hour route (Pigniolo et al. 2007:12).

From the 1850s into the early twentieth century, paddle-wheel steamboats carried travelers and freight up the Colorado River, at one time reaching as far as the area of today’s Hoover Dam (Lingenfelter 1978). The boats also carried supplies for surveying parties and for U.S. Army posts in Arizona (Palo Verde Irrigation District 2012) and were the primary means of transportation to and from Blythe until 1908 (Pigniolo et al. 2007:12). The first Colorado River crossing at Ehrenberg was a cable ferry, which was replaced by a toll bridge in 1928 (Faigin 2012a).

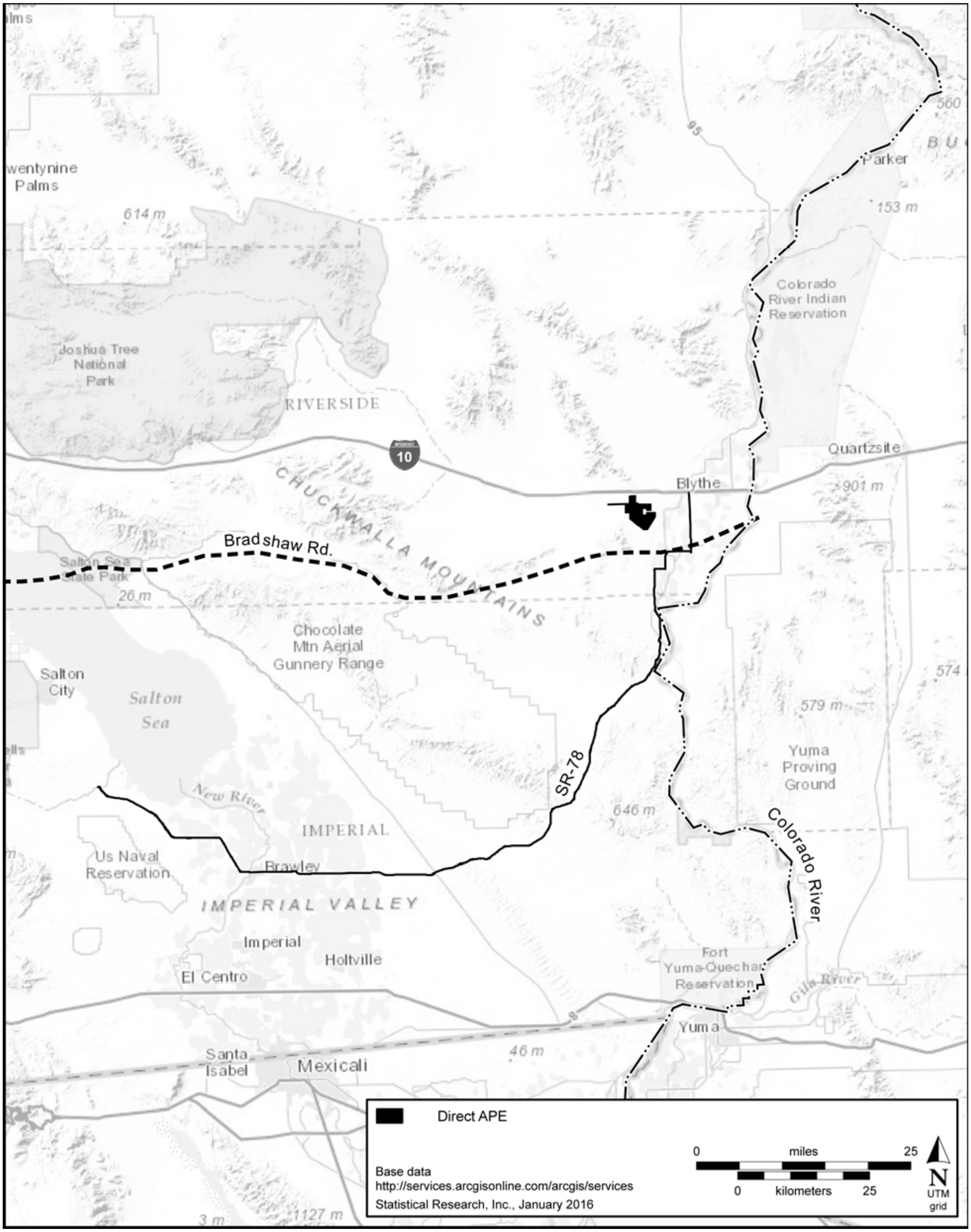

Figure 2.2. Major historical-period transportation routes in the project region.

Transportation improvements became one of the most significant agents of change in Riverside County in the early twentieth century, especially in communities relatively isolated from main population hubs. In 1900, most southern Californians lived close to work and not too far from friends and families. People got around by walking, riding horses and bicycles, and in horse-drawn wagons and buggies. After the turn of the twentieth century, automobiles quickly increased in popularity and soon became common sights on old wagon roads. Southern California railroad development had created a radiating pattern of settlement characterized by dispersed population centers. The automobile provided maximum freedom of mobility, ideal in such a landscape. The ability to travel long distances between cities connected the region and the country like never before. A 3-mile-long plank road was built between Mesaville and Blythe Junction (present-day Rice), serving only for about 1 year (Pigniolo et al. 2007:13).

Southern California roads, however, were not prepared for the automobile, and increasing automobile use brought the condition and suitability of southern California roads into relief. Few roads were paved, save for 230 miles of paved streets in the city of Los Angeles. Beyond the city, rutted tracks led to the far-flung communities of southern California, and many areas were reached only by traversing circuitous local road segments. The poor state of many of the roads at the time limited travel by automobile to an average speed of under 20 miles per hour (Belasco 1979:23). In 1910, fewer than 500,000 vehicles were on American roads (Belasco 1979:8), but the automobile was becoming increasingly common, and California was no exception to this trend. By 1912, the number had doubled, with more than 1 million motor vehicles registered in the United States.

During the 1910s and 1920s, "road associations" were created to promote the development of automobile routes in rural California (Lyman 1999). In 1920, more than 8 million passenger cars were registered in the United States (Belasco 1979:8), and automobiles were just beginning to permeate every part of society, particularly in southern California, where garages were added to older residential properties, and new homes were built with garages. In 1923, the number again nearly doubled, with 15.2 million cars registered in the United States; 19 million were registered the following year (Mark 1998); that year, California registered its millionth motor vehicle (Talley-Jones 2000:58).

In the 1930s, despite the economic depression, more people settled in California, and the number of motorists taking to the roads increased. It was during this decade that automobile camping and the development of the automobile culture first emerged, with the appearance of automobile camps and roadside motels. The Civil Aeronautics Administration established Blythe Airport (2.9 km [1.8 miles] northeast of the project area) during the 1930s; commercial operations began there in 1940.

The impact of World War II on the southern California car owner was instantaneous and severe. Blackout and dimout regulations were put into effect. Tires, gasoline, and finally, cars themselves were all strictly rationed, and speed limits were reduced (Wilson 1950:131). All but essential travel was prohibited, and carpooling became an important cog in the transportation scheme. For most Americans, automobile use was limited, and luxury travel was curtailed during that time. Following the war, however, the economy boomed, and demand for automobiles frequently outran supply. During the war, road construction had essentially ceased, and once the restrictions were lifted, more cars traveled more miles than ever before (Tomlinson 1975).

California State Route 78 follows local roads as it passes near the south and east sides of the project area (see Figure 2.2). This portion of the route, designated in 1963, is officially named the Ben Hulse Highway, after a state senator who served between 1933 and 1958 (Faigin 2012b). The route that was to become Interstate 10, running east–west at a distance of less than 0.6 km (0.4 miles) north of the project area, was defined in 1919 as Legislative Route Number 64 (as well as U.S. 60/70) (Faigin 2012a) and was paved from Indio to Blythe in 1936 (Pigniolo et al. 2007:13).

By the mid-1950s, it became clear that the existing national highway system was insufficient. Road deterioration, congestion, safety, and civil defense needs were all cited when talk of a modern system began to gain momentum under the Eisenhower administration. Further legislation in 1956 (the Federal Aid Highway Act) provided for the construction of a system of highways to be finished by 1972 at a cost of $26 billion. The interstate highway system, as it came to be known, was not completed until well into the 1980s and cost more than 10 times the projected amount.

The railroad impacted the development of transportation in the Palo Verde Valley. Receiving a charter in 1914, the California Southern Railroad Company began construction on a spur line in 1915. Operations from Rice to Blythe began in 1916; a southern extension to Ripley was completed in 1920, with operation beginning in 1921 (Cleland and McCorkle Apple 2003:86). In Rice, the railroad spur connected to the

Atchison, Topeka & Santa Fe Railway (AT&SF). The Blythe-Ripley branch of the AT&SF provided access to the gypsum mines in Midland (about 32 km [20 miles] north of Blythe) (Myrick 1992:840). It also provided a means to ship agricultural products to Los Angeles, as well as overnight passenger access to the city. In 1991, this segment of the railroad was sold to the Arizona and California Railroad, but it was abandoned nearly two decades later, in 2009.

Our review of historical maps yielded information about a single road (recorded as SRI-2333) that crossed the project APE during the historical period. This southwest–northeast–trending road appears on the 1918 General Land Office (GLO) plat map, drawn from survey data collected in 1917 (Figure 2.3). At that time, the road ended just south of the project area, in the southwest quarter of Section 23 near a house and agricultural field outside the direct APE. From that point, the road followed its current alignment northeasterly through Sections 23 and 14 but branched northeasterly from the current alignment in the northeast quarter of Section 11. More-recent 7.5-minute topographic quadrangles dated 1952 (drawn from 1948 aerial photographs and 1952 survey data) depict section-line roads running from the road recorded as SRI-2333 toward the east, in the center of the township, and between Sections 12 and 13 (recorded as SRI-9020 and P-33-014173).

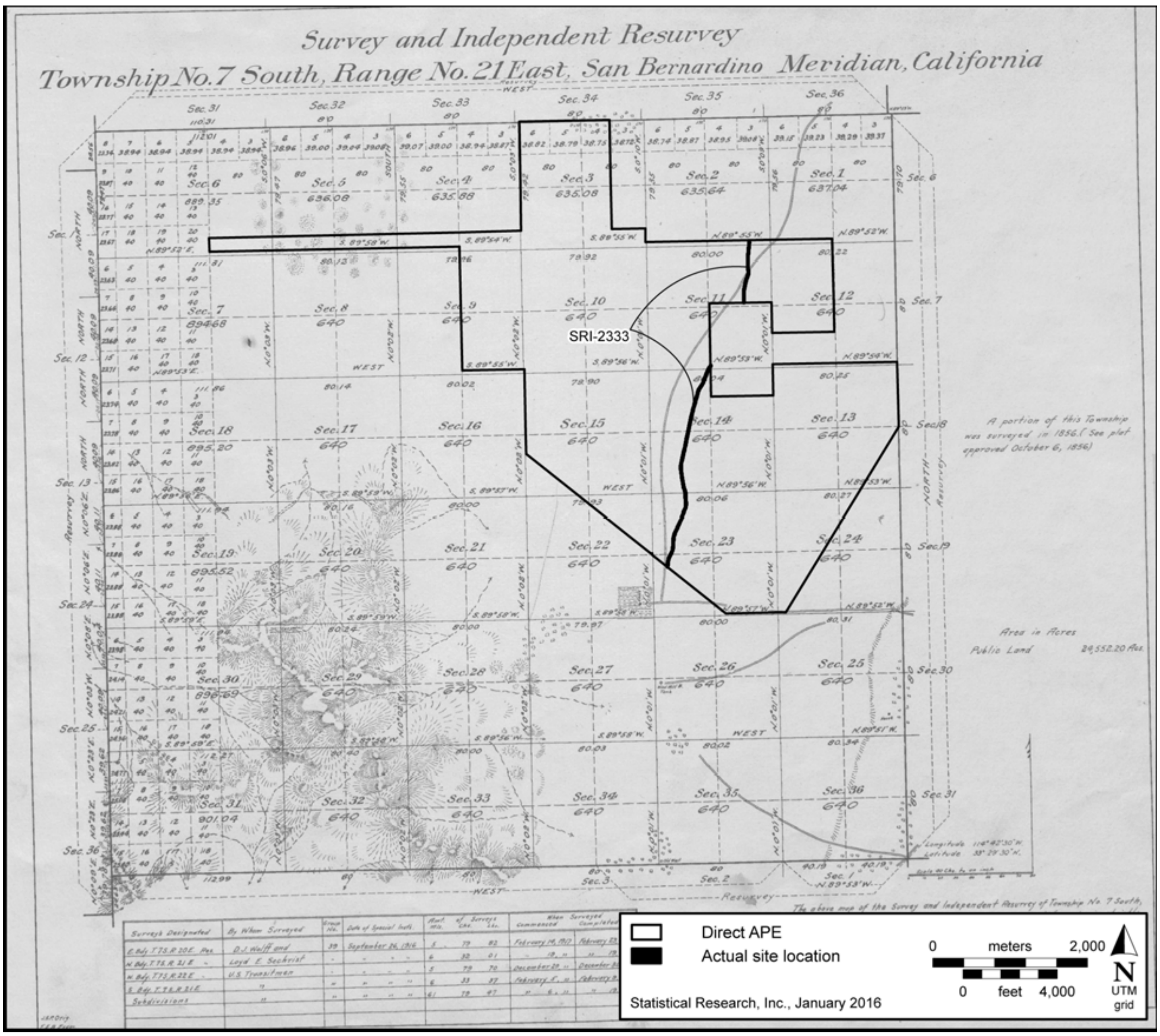

Figure 2.3. 1918 GLO plat of 1917 survey of Township 7 South, Range 21 East, SBBM, showing location of SRI-2333.

The first survey of Township 7 South, Range 21 East, in 1856, provided little topographical detail, and the surveyors likely had little physical impact on the land. The 1917 survey, however, mapped much detail within the township and established many section markers that remain in place today. Field notes for the survey (Wolff and Sechrist 1917) indicated that it was completed between February 6 and 19, 1917. The notes indicated that work had been performed variously over “level mesa,” “gently rolling mesa,” “level bottom land,” “crest of spur,” “broken malpai [*sic*] hills,” and “dry wash,” and “through greasewood [creosote bush] and scattering palo verde,” in “salt sage,” “ironwood timber,” and “mesquite.” The surveyors reported setting 85 iron posts with brass caps; this would account for exactly 1 post and cap for every section corner and center in the township. They also constructed numerous mounds of stone. The 1917 survey effort may account for many of the segmented roads, trails, and disturbances that follow section lines, half-sections, and quarter-sections within the township (recorded in this study as SRI-8085). Cut stumps within the APE may represent clearing activities performed by members of the 1917 survey crew to facilitate chaining and mapping.

Settlement and Agriculture

As previously mentioned, the history of agriculture in the Palo Verde Valley area extends back to the Patayan I period (ca. 1500–1000 B.P.). It was not until the mid-1870s, however, that the possibilities for commercial agriculture were explored. In 1850, the federal government had ceded to the state of California over 2 million acres of public swamp and overflow lands (lands that were subject to overflow and that could not be profitably used for raising crops without benefit of drainage or embankment) under the Swamp Land Act (Robinson 1948:191; USGS 2013). Under this provision, individuals could file for up to 160 acres of land to be reclaimed for agricultural development. The GLO completed a survey of Township 7 South, Range 21 East, in 1856. No cultural features were mapped within the project APE, and in fact, the only cultural feature depicted in the entire township was a “trail” running southwest–northeast across the southeast corner of Section 36, in the floor of Palo Verde Valley. The only individual for which archival information was found was H. M. C. Brown, who performed the 1856 survey of the township. Brown appears in a number of newspaper articles related to his involvement in the 1859 attempt to mark the location of the 100th meridian (*The New York Times*, 9 November 1859:2; *The Guthrie Daily Leader*, 9 February 1907:6). At that time, Brown had reportedly been a U.S. Surveyor for 20 years (*The New York Times*, 9 November 1859:2). The accuracy of the location remained in dispute (*Los Angeles Times*, 12 October 1926:19; *The Perry Journal*, 11 October 1926:1) until 1930, when 2,000 acres of Oklahoma land was given to Texas, and it was said that “2,000 persons who believed they lived in Oklahoma now find themselves citizens of the Lone Star state” (*Lincoln Evening Journal*, 18 March 1930:15). No sites related to the 1856 GLO survey were identified during this project.

In 1874, when the project area was within the boundaries of San Diego County, Oliver P. Calloway, a “noted engineer,” completed field survey for a road between San Diego and Yuma (Lech 2004:209). Near present-day Ehrenberg, Calloway observed the agricultural potential of the Palo Verde Valley and, after enlisting financial support from real estate tycoon Thomas Blythe, began amassing a land base for his plans. Together, the men recruited individuals to claim 160-acre parcels then convey ownership to Calloway and Blythe. Eventually, Blythe controlled over 303 km^2 (117 square miles) of land fronting the west side of the Colorado River and centering roughly on Ehrenberg, and Calloway engineered a water-conveyance system to irrigate the land (Lech 2004:211–214). Regional agricultural pursuits were delayed by the deaths of both men in the early stages of the scheme, but the area’s farming potential had been demonstrated (Lech 2004:215–217). In some cases, local land ownership became a hotly contested issue, with claimants applying the provisions of the California Swamp Land Act pitted against homesteaders citing federal land rights.

Arizona cattlemen visited Palo Verde Valley in 1904, and in partnership with the Hobson brothers of Ventura County, California, formed the Palo Verde Land and Water Company, assuming water rights for the entire valley. Our research resulted in some historical details concerning settlement within the project APE. Available archival evidence revealed much speculative attention to land within the APE, but no evidence was found that any of the land claims were ever patented. The earliest claim information is a Desert

Land Entry in Sections 12, 13, and 24 dated May 22, 1877. The claim was cancelled on April 20, 1896; no further details were available. Between January and March, 1909, a total of 17 Desert Land Entry claims was made for lands within the APE in Sections 3, 4, 9–11, 13–15, 22, and 23. Most of these were relinquished or cancelled in 1910 and 1911, and the remaining few were cancelled in 1949 and 1950.

During the first half of the twentieth century, a number of unsuccessful plans were drafted to develop an estimated 18,000 acres of irrigable land on the Palo Verde Mesa (Kleinsorge 1941:36). The town of Mesaville (so named for its location on Palo Verde Mesa, at a railroad siding on the Ripley branch line about 14 km [9 miles] northeast of the project area) was established in 1909 (Gunther 1984:322) but was short lived because of brackish well water and the inability to bring water to the mesa from low-lying canals nearer the river (Dekens 1962). In 1910, the *Imperial Valley Press* (29 January 1910:3) reported that "a large force of men and teams [are] at work in clearing off desert growth and leveling land for desert entrymen on the mesa lands," and that a well was "being sunk" on the northern portion of the mesa. Land on Palo Verde Mesa was opened for homesteading in 1911 (Pigniolo et al. 2007:12). Interest in development on the mesa was likely the impetus for the 1917 GLO survey of Township 7 South, Range 21 East. The Palo Verde Irrigation District was formed in 1923 to manage the valley's irrigation and drainage, and various irrigation schemes were proposed for mesa lands (AECOM 2015:38).

In the 1920s, receding Colorado River water levels and the subsequent attempts at remediation resulted in an overall drop in water level in the river while simultaneously increasing the chance of flooding in the irrigation canals (Bickell 1999:5). Local residents supported construction of Boulder Dam (now Hoover Dam), completed in 1935, because it would regulate river flow and prevent flooding; subsequent agricultural pursuits were more certain (Palo Verde Irrigation District 2012).The Great Depression brought many dustbowl refugees to the river crossing at Blythe. The newcomers sought work in agriculture, mining, and regional water projects, such as the All-American Canal, and some remained in the desert when the work was completed (Pigniolo et al. 2007:13).

In 1941, land atop the Palo Verde Mesa was said to "lie unreclaimed" (Kleinsorge 1941:36). Attempts at improving the valley's irrigation system were made during World War II, but because of a lack of funding, only a temporary rock weir was constructed. The permanent structure, Palo Verde Diversion Dam, was authorized in the 1950s (Bickell 1999:6), and a network of water-conveyance features, including levees, canals, and drains in the Palo Verde Valley bottom appear on historical-period maps as early as 1952.

Interest in land on the Palo Verde Mesa continued after World War II. A soils study of the Palo Verde Mesa, completed in 1946, concluded that most of the land within the project APE was Grade 3 (Weir and Storie 1946:6), indicating "fair" soils that "may give good results with certain specialized crops" (University of California 1978:3). Small pockets of soil in Sections 10 and 15 were determined to be of Grade 4, indicating "poor" with "a narrow range in their agricultural possibilities" and Grade 5, "very poor" and "of very limited use except for pasture, because of adverse conditions such as shallowness, roughness, and alkali content." An island running roughly from the northwest to southeast corners of Section 22 was found to be Grade 2, "good," and "suitable for most crops" (University of California 1978:3). A 1953 assessment of agricultural potential stated

> in general, the mesa lands are suitable for a large variety of farm production and should be especially suitable for grapes, tomatoes, alfalfa, cotton, wheat, barley, rye, oats, beans, corn and melons. The possibility of growing tangerines and grapefruit should not be overlooked, as these citrus fruits would make profitable permanent income, and the soils are especially adaptable to citrus.
>
> Pasture land, together with stock feeding, would be suitable and the raising of hogs and feed in combination has been practiced very successfully in the Yuma area [about 89 km (55 miles) south of the project APE] by at least one good farm operator, who has successfully overcome the heat problem in summer by specially designed pens and cooling ponds [Harrison & Woolley 1953:10].

Records on file in the National Records and Archives Administration (NARA) listed 32 claimants for parcels within the project APE during the 1950s (Table 2.2). The claims ranged in size from 40 to 320 acres, and all were either Desert Land Applications or Desert Land Entries. "Some time prior to 1951, some of the Desert Land Entries in the area commonly referred to as the Blythe Lower Mesa organized a group known as the Blythe Mesa Preorganization Association in order to lend mutual assistance to each other in obtaining water from the Colorado River" (Jenney 1955). A. E. Nicholls, who had claimed land on the mesa since as early as 1909 (New Town on Palo Verde Mesa, 13 June1950:35) and held one of the claims within the APE during the 1950s, was reportedly "one of the prime movers in the effort to obtain irrigation water" for the mesa (Desert Owners Seek Water, 14 January 1951:36) and "head of the property owners [*sic*] group" (*San Bernardino County Sun*, 9 December 1950:12). During his early tenure on the mesa, he had planned a community to be named Palowalla about 1.6 km (1 mile) north of the project area, but development was delayed until about 1950, when he created Nicholls Warm Springs at the location (see Figure 1.2). Potter B. Hueth, who had cleared brush on the mesa in 1910 (*Imperial Valley Press* 1910), also had a claim within the APE during the 1950s.

The group drew plans to bring water to the 16,000 arable acres on the mesa via a pumping station and new canal. This canal was to run generally north–south across the project APE, through Sections 10, 15, and 22 (Figure 2.4). The cooperative group hoped to annex the mesa lands to the Palo Verde [Valley] Irrigation District and pooled funds for the proposed pumping station and canal. The claimants maintained that because their objective was to irrigate their claims, their investment in Association payments for irrigation improvements should suffice as their annual proof. Hundreds of documents on file at NARA related the claimants' further assertion that the time period for proving up on their claims should be extended in light of their continued efforts to irrigate the land. They hired legal representation, retained engineers and soil experts to assess the land, sought the support of legislators, and implored government officials regarding their case. Archival documents showed that negotiations continued between claimants and the federal government until at least 1959. Claimants Esther Cassell and Ruby Thurnherr were particularly prolific correspondents on behalf of the entire group. A BLM memorandum, dated March 19, 1959, named 20 of the 32 individuals who had entries within the project APE on a list of entries that "can probably be rejected on the basis of the Regional Solicitor's opinion of February 9, 1959" (Best 1959). Archival research did not disclose a final cancellation of the various land claims, but the lack of patent documents on the GLO Web site suggests that none of the claims within the project APE was ever patented. It is clear that the pumping station and canal were not constructed.

Jojoba domestication presented a unique agricultural pursuit in the region during more-recent decades. During the 1970s, Native Americans collected and processed jojoba seed and produced oil from native plants on reservation lands in California and Arizona, providing an impetus for research and commercialization of the product (Randazzo 2014; U.S. National Research Council 1985:3). Jojoba (*Simmondsia chinensis*) is a "perennial woody shrub native to the semiarid regions of southern Arizona, southern California and northwestern Mexico" (Undersander et al. 1990). Jojoba domestication was explored as an alternative to sperm whale oil products and fossil fuels and "made the move from obscurity into the real world of agriculture with unprecedented speed" (Yermanos 1979:4, 11). In California, 1,500 acres of small jojoba plots were planted in 1977 and 1978, large plantations were established by 1979 (Yermanos 1979:6), and farms were yielding harvests by 1982 (U.S. National Research Council 1985:v). By 1990, 40,000 acres of jojoba were under cultivation in the southwestern United States (Undersander et al. 1990). In response to unpredictable yields, however, only approximately 4,000 acres remain in production today in California and Arizona (Randazzo 2014). Within the DQSP, the 160-acre private land portion of the project area located in the NE $^1/_4$ of Section 15 was formerly a jojoba farm and is now abandoned.

The climate of the Palo Verde Valley is ideal for agriculture, and crops are harvested year-round. According to the Palo Verde Irrigation District, as of 2003, crops consist largely of grains, grasses, melons, cotton, and various vegetables and citrus. With a gross return of over $37 million, alfalfa is currently the leading cultivar in the valley (Palo Verde Irrigation District 2012). Today, the economy of the CRIT is focused largely on agriculture, reservation land is leased for agricultural production, and cotton, alfalfa, and sorghum are grown (Colorado River Indian Reservation 2009; Eargle 2008:225).

Table 2.2. Land Claimants Associated with the Direct APE

Name
Allen, Don A.
Allen, Margaret
Anderson, Prudence B.
Bergstrom, Gristan Eric (possibly Erin)
Bergstrom, Pearl
Billson, H. L.
Brinkman, Gerald A.
Cain, Elmer
Callender, Frank A., Jr.
Cassell, Esther M.
Cassell, Ida May
Cassell, Ralph W.
Cehms, Judge (spelling uncertain)
Cunningham, Arva
Cunningham, Virginia L.
Gates, L. S. (Leon)
Geier, John H.
Gudzunas, Victor A.
Hueth, Potter B. (P. B.)
Miller, A. (Agnes A.)
Newman, R. (Raymond)
Newman, S. L. (Sol L.)
Nicholls, A. E.
Parker, Fred H.
Scott, John T.
Thomason, Mary E.
Thorp, Daisy (Thorpe)
Thurnherr, Frank H. (Thornherr)
Thurnherr, Ruby H. (Mrs.) (Thornherr)
Van Reid, Minnie
Wernsing, A. A.
Zeiler, Joseph

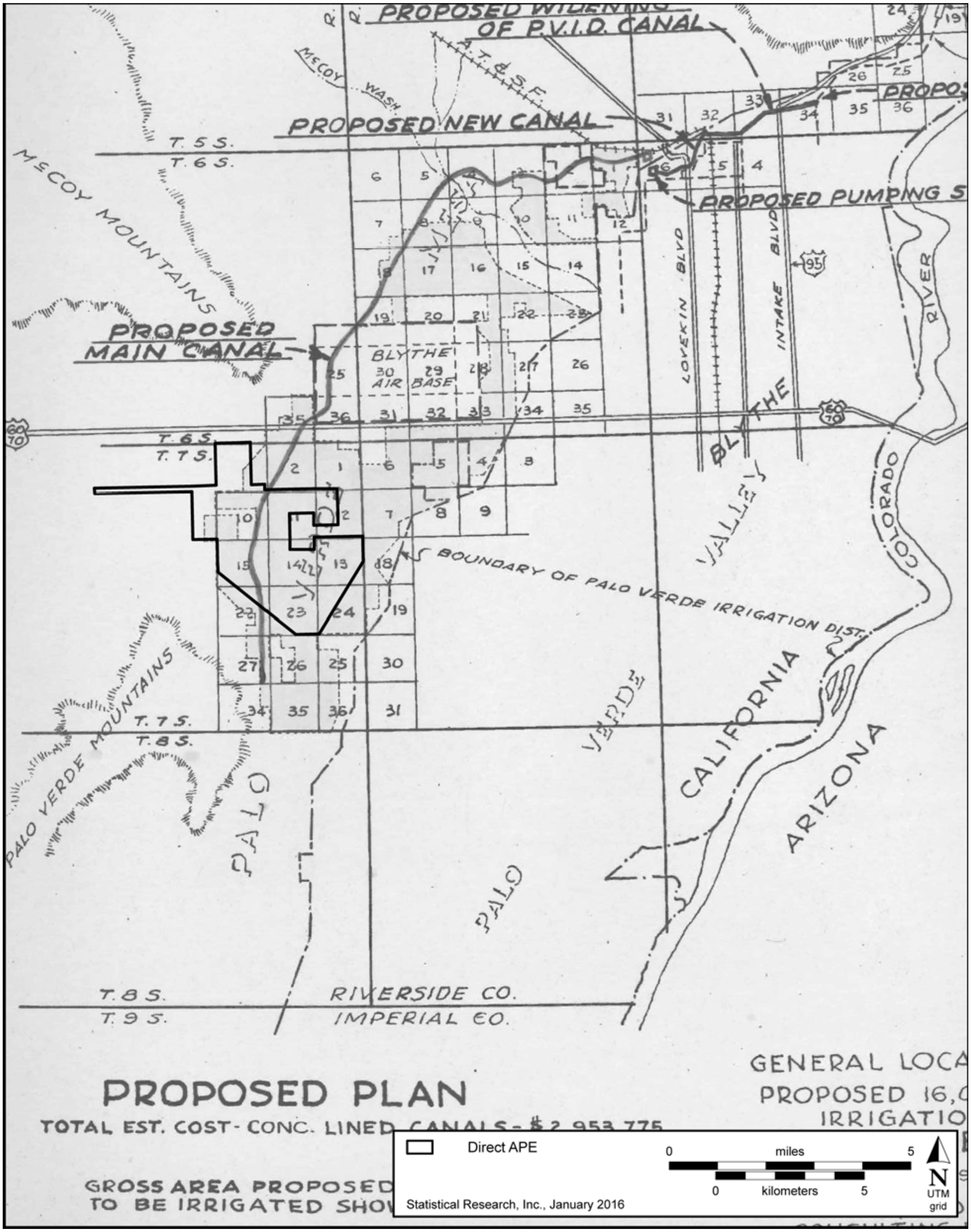

Figure 2.4. 1953 map showing proposed Palo Verde Mesa irrigation canal. Source: Harrison & Woolley 1953:Plate I.

Military Activities

Fort Yuma

The Mexican War and the California Gold Rush brought Euroamericans to the region in increasing numbers, along with increasing regional hostilities. In response, the U.S. Government established the military post that became Fort Yuma between 1849 and 1851 (Frazer 1970; State of California 2015). In 1858, the U.S. Army's defeat of the combined forces of the Mojave and Quechan proved to be the last major conflict between Native Americans and Euroamericans in the region (Pigniolo et al. 2007:11).

World War II and the Desert Training Center

During the opening days of World War II, more than 81,585 km^2 (31,500 square miles) of the Arizona and California desert were identified and developed by U.S. Army ground forces as a training facility for infantry and armored units known as the Desert Training Center (DTC) (Bischoff 2009a, 2009b; BLM 2013). The facility was originally intended to train and prepare armored units for desert warfare in the planned invasion of North Africa; however, during its years of operation, between 1942 and 1944, the training center expanded far beyond this original scope and incorporated a variety of new training exercises. In 1943, the area became known as the Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA) to reflect this new role. Of the total 85 army divisions that served in World War II, 23 trained at the DTC/C-AMA (Pew 1985:28). This translates to more than 1 million soldiers, roughly 10 percent of all U.S. personnel who served in World War II.

The Blythe Army Air Base (BAAB) was built in 1942 at the location of the Blythe Municipal Airport and served as a transportation and supply hub, as well as a training base for bombardment crews through late 1944, after which it became a refueling location. It was deactivated in 1945 (Pigniolo et al. 2007:13).

Today, across much of southeastern California and western Arizona, the remains of the training area can still be found. In California, surviving features include training camps, airfields, bivouacs, and maneuver areas, as well as more-ephemeral features, such as foxholes, machine-gun positions, and tank tracks. The complex represents a significant event and period in U.S. history, and many of these elements are considered eligible for listing in the NRHP.

The project APE lies within the DTC/C-AMA (Figure 2.5), but no DTC camps were located in the project vicinity. Considerable evidence was encountered during this investigation to indicate that training activities were performed in the immediate area.

Operation Desert Strike

In 1964, another set of military maneuvers called Operation Desert Strike was undertaken by the U.S. Army and U.S. Air Force in the same basic location as the DTC/C-AMA, in an area approximately one-third the size (Bischoff 2009a:49, 129). The exercise lasted 2 weeks and was designed to train various units in desert warfare and improve coordination among different military branches. Like sites associated with the DTC/C-AMA, Operation Desert Strike sites consist of temporary camp sites and training areas with associated artifacts dating to the 1960s, but none of the campsites is located within the project APE (Bischoff 2009a:30, 129).

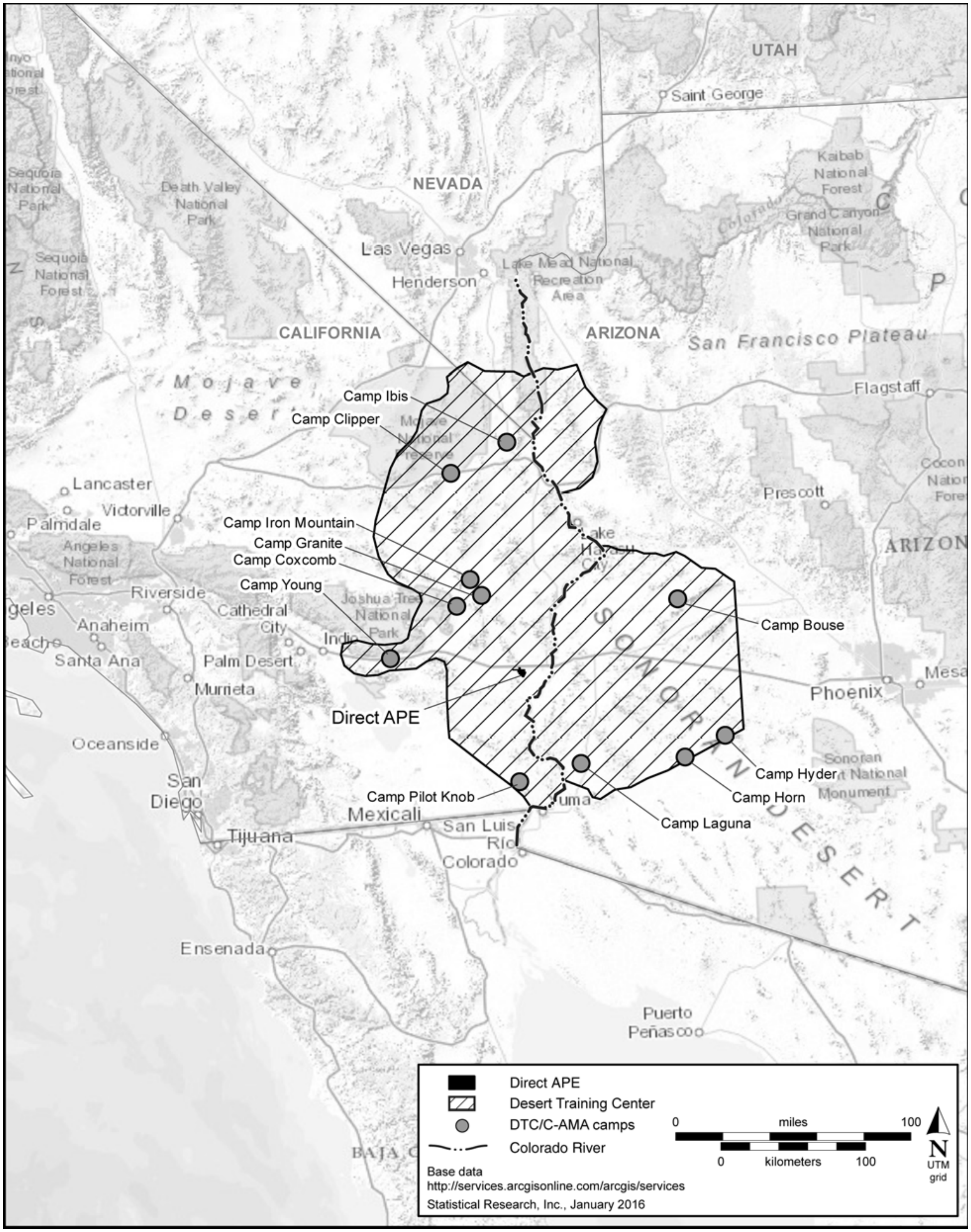

Figure 2.5. Location of the DQSP in relation to DTC/C-AMA camps in the region. Sources: Bischoff 2009a, 2009b; BLM 2013.

CHAPTER 3

Research Design and Methods

Scott H. Kremkau, Karen K. Swope, Mark Q. Sutton, and Michael K. Lerch

This chapter includes a research design that addresses both prehistoric and historical-period themes with their respective research questions and data requirements, followed by a discussion of site types and field methods.

Research Design

As lead agency, the BLM required that SRI develop a research design prior to the start of fieldwork, as a tool to evaluate the eligibility of any cultural resources within the direct APE for listing in the NRHP. A research design is an explicit statement of the theoretical and methodological approaches to be used in an archaeological study (Office of Historic Preservation [OHP] 1990:9). The research design provided here was used to guide field methods and evaluations of any cultural resources identified within the direct APE. The following sections address both the prehistoric and historical-period occupation of the APE and address various research themes important to both of these eras. This chapter is drawn from the research design and work plan for the DQSP archaeological survey submitted to BLM in March 2014 and provided to SHPO by BLM on August 21, 2014 (Wakefield 2014). On September 30, 2014, SHPO concurred with BLM that the APE was consistent with the Section 106 regulations at 36 CFR 800.16(d) and that the proposed work plan represented a reasonable and good-faith effort to identify historic properties located within the APE, as required by 36 CFR 800.4(b)(1) (Roland-Nawi 2014).

Prehistoric and Protohistoric Research Themes

Eastern Riverside County is part of the Colorado Desert, a vast desert that runs along the Colorado River westward to the Peninsular Ranges and represents the northwestern extent of the Sonoran Desert. Despite the limited resources available, humans have occupied the Colorado Desert beginning soon after they entered North America beginning some 12,000 years ago and possibly several thousand years earlier, based on evidence at sites such as Meadowcroft Rockshelter in Pennsylvania and Monte Verde in Chile, as well as data in California from coastal and island sites (Erlandson et al. 2007:55–56), as well as the widespread presence of fluted points (Rondeau et al. 2007). However, archaeological information on prehistoric cultures in the Colorado Desert remains relatively scant, and most of our current understanding of the nature of aboriginal settlement and subsistence in the area has been modeled using ethnographic data. Thus, the following research topics are proposed to tackle some of the outstanding research issues pertaining to the Colorado Desert. These topics build on the research design proposed by Schaefer (1994b), incorporating more-recent information from excavations and ethnohistoric studies.

Research Questions and Data Requirements

We pose general questions focused on topics of chronology, trade and regional interaction, ceremonial landscapes, technology, and settlement and subsistence. The research questions and the data needed to address each topic are discussed below.

Chronology

Adequate temporal control in archaeological deposits is crucial if researchers are to generate meaningful inferences from data or to address specific research questions with any degree of analytical confidence. Crucial to the current study is the timing of the prehistoric occupation of the project area. The Colorado Desert has been home to prehistoric aboriginal populations for at least 10,000 years (Rogers 1929, 1945; Schaefer and Laylander 2007). In contrast to neighboring regions, however, the antiquity of prehistoric occupations in the Colorado Desert is only recently coming into focus.

Absolute radiocarbon dates are relatively rare in this region, compared to other parts of the southwestern United States. Few stratified sites with good preservation have been identified within the Colorado Desert (Love and Dahdul 2002; McDonald 1992; Schaefer 1994b; Schaefer and Laylander 2007); of these, some of the best-preserved were found in rockshelters (McDonald 1992; Schaefer 2002; Wilke et al. 1986). Sites within the APE are confined to open-air, temporary-use campsites and activity areas. Although not as ideal as rockshelters, these sites could still contain intact subsurface deposits and features, and an increasing number of these sites have been identified within the Colorado Desert, particularly in dune environments (see Drover 1982, 1988; Hogan et al. 2010; Love and Dahdul 2002).

Among the questions about chronology we addressed are the following:

1. When were sites within the APE occupied? What is the full temporal extent of the occupation of the APE?
2. What was the intensity of prehistoric use of the APE over time?
3. How do data from sites within the APE compare with data from other regional settlement pattern studies? Do the sites within the APE represent the full occupational history of the Colorado Desert or just a subset of that history?

Data Requirements

The types of data needed to establish a chronological framework for any site include absolute dates from intact midden deposits with hearths, roasting pits, or other features that can be radiocarbon-dated and relative dates from temporally sensitive artifacts with well-established age ranges. Several previously recorded sites in and around the APE contained diagnostic projectile points and pottery (e.g., P-33-001821, P-33-001822, and P-33-021371), which would help to date the sites to general time periods. Obsidian artifacts could yield relative chronological information through the measurement of hydration rims, although variables affecting the rate of hydration are as yet imperfectly understood. In addition, the presence of sites on otherwise dated landforms may be useful in dating the sites.

Trade and Regional Interaction

The study of trade and exchange networks reveals how humans acquire material goods, technologies, and ideas. In some cases, the identification of trade goods is straightforward—for example, marine shells at inland sites hundreds of miles from the coast. In other cases, sourcing studies, which allow researchers to see where materials came from, are necessary. For widely traded items, it can be difficult to determine whether their appearance in certain areas is the result of long-distance contact with the groups who originally acquired or produced them or if the items were traded “down the line,” passing through several groups before arriving at their final destinations. In these cases, multiple lines of evidence from a variety of material or artifact classes can help show patterns in the distribution of certain goods. The resolution of these issues is also dependent on sufficient data sets from excavated contexts from several different sites along trade routes.

The Colorado Desert area borders the territories of several known prehistoric cultural groups, and evidence of trade with these groups has been documented at sites across the desert (Bean 1972:68–70; Bean et al. 1995). Several prehistoric trails pass through and near the APE, including portions of the Coco-Maricopa Trail and the Xam Kwitcan Trail, which pass just north and east of the direct APE (Bean 1972; Bean and Vane 1978; Laylander and Schaefer 2010). Prehistoric trail systems within the APE may be difficult to discern because of land-surveying activities and World War II–era use of the area for tank maneuvers. However, several recent studies have been able to differentiate prehistoric trails from animal trails and more-recent construction (Becker and Altschul 2003, 2008; Laylander and Schaefer 2010; Slaughter et al. 2000; Stone 1991).

There are several potential archaeological sources of information relating to trade and exchange, including lithics, shell, and ceramics. The exchange of lithic materials between the Colorado Desert and other areas has been documented at several sites (Bean et al. 1995; Grenda 1998; McFarland 2000; Pigniolo 1995). The two major lithic sources are Obsidian Butte, on the southern shore of the present-day Salton Sea, and the Wonderstone West Rainbow Rock Locality (CA-IMP-6300), on the western shore of ancient Lake Cahuilla (Pigniolo 1995). In a more local example of lithic procurement, a set of lithic flakes made of felsite from a quarry located at the foot of the Chuckwalla Mountains (P-33-001814) were found to refit with those from another workshop (P-33-001819) at the foot of the Mule Mountains 63 km (39 miles) away and just west of the project area (Singer 1984); similar lithic material is found in localized outcrops at Dragon Wash near Desert Center and along the eastern slopes of the Eagle Mountains of Joshua Tree National Park (George E. Kline, personal communication 2015). This is one of many sources of cryptocrystalline silicate (CCS) sources in the Chuckwalla Springs area, among others in the Palo Verde and Mule Mountains (Strong 1971:72–76). Other lithic sources in the region include northern Baja California (San Felipe obsidian), the California coast (steatite), and central Arizona (argillite).

Likewise, marine shells have been found at sites in the Colorado Desert, with the Coachella Valley functioning as a trade route between the Gulf of California and the southern California coast (Ahlstrom 2000; Rosen 1995). Ceramic figurine types from both the Great Basin and the lower Colorado River were found at sites in Tahquitz Canyon (Bean et al. 1995), Mission Creek (Altschul 1986), and Yucaipa (Grenda 1998), suggesting that the inhabitants were part of larger areas of interaction in the southwestern United States.

In addition to trade, the prehistoric groups within the Colorado Desert would have interacted in other ways. The APE is located just west of the Colorado River floodplain, in an area that was attributed to the Halchidhoma (Kendall 1983:8). Halchidhoma territory was bordered by that of the Mojave to the north, the Quechan to the south, the Cahuilla to the west, and the Chemehuevi to the northwest. These groups had complex relationships with one another, and the borders of these territories were constantly in flux. The Mojave and Quechan had an alliance and raided into Halchidhoma territory, and by 1829, the Halchidhoma had left the Colorado River and moved to the east to live with another Yuman tribe, the Maricopa (Stewart 1983a:2).

Questions pertaining to trade and interaction include:

1. What evidence is there that prehistoric and protohistoric peoples within the project area engaged in trade with areas of coastal California, the U.S. Southwest, and other neighboring culture regions?
2. What types of materials were traded prehistorically? Were finished goods or raw materials more likely to be traded? How did this change through time?
3. Are trail systems present within the APE? Where did these trails go, and when were they used?
4. Is there evidence for extensive cultural interaction (e.g., intermarriage, warfare, and trade) between different tribes at sites within the APE?

Data Requirements

The basic types of data required to address trade are those regarding the presence of lithic and ceramic artifacts, shell ornaments, and other elements of material culture that are easily transportable. Food items, such as meat, shellfish, acorns, and pinyon nuts may also have been important resources that were traded. Trade can be inferred from the distribution of nonlocal materials, such as marine shell and certain types of obsidian. Analyses of trade and exchange also require representative samples from other areas that can be used to show what materials were traded out of the study area. Sourcing studies and other chemical analyses would be required during further phases of research to determine the origins of marine shell, obsidian, and ceramic artifacts found during survey. Fortunately, the Obsidian Butte source has been well studied, and its specific mineral signature can be easily recognized in sourcing studies (Hughes 1986). Pottery can also contain abundant information about exchange and interaction. The analysis of paste inclusions (small pieces of temper added to the clay prior to firing) can provide insights into the refinement of paste recipes, as well as identify possible traded or exotic goods.

Identification of prehistoric trails has improved greatly over the last few years. Becker and Altschul (2003, 2008) noted that animal trails tend to follow the path of least resistance, whereas human trails follow the shortest route between two points. Furthermore, Laylander and Schaefer (2010) identified several metrics of prehistoric trails that should be visible during survey. For example, trails are generally 15–30 cm (6–12 inches) wide and just 2–5 cm (1–2 inches) deep. Pot drops and other artifact scatters may also be common along prehistoric trails. This differs from historical-period trails, which may share some characteristics with prehistoric trails but most often were used less intensively and for shorter periods of time and, consequently, are less distinct. For example, trails used a single time during land surveys by the survey crew generally follow section or quarter-section lines and are oriented to cardinal directions between survey monuments, as well as being less embedded and lacking associated artifacts.

Finding evidence of cultural interaction can be more challenging. Changes in tool manufacture or design can help us to identify changing social relations among occupants of a site or change through time in social connections among different social groups. The appearance of novel manufacturing techniques, such as changes in projectile point or pottery styles, can signal the arrival of a different group of people within the project area.

Ceremonial Landscapes

Rock art and intaglios (geoglyphs) are currently the primary archaeological conveyors of religion and ritual along the Colorado River. These features are associated with areas sacred to contemporary Native Americans, and they are the primary means of identifying spaces that were sacred in the past. Rock art and intaglios are common throughout the Colorado Desert; at least 20 major intaglio complexes have been identified, and dozens of rock art sites are known (Ezzo and Altschul 1993; Ezzo 1994). The Mule Tank Discontiguous Rock Art District (containing sites P-33-000504 and P-33-000773) is located within the indirect APE, southwest of the project area. Two other intaglio sites, P-33-000661 and P-33-000662, are located in the northern portion of the indirect APE. These sites are made of alignments of waterworn cobbles. In addition to large constructions like intaglios, smaller cairns, rock alignments, and trails may have been important elements of the ceremonial landscape of the project area and its surroundings. Becker and Altschul (2008), Ezzo and Altschul (1993), and Rogers (1966) have described some of the types of cairns and other features present within the wider region. Trails, in particular, although important for trade and communication, were also important elements of ceremonial landscapes (Becker and Altschul 2003, 2008).

Questions pertaining to the ceremonial landscape include:

1. What types of ceremonial sites are present within the direct and indirect APEs?
2. How and when were these sites used?
3. How do ceremonial sites within or near the APE relate to other prehistoric uses of the project region?

Data Requirements

The study of ceremonial landscapes within the APE includes a number of different artifact types. Rock art sites are not likely to be found within the APE, given the lack of large rock outcroppings, but intaglios are possible. Moreover, a spatial analysis of how trails, cairns, and other landscape features relate to habitation sites and intaglios or rock art sites in or near the APE can help to show how these different sites are interconnected.

Technology

The by-products of stone tool manufacturing are some of the most ubiquitous remains in the archaeological record. Stone was the primary source of raw material until the arrival of Euroamerican into the Colorado Desert during the eighteenth and nineteenth centuries. The earliest stone tool assemblages in the Colorado Desert were identified by Malcolm Rogers in the early twentieth century (Rogers 1929, 1945, 1966); these became known as the Lake Mojave complex (Warren 1984; Sutton 2013). If such early sites are present within the direct APE, they may be able to help refine the Lake Mojave assemblage and adaptation. The stone technologies of later cultural complexes are also poorly known.

The materials used to make flaked stone and ground stone artifacts were all obtained from bedrock outcrops or secondary gravel sources. However, specific material types were required to meet the functional requirements of the various tool types. Therefore, the prehistoric inhabitants of the region had to solve the problem of obtaining lithic raw materials that were differentially distributed across the landscape, sometimes at great distances. The result is a complex process involving the acquisition of raw materials, tool production, tool use, and the subsequent discard of expended tools. Stone tools, therefore, offer a direct link to understanding how people coped with the uncertainties of living in the arid Colorado Desert.

Quarries can include primary quarries, where actual outcroppings of stone were exploited, or secondary quarries, where boulders and cobbles of tool-quality stone are present, primarily eroding from alluvial-fan deposits. Secondary quarries have been recorded elsewhere in the Colorado Desert (e.g., CA-SBR-12263 [Linder and Powell 2006]) and can consist of considerable expanses and numbers of lithic-reduction loci and small to large workshops. Secondary quarries are frequently aggregates of lithic-reduction loci, each essentially a single reduction event dating to a specific time and unmixed with other such events. This provides the opportunity to classify and understand specific reduction events and strategies and to examine trends through time and space. Similar studies have been conducted in the Mojave Desert, to the north (Bamforth 1992; Byrd et al. 2005; Stanton et al. 2013).

Pottery was apparently first introduced in the Colorado Desert in the middle of the first millennium A.D., but the timing of this is still debated. The appearance of pottery is tied to the emergence of the Patayan culture, but a preceramic Patayan period was also present. In addition to pottery, the emergence of the Patayan culture also coincided with the appearance of arrow points (e.g., Cottonwood Triangular) and floodplain agriculture. Various ceramic typologies have been proposed (Rogers 1945; Schroeder 1957, 1979; Waters 1982a, 1982b), but these have been based primarily on surface collections and not from stratified excavation contexts. As a result, many researchers have had difficulty applying these typologies to other sites in the region, and further research is needed.

Questions pertaining to technology include:

1. What late Archaic period lithic technologies are present within the APE?
2. Were tool stone sources present within the project area? How were these sources exploited? Did the intensity and methods of exploitation change through time?
3. When did pottery appear within the project area? Can a preceramic Patayan occupation be identified?
4. Can a more definitive ceramic chronology be developed from controlled testing and associated absolute and relative dating techniques?

Data Requirements

The basic types of data required to address questions regarding technology are obvious—data regarding lithic and ceramic artifacts and the remains of their production. As determined from excavations conducted at other sites in area, the artifact types that are most likely to be encountered are flaked and ground stone tools and pottery. With regard to flaked stone tools, different technological and production techniques can be studied through the analysis of formal tools and debitage from tool manufacture. By comparing different attributes of these artifacts, we can infer how they were designed, made, used, and discarded. On the basis of these data, we can infer the intensity of tool use (expedient vs. formal tool production), the relative importance of particular technologies, and the relationship of these factors to specific activities and practices (e.g., see Parry and Kelly 1987; but see also Railey 2010). The identification of disparate or common practices can help us to identify social relations among occupants of a site or different sites or change through time in historical or social connections among people.

Although not as common as lithic artifacts, ceramics—specifically pottery—can contain abundant information about function, technology, and exchange. Various formal and stylistic data can be recorded during survey without more-intrusive chemical analyses. For example, different manufacturing and decorating technologies (such as slip and painted designs) can be deduced from studies of the interior and exterior surfaces and the vessel cross section. The analysis of paste inclusions can provide insights into the refinement of paste recipes, as well as identify possible traded or exotic goods.

Settlement and Subsistence

Issues of settlement and subsistence form the backbone of many archaeological investigations. These lines of inquiry often focus on the most basic types of questions archaeologists can ask, such as who lived here, how was the use of space organized at the site level, what did people eat, and what time of the year were they here? Although these questions may be simple, to answer them, researchers must draw on a number of disparate data sets, such as chronology, cultural affiliation, and technology. Settlement-pattern studies investigate the ways in which people organize themselves in relation to their surroundings. This includes not only environmental factors, such as access to food, water, and other important resources, but also cultural factors, such as sacred landscapes and other elements of an interactive natural world. Subsistence studies investigate how people acquired food and other necessities and how they organized themselves to meet these daily needs. Together, settlement-pattern and subsistence studies help to form a backdrop of basic archaeological knowledge that researchers can draw from to answer broader questions about cultural change within particular study areas.

The DQSP APE is located just west of the Colorado River, on a terrace above the well-watered Colorado River floodplain. The Colorado River provided a large, dependable water source, as well as habitat for a variety of plants and animals, and despite its aridity, the surrounding desert provided important sources of food as well. Although the River Yuman tribes were well known for their practice of agriculture on the river floodplain (Castetter and Bell 1951), archaeologists have tended to see the prehistoric inhabitants of the uplands away from the river as foragers (see Binford 1980), groups who lived in seasonal camps and used logistically based task groups to exploit specific resources and then return to these camps. Specific strategies varied, based on the distribution of resources across the landscape, taking into account elevation, hydrology, and soil conditions.

However, reasonable examples of intermediate lifestyles have been demonstrated in California, including the replanting of geophyte propagules prior to the gathering of the mature bulbs for food (Anderson 1997). The use of previously unavailable plant foods such as geophytes was, in turn, presumably prompted by the introduction of earthen-oven technology, which allowed for the processing of complex plant foods, primarily those containing inulins and complex carbohydrates that required long periods of baking in order to render them edible (Black and Thoms 2014). The use of such ovens has been recognized globally and is often discussed in terms of a phenomena of increased intensification culminating in a transition to settled agricultural lifestyles (Thoms 2009). In the northern Mojave Desert, patterns in the use of thermal features suggests a transition from processing geophytes between 1000 and 300 B.P. to intensive seed processing after 300 B.P. (Eerkens and Rosenthal 2002; Eerkens et al. 2009).

Ground stone implements from the early Archaic period are rare in sites in the Colorado Desert (Rogers 1966), although ethnographic sources have noted that wooden milling slabs could also be used in place of stone, and the apparent lack of such artifacts could be the result of poor preservation (Pendleton 1984:68–74). However, ground stone artifacts become more and more common as the Archaic period progresses. Many have seen this as reflecting an adaptation to a more diverse diet, with a growing reliance on seeds and nuts. During Patayan times, cultigens were adopted by people living in the floodplain. Although cultigens never replaced wild plants and animals as the primary food source, they did play an increasingly important role in local subsistence practices. Thus, paralleling lithic technologies in the region, there appears to have been a tendency toward greater subsistence diversity through time (e.g., increasing diet breadth), with people relying on a greater and greater variety of foods in order to survive. This increasing diversity should be visible archaeologically, both through the introduction of ground stone artifacts, and through an increasing diversity of faunal and plant remains.

Questions pertaining to subsistence and settlement patterns include:

1. How well does site patterning conform to the settlement models posed for prehistoric societies in the area?
2. What evidence is there for habitation? Were sites within the APE occupied year round, or were they seasonal camps? How many people were living at these sites, and how did population size change through time?
3. What types of food were consumed at the sites? What environments were people exploiting to acquire their foods?
4. What locally available raw materials were utilized?
5. Did the exploitation of certain resources change through time? If so, how?
6. When did ground stone implements first appear in the area?
7. Were domesticated plants or animals used at the sites? If so, which species were used, and when did they appear at the sites?

Data Requirements

Studies of settlement patterns require not only intensively investigated individual sites but also enough regional comparative data to construct a complete model of site types. Given the large size of the direct APE and the relatively well-surveyed indirect APE around it, there should be sufficient comparative data. Several large sites have been recorded in and around the direct APE, and these may contain archaeological deposits. Midden deposits found elsewhere in the Colorado Desert have recovered large quantities of domestic refuse (Hogan et al. 2010; Love and Dahdul 2002; Sutton 1993, 1998; Wilke 1978), and the arid environment of the project area should help preserve organic materials such as botanical and faunal remains. There may be adequate data at sites within the direct APE to study the types of activities that took place during the prehistoric and historical periods, what times of the year they took place, and whether they conform to various models of prehistoric settlement patterns for the region.

Features and artifacts, as well as faunal and botanical remains, can give clues to the types of activities that occurred at the sites, as well as the times of year the activities took place. Comparisons between the types of activities found at sites within the direct APE and at other, previously studied sites in the vicinity can place the project area in a regional context. These comparisons can also help determine whether the project sites represent the full range of activities documented in the surrounding region or a particular subset of activities.

Historical-Period Research Themes

Research Questions and Data Requirements

We pose general questions focused on the topics of European–Native American contact and historical-period interactions, mining, transportation, settlement and agriculture, and military use of the region. The research questions and the data needed to address each topic are discussed below.

European–Native American Contact and Historical-Period Interactions

The arrival of European explorers and colonists to the Americas had profound impacts on every facet of Native American societies. As noted in Chapter 2, the earliest documented European explorer of the Lower Colorado River was Hernando de Alarcón, who sailed up the Colorado River in 1540. Contact between Native American tribes and Europeans was intermittent until the late eighteenth century, when Spanish authorities attempted to exert more control over the region. For the next century—until the creation of the Fort Mojave, Colorado River, and Quechan Indian Reservations in the late nineteenth and early twentieth centuries—Native American tribes living along the Lower Colorado River interacted with increasing numbers of European and American explorers, trappers, miners, and military forces. These interactions changed many aspects of Native Americans' lives and brought them into contact with new technologies, as well as disease and violent conflict.

Ethnographic studies of River Yuman groups in the late nineteenth and early twentieth centuries have provided a great deal of information on Native American lifeways during this period, but relatively little is known about European–Native American relations during the first few centuries after European contact. The consequences of contact would have impacted Native American groups in a number of ways. Disease, along with slave trading in the early nineteenth century, would have led to serious population declines. According to Forbes (1965:343) the Quechan had a population of at least 4,000 people at the time of Spanish contact, but that number had dwindled to 1,100 to 1,200 by the time of the creation of the Quechan Indian Reservation in 1884. European goods such as ceramics, glass, and metal may have replaced traditional cooking and hunting equipment.

Questions pertaining to European-Native American contact and historical-period interactions include the following:

1. How did contact with European and American explorers and settlers impact Native American groups in the project area? Is there evidence for declining populations, disease, or conflict in the study area? Did use of resource areas or resource types change following contact?
2. How was European technology incorporated into River Yuman lifeways? Is there evidence for local use of European or American ceramics, metal items, or other introduced technologies?
3. What time frame is represented for the appearance of European and/or American artifacts within the APE?

Data Requirements

Given the ephemeral nature of Yuman settlements and the apparent population migrations that took place between the sixteenth and nineteenth centuries, understanding population dynamics requires more-nuanced data sets. However, by examining the distribution of time-sensitive artifacts such as Patayan II and III ceramics, it may be possible to see how sites dating from before and after European contact map onto the landscape.

The appearance of European or American artifacts in Native American sites, or lack thereof, is an indicator of whether, and how, foreign technology was incorporated into Yuman lifeways. The types of artifacts found give some indication of the types of social transformations taking place in the region. For example, crosses, rosary beads, and other Christian symbols would indicate exposure to Christianity. The years during which many European artifact types, such as beads, ceramics and glassware, were produced are well documented, so the dating of any European artifacts may help in determining when foreign goods were introduced into the area.

Mining

Early mining activities in Riverside County are characterized by sporadic, small-scale extraction of precious metals; later mining activities included large-scale exploitation of quarry products such as sand, gravel, and clay (Pabst 1938; Vredenburgh et al. 1981:24). Mining sites represent one or more of the phases of mining activity: prospecting, ore extraction, or ore processing and transportation. The first reflects the search for an ore body and is most often represented by hand-dug or mechanically excavated prospect pits, trenches, or other voids. The second, reflecting removal of overburden and ore bodies, is typically represented by shafts, adits, waste-rock piles, and low-grade ore dumps. The third reflects milling, smelting, refining, and transportation to and from facilities related to those activities. In some cases, related sites and features, such as residential loci, domestic refuse, and support facilities, such as mess halls or administrative offices, are identified in association with mine locations.

Current guidance regarding the inventory and evaluation of historical-period mining sites (e.g., California Department of Transportation [Caltrans] 2008; Hardesty 1990; Noble and Spude 1997) were used for context development and evaluations of significance. Government publications provide a wealth of information on historical-period mines and mining districts. Some that contain information on this part of Riverside County include Merrill (1917, 1919), Tucker and Sampson (1945), and Clark (1970). A few historical studies of mining in eastern Riverside County and along the Colorado River in both California and Arizona have been prepared, including Love (1974), Keane and Rogge (1992), and Canty and Greeley (1987); these documents may provide useful comparative information. Data gleaned from these primary and secondary sources provide the necessary framework for evaluating the significance of mining features and sites. Swope and Vredenburgh (2003) prepared a document that serves as a tool for identifying and interpreting mining-claim markers. Guidance from these documents were used in the interpretation and evaluation of any mining-related sites identified during this investigation.

Questions pertaining to mining include:

1. Are sites related to mining present within the APE? What phase of mining activity (prospecting, extraction, processing) are represented by the sites?
2. Can any mining activities be associated with specific documented mining claims, mines, or mining districts?
3. What evidence indicates how mining sites were linked to outside markets and supply networks? Are there roads, telegraph lines, or other elements of the built environment related to mining present within the APE?

Data Requirements

In order to address these questions pertaining to mining, data from archaeological sites related to one or more of the three mining phases, such as prospects, adits, shafts, rock dumps, ore bins, assay equipment, processing tanks, or access roads are required. Mining camps are frequently visible by the accumulation of historical-period refuse, such as can dumps, as well as industry-related artifacts. Roads and telegraph lines can be mapped within the APE, and the use of aerial photography and historical maps can help identify the origin and destination of these features.

Transportation

In this isolated desert region with limited water sources, the success of human activity relied on the presence of transportation networks, including footpaths, river transport/crossings, and wagon roads; later, these also included automobile roads, railroads and airports. Recognizing the evidence of historical-period transportation features is critical to the appropriate identification and interpretation of historical-period activities and the interconnectivity between the project area, the desert region, and points beyond.

Questions pertaining to transportation include:

1. Do historical-period transportation sites or features (e.g., footpaths, wagon roads, or automobile roads) remain within the direct APE?
2. How do transportation sites within the direct APE connect to areas beyond the project area, and what does that reveal about supply networks and travel within the region and to points outside the region?

Data Requirements

Historical maps and aerial photographs can be used to identify the locations and changes in transportation alignments within the APE. The origin and destination of transportation alignments are then identified to the extent possible. Roadside refuse scatters typically represent casual, dispersed disposal, but more concentrated roadside dumping can sometimes reveal the location of overnight camping or automobile repairs.

Settlement and Agriculture

Historical-period settlement in the Palo Verde Valley is inextricably connected with regional water management and agricultural speculation and development. Detailed information on these topics is available in

Palo Verde Diversion Project (Bickell 1999) and *Palo Verde Irrigation District History* (Palo Verde Irrigation District 2012), and *Blythe and the Palo Verde Valley* (Palo Verde Historical Museum and Society 2005). General information on homesteading, particularly in desert environments, was also consulted.

Historical-period agricultural properties have the potential to address important research themes including site layout and land-use patterns, economic behavior, demographics and ethnicity, and agricultural technology. The guidance document entitled *A Historical Context and Archaeological Research Design for Agricultural Properties in California* (Caltrans 2007) provides a wealth of information of use in the identification and evaluation of cultural resources representing agricultural pursuits.

Questions pertaining to settlement and agriculture include:

1. What was the nature of land occupation or ownership at the site, and what period of agricultural development, homesteading, or other settlement is represented by the sites?
2. What pending land use is indicated by the 1917 GLO survey monuments present within the APE?
3. What coping strategies were used to adjust agricultural practices to the local climate and environment? Can the relative success of a homestead or agricultural enterprise be inferred from material remains?
4. Did site occupants subsist on the products of their homestead/ranch, or did wage labor supplement their income? Where did site occupants obtain goods and supplies? What local, regional, national, and international spheres were included in the economic arrangement of this operation?
5. What was the demographic makeup of site occupants? Did site demography change over time?

Data Requirements

Physical evidence and primary GLO data regarding land surveys within the APE can be used to reconstruct details regarding past land use and speculative land planning in the project area. Pertinent information can be gleaned from both of these sources to develop a regional context within which related cultural resources can be evaluated. Land claim documents and maps, particularly GLO records, can provide information regarding dates of acquisition, nature of activities, and names of claimants. Once claimants' names have been gleaned from land records, primary documentation (including census data) can be consulted for further details regarding individuals connected with the APE. That information can be instrumental in compiling a historical narrative for the project area.General information, including homesteading regulations (Ainsworth 1955; Allen 1987; Ganoe 1937a, 1937b; Layton 1987; Norris 1982; Robbins 1962; Robinson 1948; Roet 1982), secondary reports of desert homesteading (Bagley 1978; Campbell 1961; Lee 1963; McKinney 1996; Odell 1999; Olds 1978; Peterson 1954; Rimmington 1992, 1999; Robertson 1958), and comparative archaeological studies (Guerrero et al. 1998; Panelli 1984; Stein 1988; Sterner and Majewski 1998; White et al. 2009) may provide contextual resource material. Although prepared for Arizona sites, Stein's (1990) guidance on the study and evaluation of desert homesteads is useful.

The archaeological remains of homesteads and agricultural activities can represent either or both domestic and industrial activity. Domestic features include dwellings, bunkhouses, privies, and refuse dumps, whereas agricultural features include barns and other outbuildings, fencing, corrals, irrigation features, windmills, tanks, access roads, etc.

World War II and the DTC

As noted in Chapter 2, during World War II, more than 31,500 square miles of the Arizona and California desert were used by the U.S. Army for the DTC/C-AMA, a training facility for armored units and infantry (Bischoff 2009a, 2009b; BLM 2013). In California, surviving features include training camps, airfields, bivouacs, and maneuver areas, as well as more-ephemeral features, such as foxholes, machine-gun positions, and tank tracks.

SRI created a historical and archaeological context for identifying and evaluating elements of the DTC/C-AMA (Bischoff 2009a, 2009b). Although none of the main elements of the DTC/C-AMA (e.g., divisional camps or rifle ranges) is located within the APE (see Figure 2.5), the area was likely used for maneuvers and may contain a number of different feature types. Questions pertaining to the DTC/C-AMA include:

1. What evidence is there for DTC/C-AMA–related activities within the APE? Are any camps or other logistical or operations facilities within the APE?
2. What elements of the built environment are related to the DTC/C-AMA? Are there barracks, roads, airfields, telegraph or power lines, or other parts of the built environment within the APE?
3. How are military-related features clustered? Can the types of maneuvers conducted within the APE be determined based on the types of features present?

Data Requirements

During the infiltration courses, men would dig trenches from which they would attack an "enemy" position. The position was often a battery of machine guns that would fire live ammunition over their heads. Company- and platoon-level exercises took place often and undoubtedly left traces. Although more ephemeral than larger-scale activities, these small unit-training areas may still be located. Artifacts and features associated with them most likely include shell casings, grenade containers, foxholes, C-and K-ration cans, and other refuse.

Tank tracks dating to the World War II era have been reported throughout California's Mojave Desert. Obviously, tanks featured largely in the DTC/C-AMA, and countless operations and maneuvers were conducted throughout the facility. The M3 medium tank's tracks (the belts on the vehicle) were 11.5 inches wide and could be fitted with a variety of tread materials, including rubber and steel; those on the M4 medium tank were generally 23 inches wide. Tank tracks are distinguishable on the ground from automobile tracks not only by their width but also by the marks they leave when the vehicles make turns.

Refuse deposits from the DTC/C-AMA period are identifiable by the military-related artifacts present, as well as by their location in relation to other DTC/C-AMA features. Large trash dumps, for example, have been found in direct association with several of the divisional camps and airfields. Smaller trash scatters have also been found in association with training areas, such as defensive positions, ranges, and infiltration courses. Reports indicate that the activity areas in the DTC/C-AMA were cleaned up, to varying extents, by the departing soldiers, thus many of the surface artifacts were removed. This was clearly the case at many of the divisional camps, as well as in temporary campsites and bivouacs. It may also have been the case for many of the training areas. The large trash dumps used by divisional camps and airfields, however, are clearly still in existence, as cleanup would have been impossible. They were in use for several months at a time, and large quantities of refuse accumulated.

Operation Desert Strike

In 1964, another set of military maneuvers called Operation Desert Strike was undertaken by the Army and Air Force in the same basic area as the DTC/C-AMA. Features and artifacts related to this event may also be present within the APE; these need to be distinguished from earlier military artifacts and features. Like sites associated with the DTC/C-AMA, Operation Desert Strike sites consist of temporary campsites and training areas with associated artifacts dating to the 1960s (Bischoff 2009a:129).

1. Are remnants of later military maneuvers, such as Operation Desert Strike, present within the APE? How are they different from DTC/C-AMA sites?
2. How are military-related features clustered? Can the types of maneuvers conducted within the APE be determined based on the types of features present?
3. What elements of the built environment are related to Operation Desert Strike? Are there barracks, roads, airfields, telegraph or power lines, or other parts of the built environment within the APE?

Data Requirements

Because the exercises associated with Operation Desert Strike lasted only 2 weeks, the identification of sites associated with these maneuvers may be more difficult to identify. Artifacts and features associated with them most likely include shell casings; grenade containers; foxholes; Meal, Combat, Individual ration cans; and other refuse. One potential problem in the identification of Operation Desert Strike sites is the use of earlier military surplus, especially ammunition.

Refuse deposits from the Operation Desert Strike period are identifiable by the military-related artifacts present, as well as by their location in relation to other Operation Desert Strike features. Large trash dumps, for example, have been found in direct association with several of the divisional camps and airfields. Smaller trash scatters have also been found in association with training areas, such as defensive positions, ranges, and infiltration courses.

Resources of Tribal or Cultural Significance

As lead agency, the BLM is required to

> ensure that consultation in the section 106 process provides the Indian tribe. . . a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects (36 CFR 800.2[c][2]).

In this section, several types of resources that may be considered to have cultural or religious significance to Native American tribes living near the project area are outlined. These resources may, after in-depth research and discussion with tribal representatives, be evaluated as TCPs. These property types are similar to those described by Bean and Vane (1978), CSRI (1987), and Stone (1991). To be considered a historic property under 36 CFR 800, a TCP must be eligible for listing in the NRHP, i.e., meet one or more of the four criteria for evaluation and retain integrity.

Burial Sites

Burial areas are of the utmost importance for all Native American groups in California. For the Cahuilla, Chemehuevi, Mojave, Halchidhoma, and Quechan, cremation was the most common burial practice. Formal cemeteries are present in most reservations in the area, but during the prehistoric period and into the twentieth century, cremated remains could be deposited anywhere. Although small bone fragments left exposed to the elements may deteriorate quickly, there is potential for human remains to be located within the APE. As such, field personnel were especially attentive to any discovered bone (burned or unburned) or thermal features within previously recorded or newly identified sites for signs of human remains. Project Director Patrick Stanton is a trained human osteologist and was present throughout the survey and site-recording phases of the project.

Federal law requires immediate reporting when Native American remains are discovered on public lands (Native American Graves Protection and Repatriation Act (NAGPRA) (Public Law 101-601; 104 *U.S. Statutes at Large* [Stat.] 3048; 25 *U.S. Code* 3001). The identification of human remains during any phase of the project requires that the location of the remains be recorded and the Riverside County Coroner and BLM archaeologist George Kline notified immediately. If the coroner determines the remains to be Native American in origin and not subject to a criminal investigation, the BLM, as the lead federal agency, follows the measures set forth in NAGPRA. All NAGPRA-related consultation is conducted by the BLM.

Intaglios/Geoglyphs

Three intaglio sites are located within the indirect APE. One site, P-33-000773, is part of the Mule Tank Discontiguous Rock Art District, which is listed in the NRHP. The site consists of 8 horseshoe-shaped clusters of 10 small cleared circles, each approximately 1 m in diameter; two groups of 20 cleared circles, organized into two rows of 10 circles in each group, with each circle approximately 1 m in diameter; an area with 5 larger cleared circles, which may be "house circles" (Whitley 2001); a cleared ring area approximately 33 m (110 feet) in diameter that may have been a "dance circle"; and numerous petroglyphs in small shielded drainage approximately 0.8 km (0.5 miles) west of the geoglyphs. A prehistoric trail, P-33-000343, also passes through the site.

The intaglios at P-33-000773 are most likely an example of pilgrimage art, placed on the landscape to mark the location of an important mythic event and used in rituals commemorating the activities of the gods and spirits during the mythic past (Whitley 2001). Although the mythic cycle and specific mythic events that may have been associated with this site are unknown, the presence of a dance circle and an aboriginal trail running alongside the site support this conclusion.

The location of the site provides a commanding view of portions of the Palo Verde Mesa and the northern portion of the project area. Because the site is located within the indirect APE, assessment of the visual impact of the installation of the solar facility from this vantage point is addressed in Chapter 5.

Two other sites, P-33-000661 and P-33-000662, consist of piles of waterworn cobbles arranged into circular features. These two sites are located just south of the McCoy Mountains, on the north side of the indirect APE. P-33-000661 is a simple circular feature approximately 39 by 20 m across; P-33-000662 is more complex, with two semicircular designs connected by a thin row of cobbles; it measures 71 by 15 m. The sites are located approximately 8 and 11 km west of the western edge of the Palo Verde Valley, respectively. Waterworn cobbles would not be common on the desert pavement where the sites are located, so the rocks may have been brought in from closer to the Colorado River, where cobbles terraces are common.

Resource Collection Areas

Native American groups have used the resources present in the Colorado Desert for both subsistence and ritual or ceremonial purposes for thousands of years. Of particular importance are mineral sources and plants used for medicinal purposes and basketry. Plant sources include desert lily (*Hesperocallis undulata*), Mormon tea (*Ephedra viridis*), willow (*Salix laevigata*), greasewood, and many others. Mineral resources include clay sources for ceramic production and crystal sources used for ceremonial purposes. Defining the boundaries of these resource collection areas can be difficult, but any such areas within the direct APE need to be defined and evaluated as part of a cultural resources study.

Sacred Places and Places of Power

Traditional sacred places are found throughout the Colorado Desert. Along the Colorado River, some of the more well-known sites include rock art sites and intaglios. Rock art sites include images both pecked (petroglyphs) and painted (pictographs) onto rock surfaces, whereas intaglios, or geoglyphs, are images created on the ground surface by removing a darker colored surface layer to expose a lighter colored soil layer beneath (von Werlhof 1995). At least 20 major intaglio complexes have been identified, and dozens of rock art sites are known between Blythe and the mouth of the Gila River (Ezzo 1994; Ezzo and Altschul 1993). Many sacred places were the locations of past mythic events. Ceremonies were conducted at these locations to commemorate these events and the beings and ancestors who took part in them. Often, these sacred locations are marked by intaglios depicting the mythic events and actors (Bourke 1889; Johnson n.d.) and also contain dance circles and dance paths (Kroeber 1925).

In addition to these large-scale ceremonial areas, small intaglios are often found, including what are called sleeping circles and vision circles. Sleeping circles most likely functioned as temporary campsites for travelers or for people attending ceremonies. Visions circles, sometimes called "power circles" (Johnson 1985:37), are considerably smaller than sleeping circles and tend to be found in dusters and along trails. They are intended for dreaming or meditation by an individual attempting to acquire knowledge and wisdom from the supernatural world (Ezzo 1994; Ezzo and Altschul 1993:17).

Other intaglios were apparently made by shamans for other purposes. One account identifies a large anthropomorph as a self-portrait by a shaman. Other accounts link some of these ground images to shamanic sorcery (Forde 1931:195; Harrington 1986; Trippel 1889).

Other places across the landscape may be important spiritual or ceremonial sites but lack concrete evidence of human use. These places, such as origin points or places associated with traditional stories, can include mountains, canyons, water sources, or other points on the landscape. These places can be included in songs, or associated with gods, ancestors, or other beings. An important area of concern for these sites is vandalism and destruction caused not by development but through improved access to previously inaccessible areas.

Traditional-Event Sites

In addition to the sacred places described above, other points across the landscape may be associated with traditional events or ceremonies. These can include areas where rites of passage were conducted or where mourning ceremonies or other events took place. In some cases, there may be obvious physical evidence of these events and practices, such as cleared circles on the desert pavement. However, other areas may be less visible archaeologically.

Trails

The Cahuilla, Chemehuevi, and River Yuman tribes that lived in and near the project area had a complex system of trails. Some of these trails, such as the Coco-Maricopa Trail, were part of long-distance exchange networks that connected the tribes within the project area with the wider world. Other trails led to mountains, canyons, or other important or sacred sites. Shrines or other important places may be located along the trails themselves (Bean and Vane 1978:6-40).

An important form of ritual among the River Yumans was the ceremonial pilgrimage. An important pilgrimage trail was the Xam Kwatcan Trail (Forbes 1965; Forde 1931), which ran from the mountain Avikwalal, at the southern end of the Colorado River, to Avikwa'ame, also known as Spirit Mountain or Newberry Peak, in southern Nevada, more than 300 km (186 miles) to the north. Avikwalal was believed to be a spirit house containing the ghosts of departed ancestors. Thus, the pilgrimage began at the land of the dead and terminated at the point of creation, following the mythic path of the creator deity, Mastamho, and stopping at a number of sacred locations along the way for ceremonial dancing and recitations of stories. Concerns over the destruction of trail systems as part of earth-moving construction activities have been expressed by various tribes near the project area (Bean and Vane 1978; CSRI 1987).

The Coco-Maricopa Trail was an important east–west trading route; it connected the groups of the Los Angeles Basin to the Maricopa, who lived along the Gila and Salt Rivers near modern-day Phoenix. The trail was first noted by Euroamericans in the early 1800s as a route used by the Halchidhoma and was used to carry mail from the Los Angeles area to the Colorado River (Bean and Mason 1962; Ezell 1963). The importance of the trail was documented by several early explorers to the region. Garcés, for example, noted that the Halchidhoma traded with the Gabrielino, who lived along the coast near modern-day Los Angeles (Bolton 1930:242; Forbes 1965:109). In 1823, Captain Jose Romero and his entourage may have traveled the trail while attempting to reach the Colorado River from San Diego (Bean and Mason 1962). He apparently became lost, but it is clear which sections of the trail he passed along (McCarthy 1982:C-1).

Although much of the route has not been described, it generally followed the modern route of Interstate 10 and passed just north of the direct APE. It should be noted that the trail was not a single linear path but a system of trails that connected with other north–south- and east–west-trending trails. A portion of the trail has been recorded as P-33-000053, which passes through the indirect APE on the north side of the project area.

At least 10 other trail segments have been recorded within the direct and indirect APE, although several may be segments of a smaller number of trails. Eight were recorded as prehistoric trails; the ages of the other 2 trails were ambiguous. McCarthy (1982) identified several segments of the trail system in and around the Blythe area. P-33-000343 is a trail segment that, although incompletely recorded, passes between the Palm Springs area and the Mule Mountains. This trail intersects the southwestern portion of the direct APE. The extrapolated projection of this trail intersects with another, P-33-000650, a north–south-oriented trail. Only a segment of P-33-000650 has been recorded. P-33-000772 and P-33-000775 run east–west at the south side of the direct APE and connect with P-33-000773, the intaglio site, although their complete routes have not been formally recorded (McCarthy 1982:C-8).

In addition to these known and recorded trail systems, the project area is within the general area described by the Chemehuevi Salt Song. As noted in Chapter 2, song series were important elements of many of the cultures in the Colorado Desert. Each song series could include 100–200 individual but related songs. The Chemehuevi had four main song series: Bird, Salt, Deer, and Mountain Sheep (Laird 1976:38). Each of these song series mentions specific points across the landscape and recounts important mythical events that happened at each location. These points across the landscape were linked by metaphoric trails that were followed through the course of the song series.

The Salt Song tells the story of a flock of birds traveling across the Chemehuevi territory. The trail begins near Las Vegas and continues south through the Mojave Desert until it reaches Twentynine Palms, where the trail heads east and crosses the Colorado River near Blythe. The trail then follows the river north until it reaches the Grand Canyon (Laird 1976). The songs that make up the Salt Song were sung over the course of an entire evening, ending just before sunrise. Although the Salt Song Trail is metaphysical, real places associated with the trail may be located in or near the APE.

Habitation Sites

Native consultants to Bean and Vane (1978) and CSRI (1987) noted that ethnohistoric-period villages and habitation sites are considered to be important cultural resources for current members of the River Yuman tribes. Although most large villages were located on the Colorado River floodplain, to the east of the project area, temporary camps were also scattered across the desert uplands. These sites could have been used for a variety of purposes, including plant gathering, hunting, or mineral extraction.

Four open-air habitation sites are currently known to be present within APE—one within the direct APE and three within the indirect APE. Habitation sites contain both thermal features and artifact concentrations and appear to have been primarily temporary campsites. Little in the way of archaeological work has been done at these sites, but most have pottery, which date the sites to the last 1,500 years. One site, P-33-001822, has potsherds identified as belonging to the Patayan II (ca. 1000–500 B.P.) and Patayan III (after ca. 500 B.P.) periods (Waters 1982a, 1982b). The site is located at the southern part of the indirect APE, near trail P-33-000650. Patayan III pottery was made up until the early twentieth century, so any site containing such pottery may have been used in the very recent past.

Methods of Data Collection

Data collected for this study included background and archival research, as well as a cultural resource search, the results of which were previously reported in the research design and work plan (Kremkau, Stanton, et al. 2014) and the ethnographic literature review (Kremkau, Whelan, et al. 2014). The results of these preliminary studies have been incorporated into the background sections presented above in Chapter 2 and in the research design in this chapter.

Background and Archival Research Methods

Background and archival research was necessary to correctly interpret and evaluate historical-period sites within the APE, particularly those possibly associated with homesteading, as well as to consider indirect effects that construction and operation of the DQSP may have on prehistoric NRHP-eligible sites within the direct and indirect APE. This research has resulted in a framework for evaluating historical-period sites within the applicable historic contexts. SRI consulted a number local, regional, and online repositories (Table 3.1) in order to obtain historical information specific to the project APE. Sources included historical maps (including GLO plat maps), historical aerial photographs, land patents, and land-entry files. Secondary materials, including local and regional histories and government mining reports provided a background historic context, and are cited, as appropriate.

Table 3.1. Repositories Consulted for Archival Information

Repository/Agency	Collection	Comments
Ancestry.com	U.S. federal census data, California Death Index, California Voter Registers	online subscription database
Bureau of Land Management	General Land Office records (plat maps, land patents, land-entry files)	online database
California Historical Resources Information System, Eastern Information Center	archaeological site records, historical data	by request
California State Office of Historic Preservation	historical landmarks	online database
County of Riverside, Transportation Survey Division	surveyor's field notes	in person
Los Angeles Public Library	historical *Los Angeles Times*, California index	online subscription database
Nationwide Environmental Title Research	historical aerial photographs	online database
Newspapers.com	historical California newspapers	online subscription database
Palo Verde Irrigation District	historical information	online database
U.S. Geological Survey	Historical Topographic Map Explorer	online database
	National Water Information System	online database
U.S. National Archives and Records Administration, National Archives at Riverside, California	Los Angeles District Land Office, Serialized Land Entry Case Files	

Records-Search Methods

A records search was conducted for the 5,010-acre direct APE and the initially proposed 1-mile-wide indirect APE surrounding the direct APE. The records search was conducted at the CHRIS EIC, Department of Anthropology, University of California, Riverside. The goal of the records search was to review any previous archaeological surveys that may have been conducted within or adjacent to the project area and to identify any previously recorded archaeological resources located on the property. Previously recorded resources within the indirect APE that were listed in or had been determined eligible for listing in the NRHP were identified as subject to potential adverse effects from the DQSP.

The records search involved reviewing all reports from archaeological surveys conducted within a 1-mile radius of the project area. As noted above, the indirect APE was subsequently extended to include the NRHP-listed Mule Tank Discontiguous Rock Art District, based on BLM consultation with interested tribes. USGS topographic maps held by the EIC indicating the locations of all previous cultural resource surveys and known archaeological sites and isolates were examined, and the associated survey reports and site records were photocopied. Historical maps, the NRHP, and the National Historic Landmarks and California Historical Landmarks lists were also reviewed. Although none was found to be recorded within the APE, the records search also included consideration of historical-period built-environment resources.

Native American Coordination

Part of the records search and literature review involved contacting the Native American Heritage Commission (NAHC) for a list of traditional-use areas or sacred sites within the project area and for a list of specific Native American groups or individuals who could provide additional information on cultural resources within the project area. The NAHC Sacred Lands File Search did not indicate the presence of any known Native American TCPs within the project area. However, the NAHC provided a list of 36 contacts that could provide additional information on cultural resources within the project area. The BLM also provided a contact list of tribal chairs and cultural resource staff for 15 federally recognized tribes with traditional-use areas that included the DQSP site. Letters describing the project and requesting information regarding Native American cultural resources were sent to all individuals on the contact lists, and responses were received from four of them. No specific resources were identified in the project area, although 3 tribes requested follow-up information and further consultation. A summary of Native American contacts and responses was provided in the ethnographic literature review prepared prior to the field survey of the DQSP direct APE (Kremkau, Whelan, et al. 2014:4.1, Appendix A). Government-to-government consultation with the 15 federally recognized tribes on the BLM tribal contact list has been initiated by the BLM and is ongoing.

Prior the field survey of the direct APE, the BLM provided copies of the research design (Kremkau, Stanton, et al. 2014) and the ethnographic literature review (Kremkau, Whelan, et al. 2014) to all tribes consulting with the BLM. On September 10, 2014, Michael Lerch of SRI and James Cook of First Solar met with representatives of the CRIT Office of the Attorney General and CRIT Museum in Parker, Arizona, and arranged for participation of tribal representatives in the DQSP archaeological field survey. The following day, SRI attended the second pre-application meeting for the project held by BLM in Palm Desert, California. Members of the CRIT Office of the Attorney General and the Mohave Elders Group were in attendance, and information regarding the planned archaeological survey of the project was provided by BLM and SRI. A tribal representative from CRIT accompanied SRI crews for all survey and prehistoric site recording activities during the archaeological field survey conducted during October–December 2014.

Pedestrian Archaeological Survey Methods

Archaeological fieldwork during the survey was divided into two phases: survey and site recording. An intensive pedestrian survey was performed within the direct APE, and all cultural resources over 45 years of age were mapped (the 45-year criterion recognizes that there can be a lag of up to 5 years between resource identification and the date that planning decisions are made [OHP 1995:2]) and recorded using Global Positioning System (GPS) units. Following the completion of the survey, all new and previously recorded sites were formally recorded. If any historically significant built-environment resources were identified within the indirect APE, architectural historians would perform a reconnaissance-level survey for these resources. All archaeological sites and built environment resources were to be evaluated according to the criteria for NRHP listing outlined in 36 CFR 60 (see Chapter 5).

Pedestrian survey and site-recording phases identifying, recording, and evaluating both prehistoric and historical-period archaeological resources within the direct APE was conducted between October 13 and December 11, 2014, with a follow-up visit to selected sites with BLM archaeologists on February 3, 2015. All survey methods followed the BLM guidelines outlined in the BLM Manual 8110 (BLM 2004). A crew of seven archaeologists and one Native American tribal representative surveyed the entire 5,010-acre direct APE, and three 3-person crews conducted site recording. The tribal representative was from the CRIT and accompanied the survey crew for the duration of the survey and site-recording fieldwork.

The survey was conducted by walking straight-line transects at 15-m intervals. The progress of the survey was monitored using Trimble Geo XT/XH GPS units and high-resolution aerial photographs. Waypoints were mapped at the starting and ending locations for each transect. This method was adapted from previous survey work by SRI at Fort Irwin National Training Center (Stanton et al. 2013). Crewmembers used the GPS units to record all cultural resources encountered within each transect. At each potential find, a crewmember recorded the location of the object, the type of artifact or feature, number, material, size, and any diagnostic attributes. Each point received a provenience designation (PD) number unique to each GPS device and to the survey project. The PD numbers are unique designations of space that prohibited discoveries from being incidentally duplicated.

Cultural resources identified during the survey were classified as sites or isolates. When an artifact was encountered during survey, a brief examination of the immediate area was conducted to locate any associated features or artifacts. The criteria used to define sites and isolated finds followed the guidelines set by the California OHP (1989, 1995:2). A new site was defined as any three or more artifacts found in association with one another or a single feature recorded more than 40 m from an existing site. Isolated finds were defined as one or two artifacts or any group of artifacts more than three, if these artifacts could refit (e.g., a ceramic “pot drop” or a broken glass bottle), or from a cluster of shell casings from emptying a clip. One or two artifacts found in association with one another were treated as isolated finds. Once the discovery was determined to be either a site or an isolated find, the location of the area was recorded with a GPS unit and assigned a temporary isolated-artifact or site number. Location information and a brief description were recorded on standard archaeological site forms. All isolated finds were recorded using DPR 523 forms, and at least one photograph was taken of each. Because of the limited data potential and to reduce strain on the EIC, for each topographic quadrangle, a single set of DPR forms and maps were used to record isolated historical-period cans. No artifacts were collected during the survey.

SRI staff accessed the various areas of the project area by vehicle via designated BLM open routes. All routes across the project area were provided on GPS units and printed maps. All previously recorded sites and resources were also provided on GPS units and printed maps for reference.

Because of the history of military activity within the project area, there was a potential for unexploded ordnance (UXO). SRI did not handle or disturb any UXO during survey or recording of sites. Whenever possible and safe, staff members recorded the location and photographed any UXO. This information was then reported to the BLM for remediation.

A Health and Safety Plan with appropriate contact information for emergency services was provided with the research design and work plan (Kremkau, Stanton, et al. 2014:Appendix B). The Health and Safety Plan was made available to crewmembers throughout the project. Personnel were updated and made aware of potential hazards on a continual basis by the Site Safety Officer.

Site Recording Methods

Following the pedestrian survey, 3-person crews revisited and formally recorded each new site identified during the survey. Each site was fully assessed to confirm its merit, its size, and the number and characteristics of features and artifacts within its boundaries. During recording, each site was intensively surveyed to locate all features and artifacts and to determine the site boundary. All diagnostic artifacts were analyzed in the field. Two of the survey crews recorded historical-period sites, and the third crew recorded prehistoric and multicomponent sites. A representative from CRIT accompanied the prehistoric-site-recording crew.

Previously recorded site boundaries were laid over survey data to confirm the boundaries' accuracy. If features or artifacts identified during survey were near previously recorded boundaries, those boundaries were expanded to incorporate the artifacts or features. Newly recorded sites were created from concentrations of artifacts and features identified during survey. Once the boundaries were created, crews revisited each new and previously recorded site to conduct formal site recording. Each site was fully assessed to confirm its merit, its size, and the number and characteristics of features and artifacts within its boundaries.

All previously recorded sites were reexamined to document any changes in condition since their previous recording. During recording, each site was intensively surveyed to locate all features and artifacts and to verify the site boundaries created from the survey data. All recordation followed California OHP guidelines. Written descriptions of the sites were recorded on small laptop computers using proprietary software; these descriptions were used to automatically fill in the DPR 523 forms. Artifact and feature attributes were recorded in handheld personal digital assistants (PDAs). The PDA system was designed to replace many of the previously used paper forms, such as feature- or artifact-recording forms. For example, once a feature was discovered, attributes such as feature type, dimensions, and condition were recorded. In addition, attributes could be recorded for any artifacts associated with any site or feature. Any artifacts present were entered into the PDA using predetermined artifact attributes. Once fieldwork was complete, the data stored on the PDA were downloaded into SRI's database, and the information recorded in the field was immediately available for examination, quality-assurance queries, analysis, and write-up. The locations of site boundaries, features, tools, and other artifacts were recorded with Trimble GeoXT GPS units.

Diagnostic artifacts were photographed using 10-megapixel digital cameras. Additional photographs were used to document the appearance of specific site areas, as well as the general survey area. Photographs were also used to document modern disturbances to existing archaeological resources. When previously recorded sites were revisited, copies of the associated DPR site-record forms were reviewed for comparison, and site information was updated as needed. During fieldwork, any non-archaeological points of potential concern—e.g., paleontological resources or evidence of protected animal species—identified by the crews were also photographed and their locations recorded with a GPS unit.

Isolated finds were not revisited during site recording; all pertinent information for these artifacts had been recorded during survey.

Site Types within the APE

A wide variety of prehistoric and historical-period site types were identified within the direct APE. The following section outlines the recording methods used at specific site types, in addition to the methods described above. The sites types described below are purely descriptive and are not representative of site function. Interpretive site types, such as habitation area or quarry, that imply possible site function are summarized in the records-search results (see Chapter 4) and reflect information and interpretations presented in the site records. Because interpretations may change based on available data, sites types are initially presented in a descriptive format; the functions are interpreted in Chapter 4.

Prehistoric Site Types

Four types of prehistoric sites were identified within the direct APE during the archaeological survey. These included artifact concentrations, isolated or clustered rock features, rock features with artifact concentrations, and trails.

Artifact Concentrations

Prehistoric artifact concentrations identified during the survey consisted of lithic scatters and ceramic scatters. Although in some instances, lithic material may have been found in a ceramic scatter and vice versa, these scatter types were identified by their primary artifactual components.

Lithic scatters were largely associated with the lag gravel terraces in the northern portion of the project area and are primarily composed of lithic debitage, tested cobbles, and hammerstones. These sites were associated with tool stone procurement and testing and may represent single events or repeated use of the area by the prehistoric population. Lithic material associated with these sites included quartzite and CCS (primarily chert with some chalcedony).

Ceramic scatters, on the other hand, were found throughout the central and southern portion of the project area. These scatters were associated with single or multiple vessels. The vessels were represented by several ceramic types, including Topoc Buff (Patayan II), Salton Buff (Patayan II), Parker Buff (Patayan II/III), and Colorado Buff (Patayan III). All diagnostic artifacts were analyzed in the field. If a site contained a large number of non-diagnostic artifacts, observation units measuring 5 m in diameter were placed throughout the site to characterize the artifacts and determine their approximate densities.

Rock Feature Sites

Several sites were composed of isolated or clustered rock features. These rock features primarily consisted of fire-affected cobbles in a small surface or partially buried concentration (Figure 3.1). One of these sites was entirely composed of manuports that were not thermally affected. Lithic material associated with these features was primarily quartzite with some chert and other miscellaneous materials (e.g., rhyolite, basalt, limestone, and granite). These sites were generally located in the central and southwestern portion of the project area. No charcoal or burned bone were observed on the ground surface for the sites with thermal features only. Some of these sites also may have a small number of prehistoric or historical-period artifacts. If a site contained a large number of non-diagnostic artifacts, observation units measuring 5 m in diam- eter were placed throughout the site to characterize the artifacts and approximate their densities. Any features were recorded with a GPS unit, and hand-drawn maps were created, when appropriate.

Rock Features with Artifact Scatters

A few prehistoric sites identified within the APE consisted of one or more rock features associated with prehistoric artifact scatters consisting of three or more artifacts. These features suggested that a site was used for a variety of tasks and may indicate at least a temporary occupation. As with the artifact concentrations, all diagnostic artifacts were analyzed in the field. If a site contained a large number of non-diagnostic artifacts, observation units measuring 5 m in diameter were placed throughout the site to characterize the artifacts and approximate their densities. Any features were recorded with a GPS unit, and hand-drawn maps were created, when appropriate.

Trails

A small number of prehistoric trails have also been identified within the APE. These trails were generally 15–30 cm (6–12 inches) wide. Some were well traveled, with about 2–5 cm (1–2 inches) of compacted sediment (Figure 3.2). Prior to survey, the recorded routes of known trails were extrapolated into the direct APE. These extrapolated routes were loaded onto GPS units so that survey crews were able to check those areas while in the field. If trails were identified during survey, the entire length of the trail within the direct APE was recorded with a GPS unit. Any artifacts, such as pot drops, located along the trail were recorded with the trail.

Figure 3.1. Fire-affected rock feature.

Figure 3.2. Well-traveled prehistoric trail exhibiting compacted surface.

Historical-Period Site Types

Five types of historical-period sites were identified within the direct APE during the archaeological survey. These include artifact concentrations, roads/trails, military sites, water wells, and survey markers. With the exception of water wells and survey markers, no sites related to historical-period settlement or agriculture were encountered within the direct APE. An abandoned jojoba farm located on the private parcel in the NE 1/4 of Section 15 is less than 45 years of age and was not recorded as a cultural resource.

Artifact Concentrations

The most common historical-period site type identified in the records search and during the archaeological survey was the artifact concentration. These sites generally consisted of refuse deposits or scatters associated with three time periods associated with homesteading, troop activity at the DTC/C-AMA, and civilian land-use following the closure of the DTC/C-AMA. The *Field Manual for Documenting the Desert Training Center and California Maneuver Area* (Allen et al. 2011) was consulted for recording historical-period refuse deposits associated with the DTC/C-AMA. All diagnostic artifacts were analyzed in the field. If a site contained a large number of non-diagnostic artifacts, observation units measuring 5 m in diameter were placed throughout the site to characterize the artifacts and determine their approximate densities.

Roads/Trails

A small number of historical-period roads were identified that appear to be related to nineteenth- and early-twentieth-century mining and homesteading and possibly troop activity at the DTC/C-AMA. Most of the trails within the project area are north–south or east–west linear disturbances that terminate near 1917 GLO survey markers and follow section or quarter-section lines. These trails are all single tracks and have similar widths as the prehistoric trails (approximately 50–60 cm). In contrast, however, these trails are comparatively less distinct than prehistoric trails, which tend to be more well established, indicating these historical-period trails were likely used infrequently (Figure 3.3). Historical-period trails were also distinguished from prehistoric trails by the presence of associated historical-period artifacts and with reference to documentary evidence in the form of historical maps, survey notes, and other archival records.

As with the prehistoric trails, if roads/trails were identified during survey, the entire length of the resource within the direct APE was recorded with a GPS unit. Any artifacts located along the trail were recorded with the trail.

Military Sites

A wide variety of sites related to training exercises conducted on the DTC/C-AMA were identified within the APE. Sites identified during the survey included communication wire placements, vehicle tracks, and tank emplacements. Ration-can scatters and concentrations, which were far more numerous than any other type of DTC-C-AMA–associated sites, were placed under the artifact concentration types to avoid obscuring the less-common site types. None of the DTC/C-AMA camps (see Figure 2.5) is located in or near the APE for the DQSP. The *Field Manual for Documenting the Desert Training Center and California Maneuver Area* (Allen et al. 2011) was consulted for recording historical-period sites associated with the DTC/C-AMA. Features and artifacts associated with these sites were recorded with a GPS unit. Any diagnostic artifacts associated with these sites were analyzed in the field.

Water Well Sites

Water well sites are associated with activities involved with extraction of ground water. The three sites of this type within the direct APE, SRI-42, SRI-9016, and SRI-9018, appear to be associated with drilling of water wells, perhaps in anticipation of agricultural development. All diagnostic artifacts and features were analyzed and recorded in the field.

Figure 3.3. 1917 GLO survey trail.

Survey Markers

Numerous survey markers and linear disturbances associated with these survey markers were identified during site recording. All but one of these survey markers were associated with the 1917 GLO survey of the area. A single USGS survey marker was also identified. The 1917 GLO markers and associated linear disturbances were recorded as a single site with multiple discontiguous features. Any artifacts associated with the components of these sites were recorded with a GPS unit and analyzed in the field.

Multicomponent Sites

Numerous sites within the project area had artifacts associated with two or more temporal periods. For many of these sites, this overlap was the result of a small number of artifacts that became incidentally associated with the site, usually as the result of erosion from nearby sites. In these instances, the site type or temporal period that was most representative of the site was used to describe the site. For instance, a site containing a large concentration of historical-period refuse associated with the 1950s and a single C-ration can or ceramic sherd was identified as a post-DTC/C-AMA artifact concentration. These intrusive artifacts were recorded and included in the site description but have limited bearing on overall site type or temporal period associations.

For a small number of sites, however, a single distinction could not be made. Artifact and features types from different temporal periods may be evenly represented or overlap to a degree that a single temporal association could not be made. These sites were considered multicomponent sites. As with other sites, features and artifacts associated with these sites were recorded with a GPS unit. Any diagnostic artifacts associated with these sites were analyzed in the field.

CHAPTER 4

Results

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The results of the DQSP archaeological inventory are presented in this chapter. Information collected during the records search at the CHRIS EIC and previously reported in the research design and work plan (Kremkau, Stanton, et al. 2014) is presented first, followed by the results of the field survey of the direct APE of the project and a consideration of NRHP-listed or -eligible sites located within the indirect APE. The chapter concludes with a geoarchaeological buried-site sensitivity model based on a review of geological and soils data for the project area. Previously recorded sites are mapped and discussed below according to their primary numbers or trinomial designations; newly recorded sites are listed by their SRI field numbers. A full concordance of all site numbers is contained in Appendix B.

Records-Search Results

The results of the records search conducted prior to the field survey include a review of previous studies conducted within the records-search area, which consisted of the direct APE and a 1-mile radius around it (constituting the indirect APE as initially defined), as well as a consideration of previously recorded cultural resources for the study area. The records-search results guided the development of the research design and formulation of expected site types presented in Chapter 3. Two sites listed within the Mule Tank Discontiguous Rock Art District and located outside of the 1-mile radius associated with the records search were determined to merit consideration within the indirect APE. The indirect APE was expanded to include these sites so that indirect effects to the viewshed for these sites may be addressed.

Previous Cultural Resource Studies

In total, 40 previous cultural resource studies have been conducted within or near the project area—20 within the direct APE and 20 within the indirect APE (Table 4.1; see Figure C.1). Two additional studies, Bean and Vane (1978) and Rogers (1953), were a regional ethnographic overview of the Colorado Desert area for a transmission line project and unpublished field notes based on early reconnaissance of the region, respectively. Of the 37 studies conducted specifically within the APE, 32 were archaeological surveys, 3 included site evaluations, 1 was a records search and literature review, and 1 was a special study.

The 20 projects within the direct APE studied 22 percent (1,102 acres) of the 5,010-acre direct APE. The majority of the studies were archaeological surveys, but ethnographic studies, management plans, and site evaluations were also conducted. Two of the studies that included test excavations examined cultural resources within the direct APE. No sites evaluated within the direct APE were found eligible for listing in the NRHP. Approximately 28 percent (5,070 acres) of the 18,060-acre indirect APE has been surveyed.

Table 4.1. Previous Cultural Resources Studies within the APE

EIC Report No.	Location	Project Name or Type	Year	Citation
2	regional overview	miscellaneous field notes	1953	Rogers 1953
92	direct APE	Oklahoma City–Los Angeles "A" Cable Route	1973	King et al. 1973
160	indirect APE	West Coast Mid-Continent Pipeline	1977	Greenwood 1977
161	indirect APE	West Coast Mid-Continent Pipeline	1975	Greenwood 1975
220	indirect APE	Southern California Edison Palo Verde–Devers Transmission Line	1977	Cowan and Wallof 1977a
221	indirect APE	Southern California Edison Palo Verde–Devers Transmission Line	1982	Carrico et al. 1982
222	indirect APE	Southern California Edison Palo Verde–Devers Transmission Line	1977	Cowan and Wallof 1977b
243	direct APE	Mesa Drive into Sundesert	1977	von Werlhof and Pritchett 1977
284	direct APE	Sundesert Nuclear Project	1977	Weaver 1977
982	indirect APE	Archaeological survey of geothermal drilling locations	1980	Crew and Fitting 1980
991	regional overview	Southern California Edison Palo Verde–Devers Transmission Line	1978	Bean and Vane 1978
1211	direct APE	Cultural resources overview of Colorado Desert planning units	1981	von Till Warren et al. 1981
1249	direct APE	Big Maria Planning Unit	1978	Bureau of Land Management 1978
1814	direct APE	NRHP assessment on Colorado Desert terraces	1984	Reed 1984
2210	indirect APE	US Telecom fiber-optic cable project	1986	Underwood et al. 1986
3029	direct APE	Southern California Gas Company Line 5000	1990	Padon et al. 1990
4061	direct APE	Palo Verde Mesa and Palo Verde Valley Catellus/BLM Land Exchange	1998	McDonald and Schaefer 1998
5245	indirect APE	Blythe–Eagle Mountain 161-Kv Deteriorated Pole Replacement Project	2005	Schmidt 2005
5264	indirect APE	Sprint PCS Facility RV33XC270B	2000	White 2000
6180	indirect APE	North Baja Gas Pipeline Project	2002	Wahoff and Cleland 2002a
6181	indirect APE	North Baja Gas Pipeline Project	2002	Wahoff and Cleland 2002b
6182	indirect APE	North Baja Gas Pipeline Project	2002	Wahoff and McCorkle Apple 2002
6184	indirect APE	North Baja Gas Pipeline Project	2001	McCorkle Apple 2001
6185	indirect APE	North Baja Gas Pipeline Project	2000	Underwood 2000
6186	indirect APE	North Baja Gas Pipeline Project	2000	Kirkish et al. 2000
6187	indirect APE	North Baja Gas Pipeline Project	2001	McCorkle Apple et al. 2001
6707	direct APE	Devers–Palo Verde 2 Transmission Project—Alternative Routes	2006	McDougall et al. 2006
7790	direct APE	Desert Southwest Transmission Line	2003	Schaefer 2003
7967	indirect APE	Mesa Ranch Water Pipeline	2009	Dalu 2009
8373	direct APE	OPV2 Colorado River Switchyard Project	2009	Wilson and Eckhardt 2009

EIC Report No.	Location	Project Name or Type	Year	Citation
8410	indirect APE	Devers–Palo Verde 2 Transmission Project	2004	Carrico et al. 2004
8411	direct APE	Blythe Energy Project Transmission Line	2009	Ferrell et al. 2009
8439	direct APE	Blythe Solar 1 Project	2008	Leftwich 2008a
8440	direct APE	Blythe Solar 1 Project	2008	Leftwich 2008b
8730	direct APE	Colorado River Substation Alternatives Analysis	2011	Enright and Mirro 2011
8740	direct APE	Assessor's Parcel Nos. 274-120-012, -017, -030, and 274-140-036 survey	2012	Tang et al. 2012
8786	indirect APE	Chanslor 33-kV Circuit Pole Replacement	2010	Vargas et al. 2010
--	direct APE	Blythe Solar Power Project	2010	Keller 2010
--	direct APE	Rio Mesa Electric Generating Facility	2011	Nixon et al. 2011
--	direct APE	McCoy Solar Energy Project	2011	Jordan and Tennyson 2011
8823	indirect APE	Devers–Palo Verde 2 Fiber Optic/Optical Ground Wire (FO/OPGW) Routes	2012	DeCarlo and Eckhardt 2012
--	direct APE	Blythe Mesa Solar Project	2013	Austerman et al. 2013

Key: APE = area of potential effects; EIC = Eastern Information Center, University of California, Riverside.

One particularly important project identified in the records-search results was a 1,542-acre Class II survey of part of the Palo Verde Mesa and Palo Verde Valley Catellus/BLM Land Exchange project conducted by ASM Affiliates, Inc. (ASM) (McDonald and Schaefer 1998). The project area for this report covered most of the current direct APE and portions of indirect APE. The purpose of the project was to consolidate BLM lands to increase overall management efficiency and to acquire lands with NRHP-eligible resources to better protect the resources from encroachment. This project was part of an approximately 10,652-acre land exchange with the Catellus Development Corporation. As part of this project, a site sensitivity model was created, based on geomorphology and overall site density from available records-search information. The results of this project are presented below in conjunction with the buried-site sensitivity model prepared for the DQSP.

Supplementing the records-search results provided by the EIC are the results of a Class II cultural resource sample inventory recently completed for the entire Riverside East SEZ (Millington et al. 2013). This sample inventory examined approximately 5 percent (6,000 acres) of the nearly 120,000 acres of the SEZ and was designed to create an archaeological sensitivity model for the entire SEZ. The 5,948 acres of the sample survey were divided into 42 survey quadrats, each between 85 and 160 acres. Solar projects with existing or expected ROW permit applications, such as the DQSP, were excluded from the study, and no areas within the direct APE were surveyed as part of that study. However, parts of 2 survey quadrats are located within the indirect APE, and 3 additional survey quadrats are located within 2 km of the indirect APE. The results of these studies are included in the discussions below.

Previously Recorded Cultural Resources

The records search at the EIC resulted in the identification of 252 archaeological sites and 96 isolated artifacts within the APE (see Figures C.2–C.4). Review of the Riverside East SEZ study resulted in the identification of 10 additional resources within the indirect APE: 1 historical-period site, 1 prehistoric site, 1 historical-period isolated artifact, and 7 prehistoric isolated artifacts (Millington et al. 2013). Of the resources within the records-search area, 33 archaeological sites and 12 isolated artifacts are located within the direct APE, and another 220 archaeological sites and 84 isolated artifacts have been found within indirect APE (Tables 4.2 and 4.3). Sites within the direct APE include 17 prehistoric sites, 15 historical-period sites, and 1 site with both prehistoric and historical-period components. Isolates within the direct APE include 10 prehistoric artifacts and 2 historical-period isolates. Within the indirect APE, there are 95 prehistoric sites, 89 historical-period sites, and 36 sites with both prehistoric and historical-period components. The isolates within the indirect APE include 54 prehistoric artifacts, 27 historical-period artifacts, and 3 isolated finds with both prehistoric and historical-period artifacts.

Table 4.2. Previously Recorded Archaeological Sites within the APE

Age	Site Type	Direct APE	Indirect APE	Total
Prehistoric	artifact concentration	11	69	80
	habitation area	2	2	4
	intaglio/geoglyph	—	3	3
	rock art	—	1	1
	quarry	2	6	8
	thermal feature	—	7	7
	trail	2	7	9
Subtotal		17	95	112
Historical period	artifact concentration	11	79	90
	military activity	2	2	4
	road	2	3	5
	survey marker	—	2	2
	transmission line	—	3	3
Subtotal		15	89	104
Multicomponent	artifact concentration	—	32	32
	artifact concentration; historical-period structure	—	1	1
	habitation area	—	1	1
	quarry; military activity	—	1	1
	trail	1	1	2
Subtotal		1	36	37
Total		33	220	252

Table 4.3. Previously Recorded Isolated Artifacts within the APE

Age	Direct APE	Indirect APE	Total
Prehistoric	10	54	64
Historical period	2	27	29
Multicomponent	—	3	3
Total	12	84	96

The three other survey quadrats belonging to the Riverside East SEZ located near the indirect APE included six historical-period and two prehistoric sites, as well as six prehistoric isolated artifacts (Millington et al. 2013). These study areas are located in similar terrain as the direct APE, including mountain pediment uplands and lowlands created from recent alluvium. Based on the results of the records search of the previously surveyed portions of the APE, and assuming an equal distribution of sites across the area, the density of sites within the direct APE should be approximately one site per every 22.6–46.9 acres, for an expected total of approximately 103–214 sites within the direct APE.

The gen-tie lines associated with four additional solar projects—Blythe, McCoy, Rio Mesa, and Blythe Mesa—include portions of the gen-tie portion of the DQSP direct APE and connect with the Colorado River Substation located at the west end of the gen-tie corridor (Austerman et al. 2013; Jordan and Tennyson 2011; Keller 2010; Nixon et al. 2011). Additional resources discovered during these projects were located within the DQSP records-search area, including the direct APE.

NRHP-Listed Sites within the Indirect APE

Of the sites located within the indirect APE, two are listed in the NRHP and several others have characteristics that suggest they could be considered NRHP eligible. P-33-000773, the Mule Canyon site, is located approximately 1 mile west of the direct APE and, along with P-33-000504, the Mule Tank site farther to the west, is listed in the NRHP as the Mule Tank Discontiguous Rock Art District, based on Criteria c and d. P-33-000504 is a petroglyph locus within the district and P-33-000773 is a geoglyph/intaglio component.

Sites within the indirect APE that are not listed in the NRHP but could be considered eligible include two other intaglio sites, P-33-000661 and P-33-000662, located north of Interstate 10. These sites are made of alignments of waterworn cobbles. Several prehistoric trails are also located within the indirect APE. Among these is the Coco-Maricopa Trail (McCarthy 1982; 1993:70–84, 193–194), a system of trails that connected with other north–south- and east–west-trending trails. A portion of the trail has been recorded as P-33-000053, which passes through the indirect APE on the north side of the project area and was determined NRHP eligible for the McCoy Solar Project. At least eight other trail segments (P-33-000343, P-33-000650, P-33-000673, P-33-000772, P-33-000775, P-33-003803, P-33-004568, and P-33-010822) have been recorded within the indirect APE (see Table 4.2), although several may be segments of a smaller number of trails. Two of these trails extend into the direct APE (see below).

P-33-001821, a large previously recorded site containing multiple rock features, as well as lithic and ceramic artifact scatters, is crossed by two trails and is located within the indirect APE very close to the boundary of the direct APE. During a visit to the site by BLM archaeologists and tribal representatives for a previous project, a suspected cremation locus that had not been previously recorded was observed in the site vicinity. During a field visit for the DQSP by SRI and BLM archaeologists, the locus was relocated and formally recorded, and other portions of the site were found to extend into the DQSP direct APE (see below).

Archaeological Survey Results

In total, 278 archaeological sites and 620 isolated artifacts were identified during the survey of the direct APE. These are briefly discussed below. In the following sections, the different site types found within the APE are briefly discussed. Maps detailing the location of sites and isolates can be found in confidential Appendix C; complete descriptions of individual sites are provided in DPR 523 site forms found in confidential Appendix D.

Prehistoric Sites

In total, 89 prehistoric sites were discovered during the archaeological survey of the direct APE; 15 of these sites were previously recorded (see Figures C.5 and C.6). Four different site types were identified within the direct APE: artifact concentrations, rock feature sites, rock features with artifact scatters, and trails.

Artifact Concentrations

There are 25 artifact concentrations within the direct APE (Table 4.4; see Figures C.5 and C.6). These sites vary in size from small sites with a handful of artifacts to several hundred artifacts spread over 80,000–85,000 m^2. Artifact concentrations identified during the archaeological survey consist of two main types: ceramic scatters and lithic scatters. Each of these subdivisions is defined by their primary artifact components.

Ceramic Scatters

Nine artifact concentrations that can be best defined as ceramic scatters were discovered during the archaeological survey (see Table 4.4; Figures C.5 and C.6). Two of these sites, P-33-008134 and P-33-014151, were previously recorded. The number of ceramic sherds associated with these sites range from approximately 10 to nearly 200 sherds. Small ceramic scatters (single pot drops) within the project area were generally considered isolated resources. These nine ceramic scatters, however, were given site designations, because they were associated with other artifacts or consisted of multiple vessels. The majority of these sites are located in the central and southern portion of the project area. Generally speaking, these sites appear to be surface manifestations. Some of the scatters located within areas of substantial windblown sediment, however, may have buried components, as illustrated by Isolates 5093 and 7088 (see the section Isolated Resources below).

Sherds associated with these ceramic scatters were identified as Colorado Beige, Topoc Buff, Salton Buff, Tumco Buff, Parker Buff, and Colorado Buff types (Table 4.5). Other sherds associated with these scatters, however, could not be identified to a specific type, but some diagnostic traits did allow placement within general time periods (Patayan I–III). Three of the ceramic scatters are associated with the Patayan I/II period, two are associated with the Patayan II period, and the remaining four date to the Patayan II/III period.

The largest number of ceramic sherds was found at SRI-3186, a 65-by-23-m scatter located in the central portion of the project area. At this site, nearly 200 sherds arranged in four discrete clusters associated with at least two ceramic types (Topoc Buff and Colorado Buff) were recorded. A two-track road extends east–west through the site toward a historical-period well (SRI-42), the formation of which likely resulted in dispersal and damage to the sherds.

Table 4.4. Previously Recorded and Newly Discovered Artifact Concentrations within the Direct APE, by Site Type

Site No.	Temporal Association	Features						Historical-Period Artifacts					Prehistoric Artifacts				
		Artifact Concentration	Ceramic Scatter	Lithic Scatter	Rock Feature	Thermal	Trail	Faunal Bone	Glass	Cans	Ammunition	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/ Battered Stone
Ceramic Scatter																	
SRI-52	Patayan I/II	—	1	—	—	—	—	—	—	—	—	—	67	—	—	3	—
SRI-1061	Patayan I/II	—	1	—	—	—	—	—	—	8	—	—	49	—	—	—	1
SRI-2136	Patayan I/II	—	—	—	—	—	—	—	—	2	—	—	105	—	—	—	—
SRI-3059	Patayan II/III	—	1	—	—	—	—	—	—	—	—	—	22	—	—	1	—
SRI-3186	Patayan II/III	—	4	—	—	—	—	—	—	6	—	—	187	—	—	—	—
SRI-3228	Patayan II/III	—	2	—	—	—	—	—	—	—	—	—	80	—	—	5	—
SRI-4078	Patayan II	—	—	—	—	—	—	—	—	—	—	—	170	—	—	—	—
P-33-008134	Patayan II	—	—	—	—	—	—	—	—	—	—	—	30	—	—	—	—
P-33-014151	Patayan II/III	—	—	—	—	—	—	—	—	—	—	—	12	—	—	—	—
Lithic Scatter																	
SRI-2042	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—
SRI-3057	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—
SRI-3135	prehistoric	—	—	—	—	—	—	—	—	2	—	—	—	—	—	27	—
SRI-3147	prehistoric	—	—	—	—	—	—	—	—	3	—	—	—	—	—	53	—
SRI-3306	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22	—
SRI-4024	prehistoric	—	—	—	—	—	—	—	—		—	—	—	—	—	6	1
SRI-6491	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	94	—
SRI-7019	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—
P-33-002795	prehistoric	—	—	9[a]	—	—	—	—	—	1	—	—	—	—	—	>0[b]	—
P-33-002796	prehistoric	—	—	2	—	—	—	—	—	1	—	—	—	—	—	71	—
P-33-008133	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31	—
P-33-017317	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	—

continued on next page

Site No.	Temporal Association	Features						Historical-Period Artifacts					Prehistoric Artifacts				
		Artifact Concen-tration	Ceramic Scatter	Lithic Scatter	Rock Feature	Thermal	Trail	Faunal Bone	Glass	Cans	Ammuni-tion	Miscella-neous	Ceramic	Manu-port	FAR	Flaked Stone	Ground/ Battered Stone
P-33-019021	prehistoric	1[c]	—	—	—	—	—	—	—	13	1	—	—	—	—	37	—
P-33-019733	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	39[a]	—
P-33-019735	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18[a]	—
P-33-019739	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16[a]	—

Key: FAR = fire-affected rock.
[a]Includes data from site records.
[b]Site record indicated flaked stone artifacts were found but did not specify number of artifacts.
[c]Historical period.

Table 4.5. Sherd Types Associated with Ceramic Scatters

Site No.	Temporal Association	Patayan I	Patayan I/II		Patayan II			Patayan II/III		Patayan III		Total
		Colorado Beige	Indeterminate	Indetermi-nate	Salton Buff	Topoc Buff	Tumco Buff	Indetermi-nate	Parker Buff	Indetermi-nate	Colorado Buff	
SRI-52	Patayan I/II	53	—	—	—	14	—	—	—	—	—	67
SRI-1061	Patayan I/II	—	7	42	—	—	—	—	—	—	—	49
SRI-2136	Patayan I/II	—	105	—	—	—	—	—	—	—	—	105
SRI-3059	Patayan II/III	—	—	—	—	9	—	3	—	10	—	22
SRI-3186	Patayan II/III	—	—	—	—	5	—	—	—	—	182	187
SRI-3228	Patayan II/III	—	—	—	—	1	31	2	46	—	—	80
SRI-4078	Patayan II	—	—	—	—	170	—	—	—	—	—	170
P-33-008134	Patayan II	—	—	—	30	—	—	—	—	—	—	30
P-33-014151	Patayan II/III	—	—	—	—	—	—	—	12	—	—	12
Total		53	112	42	30	199	31	5	58	10	182	722

Lithic Scatters

Sixteen sites identified as lithic scatters were found within the direct APE; 8 of these sites were previously recorded (see Table 4.4; Figures C.5 and C.6). These sites largely consist of core-reduction flakes and angular debris fragments or tested cobbles. A smaller number of artifacts consisting of bifaces, choppers, cobble unifaces, cores, edge-modified or utilized flakes, and hammerstones were also discovered at some of these sites. Chert or other CCS materials and quartzite are the primary material types that were used. Other types of materials, such as basalt and rhyolite, were less commonly targeted for tool stone. No artifacts made of the felsite materials previously noted at quarry sites west of the study area (Singer 1984) were noted, nor were any items made of obsidian found during the survey. The identified lithic scatter sites were primarily associated with the large lag gravel terraces in the northern portion of the project area and the intermittently scattered areas of desert pavement. As with the ceramic scatters, these sites generally appear to be surface scatters.

Rock Feature Sites

Thirty of the newly identified prehistoric resources are isolated or clustered rock feature sites (Table 4.6; see Figures C.5 and C.6). All but one of these sites (SRI-29) consist of concentrations of fire-affected cobbles and cobble fragments. Quartzite and chert are the primary material types used in these features, with granite, rhyolite, basalt, limestone, and other stones used to a lesser degree. The choice of stone used in these sites is likely related to desert pavement composition and material type availability, because quartzite and chert cobbles were generally more abundant than other material types. Many of the rock features were heavily eroded or deflated surface or partially buried scatters. Roughly half of these sites are composed of an isolated fire-affected rock feature with around a dozen to over 100 pieces of fire-affected rock. All of these site are located in the central and southern portions of the project area. No charcoal, burned bone, or midden was identified at any of these sites. Fifteen of these sites have small numbers of associated prehistoric and historical-period artifacts. These artifacts are generally limited to one or two flaked stone artifacts. One site (SRI-4085) has two Colorado Buff ceramic jar sherds.

SRI-29 is particularly noteworthy in that it is the only rock feature site that consists entirely of non-thermally affected stones. This site consists of a small concentration of stones composed of rhyolitic tuff. Although these stones are not fire affected, the lack of other similar material types in the vicinity of the site indicates the site is composed entirely of manuports. The majority of the rocks associated with this site are partially buried. Because there are no associated diagnostic artifacts, this site was provisionally given an age of prehistoric.

Four rock feature sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009) exhibit characteristics that make them possibly eligible for recommendation for listing in the NRHP (see Chapter 5 for NRHP-eligibility discussions). Three of these features consist entirely of one to four fire-affected rock features and no additional artifacts. Most of the rock features in these sites are partially buried, indicating potential depth to the sites.

SRI-4085 is the largest site of this type within the direct APE and consists of six rock features and two loci of thermally altered rock scatters located in the southwestern portion of the direct APE. The western half of the site is located in a dunal area, whereas the eastern half of the site is located on desert pavement. Two of the rock features were partially buried. The composition of the rock features and loci is similar to other rock feature sites, i.e., small concentrations of thermally altered cobbles and cobble fragments composed of quartzite, schist, granite, chert, rhyolite, quartz, and other unidentified rock. The loci with rock scatters may have actually once been rock features similar to those found on this site that have deflated over time. Two Colorado Buff ceramic sherds were found on the surface in the extreme northwestern portion of the site among substantial windblown sand deposits, suggesting the site may date to the Patayan III time period. An intrusive friction-lid coffee can also was found in the eastern portion of the site.

Table 4.6. Previously Recorded and Newly Discovered Rock Feature Sites within the Direct APE

Site No. (SRI-)	Temporal Association	Features						Historical-Period Artifacts					Prehistoric Artifacts				
		Artifact Concentration	Ceramic Scatter	Lithic Scatter	Rock Feature	Thermal	Trail	Faunal Bone	Glass	Cans	Ammunition	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/ Battered Stone
29	prehistoric	—	—	—	1	—	—	—	—	—	—	—	—	23	—	—	—
58	prehistoric	—	—	—	—	3	—	—	—	—	—	—	—	—	88	2	—
61	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	9	1	—
75	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	69	1	—
1025	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	36	—	—
1043	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	21	1	—
2034	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	28	—	—
3017	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	34	—	—
3022	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	50	1	—
3039	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	126	—	—
3045	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	45	2	—
3047	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	17	—	—
3175	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	94	—	—
3205	prehistoric	—	—	—	—	1	—	—	—	—	—	—		—	68	—	—
3211	prehistoric	—	—	—	—	3	—	—	—	—	—	—		—	181	1	—
3224	prehistoric	—	—	—	—	1	—	—	—	1	—	—		—	38	—	—
3237	prehistoric	—	—	—	—	4	—	—	—	—	—	—		—	66	—	—
3331	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	52	—	—
3487	prehistoric	—	—	—	—	3	—	—	—	—	—	—	—	—	84	1	—
4014	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	97	—	—
4054	prehistoric	—	—	—	—	1	—	—	13	8	—	—	—	—	107	2	—
4063	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	63	1	—
4079	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	65	1	—
4085	Patayan III	—	—	—	—	8	—	—	—	1	—	—	2	—	327	—	—

Site No. (SRI-)	Temporal Association	Features						Historical-Period Artifacts					Prehistoric Artifacts				
		Artifact Concentration	Ceramic Scatter	Lithic Scatter	Rock Feature	Thermal	Trail	Faunal Bone	Glass	Cans	Ammunition	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/ Battered Stone
5034	prehistoric	—	—	—	—	1	—	—	—	4	—	—	—	—	36	2	—
5054	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	19	1	—
6471	prehistoric	—	—	—	—	—	—	—	—	—	—	—	—	—	46	—	—
7009	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	64	—	—
7029	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	56	—	—
7040	prehistoric	—	—	—	—	1	—	—	—	1	—	—	—	—	43	1	—

Key: FAR = fire-affected rock.

Rock Features with Artifact Scatters

Thirty-one sites found within the project area were identified as rock features with artifact scatters (Table 4.7; see Figures C.5 and C.6). Two sites, P-33-001821 and P-33-013660, were previously recorded. The rock features associated with these sites are similar to the other rock features found during the archaeological survey, i.e., concentrations of primarily fire-affected quartzite and chert cobbles with a smaller number of cobbles composed of other material types. However, in these sites, one or more rock features were found in association with additional artifacts. In many instances, these artifacts were located in a discrete concentration. Mostly, however, these additional artifacts were scattered across the surface of the site. As with other rock features in the project area, these features vary in terms of their degree of preservation and lack any observable midden or charcoal. With the exception of P-33-001821, no bone was observed in association with these features.

Artifacts associated with these sites consist of ceramic sherds, flaked stone, battered stone, and historical-period cans and bottles and were similar to artifact concentrations found within the project area that were not associated with rock features.

Most of these sites are temporally ambiguous with no associated diagnostic artifacts. Seventeen of these sites, however, have a small number of temporally diagnostic ceramic sherds associated with them. As with the ceramic scatters described above, these sherds consist of several ceramic types associated with the Patayan I–III periods. Identified ceramic types include Colorado Beige (Patayan I), Tumco Buff (Patayan II), Topoc Buff (Patayan II), Parker Buff (Patayan II/III), and Colorado Buff (Patayan III). Additionally, the rock feature sites with associated with Patayan II or II/III ceramic types were primarily located in the central portion of the project area, whereas those associated with the Patayan I/II or III ceramic types were located in the south or southwestern portions of the project area.

Although most of these sites only have fewer than four rock features associated with them, several sites (P-33-001821, SRI-17, SRI-83, SRI-1058, SRI-1059, SRI-6033, and SRI-6034) have upward of 6 rock features; SRI-83 has the largest number, with 14 rock features. These sites are located in the west-southwest portion of the project area, with three (SRI-83, SRI-1058, and SRI-1059) located in a large cluster in the extreme southwestern edge of the project toward the Mule Mountains.

Nine rock feature sites with artifact scatters (P-33-001821, SRI-17, SRI-83, SRI-1059, SRI-2021, SRI-3019, SRI-4241, SRI-6033, and SRI-6034) exhibit characteristics that make them possibly eligible for recommendation for listing in the NRHP (see Chapter 5 for NRHP-eligibility discussions).

P-33-001821

This site consists of a previously recorded series of lithic and ceramic artifact scatters and thermal features. First recorded in 1980 during a survey for the Devers–Palo Verde transmission line corridor (Carrico et al. 1982), P-33-001821 was described initially as “a large but dispersed lithic and ceramic scatter” with “at least two distinct ceramic loci and four lithic scatters” but “no features were located” (Day et al. 1980). According to the first site record, most of the site area was located within the indirect APE, although a small portion of it extended into the direct APE. Subsequent to the initial recording, the site was tested, and six 1-by-2-m units were excavated to depths of 50 cm, and all surface artifacts were mapped and collected, including 133 pottery sherds of Tumco Buff belonging to two vessels, 1 quartzite core, and 13 flakes (Carrico et al. 1982:106–109). Based on the ceramics, the site was dated to the Patayan II period, from A.D. 1000 to 1500 (Waters 1982a:287–290).

The site record was updated in 2004 for a second transmission line project, known as Devers–Palo Verde II (Carrico et al. 2004). During the 2004 site recording, the boundaries were redefined from the previous oblong shape, which extended slightly into the DQSP direct APE, to a boomerang shape, which was located completely within the indirect APE and outside the direct APE (Way and Eckhardt 2004:2–3). Newly identified site components included several thermal features and numerous artifacts, as well as fragments of calcined bone, scattered across the site surface, along with two previously recorded intersecting trails (P-33-000343 and P-33-000650), in addition to the previously mentioned ceramic and lithic scatters. Subsequently, because of the newly reported hearth features with calcined bone fragments, the site was subject to a field review and resurvey in March–April 2005. No loci of calcined bone sufficient to warrant forensic examination were observed, although four bone elements, including one calcined bone fragment, were noted in association with a thermal feature recorded as “Hearth Feature 1” (Wilson et al. 2005:3–4). The site record for P-33-001821 was again updated in 2008 for a proposed substation project and found unchanged from the 2004 and 2005 site visits (Eckhardt et al. 2008).

Table 4.7. Previously Recorded and Newly Discovered Rock Feature Sites with Artifact Scatters within the Direct APE

Site No.	Temporal Association	Features							Historical-Period Artifacts					Prehistoric Artifacts					Total
		Artifact Concentration	Ceramic Scatter	Lithic Scatter	Rock Feature	Thermal	Bone Scatter	Trail	Faunal Bone	Glass	Cans	Ammunition	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/ Battered Stone	
SRI-17	Patayan II	—	—	1	—	6	—	—	—	—	5	—	—	12	—	402	17	—	436
SRI-65	Patayan III	—	—	—	—	4	—	—	—	—	—	—	—	2	—	113	1	—	116
SRI-83	Patayan II/III	2	2	—	—	14	—	—	—	—	4	—	—	61	—	465	7	—	537
SRI-124	Patayan II	—	—	—	—	1	—	—	—	—	—	—	—	6	—	21	—	—	27
SRI-133	Patayan III	—	—	1	—	1	—	—	—	—	—	—	—	1	—	48	96	—	145
SRI-134	prehistoric	—	—	—	—	1	—	—	—	1	—	—	—	—	—	69	14	—	84
SRI-1014	Patayan II	—	—	—	—	1	—	—	—	—	—	—	—	5	—	15	—	1	21
SRI-1053	Patayan III	—	—	—	—	3	—	—	—	—	—	—	—	4	—	191	4	—	199
SRI-1058	Patayan I/II	1[a]	—	—	—	6	—	—	—	13	—	—	4	42	—	195	9	1	264
SRI-1059	prehistoric	—	—	—	—	12	—	—	—	35	—	—	—	—	—	355	41	—	431
SRI-2021	Patayan II/III	—	1	1	—	5	—	—	—	—	—	—	—	24	—	220	72	—	316
SRI-2329	Patayan II	—	—	—	—	—	—	—	—	—		—	—	3	—	38	—	—	41
SRI-3019	Patayan II	—	1	—	—	3	—	—	—	—	—	—	—	27	—	182	1	—	210
SRI-3040	prehistoric	—	—	—	—	3	—	—	—	—	—	—	3	—	—	142	9	—	154
SRI-3041	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	—	68	19	1	88
SRI-3042	prehistoric	—	—	—	—	2	—	—	—	—	—	—	—	—	—	62	8	1	71
SRI-3101	Patayan I/II	—	—	—	—	1	—	—	—	—	—	—	—	9	—	36	—	—	45
SRI-4016	Patayan II	—	1	—	—	1	—	—	—	—	—	—	—	25	—	63	1	—	89
SRI-4056	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	—	22	13	—	35
SRI-4084	prehistoric	—	—	—	—	—	—	—	—	—		—	—	—	—	13	3	—	16
SRI-4241	prehistoric	—	—	1	—	3	—	—	—	—	—	—	—	—	—	85	46	—	131
SRI-5067	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	—	8	6	—	14

continued on next page

Site No.	Temporal Association	Features							Historical-Period Artifacts					Prehistoric Artifacts					Total
		Artifact Concen-tration	Ceramic Scatter	Lithic Scatter	Rock Feature	Ther-mal	Bone Scatter	Trail	Faunal Bone	Glass	Cans	Ammu-nition	Miscella-neous	Ceramic	Manu-port	FAR	Flaked Stone	Ground/ Battered Stone	
SRI-6023	Patayan II	—	—	—	—	2	—	—	—	—	—	—	—	1	—	161	2	—	164
SRI-6033	prehistoric	—	—	—	—	6	—	—	—	—	1	—	—	—	—	253	9	—	263
SRI-6034	Patayan II/III	—	—	—	—	11	—	—	—	—	—	—	—	5	—	555	1	2	563
SRI-7008	Patayan II	—	1	—	—	2	—	—	—	—	—	—	—	16	—	106	15	—	137
SRI-7010	prehistoric	—	—	—	—	1	—	—	—	—	—	—	—	—	—	33	7	1	41
SRI-7031	Patayan II	—	—	—	—	2	—	—	—	—	—	—	—	6	—	55	3	—	64
SRI-7066	prehistoric	—	—	1	—	3	—	—	—	—	—	—	—	—	—	199	39	—	238
P-33-013660	prehistoric	—	1[b]	—	—	4	—	—	—	—	—	—	—	7[b]	—	—	—	—	—
P-33-001821	prehistoric	—	2[b]	4[b]	1	2[b]	1	—	4[b]	—	—	—	—	136[b]	—	—	19[b]	—	4,940

Key: FAR = fire-affected rock.
[a] Historical period.
[b] Includes data from site records.

Subsequent to the 2004–2008 Devers–Palo Verde II studies, P-33-001821 was visited by BLM archaeologists, California Energy Commission staff, tribal representatives, and applicant contractor staff as part of the onsite review for the Rio Mesa solar project (Nixon et al. 2011). During that visit, a previously unidentified locus containing calcined bone and believed to be a cremation was found on or near the site but not formally recorded (George Kline, personal communication June 2, 2015). Although this locus was believed to be located outside the DQSP direct APE, it was unclear at the time if that locus was the same or different from the thermal feature recorded as "Hearth Feature 1" in the 2004 and 2005 site record updates.

During the SRI field survey of the direct APE for the DQSP in October–December, 2014, along with a follow-up site visit by SRI and BLM on February 3, 2015, P-33-001821 was found to be larger than mapped in the 2004, 2005, and 2008 updates and to straddle the project boundary. SRI carefully surveyed the site and located the various previously noted features, which were examined, recorded, and mapped with a GPS unit to establish precise locations relative to the DQSP boundary. Although only a small portion of the site is located within the direct APE, the entirety of the site was examined because of the aforementioned calcined bone associated with a thermal feature ("Hearth Feature 1") indicated in the site records (Way and Eckhardt 2004; Wilson et al. 2005:3). During the latest site visit by SRI and BLM archaeologists George Kline and Tiffany Arend, "Hearth Feature 1" was found to be located outside the DQSP direct APE boundaries and to contain small fragments of unburned faunal bone but no calcined bone. The calcined remains may have become buried by sediment or transported away from the site during a flood event. The "Hearth Feature 1" was recorded as Feature 9010 on the updated site record (Stanton 2015).

However, further investigation of the site, beyond the recorded boundary from 2004, 2005, and 2008, in the nearby adjoining areas of the DQSP direct APE revealed two fragments (PDs 9000 and 9006) of a chalcedony biface (Figure 4.1), a quartzite bifacially tested cobble (PD 9007), and a buried rock feature composed of non-thermally affected quartzite and chert cobbles (PD 9001). The fragments of the biface were located approximately 50 m apart from one another but could be successfully refit. The biface appears to be an Elko series point that broke while it was being made. At the request of BLM archaeologist George Kline, the artifact was collected and will be transferred to the BLM Palm Springs headquarters. The chalcedony used for this tool appears to be heat-treated and is not a material from the local area, suggesting the raw material was imported using one of the many trails in the regional prehistoric trade network. The discovery of an Elko series dart point on the site pushes the age of the site back into the Gypsum complex of the Archaic period, which extended from 4000 years B.P. to the beginning of the Patayan I period about 1500 years B.P., when ceramics first appeared in the archaeological record and arrowheads replaced dart points as the favored projectile point. This suggests that use of P-33-001821 extended from the mid–late Archaic period into the Patayan II period (A.D. 1000–500) and, thus, spans the transition from atlatl-and-dart to bow-and-arrow hunting technology and from foraging to agricultural subsistence patterns.

Figure 4.1. Chalcedony biface fragments associated with P-33-001821.

The scatter of calcined bone observed during the Rio Mesa project site visit was relocated west-southwest of the previously recorded boundary from 2004, 2005, and 2008. This locus is situated within the indirect APE on the opposite side of a transmission line access road, away from the DQSP boundary. The feature consists of approximately a dozen completely and partially calcined long-bone fragments that are scattered across a 13-by-15-m area. Evidence of sandblasting on the bone indicates these fragments were located on the ground surface for an extensive amount of time. The largest fragment is approximately 2.5 cm in length. The cortical bone is about 3–4 mm thick. Unlike the previously recorded thermal feature ("Hearth Feature 1"/PD 9010), no fire-affected rock was in association with these bones, which were recorded by SRI as Feature 9008 (see updated site map in Stanton 2015:5). Although no diagnostic skeletal elements were identified, the remains are from a medium- to medium–large-sized mammal and are consistent with an interpretation of this feature as a human cremation locus.

SRI-17

This site consists of five fire-affected rock features clustered in a 30-by-10-m area, a lithic-reduction locus, and a sparse artifact scatter throughout the site. The rock features are similar to other rock features in the project area, although in one of the features, five ceramic sherds from a Colorado Beige vessel and a quartzite tested cobble were found on the surface. Several of the features are partially buried. The rock features range in size from about 2–4 m in diameter. The lithic-reduction locus is located roughly 30 m to the north of the features and consists of a quartzite tested cobble and three quartzite core-reduction flakes. Scattered about the site are chert and quartzite core-reduction flakes, a Topoc Buff ceramic sherd, six Tumco Buff body sherds, and two quartzite tested cobbles. Historical-period artifacts include a medium-sized solvent/paint-thinner can, a C-ration can bottom, two hole-in-top cans, and a sanitary can.

SRI-83

This site is a cluster of 14 fire-affected rock features, 4 artifact concentrations, and 1 sparse artifact scatter located throughout the site. The rock features are similar to other rock features in the project area and range in size from 1 to 4 m in diameter. Two chert core-reduction flakes and 18 ceramic sherds from a Colorado Beige jar are located within one of these features. Two of the rock features have adjacent lithic and ceramic scatters, and most of the features exhibit a high potential for buried cultural deposits. The features in the western portion of the site are more deflated. The site is located in an area with a considerable amount of windblown sand and dune formation.

The artifact concentrations are 2–6-m-diameter scatters of four to nearly two dozen lithic and ceramic artifacts. Ceramics associated with these concentrations consist of Colorado Buff and Topoc Buff ceramic types. In one artifact concentration, a large buried ceramic sherd was found when the concentration was probed for subsurface deposits.

Scattered about the site are chert and quartzite core-reduction flakes, Topoc Buff ceramic sherds, a quartzite tested cobble, and three historical-period cans.

SRI-1059

This site is located on poorly formed desert pavement and consists of seven fire-affected rock features, five fire-affected rock loci, a historical-period bottle concentration dating to 1942, and a sparse lithic scatter with a small amount of amber glass fragments. The rock features all have a similar composition as other fire-affected rock features in the project area and measure 2–8 m in diameter. These rock features are deflated. The loci consist of more-dispersed scatters of fire-affected rock and are likely thermal features that have become scattered over the years. These loci have compositions similar to the rock features. The lithic scatter consists of nearly two dozen chert and quartzite core-reduction flakes and almost 20 quartzite tested cobbles. A 1-by-1-m nonexcavation, surface observation unit was placed in the fire-affected rock loci and two of the rock features to help quantify their constituents. In addition, an intact amber glass beer bottle and 20 fragments of another amber glass beer bottle were recorded at the site. These glass fragments are contemporaneous with the bottle concentration.

SRI-2021

This site consists of five fire-affected rock features, a ceramic locus, and a lithic debitage locus located among a large artifact scatter composed of ceramics, lithic debitage, tested cobbles, and retouched flaked tools. The composition of the rock features is similar to other rock features in the project area. Some of the rock features are partially buried, indicating that there may be some cultural deposition within and around the features.

The ceramic locus consists of 11 sherds from a Topoc Buff jar vessel. Twelve additional sherds from Topoc Buff or Colorado Buff vessels were recorded throughout the site, including the 4 sherds within one of the rock features.

The lithic locus consists of hundreds of core-reduction and biface-reduction flakes and covers an approximately 382-by-223-m area. The majority of the lithic artifacts associated with this locus are core-reduction flakes, biface thinning flakes, and angular debris composed of chert. Three 4-by-4-m nonexcavation, surface observation units were placed within the locus to sample the lithic debitage. Nineteen chert flakes (6 biface thinning flakes, 9 core-reduction flakes, and 4 indeterminate type flakes) were found in Observation Unit (OU) 3425. Eight chert flakes (4 biface thinning flakes, 3 core-reduction flakes, 1 indeterminate type flake) were found in OU 3441. Thirty-seven pieces of debitage (4 quartzite core-reduction flakes, 3 chert biface thinning flakes, 24 chert core-reduction flakes, 3 chert angular debris fragments, 2 chert indeterminate type flakes, and 1 chalcedony angular debris fragment) were found in OU 3444.

The site around the loci and features consists of a sparse scatter of 8 ceramic sherds (identifiable ceramic types being Topoc Buff and Colorado Buff), 2 retouched flake tools, 1 possible scraper, and over 100 chert and quartzite core-reduction flakes, angular debris, and tested cobbles.

SRI-3019

This site consists of three fire-affected rock features and a ceramic scatter. The rock features range in size from 2 to 4 m in diameter and have a composition similar to other rock features in the project area. The ceramic scatter consists of 20 body sherds from a Topoc Buff jar vessel and is located adjacent to a northeastern rock feature (Feature 3481). In total, seven ceramic sherds from a Topoc Buff jar were recorded on the southwest side of one of the rock features and may have eroded from the ceramic scatter. A single quartzite core-reduction flake was also found at the site.

SRI-4241

This site consists of a sparse lithic scatter, a fire-affected rock locus, two fire-affected rock features, and a lithic-reduction locus. The site is located on a gravel surface truncated by rills. The composition of the rock features and locus are similar to the other rock features in the project area. The fire-affected rock locus, which measures approximately 3 m in diameter, may be a heavily disturbed thermal feature. The rock features are approximately 1 m in diameter. The lithic-reduction locus consists of 22 angular debris fragments, 11 core-reduction flakes, and 7 biface thinning flakes located in a 3-m-diameter area. The lithic debris in this feature is all composed of chert. A previously recorded tested cobble (P-33-019189) was recorded in this area but could not be relocated. Two quartzite core-reduction flakes and 3 chert core-reduction flakes were recorded outside of the features.

SRI-6033

This site consists of four thermally affected rock features and two scatters of fire-affected rock. The composition of the rock features is similar to the other rock features in the project area. Two of the features are partially buried. Quartzite tested cobbles were found within at least one of the features. In addition, thermally altered rock was found scattered to the north and south of the features and may have been features that have since become disturbed. Three quartzite core-reduction flakes, one quartzite tested cobble, and a historical-period sanitary can were also recorded.

SRI-6034

SRI-6034 is particularly interesting, because the only two pieces of ground stone found in the project area were found within this site. This site consists of 11 fire-affected rock features and an associated artifact scatter consisting of several ceramic sherds, a few quartzite flakes, and a large schist ground stone fragment. The composition of the rock features is similar to the other rock features in the project area. Some of the features are partially buried; others are deflated with no apparent depth. The rock features measure between

1 and 3 m in diameter. A ground stone fragment composed of schist was found in one of the feature, and two sherds from a Colorado Buff vessel were found in another rock feature.

A second schist ground stone fragment was found in the middle of the site. Ceramic sherds from untyped Patayan II/ III, Parker Buff, and Topoc Buff vessels were found near the center of the rock feature cluster; a single sherd was discovered for each of these types.

Trails

Three sites recorded in the project area, P-33-000343, P-33-000772 and SRI-3255, are prehistoric trails (Table 4.8; see Figures C.2, C.5, and C.6). P-33-000343 is a previously recorded trail segment that extends west from P-33-001821 toward P-33-000773, one of two sites within the Mule Tank Discontiguous Rock Art District. Unrecorded portions of the trail appear to continue westward to P-33-000504, the second site in the district, also located within the indirect APE. P-33-000343 is a trail that appears to have once extended farther into the direct APE but is currently no longer visible after it enters the direct APE from the west. P-33-000772 is also a previously recorded prehistoric trail segment that extends roughly east–west through the southern portion of the project area. This site was recorded as a portion of the Coco-Maricopa Trail system and continues toward the Mule Mountains to the west. SRI-3255 is located in the east-central portion of the project area and consists of a north-northeast to south-southwest trail segment. No other prehistoric sites or artifacts are associated with SRI-3255. P-33-000772, on the other hand, passes near two prehistoric rock feature and artifact scatter sites (SRI-3101 and P-33-013660) and P-33-000343 passes through P-33-001821 and P-33-001822 (located outside the APE). All three trails exhibit characteristics that make them possibly eligible for recommendation for listing in the NRHP (see Chapter 5 for NRHP-eligibility discussions). A north–south trail (P-33-000650) that runs through P-33-001821 within the indirect APE does not appear to extend into the direct APE (i.e., evidence of it is no longer extant within the direct APE).

Historical-Period Sites

In total, 181 historical-period sites were identified within the direct APE, including artifact concentrations, roads/trails, military sites, water-well sites, and survey markers. Sixteen of these sites were previously recorded. These historical-period sites are divided into three specific temporal periods (pre-DTC/C-AMA/Homesteading, DTC/C-AMA, and post-DTC/C-AMA) and a non-temporally specific general and multitemporal period for those possible historical-period sites consisting entirely of temporally ambiguous artifacts. The majority of the historical-period sites consist of artifact scatters, primarily of bottles and cans, with some historical-period ceramics also present. These sites are generally small and range in size from less than 20 to over 30,000 m^2. A smaller number of sites are associated with roads/trails, military activities, and survey markers.

Pre-DTC/C-AMA/Homesteading (Pre-1942) Sites

Fifteen historical-period sites within the direct APE are associated with land use prior to the establishment of the DTC/C-AMA (Table 4.9; see Figures C.7–C.10). All but two of these sites are artifact concentrations associated with dumping of domestic refuse and consist largely of hole-in-cap and hole-in-top cans, sun-colored amethyst glass fragments, lard pails, and whiteware fragments. Two of these sites, P-33-014198 and P-33-017328, were previously recorded. Based on artifact composition, most of the artifact concentrations date to the early twentieth century (pre-1920s), with SRI-63 and SRI-69 possibly representing the earliest historical-period sites within the direct APE. Earlier variants of hole-in-top can technology with double solder dots and hand-soldered seams around one end of the can were discovered at these two sites. One site (SRI-1024), however, has a component associated with the early 1930s.

Table 4.8. Previously Recorded and Newly Discovered Trails within the Direct APE

Site No.	Temporal Association	Features						Historical-Period Artifacts					Prehistoric Artifacts				
		Artifact Concentration	Ceramic Scatter	Lithic Scatter	Rock Feature	Thermal	Trail	Faunal Bone	Glass	Cans	Ammuni-tion	Miscella-neous	Ceramic	Manu-port	FAR	Flaked Stone	Ground/ Battered Stone
SRI-3255	prehistoric	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
P-33-000772	prehistoric	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
P-33-000343	prehistoric	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—

Key: FAR = fire-affected rock.

Table 4.9. Previously Recorded and Newly Discovered Pre-DTC/C-AMA/Homesteading (Pre-1942) Sites within the Direct APE, by Site Type

Site No.	Feature				Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concentration	Survey Marker	Campfire/ Burn Area	Road/ Trail	Faunal Bone	Glass	White Ware	Cans	Ammuni- tion	Construction Material	Miscella- neous	Ceramic	Manu- port	FAR	Flaked Stone	Ground/ Battered Stone
	Artifact Concentration															
SRI-63	—	—	—	—	—	1	—	6	—	—	—	—	—	—	—	—
SRI-69	—	—	—	—	—	1	—	16	—	—	—	1	—	—	—	—
SRI-1024	1	—	1	—	—	30	—	62	14	—	4	—	—	—	—	—
SRI-1037	—	—	—	—	—	80	46	55	—	—	18	—	—	—	—	—
SRI-1049	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-2035	—	—	—	—	—	—	—	17	—	—	—	—	—	—	—	—
SRI-2128	—	—	—	—	—	—	—	7	—	—	1	—	—	—	—	—
SRI-2333	—	—	—	1	—	—	—	3	—	—	—	—	—	—	—	—
SRI-3014	—	—	1	—	20	—	—	10	1	7	—	—	—	—	—	—
SRI-4045	1	—	—	—	—	5	—	43	—	—	—	—	—	—	—	—
SRI-4185	—	—	—	—	—	—	—	13	—	—	1	—	—	—	—	—
SRI-5073	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	—
SRI-8085	—	22	—	13	—	—	—	—	—	—	1	14	—	—	3	—
P-33-014198	—	—	—	—	—	3	—	102	—	—	3	—	—	—	—	—
	Road/Trail															
P-33-017328	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1

Key: FAR = fire-affected rock.

The sites appear to represent secondary dumping activity from outlying settlements and/or activity loci. Consequently, the sites cannot be positively associated with their source or specific land use, beyond representing general settlement and agricultural activities in the general region.

In addition to artifact concentrations, a northeast–southwest-oriented dirt road (SRI-2333) and an array of the survey markers and linear disturbances associated with the 1917 GLO survey of the area (SRI-8085 and P-33-017328) were also identified within the direct APE. SRI-2333 appears in a GLO map from 1918, and subsequent USGS maps and aerial photographs show the road during the mid-twentieth century. In the 1918 GLO map, this road extends to a homestead located outside the southwestern edge of the direct APE.

SRI-8085 consists of 22 survey markers and 10 linear disturbances associated with the survey markers (see Figures C.11 and C.12). These disturbances are approximately 2 feet wide, oriented north–south or east–west along section or quarter-section lines, and intersect at the survey markers. These disturbances may be related to survey crews clearing areas and walking the alignments during placement of the markers. GLO survey field notes indicated that a steel tape was used to set up the survey markers (GLO 1917). Located within the site boundary of SRI-1058, a prehistoric rock feature site with artifact scatters, are several tree stumps. GLO survey field notes indicated that one member of the crew was an axman (GLO 1917). These stumps may be associated with that activity.

P-33-017328 was previously recorded as a prehistoric trail component. Further investigation revealed that the site follows a quarter-section line on a north–south alignment and is likely a linear disturbances associated with the 1917 GLO survey, based on its similarity with the disturbances associated with SRI-8085.

Three artifact concentrations (SRI-1024, SRI-3014, and SRI-4045) exhibit characteristics that make them possibly eligible for recommendation for listing in the NRHP (see Chapter 5 for NRHP-eligibility discussions).

SRI-1024

This site consists of a possible campfire with scattered refuse associated with the early twentieth century (pre-1920s) and a domestic refuse deposit from the 1930s.

The possible campfire measures approximately 7 by 5 feet in size. Associated with this feature are 1 metal harmonica sleeve, 3 all-brass-head 16-gauge shotgun shells, 11 all-brass-head 12-gauge shotgun shells, 1 small brass buckle, and 1 brass leather rivet. The 16-gauge shells are U.M.C. Co. Majestic shells; the 12-gauge shells are 1901 Winchester shells. Based on the information embossed on the harmonica sleeve, the harmonica was a Dictator brand Subway model harmonica. This portion of the site may be a campsite associated with the 1917 GLO survey.

The 1930s domestic refuse concentration measures approximately 16 by 13 feet and consists primarily of sanitary cans in a variety of sizes, a clear drinking glass base, a sardine can, four hole-in-top cans, two paint cans, two external friction lids, a clear glass bottle, and five clear glass jars.

SRI-3014

This site consists of a small number of diffusely scattered historical-period cans from the early twentieth century. These cans consist largely of hole-in-cap cans, along with a single tobacco can. An approximately north–south-oriented two-track road passes near the eastern portion of the site and is likely associated with recent development in the area.

A 12-by-9-foot area of burned wood and bone is the only feature associated with this site. This feature consists of a lens of charcoal pieces with a small amount of partially calcined and calcined medium–large-sized animal bone, a .22-caliber rim-fired short round casing embossed with /U/, a tobacco-can lid, and at least seven wire nails. The feature is located approximately 20 feet west of the can scatter. As none of the cans appears to be burned, this burn area may be a campfire, possibly associated with the 1917 GLO survey of the area.

SRI-4045

This site consists of a large concentration of knife-opened hole-in-cap cans and glass fragments, as well as a light scatter, located to the southeast, of contemporaneous artifacts (hole-in-cap cans, sun-colored-amethyst glass, aqua and clear glass, and a lard pail). The artifact concentration measures 14 by 12-feet and consists of at least 15 hole-in-cap cans, along with at least 9 cans that were too deteriorated to identify and 1 fragment of clear glass. Although many of the artifacts were visible on the ground surface, several are nearly completely buried. Some of the hole-in-cap cans have machine-soldered seams.

DTC/C-AMA (1942–1944) Sites

There are 102 historical-period sites associated with troop activity at the DTC/C-AMA (Table 4.10; see Figures C.7, C.8, C.13, and C.14). The majority of these sites consist of artifact concentrations composed of K- and C-ration cans, friction-lid soluble coffee ration cans, .50- and .30-06-caliber ammunition casings, beer and nonalcoholic-beverage bottles and cans, and communication wire fragments. In some instances, sardine cans, evaporated-milk cans, and sanitary food cans were found in association with these sites. These cans may be nonstandard resources used for rations to fill supply gaps. Five of the artifact concentration sites were previously recorded.

Nine military-activity sites were identified within the direct APE. These sites primarily consist of lengths of communication wire or, in one instance (SRI-4180), an unspooled pile of steel guy wires. One site, SRI-2135, is an array of subrectangular/circular pits that are arranged in a line in the western portion of the direct APE. These pits appear to be tank emplacements that were dug into the ground to provide a defensive line during maneuvers. Two of these sites, P-33-014147 (communication wire) and P-33-021264 (tank tracks) were previously recorded.

Post-DTC/C-AMA (Post-1942) Sites

Thirty-six historical-period sites within the direct APE are associated with post-DTC/C-AMA land use (Table 4.11; see Figures C.7, C.8, C.15, and C.16). All but one of these sites are artifact concentrations composed of domestic refuse from the 1950s and 1960s. Artifacts associated with these sites consist of an array of sanitary, meat, beverage and hole-in-top cans; glass bottles and jars associated with beverages, food, and cleaning fluids; whiteware vessel fragments; aerosol cans; construction material; toys; and other various artifacts associated with domestic or automotive activities.

One site, SRI-42, is associated with a water-well installation. Several spoils piles and vehicle washout areas were identified at the site, along with a steel pipe that extends several feet into the ground. Artifacts associated with the site are related to industrial use (e.g., motor-oil cans, 50-gallon drums, and tool and hardware fragments), food or beverages, or recreational use of firearms. The site is associated with at least the early 1960s. Archival research indicates that the eastern half of Section 14, where the well is located, was claimed at different times during the 1950s by Gerald A. Brinkman and Victor A. Gudzunas.

Two other water wells also dating to the early 1960s consist solely of the well casings, with no other associated features or artifacts. The “BLM North” well, recorded as SRI-9016, is located at the intersection of four sections, two of which (Sections 11 and 12) are partially within the APE. The “BLM South” well, recorded as SRI-9018, is located in the western half of Section 23. No land claim information dating from the time the wells were built was discovered during this research.

General and Multitemporal Historical-Period Sites

Twenty-six sites (Table 4.12; see Figures C.7, C.8, C.17, and C.18) discovered during archaeological survey could not be attributed to a specific historical period, because they lack any temporally diagnostic artifacts and archival research did not disclose specific activities at the site locations. The artifact composition of these sites is similar to other historical-period sites in the project area—e.g., corroded collections of sanitary cans and other refuse—but the lack of maker’s marks and temporally diagnostic traits prevents determining a more-precise temporal association. These sites include 17 artifact concentrations, 1 USGS survey marker that lacks a date stamp, and 8 roads/trails.

Table 4.10. Previously Recorded and Newly Discovered DTC/C-AMA (1942-1944) Sites within the Direct APE, by Site Type

Site No.	Feature					Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concen-tration	Military Pits	Tank Tracks	Guy Wire	Communication Wire	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/Battered Stone
	Artifact Concentration																
SRI-3	—	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	—
SRI-7	—	—	—	—	—	—	—	—	4	—	—	1	—	—	—	—	—
SRI-9	—	—	—	—	—	—	—	—	25	1	—	4	—	—	—	—	—
SRI-21	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—
SRI-26	—	—	—	—	—	—	—	—	6	—	—	1	—	—	—	—	—
SRI-27	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-36	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-120	—	—	—	—	—	—	—	—	15	—	—	—	—	—	—	—	—
SRI-137	—	—	—	—	1	—	—	—	2	—	—	2	—	—	—	—	—
SRI-1001	—	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	—
SRI-1011	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-1035	—	—	—	—	—	—	1	—	16	—	—	2	—	—	—	—	—
SRI-1076	—	—	—	—	—	—	—	—	43	—	—	2	—	—	—	—	—
SRI-2001	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-2009	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—
SRI-2023	—	—	—	—	—	—	—	—	4	—	—	3	—	—	—	—	—
SRI-2029	—	—	—	—	—	—	—	—	27	—	—	7	—	—	—	—	—
SRI-2030	—	—	—	—	—	—	1	—	12	—	—	—	—	—	—	—	—
SRI-2066	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-2067	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-2082	—	—	—	—	—	—	—	—	9	—	—	—	—	—	—	—	—

	Feature					Historical-Period Artifacts							Prehistoric Artifacts				
Site No.	Artifact Concen-tration	Military Pits	Tank Tracks	Guy Wire	Communication Wire	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/Battered Stone
SRI-2088	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-2094	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-2098	—	—	—	—	—	—	—	—	8	—	—	4	—	—	—	—	—
SRI-2100	—	—	—	—	—	—	1	—	12	—	—	—	—	—	—	—	—
SRI-2582	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—
SRI-3020	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—
SRI-3027	—	—	—	—	—	—	87	—	7	—	—	1	—	—	—	—	—
SRI-3031	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—
SRI-3037	—	—	—	—	—	—	—	—	5	—	—	1	—	—	—	—	—
SRI-3038	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI3078	—	—	—	—	—	—	56	—	9	—	—	—	4	—	—	—	—
SRI-3108	—	—	—	—	—	—	36	—	—	—	—	18	—	—	—	—	—
SRI-3115	—	—	—	—	—	—	—	—	13	—	—	12	—	—	—	—	—
SRI-3116	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-3119	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-3123	—	—	—	—	—	—	2	—	12	—	—	—	—	—	—	—	—
SRI-3124	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-3127	—	—	—	—	—	—	—	—	5	—	—	5	—	—	—	—	—
SRI-3155	—	—	—	—	—	—	3	—	2	—	—	—	—	—	—	—	—
SRI-3156	—	—	—	—	—	—	5	—	5	—	—	—	—	—	—	—	—
SRI-3158	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-4004	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—
SRI-4019	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-4034	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—

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Site No.	Feature					Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concen-tration	Military Pits	Tank Tracks	Guy Wire	Communication Wire	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/Battered Stone
SRI-4041	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-4116	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-4145	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—
SRI-4160	—	—	—	—	—	—	3	—	1	—	—	4	—	—	—	—	—
SRI-4167	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-4175	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-4182	—	—	—	—	—	—	2	—	5	—	—	1	—	—	—	—	—
SRI-4191	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-4196	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-4217	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-4222	1	—	—	—	—	—	90	—	44	—	—	50	—	—	—	—	—
SRI-4229	—	—	—	—	—	—	93	—	14	—	—	3	—	—	—	—	—
SRI-4231	—	—	—	—	—	—	13	—	2	—	—	—	—	—	—	—	—
SRI-4235	—	—	—	—	—	—	1	—	8	—	—	8	—	—	—	—	—
SRI-4236	—	—	—	—	—	—	22	—	19	—	—	15	—	—	—	—	—
SRI-4242	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—
SRI-5000	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—
SRI-5003	—	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	—
SRI-5006	—	—	—	—	—	—	9	—	9	—	—	—	—	—	—	—	—
SRI-5008	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-5029	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-5035	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-5070	—	—	—	—	—	—	—	—	7	—	—	6	—	—	—	—	—

Site No.	Feature					Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concentration	Military Pits	Tank Tracks	Guy Wire	Communication Wire	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/Battered Stone
SRI-5076	—	—	—	—	—	—	—	—	14	—	—	—	—	—	—	—	—
SRI-5083	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—
SRI-5099	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-5135	1	—	—	—	—	—	2	—	4	—	—	10	—	—	—	—	—
SRI-6003	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-6046	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-6053	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-6059	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—
SRI-6075	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—
SRI-6081	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-6096	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-6100	—	—	—	—	—	—	15	—	3	—	—	1	1	—	—	—	—
SRI-6104	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—
SRI-6114	—	—	—	—	—	—	1	—	2	—	—	—	—	—	—	—	—
SRI-6115	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-7018	—	—	—	—	—	—	—	—	16	—	—	—	—	—	—	—	—
SRI-7020	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—
SRI-7065	—	—	—	—	—	—	1	—	3	—	—	2	—	—	—	—	—
SRI-7072	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—
SRI-7074	—	—	—	—	—	—	—	—	28	—	—	—	—	—	—	—	—
P-33-018675	—	—	—	—	—	—	4[a]	—	3[a]	—	—	30	—	—	—	—	—
P-33-018916	—	—	—	—	—	—	—	—	21	—	—	—	—	—	—	—	—
P-33-019741	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
P-33-019742	—	—	—	—	—	—	—	—	18[a]	—	—	—	—	—	—	—	—

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Site No.	Feature					Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concen-tration	Military Pits	Tank Tracks	Guy Wire	Communication Wire	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/Battered Stone
P-33-019743	—	—	—	—	—	—	—	—	12[a]	—	—	—	—	—	—	—	—
	Military Activity																
SRI-119	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—
SRI-2135	—	4	—	—	—	—	—	—	6	—	—	4	—	—	—	—	—
SRI-3054	—	—	—	—	—	—	—	—	1	6	—	—	—	—	—	—	—
SRI-4162	—	—	—	—	1	—	—	—	3	—	—	1	—	—	—	—	—
SRI-4180	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
SRI-7076	—	—	—	—	1	—	—	—	4	—	—	1	—	—	—	—	—
SRI-7087	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
P-33-014147	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
P-33-021264	—	—	2[a]	—	—	—	—	—	4	—	—	—	—	—	—	—	—

Key: FAR = fire-affected rock.
[a] Includes data from site records.

Table 4.11. Previously Recorded and Newly Discovered Post-DTC/C-AMA (Post-1944) Sites within the Direct APE, by Site Type

Site No.	Feature			Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concentration	Water Well	Burn Area	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/ Battered Stone
	Artifact Concentration														
SRI-2	2	—	—	—	15	1	108	—	—	68	—	—	—	—	—
SRI-18	1	—	—	—	7	—	90	9	3	24	—	—	—	—	—
SRI-19	1	—	—	—	—	—	11	—	—	—	—	—	—	—	—
SRI-25	1	—	—	—	1	—	23	4	—	—	—	—	—	—	—
SRI-71	—	—	—	—	3	—	6	—	1	2	—	—	—	—	—
SRI-81	1	—	—	—	—	—	23	—	—	17	—	—	—	—	—
SRI-125	1	—	—	—	1	—	14	—	—	—	—	—	—	—	—
SRI-132	—	—	—	—	1	—	7	—	—	—	—	—	—	—	—
SRI-147	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—
SRI-1009	2	—	—	1	10	2	196	—	—	8	1	—	—	—	—
SRI-1056	1	—	—	1	566	29	51	1	18	9	—	—	—	—	—
SRI-1070	—	—	—	—	—	—	11	—	—	—	—	—	—	—	—
SRI-2007	—	—	—	—	11	—	4	—	—	—	—	—	—	—	—
SRI-2008	—	—	—	—	—	—	11	—	—	—	—	—	—	—	—
SRI-2014	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—
SRI-2017	1	—	—	—	2	—	34	—	—	—	—	—	—	—	—
SRI-3007	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-3010	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—
SRI-3029	—	—	—	—	1	—	3	—	5	1	—	—	—	—	—
SRI-4005	—	—	—	—	6	—	1	—	—	—	—	—	—	—	—
SRI-4080	—	—	—	—	2	—	10	—	—	—	—	—	—	—	—
SRI-4208	—	—	—	—	1	—	9	—	—	—	—	—	—	—	—
SRI-4250	3	—	—	9	325	5	280	—	—	36	—	—	—	—	—

Site No.	Feature			Historical-Period Artifacts							Prehistoric Artifacts				
	Artifact Concentration	Water Well	Burn Area	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/ Battered Stone
SRI-5106	3	—	—	—	—	—	59	—	—	—	—	—	—	1	—
SRI-6011	2	—	—	—	1	—	83	1	—	2	—	—	—	—	—
SRI-6017	1	—	—	—	2	—	50	—	1	1	—	—	—	—	—
SRI-6018	—	—	—	—	141	—	3	—	—	58	—	—	—	—	—
SRI-6021	1	—	—	—	1	3	19	—	—	2	—	—	—	—	—
SRI-6022	1	—	—	—	30	2	53	—	—	1	—	—	—	—	—
SRI-6119	—	—	—	—	29	—	36	—	—	2	—	—	—	1	—
SRI-7024	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-7060	—	—	—	—	—	—	15	—	—	—	—	—	—	—	—
P-33-018852	2	—	1	—	35[a]	—	166[a]	—	—	12[a]	1	—	—	—	—
P-33-019740	—	—	—	—	—	—	9[a]	—	—	—	—	—	—	—	—
P-33-021132	1[a]	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Water-Well Site															
SRI-42	1	7	—	—	4	1	20	53	5	66	—	—	—	—	—
SRI-9016	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
SRI-9018	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—

Key: FAR = fire-affected rock.
[a] Includes data from site records.

Table 4.12. Previously Recorded and Newly Discovered General Historical-Period/Multitemporal Sites within the Direct APE, by Site Type

Site No.	Temporal Association	Feature			Historical-Period Artifacts							Prehistoric Artifacts				
		Artifact Concentration	Benchmark	Road/Trail	Faunal Bone	Glass	White Ware	Cans	Ammunition	Construction Material	Miscellaneous	Ceramic	Manuport	FAR	Flaked Stone	Ground/Battered Stone
Artifact Concentration																
SRI-138	historical period	—	—	—	—	1	—	5	—	—	—	—	1	—	—	—
SRI-1021	DTC/ post-DTC	—	—	—	—	3	—	53	—	—	4	—	—	—	—	—
SRI-3103	historical period	1	—	—	—	—	—	7	—	—	—	—	—	—	—	—
SRI-3117	historical period	—	—	—	—	—	—	7	—	—	1	—	—	—	—	—
SRI-4028	historical period	—	—	—	—	16	—	2	—	—	—	—	—	—	—	—
SRI-4098	historical period	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—
SRI-4127	historical period	—	—	—	—	3	—		—	—	—	—	—	—	—	—
SRI-4151	historical period	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-4178	historical period	—	—	—	—	7	—	6	—	—	—	—	—	—	—	—
SRI-4186	historical period	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-4248	historical period	—	—	—	—	—	—	3	—	1	5	—	—	—	—	—
SRI-5087	historical period	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-5132	historical period	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—
SRI-6005	historical period	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—
SRI-6087	historical period	1	—	—	—	—	—	15	—	—	—	—	—	—	—	—
P-33-018853	DTC/ post-DTC	2	—	—	—	48	—	18	—	—	23	—	—	—	—	—
P-33-019736	historical period	1[a]	—	—	—	—	—	—	—	53[a]	2[a]	—	—	—	—	—
Road/Trail																
SRI-96	historical period	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—
SRI-121	historical period	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
SRI-122	historical period	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
SRI-129	historical period	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—

Site No.	Temporal Association	Feature: Artifact Concentration	Feature: Benchmark	Feature: Road/ Trail	Historical-Period Artifacts: Faunal Bone	Historical-Period Artifacts: Glass	Historical-Period Artifacts: White Ware	Historical-Period Artifacts: Cans	Historical-Period Artifacts: Ammunition	Historical-Period Artifacts: Construction Material	Historical-Period Artifacts: Miscellaneous	Prehistoric Artifacts: Ceramic	Prehistoric Artifacts: Manuport	Prehistoric Artifacts: FAR	Prehistoric Artifacts: Flaked Stone	Prehistoric Artifacts: Ground/ Battered Stone
SRI-2051	historical period	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
SRI-9020	historical period	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
P-33-014173	historical period	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
P-33-014199	historical period	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—
Survey Marker																
SRI-5063	historical period	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—

Key: FAR = fire-affected rock.

[a] Includes data from site records.

Three of the roads/trails (SRI-121, SRI-122, and SRI-2051) are similar to the linear disturbances associated with the 1917 GLO survey (see Pre-DTC/C-AMA/Homesteading [Pre-1942] Sites section above)—i.e., they are narrow and lightly used single path trails—although they are slightly out of the alignment with the linear disturbances at SRI-8085. However, when compared to the Public Land Survey System base map, they are roughly in line with quarter-quarter section lines, albeit with an approximately 7° error—much less precise than those associated with SRI-8085. This diminished precision suggests that these trails were made during another survey, possibly by another surveyor hired by a landowner, speculative owner, or claimant, or even for military purposes. The level of disturbance could correspond with individuals or small groups clearing and/or repeatedly walking linear alignments imprecisely reflecting land boundaries.

P-33-014199 is a north–south-oriented section road. SRI-96 and SRI-129, the remaining historical-period trails, are 2-foot-wide ephemeral trails similar to those associated with the 1917 GLO survey. The trails associated with the GLO survey, however, follow section or quarter-section lines. SRI-96 is located approximately 400 feet east of one of these trails (P-33-017328). These two trails may represent an error made during the GLO survey, or they may have been created intentionally for an unknown purpose. These trails are unlikely to be prehistoric, based on their rather ephemeral nature and the precise nature of the orientation (SRI-96 is perfectly oriented north–south for nearly 1 km). P-33-04173 and SRI-9020 are both east–west-oriented roads that are depicted on the USGS 1952 7.5-minute quadrangles for the project area, based on aerial photographs from 1948. However, it is unknown how long the roads had been in place prior to that date. Both roads are aligned along section lines and presumably are no older than the 1917 GLO survey.

Multitemporal sites are historical-period sites that consist of two or more identifiable temporal components. During survey, there were only two multitemporal sites, both of which are artifact concentrations (SRI-1021 and P-33-018853) consisting of a scatter of artifacts that can be associated with troop activity at the DTC/C-AMA, as well as post-DTC/C-AMA civilian land use (see Figures C.13–C.16).

Multicomponent Sites

Unlike multitemporal sites, multicomponent sites consist of both prehistoric and historical-period components. Although many sites found during the archaeological survey of the direct APE were found to have minor multicomponent aspects (e.g., a site that is primarily a lithic scatter with a couple of isolated historical-period cans), eight sites have a more even distribution of historical-period and prehistoric artifacts and features (Table 4.13; see Figures C.7 and C.8). These sites consist of DTC/C-AMA or post-DTC/C-AMA artifact concentrations associated with a prehistoric ceramic scatters, lithic scatters, or rock features. Some of the prehistoric components have ceramic sherds associated with the Patayan II or II/III periods.

One of these site, P-33-019618, exhibits characteristics that make it possibly eligible for recommendation for listing in the NRHP (see Chapter 5 for NRHP-eligibility discussions). This site was previously recorded in 2009 by AECOM for the proposed Blythe Solar Power Project (Kry 2009); at the time, it was considered to be a lithic scatter and opportunistic lithic-procurement and assaying site located on a desert pavement terrace. As a result of the current project, SRI staff considerably expanded the previously recorded site boundary to include an adjacent terrace to the west, as well as a concentration of historical-period artifacts. A small rill separates the previously recorded area from the expanded site area.

Much as it was described when first recorded, the adjacent terrace consists of a sparse scatter of lithic debitage and tested cobbles located on the desert pavement terrace surface. The lithic debitage is consistent with opportunistic lithic procurement and assaying of chert and quartzite lag gravels. Numerous artifacts were recorded throughout the site, including nearly 200 flakes, approximately 30 tested cobbles, 3 cores, and 2 lithic-reduction loci. All of the lithic debitage consists of quartzite and chert. One Colorado Buff sherd was found in the rill between the two terrace landforms that constitute the site.

Table 4.13. Previously Recorded and Newly Discovered Multicomponent Sites within the Direct APE, by Site Type

Site No.	Temporal Association	Features					Historical-Period Artifacts			Prehistoric Artifacts				Total Artifacts
		Artifact Concentration	Ceramic Scatter	Lithic Scatter	Unknown Disturbance	Thermal	Glass	Cans	Miscellaneous	Ceramic	FAR	Flaked Stone	Ground/ Battered Stone	
	Artifact Concentration/Ceramic Scatter													
SRI-2068	Patayan II–III/ DTC	—	—	—	—	—	—	16	—	36	—	1	—	53
SRI-3256	Patayan II/DTC	—	—	—	—	—	—	2	2	1	—	—	—	5
SRI-3260	Patayan II/DTC	—	1	—	—	—	2	24	8	49	—	—	—	83
	Artifact Concentration/Rock Feature													
SRI-4017	prehistoric/DTC	—	—	—	—	1	—	12	—	—	27	2	—	41
	Artifact Concentration/Lithic Scatter													
SRI-3015	prehistoric/DTC	—	—	—	—	—	1	2	—	—	—	1	—	4
SRI-4060	prehistoric/ pre-DTC	—	1	—	—	—	32	5	—	11	—	4	1	53
P-33-019734	prehistoric/DTC	—	—	—	—	—	—	4[a]	—	—	—	8[a]	—	—

Key: DTC = Desert Training Center; FAR = fire-affected rock.
[a] Includes data from site records.

In addition to the prehistoric components, a large concentration of historical-period domestic refuse is located at the toe of the terrace slope, with several scattered historical-period artifacts located in a drainage downslope and adjacent to the terrace. Two cans, a ration can lid, and small cleared area were observed on the terrace slopes. Although most of the historical-period artifacts are domestic refuse, the ration can components, an amber glass bottle from the early 1940s, and a training variant M1A1 landmine are all associated with troop activity at the DTC/C-AMA during World War II. The remaining historical-period artifacts associated with this site date to the early 1950s. In January 2015, UXO specialists monitored by BLM archaeologists removed the landmine from the site and disposed of it.

A 17-by-15-foot cleared area was also discovered within the site. The northern end of the cleared area has been pushed up, creating a small (9-by-2.5-foot) berm composed of sediment and cobbles from the desert pavement. Although this berm is only about 6 inches in height, it may have acted as a low windbreak or cover for a fighting position. There are no artifacts associated with this feature. Rodent burrowing is evident throughout the feature. The nature of the cleared area is unknown and may be related to military activity or disturbance caused by OHV traffic through the area.

Sites That Could Not Be Relocated

One previously recorded site (P-33-014387) could not be previously recorded. This site is a small lithic scatter composed of tested cobbles and flakes on weak desert pavement that was recorded in 2004 by Mooney Jones & Stokes during a survey for the proposed Blythe Energy Transmission Project (Craft et al. 2005) and updated in 2008 by ICF Jones & Stokes (Chmiel et al. 2008). The location of the site and nearby area was visited during the survey and revisited during site recording. Although the description of the landscape in the site record was consistent with the visited location, no resources were relocated during either visit. The Blythe Energy Transmission Project corridor bordered the DQSP along its southeastern boundary. This resource may be misplotted.

Isolated Resources

In total, 620 isolated resources were identified during survey (see Appendix E). The majority of these resources (n = 380) are associated with the historical period (see Figures C.19–C.21) and are primarily ration cans associated with the DTC/C-AMA and food and beverage cans, with associated date ranges from the early twentieth century to the 1960s. Forty-one isolated jars or bottles were also discovered. As with the cans, these artifacts are associated with troop activity at the DTC/C-AMA, as well as land use by civilians following the closure of the training center. Ammunition (n = 28) found during survey consists of .50-caliber and .30-06-caliber rounds, as well as a grenade and an ammunition door from a Sperry ball turret (Figure 4.2), possibly from the B-24 bombers stationed at the BAAB. The two buttons (Figure 4.3) that were discovered are two-holed shell shirt buttons. Finally, 20 miscellaneous-type historical-period artifacts were discovered. These artifacts consist of tools, pieces of wire, eating utensils, and parts of oil filters.

In addition to the historical-period isolated resources, 157 prehistoric isolated resources were discovered (see Figures C.22–C.24), including 86 pot drops and 71 flaked stone artifacts (i.e., flakes, tested cobbles, and cobble choppers). The pot drops range in size from only a few ceramic sherds to over 80 sherds. Nine ceramic types were identified among the isolated resources (Table 4.14). These include three Patayan I types (Black Mesa, Colorado Beige, and Colorado Red), three Patayan II types (Tumco Buff, Topoc Buff, and Topoc Red-on-Buff), one Patayan II/III type (Parker Buff), and two Patayan III types (Colorado Buff and Colorado Red-on-Buff). Slightly more than one-third of the isolated resources with ceramics were associated with the Topoc Buff type.

Figure 4.2. Sperry ball turret ammunition door.

Figure 4.3. Shell shirt button.

Table 4.14. Distribution of Ceramic Types among Isolated Resources within the Direct APE

PD No.	Patayan I				Patayan I/II		Patayan II				Patayan II/III		Patayan III		
	Indeterminate	Black Mesa Buff	Colorado Beige	Colorado Red	Indeterminate	Black Mesa or Tumco Buff	Indeterminate	Tumco Buff	Topoc Buff	Topoc Red-on-buff	Indeterminate	Parker Buff	Indeterminate	Colorado Buff	Colorado Red-on-buff
11	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—
32	—	9	—	—	—	—	—	—	—	—	—	—	—	—	—
38	—	—	—	—	—	—	—	15	—	—	—	—	—	—	—
39	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—
40	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—
43	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—
45	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
49	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
57	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—
62	—	—	20	—	—	—	—	—	—	—	—	—	—	—	—
66	—	—	—	—	—	—	—	—	—	—	—	—	—	74	—
76	—	—	50	—	—	—	—	—	—	—	—	—	—	—	—
77	—	—	12	—	—	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—
106	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
109	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—
111	—	—	—	—	—	—	—	—	—	—	31	—	—	—	—
113	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—
126	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
131	—	—	—	—	—	—	—	—	—	—	29	—	—	—	—
1052	—	—	—	—	—	—	—	87	—	—	—	—	—	—	—
2015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12
2031	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—

PD No.	Patayan I Indeterminate	Patayan I Black Mesa Buff	Patayan I Colorado Beige	Patayan I Colorado Red	Patayan I/II Indeterminate	Patayan I/II Black Mesa or Tumco Buff	Patayan II Indeterminate	Patayan II Tumco Buff	Patayan II Topoc Buff	Patayan II Topoc Red-on-buff	Patayan II/III Indeterminate	Patayan II/III Parker Buff	Patayan III Indeterminate	Patayan III Colorado Buff	Patayan III Colorado Red-on-buff
2071	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—
2079	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—
2093	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
2101	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
2175	—	—	—	—	—	—	—	—	—	—	6	—	—	—	—
2379	—	—	—	—	—	—	—	—	—	—	—	—	7	—	—
2417	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—
2697	—	—	—	—	—	—	—	—	—	—	16	—	—	—	—
3008	—	—	—	—	—	—	28	—	—	—	—	—	—	—	—
3013	—	—	—	—	—	—	—	—	13	—	—	—	—	—	—
3043	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
3060	—	—	—	—	—	—	—	17	—	—	—	—	—	—	—
3086	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
3098	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—
3099	—	—	—	—	—	—	—	—	—	—	38	—	—	—	—
3104	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
3107	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—
3183	—	—	—	—	—	—	—	—	—	39	—	—	—	—	—
3407	—	—	41	—	—	—	—	—	—	—	—	—	—	—	—
3412	—	—	—	—	—	—	—	—	—	—	—	33	—	—	—
4010	—	—	—	—	—	42	—	—	—	—	—	—	—	—	—
4035	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—
4039	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—
4040	—	—	—	—	—	—	—	—	22	—	—	—	—	—	—

continued on next page

PD No.	Patayan I				Patayan I/II		Patayan II				Patayan II/III		Patayan III		
	Indetermi-nate	Black Mesa Buff	Colorado Beige	Colorado Red	Indetermi-nate	Black Mesa or Tumco Buff	Indetermi-nate	Tumco Buff	Topoc Buff	Topoc Red-on-buff	Indetermi-nate	Parker Buff	Indetermi-nate	Colorado Buff	Colorado Red-on-buff
4055	—	—	—	—	—	—	—	—	—	—	6	—	—	—	—
4069	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—
4070	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—
4072	—	—	—	—	—	—	—	—	17	—	—	—	—	—	—
4113	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—
4115	—	—	—	—	—	—	—	—	30	—	—	—	—	—	—
4125	—	—	—	—	—	—	—	—	—	—	18	—	—	—	—
4136	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—
4141	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
4212	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—
5049	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
5052	—	—		—	—	7	—	—	—	—	—	—	—	—	—
5074	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
5093	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
6035	—	—	—	35	—	—	—	—	—	—	—	—	—	—	—
6063	—	—	—	—	—	—	—	—	9	—	—	—	—	—	—
6073	—	—	—	—	—	—	—	—	—	—	7	—	—	—	—
6097	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
6102	—	—	—	—	—	—	—	—	—	—	—	—	14	—	—
6295	—	—	—	—	—	—	—	—	—	—	—	5	—	—	—
6323	—	—	70	—	—	—	—	—	—	—	—	—	—	—	—
6324	—	—	—	—	—	—	75	—	—	—	—	—	—	—	—
6331	—	—	—	—	—	—	—	—	—	—	—	7	—	—	—
7000	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—
7003	—	—	—	—	—	—	—	—	9	—	—	—	—	—	—

PD No.	Patayan I				Patayan I/II		Patayan II				Patayan II/III		Patayan III		
	Indeterminate	Black Mesa Buff	Colorado Beige	Colorado Red	Indeterminate	Black Mesa or Tumco Buff	Indeterminate	Tumco Buff	Topoc Buff	Topoc Red-on-buff	Indeterminate	Parker Buff	Indeterminate	Colorado Buff	Colorado Red-on-buff
7011	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—
7017	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
7023	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7025	—	—	—	—	18	—	—	—	—	—	—	—	—	—	—
7026	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—
7028	—	—	—	—	—	—	—	—	14	—	—	—	—	—	—
7033	—	—	—	—	—	—	—	—	25	—	—	—	—	—	—
7048	35	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7049	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
7050	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—
7051	—	—	—	—	—	—	—	23	—	—	—	—	—	—	—
7088	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
8092	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—

Key: PD = provenience designation.

Four of the pot drops are somewhat noteworthy in comparison to other ceramics in the project area. Although most of the vessels associated with these pot drops are incomplete, three vessels (Isolates 3104, 5093, and 7088) are relatively complete. The observable sherds for Isolate 3104 are large and consist of rim, body, and base sherds that could be refit into at least one-third of a vessel. Isolates 5093 and 7088 (previously recorded as P-33-019390) consist of large, partially buried body sherds. These two isolated resources are located within the dunes that stretch across the north-central portion of the project area within the Gen-Tie corridor. Based on the size of the sherds and their location within an area of extensive wind-blown sediment, additional large fragments of these vessels may be present below the surface of the dunes. The final pot drop of note is Isolate 7048, which is decorated with a punctated pattern (Figure 4.4). Although relatively common along the Colorado River, it is one of the few fragments found within the direct APE that features this decoration style. The relative uniqueness and completeness of these four resources may warrant further investigation and possible collection.

One projectile point, a possible Gypsum point made of chert (Figure 4.5), and one quartzite hammerstone were also discovered. The projectile point (Isolate 108) was found along the southeastern boundary of the project area. The isolated lithic artifacts are largely composed of chert or quartzite; none are composed of obsidian.

One isolated resource (Isolate 7000) consists of a historical-period can and a small cluster of pot sherds.

Architectural Resources

No new or previously recorded architectural resources were identified within the direct APE, and no NRHP-eligible or listed architectural resources were identified within the indirect APE as a result of the records search.

Buried-Site Sensitivity

Because identification of archaeological resources in a pedestrian survey is limited to sites and isolates visible on the ground surface, there is the possibility that resources obscured by soil deposition over time or recent aeolian sand distributions could be overlooked. In the following section, we address the potential for buried sites to be located within the direct APE and provide a model to anticipate where in the project area such buried resources may be located.

Buried-Site Sensitivity Models

All buried-site sensitivity models are based on the relationship between landform age and the accepted dates of human habitation in North America. Put simply, buried archaeological resources are not possible in landforms that developed prior to the colonization of the continent, which based on our present understanding, occurred sometime in the latest Pleistocene. Using this concept as a methodological framework, the first step in model construction is to delineate relict Pleistocene landforms (low potential) from those that aggraded coeval with potential human habitation (latest Pleistocene–present). This can be accomplished by several means but generally involves the use of surficial geologic maps, soil surveys, aerial or satellite imagery, and correlation of project landforms/soils with regional geochronologies. More-robust models will also include field verification via subsurface testing and absolute (i.e., radiocarbon) dating of stratigraphic sequences.

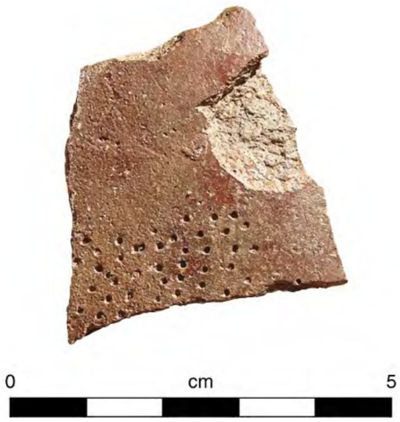

Figure 4.4. Close-up view of punctated pattern on ceramic bodysherd.

Figure 4.5. Possible Gypsum point.

Limitations of Sensitivity Models

It is important to note that discrepancies will exist between the "geologic potential" and the actual "probability" for buried archaeology (Meyer et al. 2010a:142). Whereas geologic potential is based simply on relative landform age (i.e., young surfaces have higher sensitivity than older surfaces), the probability of finding buried sites is dependent on multiple factors, including the precise age of the landform/geomorphic surface, slope gradient, the depositional environment of the sediments underlying the landform, the presence or absence of buried soils, proximity to water, and indeterminate cultural influences. Although some of these variables can be incorporated into models based on existing data sources, others will require field study and postfield analysis.

Inaccuracies can also be a result of the limitations inherent to soil and geologic maps that, in most instances, form the foundation of the sensitivity models. Map scale and the generalizations used to define mapping units are the most common source of error (Holliday 2004). If soil survey maps are used, it is important to recognize that, unlike many geologic units, soil boundaries do not have abrupt contacts. Soils more commonly grade from one type to another over relatively long distances. As defined in soil taxonomy, a soil mapping unit (soil series) may include up to 10 percent of a contrasting soil type or up to 50 percent, if the inclusion is similar to the primary mapping unit (Soil Survey Staff 1975). As a result, most mapped soil series will include other soil types, including soils significantly different from the mapped unit. It is also important to note that the minimum size delineated on county soil maps ranges from 1–4 hectares or 10,000–40,000 m^2 (Soil Survey Staff 1993). Most archaeological sites are significantly smaller than this (Holliday 2004).

Model Construction

The potential for buried intact archaeological resources within the APE is assessed here using relative landform age, depositional environments, the presence or absence of buried soils, and proximity to potential ephemeral water sources. Although slope is an important environmental characteristic to consider, applying this variable to the low-relief surfaces of the DQSP area has little effect on the distribution of sensitive landforms. It is also recognized that cultural factors often have a strong influence on site location; however, these are difficult to quantify and are not taken into account here. All of the information used to construct this model was extracted from existing soil surveys, geologic maps, and high-resolution satellite imagery. This model has not been verified in the field.

Landform age was determined by examining geomorphic surface characteristics visible in high-resolution satellite imagery and the analysis of 1:24,000-scale soil survey maps (Soil Survey Staff 2015). 1:100,000-scale geologic maps of eastern Riverside County were also reviewed (Hayhurst and Bedrossian 2010; Stone 2006); however, the small scale of these maps made them less useful as a base for the predictive model. The soil taxonomic classification for each of the soil series provided information on relative soil age and the soil-forming environment (see Appendix A). Soils are considered an accurate predictor of age, because soil development is time dependent (Birkeland 1999; Holliday 2004; Jenny 1941). Older landforms have well-developed soils (if not severely eroded) with diagnostic subsurface horizons (B horizons), whereas younger landforms have weakly developed soils with simple A-C horizons (no B horizon). Soil formation in arid environments is characterized by the accumulation of soluble salts, because there is insufficient moisture to leach the salt from the soil profile (Birkeland 1999; Schaetzl and Anderson 2005). Studies of soil development on desert piedmonts in the eastern Mojave suggest the accumulation of salts (namely calcium carbonate) in subsurface horizons is controlled by dust influx rather than the lithology or particle size of the soil parent material (Harden et al. 1991; McFadden et al. 1989). Because dust influx is largely controlled by climate, soil formation can be used to differentiate late Quaternary landforms over broad areas of the Mojave Desert (McFadden et al. 1989).

Landform age was further estimated by the presence or absence of desert pavement and rock varnish in satellite imagery. Like soils, desert pavement and the accumulation of varnish on surface clasts is time dependent (Bull 1991; Helms et al. 2003; McFadden et al. 1989). In the eastern Mojave, desert pavements are largely restricted to middle Holocene or older surfaces, with the strongest pavements requiring 20,000–35,000 years to develop (McFadden et al. 1989). Moderate to strongly developed rock varnish is also restricted to middle Holocene or older surfaces, although incipient varnish may be associated with deposits less than 2,000 years old (Dorn 1984; McFadden et al. 1989).

Depositional environments and the presence or absence of buried soils were assessed based on the soil series descriptions (Soil Survey Staff 2015). Gravelly alluvial-fan deposits such as those associated with the Carrizo series are less likely to contain intact buried archaeological resources, because the depositional environment has sufficient tractive force to displace artifacts (Waters 1992). Generally, artifacts recovered from very gravelly alluvium are displaced from their primary contexts.

Buried soils represent former stable land surfaces that were available for cultural use for long periods of time (Holliday 2004). Discrete periods of climatically induced alluvial-fan and aeolian sedimentation have resulted in soil burial in distal alluvial-fan settings across a broad region of the Mojave and western Sonoran Deserts (Bacon et al. 2010; McDonald et al. 2003; Miller et al. 2010; Rendell et al. 1994). As discussed by Waters (1992), distal alluvial-fan settings are favorable to the preservation of archaeological resources, because of the low-energy depositional environment and because older surfaces are often buried by younger alluvium.

Finally, several potential arroyo-mouth pans or playas were identified in satellite imagery in the northeastern and southwestern portion of the APE. It is possible that aeolian sand has blocked natural drainage at these locations. Although infiltration of runoff is high, surface water may have been available for short periods of time following large precipitation events. Areas of high geologic potential within or adjacent to these areas should be of special concern during future cultural resource investigations.

Model Explanation

The soils in the project area have been grouped into low, moderate, and high potential, based on the age of the geomorphic surface, presence or absence of buried soils, and depositional environment. The information presented here allows resource managers to make informed decisions concerning the level of effort needed to locate buried archaeological resources. Although there are a number of caveats associated with buried-site sensitivity models based on existing soil/geologic maps, this model provides a solid foundation for future geoarchaeological research in the project area.

Low-potential areas are restricted to a relict piedmont surface in the north-central direct APE mapped as the Chuckawalla soil series (Table 4.15; Figures 4.6 and 4.7). Although this surface has been mapped as Holocene fan alluvium by Hayhurst and Bedrossian (2010), strong soil development coupled with a moderate to strong desert pavement with rock varnish suggests a late Pleistocene age (Harden et al. 1991; McFadden et al. 1989). Regional geoarchaeological sensitivity models in areas west of the project area also correlated the Chuckawalla soil series with late Pleistocene landforms (Meyer et al. 2010b:28). The alluvium underlying this surface was deposited prior to the arrival of humans in North America and, therefore, has a low sensitivity for intact buried archaeology. However, localized aeolian and sheetwash deposits do have some potential to shallowly bury cultural resources and should be taken into consideration.

Areas of moderate potential within the APE include the Carrizo and Aco soil series (see Table 4.15; Figure 4.6). The Carrizo series is mapped on late Holocene and active or recently active alluvial fans in the north-central project area. Unfortunately the boundary between the Carrizo and Chuckawalla soil series is highly complex (see Figure 4.6). Owing to this complexity, a significant level of overlap can be expected between these two series. To correct for this, the boundary has been adjusted so that only those piedmont surfaces with visible desert pavement are included in the Chuckawalla series (Figure 4.8). This should increase the accuracy of the model to some degree.

Although the Carrizo series is mapped on young piedmont surfaces, the potential for buried archaeology is considered to be moderate. The extremely gravelly alluvium described for this series was deposited in a high-energy channel and/or debris-flow environment. Buried cultural resources, if present, have likely been displaced from their original contexts. Some potential does exist, however, because these deposits bury older landforms (buried soils are likely). Incipient buried soils within the gravelly late Holocene alluvium can also not be ruled out. Field study of these deposits is needed before a more accurate assessment of sensitivity can be made.

Table 4.15. Sensitivity Model Summary and Explanation

Soil Series (Map Color)	Landform(s)	Geologic Mapping Unit[a]	B Horizon	Depth to B Horizon (cm)	Pavement/ Varnish	Soil Texture	Regional Correlations[b]	Geologic Potential	Surface Age	Potential Depth of Culture-Bearing Strata (cm)
Aco (greenish gray)	distal fan/alluvial plain	Qot and Qf (late Holocene and early–middle Pleistocene)	Bk	8	moderate pavement/ weak varnish	sandy loam to coarse sandy loam	early Holocene or older fan alluvium	moderate	early Holocene-undifferentiated	<50
Carrizo (tan)	incised channels and active fans	Qf (late Holocene		150+		gravelly sand	late Holocene fans	moderate	late Holocene	150+
Chuckawalla (dark grey)	alluvial fan	Qf (late Holocene)	Bk and Btk	4	moderate to strong pavement/ moderate to strong varnish	silt loam and gravelly silty clay loam	late Pleistocene fans	low	late Pleistocene	0 (local burial by thin aeolian deposits)
Orita (olive green)	distal fan/alluvial plain	Qot and Qf (late Holocene and early–middle Pleistocene)	Bt and Btk	55	none	gravelly fine sandy loam, gravelly clay loam	late Holocene over Pleistocene fan	high	late Holocene	50–60
Rositas (brown and green)	dunes, sand sheets, and blowouts	Qe, Qf, and Qot (late Holocene and early–middle Pleistocene)		150+	none	fine sand	Holocene and late Pleistocene aeolian	high	late Holocene (dunes and Sand sheets), older deposits (blowouts/deflated areas)	150+

[a] From Hayhurst and Bedrossian (2010).
[b] From Bacon et al. (2010); Harden (1991); Lancaster and Tchakerian (2003); McFadden et al. (1989); Miller et al. (2010); Rendell et al. (1994).

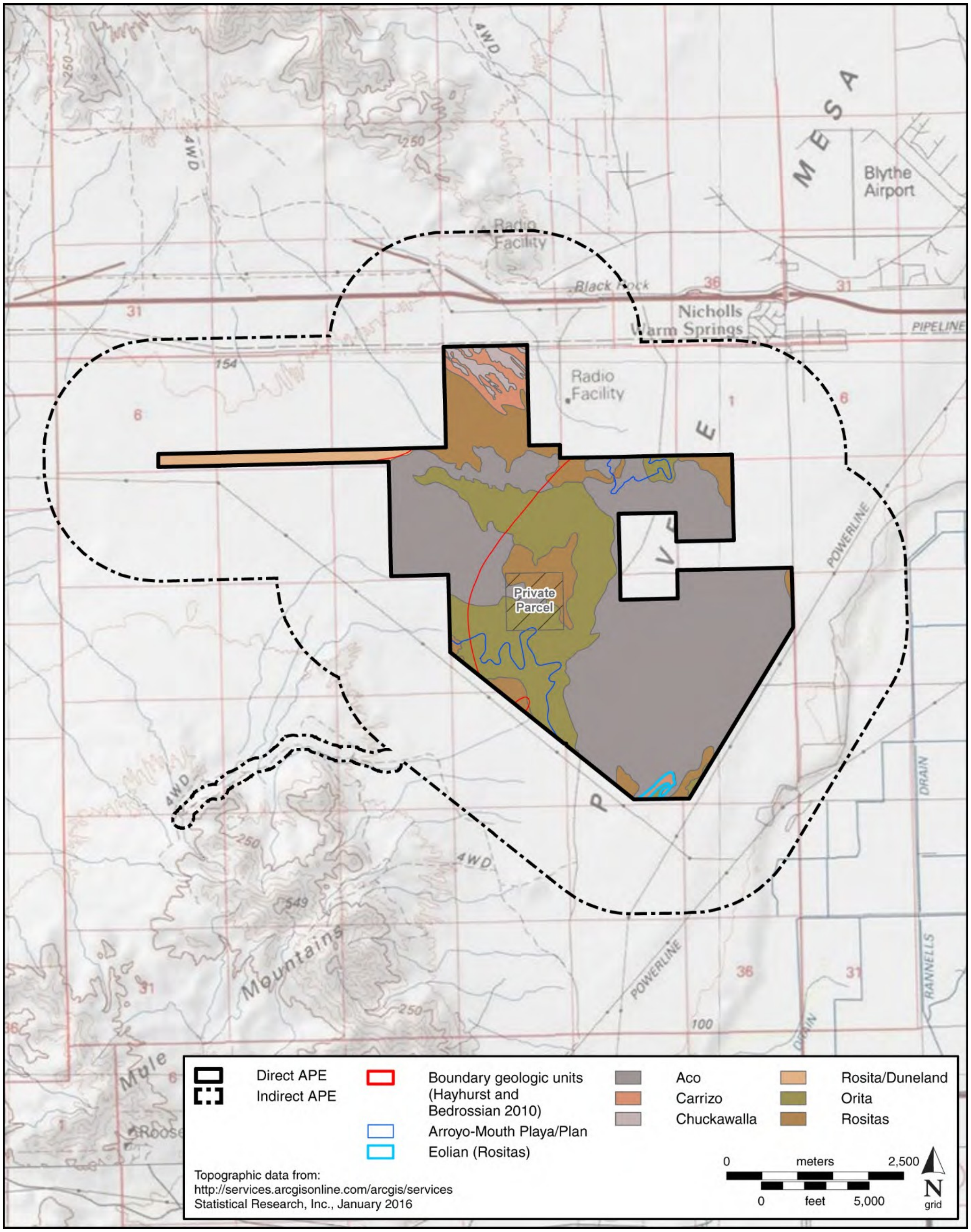

Figure 4.6. Distribution of soil types within the direct APE.

Figure 4.7. Overview of Chuckawalla soil series in the northern portion of the direct APE.

Figure 4.8. Intersection of Chuckawalla (desert pavement on right) and Carrizo (drainage on left) soil series in northwestern portion of project area.

The Aco soil series is mapped over broad areas of the eastern and west-central project area (see Figure 4.6). This series overlaps with both the Qot (early–middle Pleistocene Colorado River deposits) and the Qf (Holocene alluvium) geologic mapping units of Hayhurst and Bedrossian (2010) (see Table 4.15). The presence of Bk subsurface horizons indicates at least moderate levels of soil development. Weak to moderately developed desert pavement with rock varnish further suggests longer periods of landform stability. Based on regional correlation with dated landforms, the Aco series likely represents an early Holocene or older surface (Harden et al. 1991; McFadden et al. 1989). Locally, the Aco series may signify a mantle of younger alluvium over relict Pleistocene Colorado River deposits, where it overlaps with the Qot surface of Hayhurst and Bedrossian (2010). Although the window of potential human occupation is relatively narrow, latest Pleistocene–early Holocene, buried cultural resources are still possible.

High-potential landforms are mapped as the Rositas and Orita soil series (see Table 4.15; Figure 4.6). The official soil series description for the Orita series identifies a buried soil mantled by 55 cm of late Holocene fan alluvium. Similar to the Carrizo series, however, the late Holocene alluvium is very gravelly, indicating a high-energy depositional environment. Strong soil development in the buried soil suggests a Pleistocene age; therefore, deeply buried archaeology is not expected.

The Rositas series represents soils developed in locally thick sequences of aeolian sand (Figure 4.9). Regionally, at Dale Lake-Palen Dry Lake west of the project area, Rendell et al. (1994) dated major periods of aeolian deposition from 35–25 kya (thousand years ago) and 15–10 kya. Smith (1967) also identified a possible depositional episode from 7–4 kya. Lancaster and Tchakerian further identified buried soils within the aeolian sand marking periods of nondeposition and stability from 20–15, 14, and 4 kya. A similar sequence may be present in the project area; however, this would require field verification.

The source of aeolian sand within the direct APE is distal alluvial-fan and playa settings (Ford Dry Lake) immediately to the west in Chuckwalla Valley. According to the distribution of the Rositas series, aeolian sand mantles the western arm and the northern and southern boundaries of the APE (see Figure 4.6). An isolated pocket of aeolian sand is also present near the center of the project area. The official soil series description indicates aeolian sand in these areas extends to a depth of 150+ cm (see Table 4.15). The actual thickness of dunes and sand sheets across the APE will vary considerably, however.

In other areas of the Chuckwalla Valley, migrating aeolian sand has blocked natural drainages forming small playa lakes or pans (Kenney 2010). Aeolian sand in the southwestern direct APE may have blocked several drainages coming off the Mule Mountains, forming a small playa (see Figure 4.6). A similar situation may exist at the mouth of an ephemeral drainage in the northeastern direct APE (see Figure 4.6). These areas represent a potential water source and should be investigated more closely in the future.

Catellus/BLM Land Exchange Project Sensitivity Study

As previously indicated, in 1998, ASM conducted a 1,542-acre Class II survey as part of the Palo Verde Mesa and Palo Verde Valley Catellus/BLM Land Exchange project (McDonald and Schaefer 1998). As part of this project, a site sensitivity model was created, based on geomorphology and overall site density from available records-search information. The results of that study divided its project area into four sensitivity categories: high, medium, low, and none. Areas with high site potential consisted of upland areas with a potential for exposed volcanic or metavolcanic stone that might have been used as tool stone, as well as springs and historical-period roads and wells. Medium-sensitivity areas focused on the slopes below higher-sensitivity areas. Low-sensitivity areas were those locations within late Holocene alluvial formations. Areas without sensitivity were those located in active dunes or those areas subjected to recent agriculture.

When this sensitivity model was applied to the DQSP direct APE, only the most-northern portion of the direct APE fell within the high-sensitivity area. This area corresponds to the Chuckawalla and Carrizo soils associated with alluvial fans and channels. The northwestern portion of the direct APE overlapped with an area defined as having no sensitivity. The DQSP buried-site sensitivity analysis shows this area as being associated with Aco and Rositas soils (see Figure 4.6). This area was likely identified as having no sensitivity in 1998 because of the presence of several active dunes. The remainder of the DQSP direct APE overlapped with areas defined during the 1998 project as having low sensitivity. During the current project, however, this area was found to be more complex than initially reported, containing at least four different soil series with differing degrees of sensitivity.

Figure 4.9. Overview of aeolian sand deposits within the Rositas soil series.

Summary and Interpretation

In total, 278 sites and 620 isolated finds were recorded during the DQSP survey. Of these 278 sites, 181 sites are historical-period, 89 are prehistoric, and 8 are multicomponent. The majority (n = 463) of the isolated finds are historical-period and are primarily cans. The remaining 157 isolated finds are prehistoric and largely consist of flaked stone and ceramic artifacts.

Although temporally diagnostic artifacts of early use of the project area are scant, an Elko series dart point discovered at site P-33-001821 (see Figure 4.1) and an isolated Gypsum point (Isolate 108; see Figure 4.5), both located in the southernmost portion of the project area (see Figures C.6 and C.23), indicate that prehistoric use of the study area began in the mid–late Archaic period (8500–1500 B.P.) and continued until the time of historic contact. There is abundant evidence of aboriginal use of the area during the Patayan period (1500–200 B.P.) in the form of ceramic sherds (see Tables 4.5 and 4.14). The project area continued to be used during the historical period by the ethnographic River Yuman tribes. The primary use of the DQSP area appears to have been as a resource-procurement area for lithic materials in the northern portion of the project site and for plant resources such as desert lily in the southern portion. The area also served as a travel corridor for trails, such as P-33-000343, between villages along the Colorado River and ceremonial areas in Mule Mountains west of the project area, with a suggestion of stops along the way at sites such as P-33-001821 and SRI-1822 at the western edge of the direct APE.

Nearly half of the prehistoric sites identified as lithic scatters are located in the northern part of the direct APE. These sites are directly associated with the well-defined desert pavement that covers the alluvial fans of the Chuckawalla soil series and, to a lesser degree, the channels and fans associated with the Carrizo soil series that interdigitate with the Chuckawalla soils (see Figures C.25 and C.26). Because lithic raw material (e.g., chert or quartzite cobbles) is abundant there, these lithic scatters tend to be largest within the direct APE. These sites are likely pavement quarries with the abundant lithic material representing one prolonged or multiple excursions to the alluvial fans to exploit the readily available resources. These lithic scatters primarily consist of core flakes, indicating that the cores were prepared at this location and transported to another location for tool manufacturing. Similar behavior was observed in the pavement quarry sites located on at the Fort Irwin National Training Center in the central Mojave Desert (Stanton et al. 2013).

In addition to these sites, four prehistoric sites located in the northern direct APE were identified as rock features with associated artifact scatters. The artifact scatters associated with these sites are almost entirely composed of substantial lithic scatters. Ceramics are very rare in this portion of the direct APE and only one sherd was found in association with a site (SRI-133). These sites were generally located off the slopes of the larger alluvial fans and were found among the more-level fans and channels of the Carrizo soil series as well as the Rositas soils (see Figures C.5 and C.25). These sites may represent small temporary campsites associated with groups visiting the desert pavement quarries.

The majority of the prehistoric sites are located within the central and southwestern portion of the direct APE and are associated with the Orita and Rositas soils (see Figures C.6 and C.26), both of which also have high potential for containing buried resources at depths to 150 cm or more (see Table 4.15). Compared to the lithic scatters in the northern portion of the APE, these sites are generally small in size but represent all prehistoric site types found within the direct APE, indicating a broader range of activities were conducted in this area.

Furthermore, although rock feature sites are common in this area, most of these sites are small and are composed of three or fewer rock features. Even so, a small number of rock feature sites in the southwestern portion of the direct APE are larger in area and feature numbers, with sites such as SRI-83 and SRI-1059 consisting of a dozen or more rock features and the largest rock feature site, SRI-1059, covering an area of approximately 31,000 m^2. Additionally, one of the larger sites within the indirect APE, P-33-001821, also extends into the southwestern part of the direct APE. This site covers approximately 52,000 m^2 and not only consists of several lithic-scatter loci and a ceramic-scatter locus but also contains at least one concentration of calcined bone (located off the project site within the indirect APE), which may be associated with a possible human cremation. At least two prehistoric trails are associated with this site, including P-33-000343, which extends westerly to the Mule Tank Discontiguous Rock Art District (P-33-000504 and P-33-000773), and the north–south-trending P-33-000650.

These sites in the central and southwestern portion of the direct APE may be associated with intensive harvesting of food sources, such as desert lily corms, as well as exploitation of smaller, less-developed areas of desert pavement. Furthermore, because several of these sites are located along established trails that connect with ceremonial locations, these sites may represent places where ritual attendees could stop and restock supplies. None of these sites appears to be represent prolonged habitation of the area; they were likely temporary camps.

No prehistoric sites were encountered along the gen-tie corridor. This area is covered with sediments in the Rositas soil series, which is associated with a high level of sensitivity. Much of this area is covered with windblown sediment and, as such, any archaeological resources present may be buried and not visible during a surface survey.

Historical-period land use of the project area was divided into three broad periods that cover the years prior to, during, and after use of the DTC/C-AMA during World War II. The project area was surveyed by the GLO in 1917, and numerous survey markers and trails associated with this survey are still present. Prior to the area being used as a U.S. Army training area, the land within the direct APE was unsettled but at least one homestead (not yet formally recorded) was located south-southwest of the southern portion of the direct APE and within the indirect APE. Though the DQSP direct APE was undeveloped, several refuse deposits dating to the 1920s or earlier and one refuse deposit dating to the 1930s were identified. These refuse deposits appear to primarily represent clandestine domestic refuse dumping, although in at least two instances, burned wood fragments were found in association. Although this may suggest that the sites are associated with a burn pile, none of the artifacts showed evidence of being thermally-affected (e.g., melted glass). The remains of shotgun shells and small-caliber rounds were found in association with the scatters, suggesting at least some of the earlier refuse may be associated with camping or hunting trips, possibly generated during the trip or brought with the hunters or campers and then discarded while on the trip.

Between 1942 and 1944, the project area was part of the DTC/C-AMA. Sites associated with this time period primarily consist of refuse deposits composed of K- and C-ration cans, as well as nonstandard-issue food cans that were requisitioned by the government to fill gaps in the supply line. Sites associated with communication wire segments, tank pits, and vehicle tracks, in addition to the isolated remains of ammunition (.30-06 and .50 caliber rounds) and explosives (a grenade and antitank mine) were also discovered.

Following the closing of the DTC/C-AMA, the land was once again open to the public. Sites associated with this time period almost entirely consist of domestic refuse deposits. Three sites, SRI-42, SRI-9016, and SRI-9018, consist of water wells and represent an era of attempted development of the area for agricultural uses in the 1950s and 1960s.

CHAPTER 5

Evaluations and Recommendations

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NRHP-Eligibility Recommendations

SRI has developed preliminary NRHP-eligibility recommendations for all 278 sites within the direct APE (see Appendix B). Evaluation recommendations were made following the guidelines and eligibility criteria established in 36 CFR 60.4. The research questions and data requirements outlined in the research design (Kremkau, Stanton, et al. 2014) and presented above in Chapter 3 were used as the references for determining site eligibility. The 278 sites were classified as either eligible, not eligible, or possibly eligible, the last category denoting sites that require additional research before an eligibility recommendation can be provided. In the following section, we briefly discuss the NRHP eligibility of the resources within the APE. None of the historical-period sites nor any of the 620 isolated finds met any of the eligibility criteria, and all are recommended not eligible for listing in the NRHP. The single isolated artifact that is located on the 160-acre privately owned parcel within the direct APE and is thus subject to compliance with CEQA is also recommended not eligible for listing in the CRHR; no prehistoric or historical-period sites are located on the private parcel.

NRHP-Eligibility Criteria

Section 106 of the NHPA requires the BLM to take into account the effects of an undertaking on historic properties, defined as cultural resources listed in or eligible for listing in the NRHP (36 CFR 800). Determination of NRHP eligibility for cultural resources prior to making a finding of effect is made according to the following criteria:

> The quality of significance in American history, architecture, archeology, 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
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
> (b) that are associated with the lives of persons significant in our past; or
> (c) that embody the distinctive characteristics of a type, period, 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
> (d) that have yielded, or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

If cultural resources do not possess integrity or do not meet the above criteria, they are not considered historic properties and are not further considered in the Section 106 process.

In addition to the above criteria, there is a general stipulation that a historic property must be 50 years old or older (for exceptions, see 36 CFR 60.4, Criteria Considerations). The importance of information in prehistory or history is measured by a resource's ability to answer research questions (McClelland 1997). In addition to research potential, both Native American and Euroamerican historic properties may have general-public and culture-specific values. Historic properties may also have broader public significance, such as serving to educate the public about important aspects of national, state, or local history. Below, we discuss our evaluations, in terms of the above-listed NRHP-eligibility criteria, of the archaeological resources we identified within the APE during survey, with attention focused on two particular aspects of evaluation: research potential and integrity.

Research Potential

The research potential of any particular historic property is assessed with reference to a specific historic context or research design and themes. Historic contexts form the framework according to which much of the federal historic-preservation process is structured. A historic context is a body of information about a property, organized by three basic elements: theme, place, and time (McClelland 1997:1). Theoretically, all the historic contexts of a particular geographic area together constitute a comprehensive history of the area that could be broken down into a series of historically meaningful segments, each of which would constitute an individual historic context. Therefore, grouped together, the various historic contexts of an area form a comprehensive summary of all aspects of the area's history.

Integrity

Another key determination regarding NRHP eligibility involves the concept of integrity, which refers to the physical condition of a historic property. If the physical condition of a site considered eligible for listing in the NRHP under Criterion d is such that important information about the past potentially can be derived from it, then it is said to possess good integrity. If various processes of disturbance—environmental or cultural, intentional or unintentional—have impacted the property such that the cultural essence of the site has been lost or severely damaged, then the property is said to lack integrity. The critical aspect of evaluating integrity is assessment of the nature and extent of disturbance processes. Extensive impacts by recent human activity, such as vandalism or vehicular traffic, are relatively easy to recognize and assess, but other forms of disturbance are more subtle. For example, consider an artifact concentration. If environmental processes, such as erosion, have displaced artifacts and altered the geomorphological context, the condition of the scatter today might be considerably different from what it was when it was first created. Many of the artifacts may have been redeposited and those that remain may no longer be in primary context. If subsurface deposits are present, they may no longer be spatially associated with the surface artifacts.

Criteria of Adverse Effect

If a project alters the character-defining elements of an NRHP-eligible property, such as features relevant to its environment or its use, in a manner that affects the property's eligibility for the NRHP, such an alteration, is considered an adverse effect. Adverse effects can include

- physical destruction, damage, or alteration of all or part of the property;
- isolation of the property from its setting or alteration of the character of its setting when that character contributes to the property's qualification for listing in the NRHP;

- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; or
- transfer, lease, or sale of a federally owned property without adequate conditions or restrictions regarding its preservation, maintenance, or use (36 CFR 800.5[a][2]).

If a historic property within the APE were subject to any of the above, it would be considered an adverse effect to the property.

NRHP Site Evaluations

SRI's NRHP-eligibility recommendations are presented below. The discussions are organized by the site types presented in Appendix B. These eligibility recommendations are preliminary and may change following additional research at some sites and consultation by the BLM with the tribes and the public. Ultimately, formal determinations of eligibility will be made by BLM, with concurrence by the SHPO.

Historical-Period Sites

Historical-period sites are classified as artifact concentrations, military-activity sites, water-well sites, roads/trails, and survey markers.

Artifact Concentrations

In total, 157 historical-period artifact concentrations were recorded within the direct APE. Generally, the artifact concentrations can be divided into three main time periods: pre-DTC/C-AMA/Homesteading, DTC/C-AMA, and post-DTC/C-AMA.

The artifact concentrations dating to the DTC/C-AMA operations consist of small scatters of C- and K-ration cans and other historical-period refuse, such as beverage bottles or cans or nonstandard food cans, and are likely associated with training and maneuvers within the APE. The historic and archaeological contexts prepared for DTC/C-AMA sites identified refuse deposits as one of the property types associated with the resource. The guidance document indicated that DTC/C-AMA refuse deposits can range from "isolated artifact scatters to large trash dumps, used for long periods of time. Refuse deposits from the DTC/C-AMA period will be identifiable by the military-related artifacts present, as well as by their location" (Bischoff 2009a:127). The small scatters identified within the project APE were likely associated with temporary campsites and bivouacs and were not "cleaned up by the departing soldiers," as many others were. The DTC/C-AMA is "particularly relevant to several broad, important themes in American history," was "the largest training facility and the only one of its kind in American military history," and was "associated with several preeminent figures in the American Army" (Bischoff 2009a:133–134). Nevertheless, the guidance went on to state that "whereas these resources have the potential to be considered significant under any or all of the four criteria, more often than not they will be considered primarily eligible under Criterion d for their ability to yield information important in history" (Bischoff 2009a:134). Although the small sites retain aspects of integrity, it is not possible to relate them to specific military activities or units. They do not contain sufficient quantity or variety of materials to support statistically valid analyses, nor do they contain further data potential. The DTC/C-AMA sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The artifact concentrations dating to the DTC/C-AMA period are recommended not eligible for listing in the NRHP under any criteria.

The artifact concentrations associated with the mid–late twentieth century represent small "wildcat" dumps, likely associated with residential areas north of the direct APE and with use of the project area for OHV or other recreational activity. The artifact concentrations are surficial deposits, lacking stratigraphic integrity and the quantity and variety of materials that would allow statistically valid analyses. These sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The dumps cannot be associated with specific households or individuals and otherwise lack context. The mid–late-twentieth-century artifact concentrations are thus recommended not eligible for listing in the NRHP.

A dozen artifact concentrations date to the early twentieth century. These concentrations contain a variety of domestic refuse, as well as other artifact types. Most of these scatters are highly disturbed, but three are in good condition: SRI-1024, SRI-3014, and SRI-4045. No homesteads or other historical-period residential areas were identified within the direct APE. SRI-1024, SRI-3014, and SRI-4045 cannot be associated with a particular activity, residence or individual. SRI-1024 and SRI-3014 contain burn areas or campfires, and a potential association with the 1917 GLO survey crew was considered. The historic context and research design for work-camp properties in California (Caltrans 2013:97, 112, 114, 123, 169) listed surveyors' camps as a potential work camp property type. It is not possible, however, to make a conclusive association of these sites with activities of the 1917 survey crew. The artifact concentrations are surficial deposits, lack stratigraphic integrity, and do not contain the quantity and variety of materials that would allow statistical analyses. These sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The early-twentieth-century artifact concentrations are recommended not eligible for listing in the NRHP under any criteria.

Military-Activity Sites

The nine sites associated with military activity are all related to the use of the APE as part of the DTC/C-AMA. None of these sites appears to be related to the activities of Operation Desert Strike in 1964. The sites consist of small features, including tank emplacements, vehicle tracks, or lengths of communications wire. The historic and archaeological contexts prepared for DTC/C-AMA sites identified tank tracks as one of the property types associated with the resource. The guidance document indicated that tanks were a "primary aspect of the DTC/C-AMA, and countless operations and maneuvers were conducted throughout the facility" (Bischoff 2009a:127). Tank tracks, therefore, have been reported throughout the DTC/C-AMA.

Despite the relevance of the DTC/C-AMA "to several broad, important themes in American history," its role as "the largest training facility and the only one of its kind in American military history" and its association with "several preeminent figures in the American Army" (Bischoff 2009a:133–134), the guidance also stated that "whereas these resources have the potential to be considered significant under any or all of the four criteria, more often than not they will be considered primarily eligible under Criterion d for their ability to yield information important in history" (Bischoff 2009a:134). Although the tank emplacements, vehicle tracks, and lengths of communications wire retain aspects of integrity, it is not possible to relate them to specific military activities or units. They do not contain sufficient identifiable association, nor do they contain further data potential. The nine military-activity sites are recommended not eligible for listing in the NRHP under any criteria.

Water-Well Sites

Three abandoned water well sites were recorded within the direct APE. One site (SRI-42) consists of a well casing surrounded by a disturbed area and artifact scatter. Archival research failed to disclose an association with a particular residence, agricultural use, or individual, although it was determined that the well dates to the early 1960s. The artifacts at the site date to the mid–late twentieth century. The artifact concentrations are surficial deposits, lack stratigraphic integrity, and do not contain the quantity and variety of materials that would allow statistical analyses. Two other sites (SRI-9016 and SRI-9018) each consist of a single well casing with no associated artifacts or other features. These two sites also date to the early 1960s. These wells may be associated with activities during the 1950s and 1960s related to possible development of the Palo Verde Mesa area for agricultural activities by the Palo Verde Irrigation District. The water-well sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. These three sites are recommended not eligible for listing in the NRHP under any criteria.

Survey Markers

Two survey marker sites were identified within the direct APE. The first site, SRI-8085, consists of 22 survey markers and 10 linear disturbances associated with a 1917 survey by the GLO. They are small, bronze markers set on pipes or other foundations, set into the ground. The linear disturbances are approximately 2-foot-wide north–south or east–west ephemeral trails along section or quarter-section lines that were created during the survey for and placement of the markers. The number and array of markers and disturbances is related to the 1917 survey, which included setting markers at 85 locations (all section corners and centers). Although government surveys are associated with events that have contributed significantly to broad historical patterns, early-twentieth-century survey markers are common through the California desert and elsewhere, and their purpose and morphology are well documented; SRI-8085 does not meet Criteria a or c. The names of all the surveyors for the 1917 survey (GLO 1917) were reviewed and researched, and none was found to be significant in our past (Table 5.1). Based on the results of our archival research, SRI-8085 is not associated with the lives of persons significant in our past and does not appear eligible under Criterion b. Documentation of the site included background and archival research, field recordation, collection of a photographic record, and detailed mapping. The site was thoroughly documented during this investigation and has no further research potential under Criterion d. SRI-8085 is recommended not eligible for listing in the NRHP.

The other survey marker site, SRI-5063, consists of an undated USGS marker. Individual survey markers are ubiquitous features that can be found throughout California and the United States as a whole. Therefore, this site is not eligible under Criteria a, b, or c. Documentation of the site included background and archival research, field recordation, collection of a photographic record, and detailed mapping. The site was thoroughly documented during this investigation, and has no further research potential under Criterion d. Although this site is in good condition, SRI recommends it not eligible for listing in the NRHP.

Roads/Trails

Ten historical-period roads/trails were identified within the direct APE and are of sufficient age and integrity for consideration as historic properties. One of the sites, SRI-2333, is depicted on an early twentieth-century map. This southwest–northeast-trending road appears on the 1918 GLO plat map, drawn from survey data collected in 1917 (see Figure 2.3). At that time, the road ended just south of the project APE, in the southwest quarter of Section 23 near a house and agricultural field outside the direct APE. From that point, the road followed its current alignment northeasterly through Sections 23 and 14 but branched northeasterly from the current alignment in the NE ¼ of Section 11. Its northern terminus at that time remains unknown. By 1952, the road continued northerly to a network of roads accessing mines in the Little Maria Mountains and had been extended southerly to connect with the Bradshaw Trail.

Table 5.1. Survey Crewmembers on the 1917 GLO Survey of Township 7 South, Range 21

Name	Date of Involvement	Nature of Involvement
Atchison, Harold	1917	survey crew cornerman
Beckwith, Elmo	1917	survey crew 1st chainman
Brown, H. M. C.	1856	surveyor
Henry, George	1917	survey crew 2nd chainman
Hill, Bradley L.	1917	survey crew axman
Hutton, Willard	1917	survey crew cornerman
Lightfoot, Edward	1917	survey crew flagman
Murtaugh, Tim	1917	survey crew 2nd chainman
Pecore, C. W.	1917	survey crew 1st chainman
Sechrist, Loyd E.	1917	U.S. transitman
Thomas, Ollie	1917	survey crew transitman
Wolff, D. J.	1917	U.S. transitman

Note: From Wolff and Sechrist 1917:250.

In addition to SRI-2333, a two-track section road (P-33-014199) and two ambiguous trails (SRI-96 and SRI-129), were also discovered. Although these linear sites played roles in local and regional history as specific cultural resources related to settlement and industrial development, they did not make significant contributions to history in terms of culture, economics, politics, or technology. Another of these sites, P-33-017328, was previously recorded as a prehistoric trail segment. Further investigation revealed that this site is longer than originally recorded, is located precisely along a quarter-section line, and is likely associated with the 1917 GLO land survey and with the other features recorded as SRI-8085.

Three linear sites (SRI-121, SRI-122, and SRI-2051) appear to be associated with surveys that further subdivide the section and quarter-section subdivisions mapped by the 1917 GLO survey. The fact that these subdivisions are slightly oblique in relation to the official section divisions suggests these sites were made during another survey, possibly by a surveyor hired by a landowner, speculative owner, or claimant.

Finally, a map dated 1952 (drawn from aerial imagery dated 1948) shows a road in an east–west alignment along the north side of Section 13 that was recorded in this study as SRI-9020. Archival data from that decade shows three claimants for land in the northern part of Section 13: Don A. Allen, Elmer Cain, and Frank A. Gallender, Jr. Previously recorded road P-33-014173, which is also depicted on the 1952 map, runs east–west along the boundary between Sections 13, 14, 23, and 24. Adjacent land was claimed at that time by Ida May Cassell, Esther M. Cassell, Ralph W. Cassell, Victor A. Gudzunas, Prudence B. Anderson, Gerald A. Brinkman, John T. Scott, Minnie Van Reid, and H. L. Billson.

The roads and trails do not meet any of the NRHP-eligibility criteria. Despite background and archival research, origin and destination points for the linear features were not identified, nor do any of the names associated with adjacent land claims appear to be important in local or regional history. The sites were thoroughly documented during this investigation through field recordation, collection of a photographic record, and detailed mapping. However, the sites could not address any of the research questions in the research design (Kremkau, Stanton, et al. 2014), and further research at the sites will not yield additional information important to history. Therefore, SRI recommends the historical-period road/trail sites not eligible for listing in the NRHP.

Architectural Resources

There are no historical-period built environment resources identified within the direct or indirect APE that require evaluation regarding direct or indirect effects resulting from construction of the DQSP.

Prehistoric Sites

The prehistoric sites are classified as artifact concentrations, rock feature sites, rock feature with artifact scatter sites, and trails.

Artifact Concentrations

Artifact concentrations are groups of artifacts scattered across the ground surface that lack features such as pits or thermal features. Two types are artifact concentrations, lithic scatters and ceramic scatters, were discovered. In total, 9 ceramic and 16 lithic scatters were identified within the direct APE. The majority of these sites are sparse scatters (with less than 50 artifacts) that do not retain any integrity and lack diagnostic artifacts. These artifact concentrations are recommended not eligible for listing in the NRHP.

Rock Feature Sites

Thirty of the prehistoric sites in the project area are rock feature sites. These sites consist of one or more rock features, usually with no associated artifacts. The majority of the rock features appear to be thermal features (earth ovens used for food preparation) and contain a mix of fire-altered and unaltered rock. The features vary greatly in size and integrity. Most intact features measure between 1 and 3 m in diameter and consist of between 20 and 50 pieces of rock. Most of the rock feature sites are deflated, and the rock features retain no integrity. SRI recommends these sites not eligible for listing in the NRHP, because they lack integrity and cannot address any research questions.

Four sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009), however, retain some integrity and are possibly eligible for listing in the NRHP under Criterion d, pending formal evaluation. Such sites may contain important datable materials that can answer chronological questions, as Eerkens and Rosenthal (2002) have demonstrated in the northern Mojave Desert, and they may also be able to provide important information related to questions of settlement and subsistence. Although the use of earth ovens is conventionally correlated with the baking of agave or other succulent species (Castetter 1935), the scale of these particular features suggests that they may have served for the baking of small-scale plants such as geophytes (Thoms 2009). Ethnographic literature indicates that bulbs, corms, tubers, or rhizomes were traditionally gathered and subsequently processed in small earth ovens (Havard 1895). Scholze (2010) has noted that, in northern California alone, 85 percent of 73 ethnographic sources make reference to root crops, suggesting subsistence reliance. Moreover, Anderson (1993), among others, has noted that some California tribes gathered edible bulbs, corms and even replanted cormlets, bulblets, and sections of root for future use (Anderson 1993). In the anthropological literature, these plants have often been reported as “Indian potatoes” or “root-crops” (Anderson 1997:150). One geophyte plant species in particular, desert lily, was identified as common within the current survey area (see Table 2.1) and is known to have been utilized ethnographically. Ethnographic information indicates the bulbs were eaten raw or baked in a pit oven pit by the Cahuilla (Bean and Saubel 1972:77) or eaten raw, baked, or boiled by the River Yumans (Castetter and Bell 1951:207). A geographical study of the Palo Verde Mesa noted that “during the spring months large fields of desert day lilies (*Hesperocallis undulata*) are to be found growing profusely in localized areas throughout the lower terrace” (Rumage 1956:40).

Overall, California is extremely rich in geophyte species, in comparison to the rest of the United States (Rundel 1996). Archaeobotanical investigations of earth-oven technology, as well as the study of prehistoric utilization of geophytes, are still in their infancy, and few sites have produced archaeological remains of geophytes. However, recent studies in central Texas have succeeded in developing pioneering methods for detecting archaeobotanical evidence of geophytes within earth ovens (Dering 2003). These newly introduced methods elevate the potential of these types of sites for future research, particularly for establishing links between hunter-gatherer lifestyles and settled agriculture. The gathering, replanting, and processing of wild-plant species, should this be demonstrable, may offer evidence as to why prehistoric peoples eventually adopted a sedentary lifestyle.

Rock Features with Artifact Scatters

These sites consist of one or more rock features with an associated artifact scatter. The diversity of artifacts and feature types among these sites imply that the site type was used for a variety of tasks and may indicate at least a temporary occupation. Of the 31 sites associated with this site type, 9 rock features with artifact scatter sites retain some level of integrity, and excavations at the sites may be able to address some of the research questions outlined in Chapter 3. Four of these sites, SRI-83, SRI-2021, SRI-6034, and P-33-001821, have several intact rock features. A large scatter of calcined bone that may be a human cremation is associated with P-33-001821, and SRI-6034 is the only site within the direct APE that yielded pieces of ground stone. SRI recommends these four sites eligible for listing for the NRHP under Criterion d, and in the case of P-33-001821, under Criteria a and b as well. Five other sites—SRI-17, SRI-1059, SRI-3019, SRI-4241, and SRI-6033—retain some integrity and are possibly eligible for listing in the NRHP, pending formal evaluation.

Trails

Three prehistoric trails were identified within the APE. The trails consist of narrow, linear features and were not associated with any artifact scatters. P-33-000343 and P-33-000772 were both previously recorded, and the current survey found them to be in generally the same condition as originally recorded. The third trail, SRI-3255, runs southwest–northeast though the direct APE. All three sites are recommended eligible for listing in the NRHP under Criterion d and possibly under Criteria a and b, depending on the results of tribal consultation by the BLM. Ethnographic studies based on literature review and interviews with tribal representatives have consistently noted that trails are important for both economic and spiritual reasons and were used well into the historical period (Bean and Vane 1978:6-54, 7-13–7-14; CSRI 1987:132–134).

Multicomponent Sites

All eight of the multicomponent sites within the direct APE are artifact concentrations. These sites contain a mix of prehistoric and historical-period artifacts. The prehistoric component of one of the larger multicomponent sites, P-33-019618, contains the largest number of flaked stone artifacts (primarily flakes and tested cobbles), has the potential to contain subsurface deposits, and may be able to address research questions. Therefore, SRI recommends P-33-019618 eligible for listing in the NRHP under Criterion d.

NRHP-Eligibility Summary

Four prehistoric rock feature with artifact scatter sites (P-33-001821, SRI-83, SRI-2021, and SRI-6034), three trail sites (P-33-000343, P-33-000772, and SRI-3255), and the prehistoric component only of one multicomponent artifact concentration site (P-33-019618) are recommended eligible for listing in the NRHP under Criterion d (Table 5.2). Because of their possible significance to tribes in the region, four of those sites (P-33-000343, P-33-000772, P-33-001821, and SRI-3255) may also be eligible under Criteria a and b, pending further consultation with the tribes by BLM. Nine additional sites, including 4 prehistoric rock feature sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009), and 5 prehistoric rock feature sites with

Table 5.2. Summary of NRHP-Eligible Sites and Recommendations

Primary No. (Trinomial)	SRI No.	Site Type	Age	NRHP Eligibility Recommendation and Criteria	Testing and Treatment Recommendations
P-33-000343 (CA-RIV-343T)	9003	trail	prehistoric	recommended eligible, Criterion d, possibly Criteria a or b	avoid; consult with tribes regarding Criteria a and b
P-33-000772 (CA-RIV-772T)	110	trail	prehistoric	recommended eligible, Criterion d, possibly Criteria a or b	avoid; consult with tribes regarding Criteria a and b
P-33-001821 (CA-RIV-1821)	8020	rock feature with artifact scatter	prehistoric	recommended eligible, Criterion d, possibly Criteria a or b	avoid; consult with tribes regarding Criteria a and b
P-33-019618 (CA-RIV-009935)	127	multicomponent artifact concentration	prehistoric component only	recommended eligible, Criterion d	avoid
P-33-024719 (CA-RIV-012240)	17	rock feature with artifact scatter	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024283 (CA-RIV-011937)	83	rock feature with artifact scatter	prehistoric	recommended eligible, Criterion d	avoid
P-33-023456 (CA-RIV-011990)	1059	rock feature with artifact scatter	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024361 (CA-RIV-011995)	2021	rock feature with artifact scatter	prehistoric	recommended eligible, Criterion d	avoid, if feasible, or conduct data recovery
P-33-024377 (CA-RIV-012011)	3019	rock feature with artifact scatter	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024385 (CA-RIV-012019)	3039	rock feature	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024393 (CA-RIV-012027)	3237	rock feature	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024394 (CA-RIV-012028)	3255	trail	prehistoric	recommended eligible, Criterion d, possibly Criteria a or b	avoid; consult with tribes regarding Criteria a and b
P-33-024459 (CA-RIV-012091)	4085	rock feature	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024476 (CA-RIV-012108)	4241	rock feature with artifact scatter	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024496 (CA-RIV-012128)	6033	rock feature with artifact scatter	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility
P-33-024497 (CA-RIV-012129)	6034	rock feature with artifact scatter	prehistoric	recommended eligible, Criterion d	avoid, if feasible, or conduct data recovery
P-33-024511 (CA-RIV-012143)	7009	rock feature	prehistoric	possibly eligible, Criterion d	conduct formal testing to evaluate NRHP eligibility

Key: NRHP = National Register of Historic Places; SRI = Statistical Research, Inc.

artifact scatters (SRI-17, SRI-1059, SRI-3019, SRI-4241, and SRI-6033), are possibly eligible for listing in the NRHP, but additional research is needed (see Table 5.2; Appendix B). No sites recommended NRHP eligible are located in the 160-acre private parcel located within the APE. Figure C.27 shows the location of the eligible and possibly eligible sites within the project area, as well as the relationship superimposed on the map of the proposed DQSP facility (solar arrays, fence lines, etc.).

None of the sites within the direct APE appear to be eligible for listing in the NRHP as contributors to a district. Two previously recorded sites within the indirect APE, however, are listed in the NRHP as the Mule Tank Discontiguous Rock Art District.

Management Recommendations

Results from the archaeological survey have yielded a wealth of information that demonstrates the rich and diverse cultural landscape within the project area. This section provides management recommendations for mitigating adverse effects to cultural resources within the direct APE and within the viewshed of the project area, as well as addresses the results of the buried-site-sensitivity model presented in Chapter 4 (see Table 5.2).

Recommended Eligible Sites

As previously mentioned, four prehistoric rock feature with artifact scatter sites (P-33-001821, SRI-83, SRI-2021, and SRI-6034) and the prehistoric component of one multicomponent site (P-33-019618) are recommended eligible for listing in the NRHP under Criterion d, and in the case of P-33-001821, possibly under Criteria a and b. To lessen adverse effects to these five cultural resources, the area where these sites are located should be avoided, along with a buffer area of at least 30 m. If avoidance of these areas is not practical, archaeological data recovery and/or mitigative treatment should occur within portions of the sites that will be affected by development of the DQSP to confirm the potential data yield of the sites, as well as recover any data that may address research questions pertaining to prehistoric themes, such as settlement and subsistence, presented in Chapter 3.

The three prehistoric trails (P-33-000343, P-33-000772, and SRI-3255) are related to prehistoric trade networks and, in the case of P-33-000343 and P-33-000772, which extend to the Mule Tank Discontiguous Rock Art District (P-33-000773) outside of the project area, the overall ceremonial landscape of the region. For these sites, further investigation is recommended to trace the trail alignments on high-resolution aerial photographs and examine them carefully on the ground to document them more completely using GPS and digital photography. Decisions regarding their ultimate determinations of NRHP eligibility and treatment should be based on the results of tribal consultation by the BLM.

Possibly Eligible Sites

Nine prehistoric sites were identified as being possibly eligible for listing in the NRHP because of overall site integrity and their potential for providing information that may help address the research questions presented in Chapter 3. As with the recommended eligible sites, these sites should be avoided to lessen adverse effects to these resources during construction of the DQSP; if avoidance is not practical, then appropriate mitigative treatments should be implemented. For the four prehistoric rock feature sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009) and five prehistoric rock feature sites with artifact scatters (SRI-17, SRI-1059, SRI-3019, SRI-4241, and SRI-6033), testing and/or data recovery of the sites to confirm eligibility and to capture any information that may help address research questions is warranted.

Additional Testing of Rock Feature Sites

Fire-affected rock features are one of the more common features within the direct APE as well as within the landscape in the vicinity of the project (Jordan and Tennyson 2011; Keller 2010). Many of the rock features associated with the sites within the direct APE appear deflated or scattered. Those with observable good integrity are indicated above as recommended eligible or possibly eligible for listing in the NRHP. Usually for sites recommended not eligible, no additional testing or mitigative treatments are recommended. However, many of these features are located in areas associated with the Orita and Rositas soil series, where there is a high potential for buried resources (see Chapter 4). Additional testing is recommended at a sample of these sites to confirm their scattered and surficial nature, as well as provide comparative information for the intact sites where testing and data recovery will occur.

Mule Tank Discontiguous Rock Art District Viewshed

Although located within the indirect APE and more than 1 mile from the direct APE, the Mule Tank Discontiguous Rock Art District (P-33-000504 and P-33-000773) is located at a higher elevation and looks out over the project area. P-33-000504 is the petroglyph locus within the district, and P-33-000773 is the geoglyph/intaglio component. These sites are listed in the NRHP and were recommended eligible, based on Criteria c and d. Therefore, any visual adverse effect the DQSP may have on the viewshed of the district must be addressed and mitigated. Using geographic information system data and aerial photography of the area, the viewshed of the district will be identified. If the DQSP area is found to create a visual adverse effect, mitigation of the adverse effect in the form of an intensive and detailed site update involving recordation of the geoglyphs and petroglyphs within the site should occur.

Buried-Site Sensitivity

The buried-site sensitivity model (see Chapter 4) identifies the Orita and Rositas soil series as having high potential for buried archaeological resources at depths of up to 150 cm or more below the ground surface. These two soils cover a southwest–northeast swath through the central portion of the direct APE as well in the northern portion of the direct APE and along the gen-tie corridor. Smaller pockets of the soils are also located in the southern, eastern, and northeastern portion of the project area. Because of the sensitivity of these areas and the unknown nature of the subsurface deposits, test excavation and trenching is recommended to confirm the potential depths where buried resources may be present, especially along the gen-tie corridor and in the smaller pockets where fewer surface discoveries were made. Furthermore, although archaeological monitoring is recommended for the entirety of the direct APE, earthmoving activities in areas associated with the Orita and Rositas soil series are particularly sensitive and should especially be monitored.

Soil Descriptions

(Source: https://soilseries.sc.egov.usda.gov/osdname.asp, accessed)
Note: Values in English units of measurement are those in the original soil-series description.

Aco Series

The Aco series consists of very deep, well-drained to somewhat excessively drained soils that formed in mixed alluvium on terraces slightly above the floodplain. Slopes are 0–8 percent. The mean annual precipitation is approximately 4 inches, and the mean annual air temperature is approximately 72°F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, hyperthermic Typic Haplocalcids

TYPICAL PEDON: Aco sandy loam—native shrubs. (Colors are for dry soil unless otherwise noted.) Surface pavements of very coarse sand and gravel up to 3 inches in diameter. Some pebbles have weak desert varnish, and some are embedded to 1/2 inch into the soil surface.

A1: 0–3 inches; pinkish gray (7.5YR 7/2) sandy loam, brown (7.5YR 5/4) moist; strong fine medium, thick and very thick platy structure; slightly hard, very friable, nonsticky, nonplastic; few fine roots; many very fine discontinuous vesicular pores; few colloidal coatings on sand grains; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (2–5 inches thick)

Bk1: 3–18 inches; Light brown (7.5YR 6/4) coarse sandy loam, strong brown (7.5YR 5/6) moist; massive; soft, very friable, nonsticky, nonplastic; few very fine and medium roots; few very fine open vesicular pores in upper portion of horizon and common very fine tubular pores throughout; few colloidal coatings and stains on mineral grains; violently effervescent with approximately 7 percent by volume of medium to large, irregular lime concretions; moderately alkaline (pH 8.2); diffuse irregular boundary. (12–18 inches thick)

Bk2: 18–46 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky, nonplastic; common very fine pores; few colloidal coatings and stains on mineral grains; violently effervescent with approximately 9 percent by volume of medium to large, irregular lime concretions; moderately alkaline (pH 8.2); gradual wavy boundary. (26–30 inches thick)

C: 46–60 inches; very pale brown (10YR 7/4) fine sand, light yellowish brown (10YR 6/4) moist; single grained; loose; violently effervescent, lime on bottoms of some rock fragments near top of the horizon; moderately alkaline (pH 8.0).

TYPE LOCATION: Riverside County, California; approximately 1,180 feet south and 335 feet west of monument in northeast corner of Section 2, Township 6 South, Range 22 East.

GEOGRAPHIC SETTING: Aco soils are on terraces slightly above the floodplain at elevations of 30 to approximately 1,000 feet. Slopes are less than 8 percent and usually less than 2 percent. The soils formed in relatively young coarse- and moderately coarse-textured alluvium from a wide variety of rocks. The climate is arid with an average annual precipitation of approximately 4 inches that occurs as gentle winter rains or as erratic, high-intensity summer storms. The average July temperature is approximately 92°F, the average January temperature is approximately 53°F, and the mean annual temperature is approximately 72°F. The frost-free season is approximately 290 days.

Chuckawalla Series

The Chuckawalla series consists of very deep, well-drained soils formed in stratified mixed alluvium. Chuckawalla soils are on fan terraces and have slopes of 0–15 percent. The mean annual precipitation is 4 inches, and the mean annual air temperature is 73°F.

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, hyperthermic Typic Calciargids

TYPICAL PEDON: Chuckawalla very gravelly silt loam—rangeland. (Colors are for dry soil unless otherwise noted). Surface pavement of closely fitted subangular and rounded gravels that are 0.5–3 inches in diameter and have strong desert varnish on exposed surfaces. (0.5–1.5 inches thick)

E: 0–1.375 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak thick platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and medium vesicular pores; slightly effervescent on tops of plates, strongly effervescent on sides and bottoms; moderately alkaline (pH 8.2); abrupt wavy boundary. (1/4–1 1/2 inches thick)

BAt: 1.375–2.5 inches; light brown (7.5YR 6/4) gravelly silty clay loam, brown (7.5YR 4/4) moist; weak very thick platy structure parting to weak fine and medium subangular blocky; slightly hard, friable, sticky and plastic; many very fine, fine, and medium vesicular pores; few faint clay films in pores; clean silt grains on peds; 15 percent gravel; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0–3 inches thick)

Bt: 2.5–4 inches; light reddish brown (5YR 6/4) gravelly silty clay loam, reddish brown (5YR 4/4) moist; weak and moderate medium angular blocky and weak fine prismatic structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine, fine, and medium vesicular pores; few faint clay films in pores; clean silt grains on peds; 15 percent gravel; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0–3 inches thick)

Btk1: 4–7 inches; light reddish brown (5YR 6/4) gravelly silty clay loam, yellowish red (5YR 5/6) moist; weak fine subangular blocky structure parting to granular; soft, very friable, moderately sticky and moderately plastic; many very fine irregular pores; 25 percent gravel; colloidal staining on sand grains, few calcium carbonate–coated sand grains and rounded calcium carbonate nodules; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (1–4 inches thick)

2Btk2: 7–16 inches; reddish yellow (7.5YR 6/6) extremely gravelly clay loam, strong brown (7.5YR 5/6) moist; massive; soft, very friable, moderately sticky and moderately plastic; many very fine irregular pores; 70 percent gravel; colloidal staining on sand grains; strongly effervescent in matrix; violently effervescent on bottoms of gravel; strongly alkaline (pH 8.6). (4–10 inches thick)

2Ck: 16–60 inches; light brown (7.5YR 6/4) stratified extremely cobbly fine sandy loam, brown (7.5YR 5/4) moist; massive; many fine and medium irregular pores; 80 percent gravel and cobble; thick calcium carbonate coating on bottoms and sides of rock fragments; moderately alkaline (pH 8.4); weakly cemented in some parts.

TYPE LOCATION: Riverside County, California; on jeep trail north of Palo Verde Valley; approximately 525 feet south and 300 feet east of the W 1/4 corner of Section 24, Township 5 South, Range 23 East; 33° 43′ 35″ north latitude, 114° 32′ 16″ west longitude.

GEOGRAPHIC SETTING: Chuckawalla soils are on fan terraces. Slopes are 0–15 percent. The soils formed in stratified mixed gravelly alluvium. They typically have a well-developed desert pavement with a thick varnish (patina). The climate is arid with very hot, dry summers and cool, slightly moist winters. Mean annual precipitation is 2–7 inches. Most storms occur in the winter months, but some rainfall occurs as erratic, high-intensity summer thundershowers. There are also occasional severe wind and dust storms. Elevation ranges from 400 to 1,800 feet. Mean January temperature is 53°F; mean July temperature is 92°F; mean annual air temperature is 70°F–74°F. Frost-free period is 240–350 days.

Carrizo Series

The Carrizo series consists of very deep, excessively drained soils formed in mixed igneous alluvium. Carrizo soils are on numerous landforms on floodplains, fan piedmonts, and bolson floors. Slopes range from 0 to 15 percent. The mean annual precipitation is approximately 100 mm (4 inches), and the mean annual air temperature is approximately 21.5°C (71°F).

TAXONOMIC CLASS: Sandy-skeletal, mixed, hyperthermic Typic Torriorthents

TYPICAL PEDON: Carrizo extremely gravelly sand—rangeland and wildlife habitat. (Colors are for dry soil unless otherwise noted.) The soil surface is covered by approximately 70 percent gravel, 6 percent cobbles, and 4 percent stones.

A: 0–5 cm (0–2 inches); pale brown (10YR 6/3) extremely gravelly sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 55 percent gravel, 6 percent cobbles, and 4 percent stones; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (2.5–10 cm thick)

C: 5–152 cm (2–60 inches); pale brown (10YR 6/3) stratified extremely gravelly and very gravelly coarse sand, brown (10YR 4/3) moist; massive to single grain; soft, slightly hard, or loose, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine and few fine and medium interstitial pores; averages 55 percent gravel, 10 percent cobbles, and 5 percent stones; very slightly effervescent and slightly effervescent; moderately alkaline (pH 8.4) and slightly alkaline (pH 7.8).

TYPE LOCATION: San Bernardino County, California; approximately 18.5 km (11.5 miles) southwest of Amboy; approximately 610 m (2,000 feet) south and 305 m (1,000 feet) west of the northeast corner of Section 18, Township 4 North, Range 11 East, San Bernardino Base and Meridian; U.S. Geological Survey Lead Mountain Northeast, California, 7.5-minute topographic quadrangle; 34° 26′ 11.1″ north latitude, 115° 51′ 47.8″ west longitude; Universal Transverse Mercator (UTM) 11S, 0604440E 3810938N (Digital Terrain Model: North American Datum 1983 [NAD83]).

GEOGRAPHIC SETTING: Carrizo soils are on numerous landforms on floodplains, fan piedmonts, and bolson floors. Slopes range from 0 to 15 percent. The soils formed in mixed igneous alluvium. Elevations are -82–793 m (-270–2,600 feet). The climate is arid with hot, dry summers and warm, moist winters. Precipitation is greatest in the winter with a lesser secondary peak in the summer. The mean annual precipitation is 75–175 mm (3–7 inches); mean January temperature is 12°C (53°F); mean July temperature is 35°C (95°F); mean annual air temperature is 20°C–23°C (68°F–73.5°F); the frost-free season is 300–340 days.

Orita Series

The Orita series consists of very deep, well-drained soils that formed in alluvium from mixed sources. Orita soils are on fan remnants and terraces. Slopes are 0–2 percent. The mean annual precipitation is approximately 4 inches, and the mean annual air temperature is approximately 72°F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, hyperthermic Typic Haplargids

TYPICAL PEDON: Orita gravelly fine sandy loam—desert. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with a continuous pavement of fine gravel of leucogranite and some schist and quartz; some gravel is weakly varnished by dark coatings, some by calcium carbonate.

C1: 0–4 inches; light brown (7.5YR 6/4) gravelly fine sandy loam, brown (7.5YR 4/4) moist; moderate and strong thick platy structure; soft, very friable; few fine roots; many very fine vesicular pores; approximately 15 percent gravel; slightly effervescent, lime disseminated; moderately alkaline (pH 8.2); clear smooth boundary. (3–12 inches thick)

C2: 4–10 inches; light brown (7.5YR 6/4) gravelly sand, brown (7.5YR 5/4) moist; weak and moderate thick platy structure; soft, loose; few fine roots; many very fine pores; approximately 25 percent gravel; slightly effervescent, lime disseminated; moderately alkaline (pH 8.2); abrupt smooth boundary. (0–6 inches thick)

2A: 10–22 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, very friable, slightly sticky; few fine roots to 18 inches; many very fine tubular pores; strongly effervescent, fine lime mycelia; moderately alkaline (pH 8.2); gradual smooth boundary. (10–15 inches thick)

2Bt: 22–42 inches; reddish yellow (5YR 6/6) gravelly clay loam, yellowish red (5YR 4/6) moist; massive; hard, friable, sticky, plastic; many very fine and fine tubular pores; approximately 15 percent gravel; thin clay films line a few pores; strongly and violently effervescent; fine and medium soft bodies of lime; moderately alkaline (pH 8.2); gradual irregular boundary. (10–20 inches thick)

2Btk1: 42–60 inches; light reddish brown (5YR 6/4) gravelly clay loam, reddish brown (5YR 4/4) moist; massive; hard, friable, sticky, plastic; many very fine and fine tubular pores; 20 percent gravel; clay bridges between mineral grains; common stains on mineral grains; strongly and violently effervescent; lime segregated into medium and large soft bodies and concretions; moderately alkaline (pH 8.2); gradual irregular boundary. (6–10 inches thick)

2Btk2: 60–68 inches; reddish yellow (5YR 7/6) gravelly clay loam, yellowish red (5YR 4/6) moist; massive; slightly hard, very friable, sticky, slightly plastic; many very fine and fine tubular pores; approximately 25 percent gravel; clay bridges and coatings on mineral grains; strongly and violently effervescent; lime in fine concretions and soft bodies; moderately alkaline (pH 8.2); clear smooth boundary. (0–10 inches thick)

2C: 68–80 inches; light brown (7.5YR 6/4) gravelly fine sandy loam, brown (7.5YR 5/4) moist; massive; soft, very friable; many fine and very fine pores; approximately 40 percent gravel; few dark coats on mineral grains; strongly effervescent in matrix, violently effervescent on carbonate-coated gravel; moderately alkaline (pH 8.2).

TYPE LOCATION: Riverside County, California; approximately 7 miles west and 5 miles north of Blythe; approximately 55 feet west and 5 feet north of brass-capped monument at southeast corner of Section 36, Township 5 South, Range 21 East; 33° 41′ 24″ north latitude, 114° 43′ 41″ west longitude; UTM Zone 11 710567E and 3730099N (NAD83).

GEOGRAPHIC SETTING: The Orita soils are on fan remnants and terraces at elevations of 300–1,600 feet. Slopes are 0–2 percent. The soils formed in somewhat stratified and gravelly alluvium derived from many kinds of rock. The climate is arid. Mean annual precipitation is approximately 3–5 inches. The average January temperature is approximately 53°F, the average July temperature is approximately 90°F, and the average annual temperature is 70°F–73°F. The frost-free season is approximately 270–360 days.

Rositas Series

The Rositas series consists of very deep, somewhat excessively drained soils formed in sandy aeolian material. Rositas soils are on dunes and sand sheets. Slope ranges from 0 to 30 percent with hummocky or dune microrelief. Mean annual precipitation is approximately 4 inches, and the mean annual air temperature is approximately 72°F.

TAXONOMIC CLASS: Mixed, hyperthermic Typic Torripsamments

TYPICAL PEDON: Rositas fine sand—rangeland and wildlife habitat. (Colors are for dry soil unless otherwise noted.)

C1: 0–9 inches; reddish yellow (7.5YR 7/6) fine sand, strong brown (7.5YR 5/6) moist; single grained; loose, nonsticky and nonplastic; common fine and medium roots; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (4–10 inches thick)

C2: 9–60 inches; reddish yellow (7.5YR 7/6) fine sand, strong brown (7.5YR 5/6) moist; single grained; loose, nonsticky and nonplastic; few fine roots; strongly effervescent; moderately alkaline (pH 8.0).

TYPE LOCATION: Imperial County, California; approximately 17 miles east of Holtville; approximately 4,000 feet west and 300 feet south of the main entrance to Imperial Irrigation District, Experiment Farm No. 2; northwest 1/4 of Section 5, Township 17 South, Range 19 East.

GEOGRAPHIC SETTING: Rositas soils are on dunes and sand sheets. Slope ranges from 0 to 30 percent. These soils formed in sandy aeolian material. Elevations are 270 feet below sea level to 2,000 feet. The climate is low-latitude desert, with mild winters and very hot summers. Precipitation is greatest in the winter with a lesser secondary peak in the summer. The mean annual precipitation is 0–8 inches. The mean January temperature is approximately 53°F, mean July temperature is 92°F, and the mean annual air temperature is 70°F–77°F. The frost-free period is approximately 250–365 days.

APPENDIX B

Site Evaluations and NRHP Eligibility

A.2

Site No.	Age	Site Type	NRHP Eligibility
P-33-000343	prehistoric	trail	eligible
P-33-000772	prehistoric	trail	eligible
P-33-001821	prehistoric	features with artifact concentration	eligible
P-33-002795	prehistoric	lithic scatter	not eligible
P-33-002796	prehistoric	lithic scatter	not eligible
P-33-008133	prehistoric	lithic scatter	not eligible
P-33-008134	prehistoric	ceramic scatter	not eligible
P-33-013660	prehistoric	features with artifact concentration	not eligible
P-33-014147	historical period	military activity	not eligible
P-33-014151	prehistoric	ceramic scatter	not eligible
P-33-014173	historical period	road	not eligible
P-33-014198	historical period	artifact concentration	not eligible
P-33-014199	historical period	road/trail	not eligible
P-33-017317	prehistoric	lithic scatter	not eligible
P-33-017328	historical period	trail	not eligible
P-33-018675	historical period	artifact concentration	not eligible
P-33-018852	historical period	artifact concentration	not eligible
P-33-018853	historical period	artifact concentration	not eligible
P-33-018916	historical period	artifact concentration	not eligible
P-33-019021	prehistoric	lithic scatter	not eligible
P-33-019618	multicomponent	artifact concentration/lithic scatter	eligible
P-33-019733	prehistoric	lithic scatter	not eligible
P-33-019734	historical period	artifact concentration/lithic scatter	not eligible
P-33-019735	prehistoric	lithic scatter	not eligible
P-33-019736	historical period	artifact concentration	not eligible
P-33-019739	prehistoric	lithic scatter	not eligible
P-33-019740	historical period	artifact concentration	not eligible
P-33-019741	historical period	artifact concentration	not eligible
P-33-019742	historical period	artifact concentration	not eligible
P-33-019743	historical period	artifact concentration	not eligible
P-33-021132	historical period	artifact concentration	not eligible
P-33-021264	historical period	military activity	not eligible
SRI-2	historical period	artifact concentration	not eligible
SRI-3	historical period	artifact concentration	not eligible
SRI-7	historical period	artifact concentration	not eligible
SRI-9	historical period	artifact concentration	not eligible
SRI-17	prehistoric	features with artifact concentration	possibly eligible
SRI-18	historical period	artifact concentration	not eligible
SRI-19	historical period	artifact concentration	not eligible
SRI-21	historical period	artifact concentration	not eligible

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Site No.	Age	Site Type	NRHP Eligibility
SRI-25	historical period	artifact concentration	not eligible
SRI-26	historical period	artifact concentration	not eligible
SRI-27	historical period	artifact concentration	not eligible
SRI-29	prehistoric	rock features	not eligible
SRI-36	historical period	artifact concentration	not eligible
SRI-42	historical period	water well site	not eligible
SRI-52	prehistoric	ceramic scatter	not eligible
SRI-58	prehistoric	rock features	not eligible
SRI-61	prehistoric	rock features	not eligible
SRI-63	historical period	artifact concentration	not eligible
SRI-65	prehistoric	features with artifact concentration	not eligible
SRI-69	historical period	artifact concentration	not eligible
SRI-71	multicomponent	artifact concentration	not eligible
SRI-75	prehistoric	rock features	not eligible
SRI-81	historical period	artifact concentration	not eligible
SRI-83	prehistoric	features with artifact concentration	eligible
SRI-96	historical period	road/trail	not eligible
SRI-119	historical period	military activity	not eligible
SRI-120	historical period	artifact concentration	not eligible
SRI-121	historical period	road/trail	not eligible
SRI-122	historical period	road/trail	not eligible
SRI-124	prehistoric	features with artifact concentration	not eligible
SRI-125	historical period	artifact concentration	not eligible
SRI-129	historical period	road/trail	not eligible
SRI-132	historical period	artifact concentration	not eligible
SRI-133	prehistoric	features with artifact concentration	not eligible
SRI-134	prehistoric	features with artifact concentration	not eligible
SRI-137	historical period	artifact concentration	not eligible
SRI-138	historical period	artifact concentration	not eligible
SRI-147	historical period	artifact concentration	not eligible
SRI-1001	historical period	artifact concentration	not eligible
SRI-1009	historical period	artifact concentration	not eligible
SRI-1011	historical period	artifact concentration	not eligible
SRI-1014	prehistoric	features with artifact concentration	not eligible
SRI-1021	historical period	artifact concentration	not eligible
SRI-1024	historical period	artifact concentration	not eligible
SRI-1025	prehistoric	rock features	not eligible
SRI-1035	historical period	artifact concentration	not eligible
SRI-1037	historical period	artifact concentration	not eligible
SRI-1043	prehistoric	rock features	not eligible
SRI-1049	historical period	artifact concentration	not eligible

Site No.	Age	Site Type	NRHP Eligibility
SRI-1053	prehistoric	features with artifact concentration	not eligible
SRI-1056	historical period	artifact concentration	not eligible
SRI-1058	prehistoric	features with artifact concentration	not eligible
SRI-1059	prehistoric	features with artifact concentration	possibly eligible
SRI-1061	prehistoric	ceramic scatter	not eligible
SRI-1070	historical period	artifact concentration	not eligible
SRI-1076	historical period	artifact concentration	not eligible
SRI-2001	historical period	artifact concentration	not eligible
SRI-2007	historical period	artifact concentration	not eligible
SRI-2008	historical period	artifact concentration	not eligible
SRI-2009	historical period	artifact concentration	not eligible
SRI-2014	historical period	artifact concentration	not eligible
SRI-2017	historical period	artifact concentration	not eligible
SRI-2021	prehistoric	features with artifact concentration	eligible
SRI-2023	historical period	artifact concentration	not eligible
SRI-2029	historical period	artifact concentration	not eligible
SRI-2030	historical period	artifact concentration	not eligible
SRI-2034	prehistoric	rock features	not eligible
SRI-2035	historical period	artifact concentration	not eligible
SRI-2042	prehistoric	lithic scatter	not eligible
SRI-2051	historical period	road/trail	not eligible
SRI-2066	historical period	artifact concentration	not eligible
SRI-2067	historical period	artifact concentration	not eligible
SRI-2068	multicomponent	artifact concentration/ceramic scatter	not eligible
SRI-2082	historical period	artifact concentration	not eligible
SRI-2088	historical period	artifact concentration	not eligible
SRI-2094	historical period	artifact concentration	not eligible
SRI-2098	historical period	artifact concentration	not eligible
SRI-2100	historical period	artifact concentration	not eligible
SRI-2128	historical period	artifact concentration	not eligible
SRI-2135	historical period	military activity	not eligible
SRI-2136	prehistoric	ceramic scatter	not eligible
SRI-2329	prehistoric	features with artifact concentration	not eligible
SRI-2333	historical period	Road/trail	not eligible
SRI-2582	historical period	artifact concentration	not eligible
SRI-3007	historical period	artifact concentration	not eligible
SRI-3010	historical period	artifact concentration	not eligible
SRI-3014	historical period	artifact concentration	not eligible
SRI-3015	multicomponent	artifact concentration	not eligible
SRI-3017	prehistoric	rock features	not eligible

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Site No.	Age	Site Type	NRHP Eligibility
SRI-3019	prehistoric	features with artifact concentration	possibly eligible
SRI-3020	historical period	artifact concentration	not eligible
SRI-3022	prehistoric	rock features	not eligible
SRI-3027	historical period	artifact concentration	not eligible
SRI-3029	historical period	artifact concentration	not eligible
SRI-3031	historical period	artifact concentration	not eligible
SRI-3037	historical period	artifact concentration	not eligible
SRI-3038	historical period	artifact concentration	not eligible
SRI-3039	prehistoric	rock features	possibly eligible
SRI-3040	prehistoric	features with artifact concentration	not eligible
SRI-3041	prehistoric	features with artifact concentration	not eligible
SRI-3042	prehistoric	features with artifact concentration	not eligible
SRI-3045	prehistoric	rock features	not eligible
SRI-3047	prehistoric	rock features	not eligible
SRI-3054	historical period	military activity	not eligible
SRI-3057	prehistoric	lithic scatter	not eligible
SRI-3059	prehistoric	ceramic scatter	not eligible
SRI-3078	historical period	artifact concentration	not eligible
SRI-3101	prehistoric	features with artifact concentration	not eligible
SRI-3103	historical period	artifact concentration	not eligible
SRI-3108	historical period	artifact concentration	not eligible
SRI-3115	historical period	artifact concentration	not eligible
SRI-3116	historical period	artifact concentration	not eligible
SRI-3117	historical period	artifact concentration	not eligible
SRI-3119	historical period	artifact concentration	not eligible
SRI-3123	historical period	artifact concentration	not eligible
SRI-3124	historical period	artifact concentration	not eligible
SRI-3127	historical period	artifact concentration	not eligible
SRI-3135	prehistoric	lithic scatter	not eligible
SRI-3147	prehistoric	lithic scatter	not eligible
SRI-3155	historical period	artifact concentration	not eligible
SRI-3156	historical period	artifact concentration	not eligible
SRI-3158	historical period	artifact concentration	not eligible
SRI-3175	prehistoric	rock features	not eligible
SRI-3186	prehistoric	ceramic scatter	not eligible
SRI-3205	prehistoric	rock features	not eligible
SRI-3211	prehistoric	rock features	not eligible
SRI-3224	prehistoric	rock features	not eligible
SRI-3228	prehistoric	ceramic scatter	not eligible
SRI-3237	prehistoric	rock features	possibly eligible
SRI-3255	prehistoric	trail	eligible

Site No.	Age	Site Type	NRHP Eligibility
SRI-3256	historical period	artifact concentration	not eligible
SRI-3260	multicomponent	artifact concentration/ceramic scatter	not eligible
SRI-3306	prehistoric	lithic scatter	not eligible
SRI-3331	prehistoric	rock features	not eligible
SRI-3487	prehistoric	rock features	not eligible
SRI-4004	historical period	artifact concentration	not eligible
SRI-4005	historical period	artifact concentration	not eligible
SRI-4014	prehistoric	rock features	not eligible
SRI-4016	prehistoric	features with artifact concentration	not eligible
SRI-4017	multicomponent	artifact concentration/rock features	not eligible
SRI-4019	historical period	artifact concentration	not eligible
SRI-4024	prehistoric	lithic scatter	not eligible
SRI-4028	historical period	artifact concentration	not eligible
SRI-4034	historical period	artifact concentration	not eligible
SRI-4041	historical period	artifact concentration	not eligible
SRI-4045	historical period	artifact concentration	not eligible
SRI-4054	prehistoric	rock features	not eligible
SRI-4056	prehistoric	features with artifact concentration	not eligible
SRI-4060	multicomponent	artifact concentration/lithic scatter	not eligible
SRI-4063	prehistoric	rock features	not eligible
SRI-4078	prehistoric	ceramic scatter	not eligible
SRI-4079	prehistoric	rock features	not eligible
SRI-4080	historical period	artifact concentration	not eligible
SRI-4084	prehistoric	features with artifact concentration	not eligible
SRI-4085	prehistoric	rock features	possibly eligible
SRI-4098	historical period	artifact concentration	not eligible
SRI-4116	historical period	artifact concentration	not eligible
SRI-4127	historical period	artifact concentration	not eligible
SRI-4145	historical period	artifact concentration	not eligible
SRI-4151	historical period	artifact concentration	not eligible
SRI-4160	historical period	artifact concentration	not eligible
SRI-4162	historical period	military activity	not eligible
SRI-4167	historical period	artifact concentration	not eligible
SRI-4175	historical period	artifact concentration	not eligible
SRI-4178	historical period	artifact concentration	not eligible
SRI-4180	historical period	military activity	not eligible
SRI-4182	historical period	artifact concentration	not eligible
SRI-4185	historical period	artifact concentration	not eligible
SRI-4186	historical period	artifact concentration	not eligible
SRI-4191	historical period	artifact concentration	not eligible

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Site No.	Age	Site Type	NRHP Eligibility
SRI-4196	historical period	artifact concentration	not eligible
SRI-4208	historical period	artifact concentration	not eligible
SRI-4217	historical period	artifact concentration	not eligible
SRI-4222	historical period	artifact concentration	not eligible
SRI-4229	historical period	artifact concentration	not eligible
SRI-4231	historical period	artifact concentration	not eligible
SRI-4235	historical period	artifact concentration	not eligible
SRI-4236	historical period	artifact concentration	not eligible
SRI-4241	prehistoric	features with artifact concentration	possibly eligible
SRI-4242	historical period	artifact concentration	not eligible
SRI-4248	historical period	artifact concentration	not eligible
SRI-4250	historical period	artifact concentration	not eligible
SRI-5000	historical period	artifact concentration	not eligible
SRI-5003	historical period	artifact concentration	not eligible
SRI-5006	historical period	artifact concentration	not eligible
SRI-5008	historical period	artifact concentration	not eligible
SRI-5029	historical period	artifact concentration	not eligible
SRI-5034	prehistoric	rock features	not eligible
SRI-5035	historical period	artifact concentration	not eligible
SRI-5054	prehistoric	rock features	not eligible
SRI-5063	historical period	survey marker	not eligible
SRI-5067	prehistoric	features with artifact concentration	not eligible
SRI-5070	historical period	artifact concentration	not eligible
SRI-5073	historical period	artifact concentration	not eligible
SRI-5076	historical period	artifact concentration	not eligible
SRI-5083	historical period	artifact concentration	not eligible
SRI-5087	historical period	artifact concentration	not eligible
SRI-5099	historical period	artifact concentration	not eligible
SRI-5106	multicomponent	artifact concentration	not eligible
SRI-5132	historical period	artifact concentration	not eligible
SRI-5135	historical period	artifact concentration	not eligible
SRI-6003	historical period	artifact concentration	not eligible
SRI-6005	historical period	artifact concentration	not eligible
SRI-6011	historical period	artifact concentration	not eligible
SRI-6017	historical period	artifact concentration	not eligible
SRI-6018	historical period	artifact concentration	not eligible
SRI-6021	historical period	artifact concentration	not eligible
SRI-6022	historical period	artifact concentration	not eligible
SRI-6023	prehistoric	features with artifact concentration	not eligible
SRI-6033	prehistoric	features with artifact concentration	possibly eligible
SRI-6034	prehistoric	features with artifact concentration	eligible

Site No.	Age	Site Type	NRHP Eligibility
SRI-6046	historical period	artifact concentration	not eligible
SRI-6053	historical period	artifact concentration	not eligible
SRI-6059	historical period	artifact concentration	not eligible
SRI-6075	historical period	artifact concentration	not eligible
SRI-6081	historical period	artifact concentration	not eligible
SRI-6087	historical period	artifact concentration	not eligible
SRI-6096	historical period	artifact concentration	not eligible
SRI-6100	historical period	artifact concentration	not eligible
SRI-6104	historical period	artifact concentration	not eligible
SRI-6114	historical period	artifact concentration	not eligible
SRI-6115	historical period	artifact concentration	not eligible
SRI-6119	historical period	artifact concentration	not eligible
SRI-6471	prehistoric	rock features	not eligible
SRI-6491	prehistoric	lithic scatter	not eligible
SRI-7008	prehistoric	features with artifact concentration	not eligible
SRI-7009	prehistoric	rock features	possibly eligible
SRI-7010	prehistoric	features with artifact concentration	not eligible
SRI-7018	historical period	artifact concentration	not eligible
SRI-7019	prehistoric	lithic scatter	not eligible
SRI-7020	historical period	artifact concentration	not eligible
SRI-7024	historical period	artifact concentration	not eligible
SRI-7029	prehistoric	rock features	not eligible
SRI-7031	prehistoric	features with artifact concentration	not eligible
SRI-7040	prehistoric	rock features	not eligible
SRI-7060	historical period	artifact concentration	not eligible
SRI-7065	historical period	artifact concentration	not eligible
SRI-7066	prehistoric	features with artifact concentration	not eligible
SRI-7072	historical period	artifact concentration	not eligible
SRI-7074	historical period	artifact concentration	not eligible
SRI-7076	historical period	military activity	not eligible
SRI-7087	historical period	military activity	not eligible
SRI-8085	historical period	survey marker	not eligible
SRI-9016	historical period	water-well site	not eligible
SRI-9018	historical period	water-well site	not eligible
SRI-9020	historical period	road	not eligible

Key: NRHP = National Register of Historic Places.

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Addendum to

Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California

Michael K. Lerch

Addendum prepared for
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Transportation and Land Management Agency—Planning Department
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Riverside County Archaeological Report 5020A

Technical Report 15-36A
Statistical Research, Inc.
Redlands, California

May 2017

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Project: Desert Quartzite Solar Project (U.S. Department of the Interior Bureau of Land Management [BLM] Project No. CACA 049397, Riverside County Conditional Use Permit 3721)

Applicant: Desert Quartzite, LLC, A Wholly Owned Subsidiary of First Solar Development, Inc.

Agency: BLM, Palm Springs–South Coast Field Office

Permits: BLM Permit for Archaeological Investigations CA-13-06, Fieldwork Authorization 66.66-15-02

Project location:

USGS 7.5-Minute Quadrangle	Township/Range (BM)	Sections
Ripley, California	7 South/21 East (SBBM)	11, 12, 13, 14, 23, 24
Roosevelt Mine, California	7 South/21 East (SBBM)	3, 4, 5, 6, 9, 10, 11, 14, 15, 22, 23

Key: BM = baseline and meridian; SBBM = San Bernardino Baseline and Meridian; USGS = U.S. Geological Survey.

Dates of Fieldwork: October 13–December 11, 2014; February 3, 2015

Acreage of Direct Area of Potential Effects (APE): 5,010

Total Acreage Surveyed: 5,010

Total Acreage Surveyed on BLM Land: 4,850; **Private Land:** 160

Acreage of Indirect APE: 18,060

Results—Direct APE: In total, 278 sites were recorded within the direct APE: 181 historical-period sites, 89 prehistoric sites, and 8 multicomponent sites. In addition, 620 isolated artifacts were recorded (Appendix B, revised).

Results—Indirect APE: Based on the results of the records search completed prior to the survey fieldwork and reported in the research design (Kremkau et al. 2014:3.5, Tables 3.2 and 3.3), 220 sites are located within the indirect APE, defined as a 1-mile radius around the direct APE and a travel corridor into the Mule Mountains: 89 historical-period sites, 95 prehistoric sites, and 36 multicomponent sites.

Sites Recommended Eligible for Listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR): Within the direct APE, 7 prehistoric sites and the prehistoric component of 1 multicomponent site are recommended eligible for listing in the NRHP and the CRHR on the basis of available information. An additional 9 prehistoric sites are possibly eligible for listing in the NRHP and the CRHR, pending additional research and formal evaluation.

Two sites recommended eligible for listing in the NRHP and the CRHR, P-33-000343 and P-33-001821, are within the direct APE and also extend into the indirect APE. Two additional sites, P-33-000733 and P-33-000504, are listed in the NRHP as the Mule Tank Discontiguous Rock Art District and are situated within the indirect APE. Finally, two historical-period resources, both transmission lines (P-

33-011110 and P-33-012532/CA-RIV-7127H) located within the indirect APE, have been determined eligible for listing in the NRHP.

Sites Recommended Not Eligible for Listing in the NRHP and the CRHR: The remaining 261 sites and all 620 isolates within the direct APE are recommended not eligible for listing in the NRHP.

Management Recommendations: Sites that are listed in or recommended eligible for listing in the NRHP and the CRHR should be avoided. Until the possibly eligible sites are formally evaluated, they should be assumed eligible for listing in the NRHP and the CRHR, for planning purposes. If avoidance of these areas is not feasible, archaeological data recovery or other approved mitigative treatment should occur within the portions of the sites that will be affected by development of the DQSP.

Introduction

Desert Quartzite, LLC, a wholly owned subsidiary of First Solar Development, Inc. (First Solar), is proposing to develop, construct, and operate a 300-megawatt[1] (MW) power generating solar photovoltaic (PV) facility in eastern Riverside County, California—the Desert Quartzite Solar Project (DQSP). At the request of First Solar, Statistical Research, Inc. (SRI), conducted a Class III archaeological survey of the project site to provide information to the U.S. Department of the Interior Bureau of Land Management (BLM) and the County of Riverside (County), to comply with federal and state environmental and historic-preservation laws and regulations.

The archaeological survey was reported in *Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California*, edited by Michael K. Lerch, Patrick B. Stanton, and Karen K. Swope (Lerch et al. 2016). The purpose of the study was to identify and evaluate archaeological resources within the project's area of potential effects (APE) regarding their eligibility for listing in the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR).

At the time the initial survey report was prepared, it was the understanding of the authors that only the resources located on the 160-acre privately owned inholding within the otherwise federal lands in the project area would require evaluation under the CRHR. Subsequently, the County determined that its environmental review must include the entirety of the proposed DQSP. Accordingly, this addendum provides evaluations of all archaeological resources within the direct APE of the DQSP, as identified in the original survey report (Lerch et al. 2016), for eligibility for listing in the CRHR in addition to the NRHP. It also includes a more-detailed review of potential effects of the DQSP on NRHP-eligible resources located within the indirect APE.

The background information, research design and methods, results, and soil descriptions previously presented in Chapters 2–3; all but the records-search results of the area subject to indirect effects presented in Chapter 4; and Appendix A of the original survey report (Lerch et al. 2016:9–120) remain unchanged and are not included in this addendum. Portions of the introductory Chapter 1, the results of the records search in the indirect APE in Chapter 4, the evaluations and recommendations in Chapter 5, and the details of site evaluations and NRHP eligibility presented in Appendix B of the original report have been updated to reflect the CRHR evaluations. Confidential Appendixes C, D, and E are unchanged.

Project Location

The proposed project area is located 0.8 km (1/2 mile) south of Interstate 10 and the community of Mesa Verde and about 13 km (8 miles) west of the city of Blythe in eastern Riverside County, California (Figure 1). The DQSP area is located in Sections 11–14, 23, and 24, Township 7 South, Range 21 East (San Bernardino Baseline and Meridian [SBBM]), on the Ripley, California, 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle and in Sections 3–6, 9–11, 14, 15, 22, and 23, Township 7 South, Range 21 East (SBBM), on the Roosevelt Mine, California, 7.5-minute USGS topographic quadrangle (Figure 2).[2]

[1] The electrical generating capacity of the Desert Quartzite Solar Project was increased to 450 megawatts as a result of increases in photovoltaic module efficiencies from the 300-megawatt capacity shown in the project's SF299 right-of-way (ROW) grant application based on the Plan of Development filed on May 23, 2014 (Skinner 2016).

[2] Figures 1 and 2 depict the DQSP and its generator-tie-line (gen-tie-line)–corridor as they were configured during the archaeological survey reported by Lerch et al. (2016). Since that time, the west end of the gen-tie corridor has been enlarged where it enters the Colorado River Substation (CRSS).

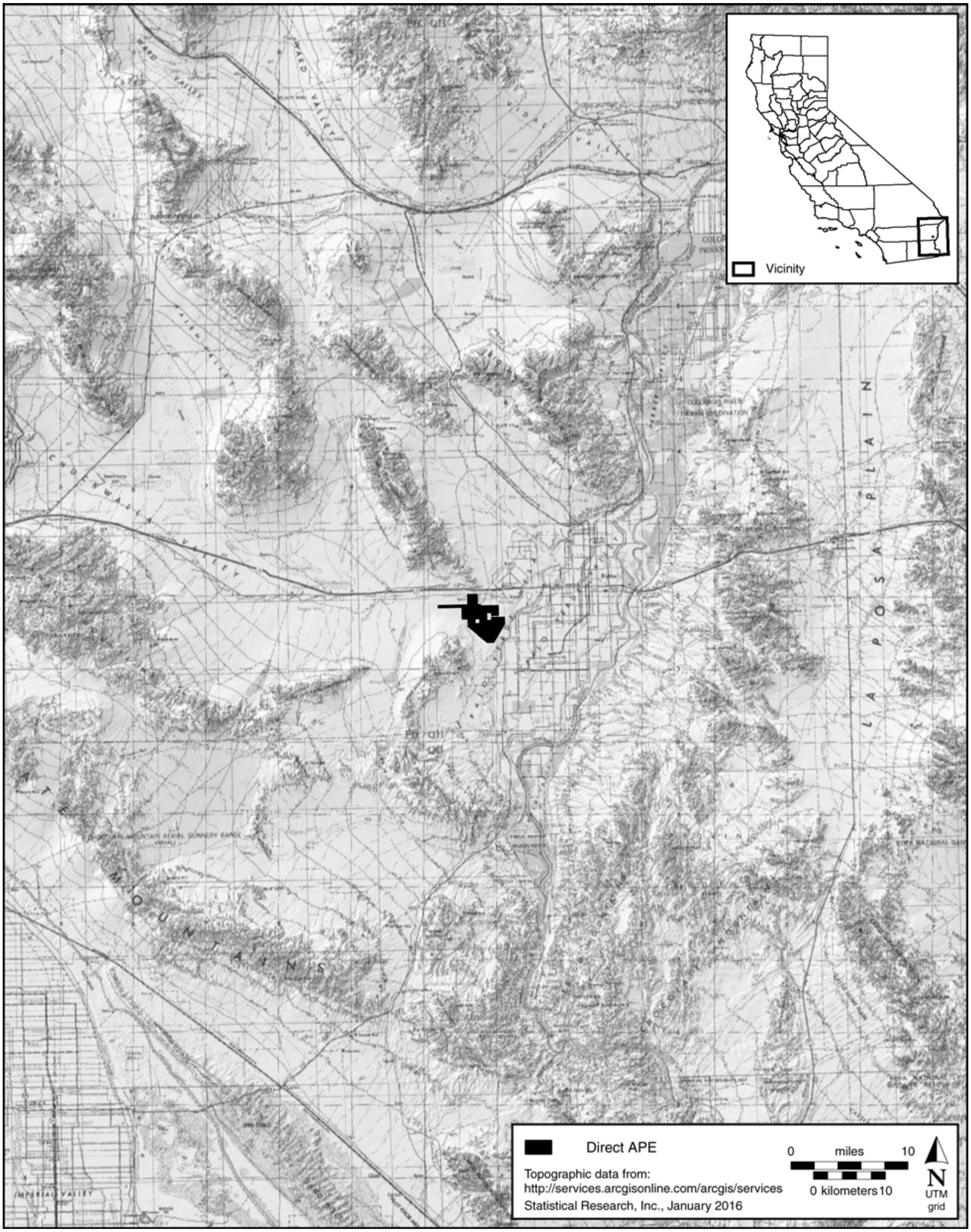

Figure 1. Vicinity map of the Desert Quartzite Solar Project.

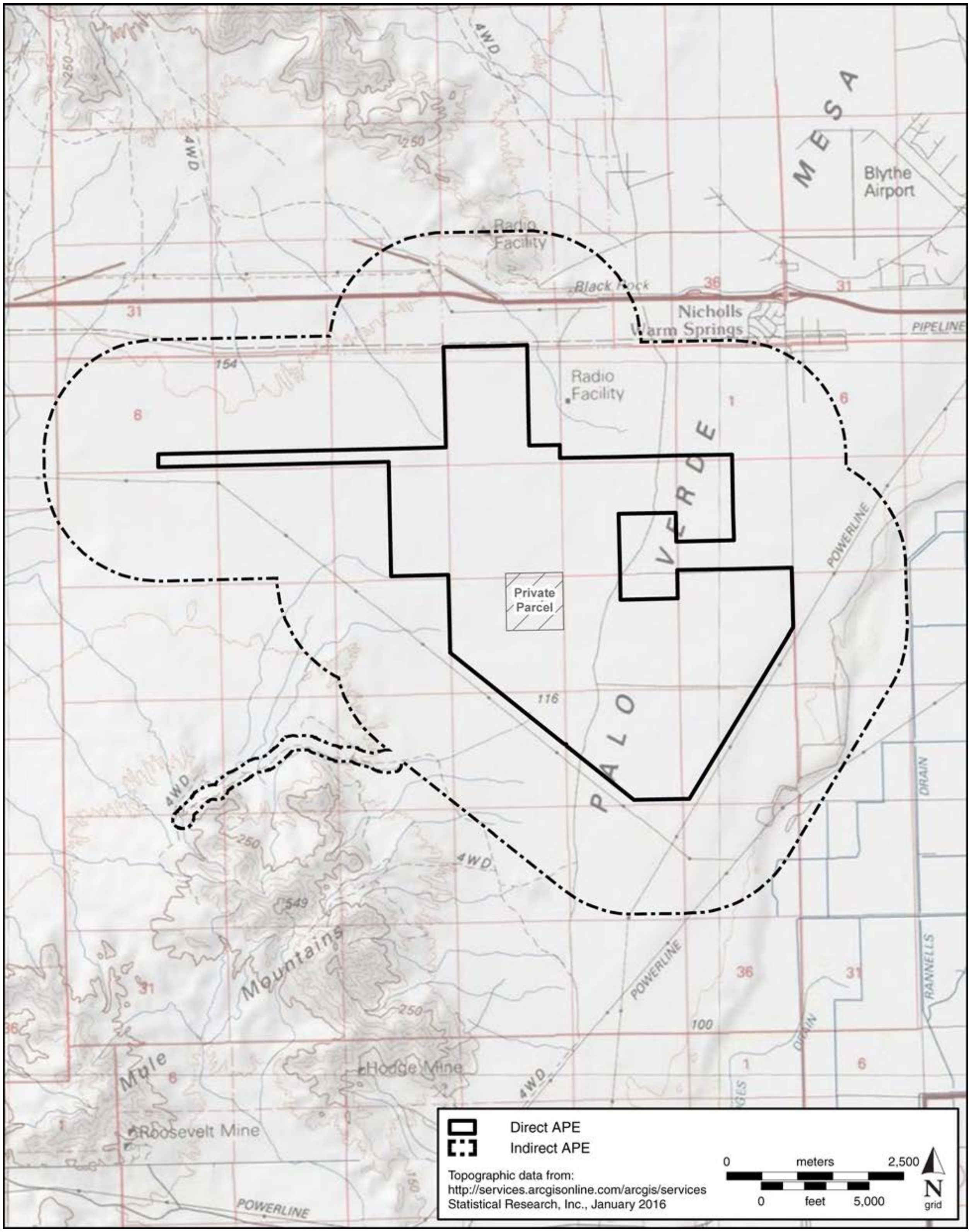

Figure 2. Project location map of the Desert Quartzite Solar Project.

The project site is situated on Palo Verde Mesa in the Colorado Desert, with the McCoy Mountains to the north, the Mule Mountains to the southwest, Chuckwalla Valley to the west, and Palo Verde Valley and the Colorado River to the east.

The DQSP area is bounded on the southwest and southeast by existing electrical transmission lines and access roads, including the Devers–Palo Verde Transmission Line Nos. 1 and 2. An existing 7.5-MW solar PV project, the NRG Blythe Solar Power Plant, is located on 200 acres adjacent to the northern boundary of the DQSP site. A portion of the Blythe Mesa Solar Project, a 485-MW, 3,660-acre PV project approved by the County in 2014 and by the BLM in 2015, is located on a keyhole-shaped parcel of land that is surrounded on three sides (the north, west, and south) by the DQSP site. The DQSP is located within the Riverside East Solar Energy Zone, identified as part of BLM's comprehensive Solar Energy Program (the Western Solar Plan) for utility-scale solar energy development on BLM-administered lands in six southwestern states, including California.

Project Description[3]

The DQSP includes a PV solar-facility site of approximately 3,560 acres on BLM land and 160 acres of private land, along with a corridor for gen-tie lines that extends for 3 miles and covers an area of 58 acres; this is all situated within a total project area of 5,010 acres. The total project area was initially defined on the basis of the right-of-way (ROW) grant application for a somewhat larger project footprint and associated buffer areas proposed in earlier versions of the DQSP *Plan of Development* (Desert Quartzite, LLC 2014).

The DQSP would consist of a single unit with a generating capacity of 300 MW. The proposed facilities on BLM-managed public land would include PV solar arrays, a gen-tie line, a 120-by-50 foot operations and maintenance building, an on-site substation, and ancillary facilities. The only facilities to be placed on the private land parcel would be solar arrays. The only linear facility extending out of the solar plant site would be the gen-tie line. The DQSP would use existing access roads.

The DQSP would involve the installation of thin-film solar modules made by First Solar, or other PV technology, mounted on either single-axis horizontal tracker structures, fixed-tilt mounting systems, or a combination of these two mounting systems. The mounting system for the PV modules would consist of steel posts driven into the ground to a depth of between 1.2 and 2.1 m (4 and 7 feet), and posts for single-axis tracking structures would need to be driven up to 3.7 m (12 feet) into the ground. The solar module assemblies would be organized into arrays. Each array would be approximately 800 feet long and 500 feet wide. The exact placement of the arrays within the DQSP area would be based on topography, hydrology, and geotechnical conditions and could also be modified to avoid cultural resources.

Applicable Regulations

Because most of the project area is on public land managed by the BLM, the project will require a BLM ROW grant (ROW No. CACA 049397). Issuance of a ROW grant for the project is considered an *undertaking* as defined by the National Historic Preservation Act of 1966, as amended (NHPA), and therefore, the BLM must comply with Section 106 of the NHPA (54 *U.S. Code* 300101), and its implementing regulations, 36 *Code of Federal Regulations* (CFR) 800, as well as BLM policies regarding cultural resources (BLM 2004). As required by the NHPA, as the federal agency that would approve the ROW grant, the BLM "shall take into account the effect of the undertaking on any historic property. The head of the Fed-

[3] See Footnotes 1 and 2 for changes to the project description since the archaeological survey report (Lerch et al. 2016) was completed.

eral agency shall afford the Council a reasonable opportunity to comment with regard to the undertaking" (54 *U.S. Code* 306108). The BLM also must comply with the requirements of the National Environmental Policy Act (NEPA).

The portion of the project on private land will require a Conditional Use Permit (CUP) from the County (Riverside County CUP No. 3721), along with review under the California Environmental Quality Act (CEQA), with the County as the lead CEQA agency. The BLM and the County will prepare a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to meet the NEPA and CEQA requirements for the DQSP.

The CUP for the private-land portion of the DQSP is a "project" subject to the CEQA (Public Resources Code [PRC], Sections (§) 21000 et seq.) and the CEQA Guidelines (California Code of Regulations [CCR] Title 14, §15000 et seq.), as amended to date. The CEQA requires that the lead agency "shall determine whether the project may have a significant effect on archaeological resources" (PRC §21083.2), according to the CEQA Guidelines for "determining the significance of impacts to archeological and historical resources" (CCR Title 14, §15064.5). The lead agency for the project under the CEQA is the County.

For potential impacts to an archaeological or historical resource to be considered significant under the CEQA, the resource must be determined to be a "historical resource"—that is, one listed in or determined eligible for listing in the CRHR, included in a local register of historical resources, or determined by the lead agency to be a historical resource (PRC §21084.1). The term "historical resource" may apply to archaeological sites. For an archaeological site that does not meet the criteria for consideration as a "historical resource," however, a determination must be made as to whether it qualifies as a "unique archaeological resource" (PRC §21083.2[g]; CCR §15064.5[c][3]).

A cultural resource property that is listed in or determined eligible for listing in the NRHP is also listed automatically in the CRHR (PRC §5024.1[d]). Thus, for the purposes of this study, cultural resources are evaluated for significance with reference to their eligibility for listing in the NRHP, according to criteria published in 36 CFR 60.4. Cultural resources found to be not eligible for listing in the NRHP are also considered with respect to eligibility for listing only in the CRHR, because the CEQA criteria for integrity, age, and representation of local and California history set thresholds for significance that are different from those of the NHPA.

APE Definitions

Studies to identify and evaluate cultural resources must carefully establish the impact area, referred to in federal regulations as the APE for the undertaking and in the CEQA Guidelines as the affected "environment," which means "the physical conditions which will be affected by a proposed project including land . . . and objects of historical or aesthetic interest" (CCR §15360). We refer to the regulations implementing the NHPA for the following definition of APE:

> *Area of potential effects* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking [36 CFR 800.16(d)].

The APE considered for this study consists of the direct APE and the indirect APE, which are defined below. When the term "APE" is not defined as "direct" or "indirect," it refers to both together.

Direct APE

The direct APE was defined in the archaeological survey report (Lerch et al. 2016:5) as the entire 5,010-acre area containing the BLM ROW grant application area, the County CUP area, and the gen-tie corridor. The direct APE includes 4,850 acres of BLM land and 160 acres of private land.[4] It is the area where direct effects due to the implementation of the proposed development are possible (36 CFR 800.5[a][2][i]). Such direct effects to archaeological resources evaluated as NRHP eligible may include construction of perimeter fences and staging areas, grading for interior access roads, mowing and tilling to prepare the ground surface for installation of solar panels, trenching and excavation for electrical conduits and vaults, and construction of the gen-tie pylons and access road.

Within the direct APE, ground-disturbing activities would range in depths from 12–18 cm (5–7 inches) for the site surface preparation to 3.7 m (12 feet) for the solar-panel-support posts to 1.2 m (4 feet) for electrical-conduit trenches and to approximately 3 m (10 feet) for electrical vaults (Desert Quartzite, LLC 2014:35–38). These depths of disturbance, or the vertical APE, will be distributed across the project site at various locations within the direct APE. No mass grading is proposed for the DQSP.

Indirect APE

The indirect APE includes those areas outside of the direct APE that may contain historic properties that could be affected by the proposed project. Analysis of the effects of the undertaking in the indirect APE takes into consideration the introduction of visual, atmospheric, or audible elements that could diminish the integrity of significant historic features of resources listed in, or eligible for listing in, the NRHP (36 CFR 800.5[a][2][v]). Based on the results of the literature review and archaeological records search presented in the research design and work plan (Kremkau et al. 2014), the indirect APE was defined initially as a 1-mile area that contained approximately 13,000 acres extending around all sides of the direct APE. This definition was included by the BLM in its initial consultation letter to the SHPO dated August 21, 2014 (Wakefield 2014), and the SHPO concurred (Roland-Nawi 2014). However, during subsequent government-to-government consultation between BLM archaeologists and interested tribal representatives, concerns were expressed over potential effects of the DQSP on two sites containing rock art and ceremonial features that are listed in the NRHP (George Kline, personal communication 2015), and the indirect APE was expanded to 18,060 acres to include those resources, as currently shown in Figure 2.

Two NRHP-listed resources, P-33-000504 and P-33-000773,[5] listed in the NRHP as the Mule Tank Discontiguous Rock Art District, are located within the indirect APE, both located more than 1 mile from the DQSP boundary and the direct APE. Two other NRHP-eligible resources, the Pilot Knob–Blythe 161-kV transmission line (P-33-11110) and the Blythe–Niland 161-kV transmission line (P-33-012532/CA-RIV-

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[4] The changes in the project description cited in Footnote 1 have increased the direct APE slightly in the area where the gen-tie corridor enters the CRSS. Those areas had been previously surveyed (Enright and Mirro 2011), and the results will be included, along with the survey reported by Lerch et al. 2016) and in this addendum, in the DQSP EIS/EIR.

[5] Resources mentioned in this report are identified by several numbering systems. Generally, previously recorded sites are depicted on maps and listed in text and tables by their primary numbers, which consist of the letter "P" (for the Primary Record of the California Department of Parks and Recreation [DPR] recordation forms [DPR 523 series]), the two-digit code for the relevant county, and sequentially assigned six-digit numbers (e.g., P-33-000010 refers to the tenth primary number assigned in Riverside County). Archaeological sites may also be listed by a trinomial designation. The trinomial consists of the two-letter code "CA" (for California), the three-letter code for the relevant county, and a sequentially assigned number (e.g., CA-RIV-3 refers to the third trinomial assigned in Riverside County). In addition, a suffix that indicates the presence of "prehistoric" or "historical-period" materials at a recorded property may be included. The lack of a suffix on a trinomial indicates the presence of exclusively prehistoric materials, the suffix "H" indicates the presence of exclusively historical-period materials, and the suffix "/H" indicates the presence of prehistoric and historical-period materials. Some archaeologists also use the suffix "T" to denote trail sites. Isolated archaeological resources and architectural resources are listed by primary number only. Finally, newly recorded sites are listed by their field numbers, which are indicated in this report as "SRI-*nnnn*." Primary numbers and trinomials for the newly recorded sites and isolates have been added to the master table of sites shown in the revised Appendix B.

7127H), have also been identified within the indirect APE. Potential cumulative effects of the DQSP and other previous projects in the region on these resources will be considered by the BLM and the County in the project's EIS/EIR.

Records-Search Results

Updated results from the records-search information for the indirect APE are presented below.

Previously Recorded Cultural Resources: NRHP-Listed and -Eligible Sites within the Indirect APE

Of the sites located within the indirect APE, two are listed in the NRHP, two have been determined eligible, and several others have characteristics that suggest they could be considered NRHP eligible. The NRHP-listed sites include P-33-000773, the Mule Canyon site, located approximately 1 mile west of the direct APE and P-33-000504, the Mule Tank site farther to the west, which together are recognized as the Mule Tank Discontiguous Rock Art District, based on Criteria c and d. P-33-000504 is a petroglyph locus within the district, and P-33-000773 is a geoglyph/intaglio component.

Two transmission lines located within the indirect APE along the southeastern boundary of the DQSP have been determined eligible for listing in the NRHP. These lines are the Pilot Knob–Blythe 161-kV transmission line (P-33-11110) and the Blythe–Niland 161-kV transmission line (P-33-012532/CA-RIV-7127H) (see Lerch et al. 2016:Figure C.2). The former is a 64.4-mile-long line made of H-frame wooden poles built in 1951 that parallels the 2-mile-long boundary of the DQSP. The latter is a line of similar wooden-pole H-frame construction built in the 1940s and 1950s and is located in the same corridor.

Sites within the indirect APE that are not listed in the NRHP or determined eligible but could be considered eligible include two other intaglio sites, P-33-000661 and P-33-000662, located north of Interstate 10. These sites are alignments of waterworn cobbles. Several prehistoric trails are also located within the indirect APE. Among them is the Coco-Maricopa Trail (McCarthy 1982; 1993:70–84, 193–194), a system of trails that connected with other north–south- and east–west-trending trails. A portion of the trail has been recorded as P-33-000053, which passes through the indirect APE on the northern side of the project area and was determined eligible for listing in the NRHP as a result of cultural resources evaluation associated with the McCoy Solar Project. At least eight other trail segments (P-33-000343, P-33-000650, P-33-000673, P-33-000772, P-33-000775, P-33-003803, P-33-004568, and P-33-010822) have been recorded within the indirect APE (see Lerch et al. 2016:Table 6), although several may be segments of a smaller number of trails. Two of these trails extend into the direct APE.

P-33-001821, a large previously recorded site containing multiple rock features as well as lithic and ceramic artifact scatters is crossed by two trails and is located within the indirect APE, very close to the boundary of the direct APE. During a visit to the site by BLM archaeologists and tribal representatives for a previous project, a suspected cremation locus that had not been previously recorded was observed in the site vicinity. During a field visit for the DQSP by SRI and BLM archaeologists, the locus was relocated and formally recorded, and other portions of the site were found to extend into the DQSP direct APE.

Evaluations and Recommendations

NRHP- and CRHR-Eligibility Criteria

SRI has developed preliminary NRHP- and CRHR-eligibility recommendations for all 278 sites within the direct APE (see the revised Appendix B). Evaluation recommendations were made following the guidelines and eligibility criteria established in 36 CFR 60.4. The research questions and data requirements outlined in the research design (Kremkau et al. 2014) and presented in Chapter 3 of the report by Lerch et al. (2106) were used as the references for determining site eligibility. The 278 sites were classified as either eligible, not eligible, or possibly eligible, the last category denoting sites that require additional research before an eligibility recommendation can be provided. In the following section, we briefly discuss the NRHP and CRHR eligibility of the resources within the APE. None of the historical-period sites nor any of the 620 isolated finds met any of the eligibility criteria, or they lack integrity, and all are recommended not eligible for listing in the NRHP and the CRHR. In addition, neither the prehistoric sites nor the historical-period sites can be considered as elements of a district, because they do not represent "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (Shrimpton 2002). The single isolated artifact that is located on the 160-acre privately owned parcel within the direct APE and is thus subject to compliance with the CEQA is also recommended not eligible for listing in the CRHR; no prehistoric or historical-period sites are located on the private parcel.

NRHP-Eligibility Criteria

Section 106 of the NHPA requires the BLM to take into account the effects of an undertaking on "historic properties," defined as cultural resources listed in or eligible for listing in the NRHP (36 CFR 800). Determination of NRHP eligibility for cultural resources prior to making a finding of effect is made according to the following criteria:

> The quality of significance in American history, architecture, archeology, 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
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or
>
> (c) that embody the distinctive characteristics of a type, period, 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
>
> (d) that have yielded, or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

If cultural resources do not possess integrity or do not meet the above criteria, they are not considered historic properties and are not further considered in the Section 106 process.

In addition to the above criteria, there is a general stipulation that a historic property must be 50 years old or older (for exceptions, see 36 CFR 60.4, Criteria Considerations). The importance of information in prehistory or history is measured by a resource's ability to answer research questions (McClelland 1997). In addition to research potential, both Native American and Euroamerican historic properties may have general-public and culture-specific values. Historic properties may also have broader public significance, such as serving to educate the public about important aspects of national, state, or local history.

CRHR-Eligibility Criteria

For purposes of the CEQA, a "historical resource" is any object, building, structure, site, area, place, record, or manuscript listed in or eligible for listing in the CRHR (PRC §21084.1). A resource is eligible for listing in the CRHR if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

The CCR (Title 14, §4852) further provides that cultural resources of local significance are CRHR eligible.

Historical resources defined by the CRHR criteria listed above (PRC §5024.1) are eligible for listing in the CRHR and include resources determined eligible for listing in the NRHP (CCR Title 14, §4851[a][1]). Thus, the County may apply the determinations of NRHP eligibility to its findings of historical significance under the CEQA. Cultural resources determined not eligible for listing in the NRHP may still qualify as historical resources under the CEQA, and thus, a separate determination regarding whether they are historical resources must be made by the County.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity, as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Simply put, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance (CCR Title 14, §4852).

Criteria for Unique Archaeological Resources

The CEQA also requires the lead agency to consider whether the project will have a significant effect on unique archaeological resources (even if they are not eligible for listing in the CRHR) and to avoid unique archaeological resources when feasible or mitigate any effects to less-than-significant levels (PRC §21083.2). As used in the CEQA,

> a unique archaeological resource means 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 that 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.
>
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Below, we discuss our evaluations, in terms of the above-listed NRHP- and CRHR-eligibility criteria, of the archaeological resources we identified within the APE during survey, with attention focused on two particular aspects of evaluation: research potential and integrity.

Research Potential

The research potential of any particular historic property is assessed with reference to a specific historic context or research design and themes. Historic contexts form the framework according to which much of the federal historic-preservation process is structured. A historic context is a body of information about a property, organized by three basic elements: theme, place, and time (McClelland 1997:1). Theoretically, all the historic contexts of a particular geographic area together constitute a comprehensive history of the area that could be broken down into a series of historically meaningful segments, each of which would constitute an individual historic context. Therefore, grouped together, the various historic contexts of an area form a comprehensive summary of all aspects of the area's history.

Integrity

Another key determination regarding NRHP eligibility involves the concept of integrity, which refers to the physical condition of a historic property. If the physical condition of a site considered eligible for listing in the NRHP under Criterion d is such that important information about the past potentially can be derived from it, then it is said to possess good integrity. If various processes of disturbance—environmental or cultural, intentional or unintentional—have impacted the property such that the qualities that make the site significant have been lost or severely damaged, then the property is said to lack integrity. The critical aspect of evaluating integrity is assessment of the nature and extent of disturbance processes. Extensive impacts by recent human activity, such as vandalism or vehicular traffic, are relatively easy to recognize and assess, but other forms of disturbance are more subtle. For example, consider an artifact concentration. If environmental processes, such as erosion, have displaced artifacts and altered the geomorphological context, the condition of the scatter today might be considerably different from what it was when it was first created. Many of the artifacts may have been redeposited and those that remain may no longer be in primary context. If subsurface deposits are present, they may no longer be spatially associated with the surface artifacts.

Criteria of Adverse Effect

If a project alters the character-defining elements of an NRHP- or CRHR-eligible property, such as features relevant to its environment or its use, in a manner that affects the property's eligibility for listing in the NRHP or the CRHR, such an alteration is considered an adverse effect. Adverse effects can include

- physical destruction, damage, or alteration of all or part of the property;
- isolation of the property from its setting or alteration of the character of its setting when that character contributes to the property's qualification for listing in the NRHP;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; or
- transfer, lease, or sale of a federally owned property without adequate conditions or restrictions regarding its preservation, maintenance, or use (36 CFR 800.5[a][2]).

If a historic property/historical resource within the APE were subject to any of the above, it would be considered an adverse effect to the property.

NRHP- and CRHR-Eligibility Recommendations

SRI's NRHP- and CRHR-eligibility recommendations are presented below. The discussions are organized by the site types presented in the revised Appendix B. These eligibility recommendations are preliminary and may change following additional research at some sites and consultation by the BLM with the tribes and the public. Ultimately, formal determinations of eligibility will be made by BLM and County, with concurrence by the SHPO.

Historical-Period Sites

Historical-period sites are classified as artifact concentrations, military-activity sites, water-well sites, roads/trails, and survey markers.

Artifact Concentrations

In total, 157 historical-period artifact concentrations were recorded within the direct APE. Generally, the artifact concentrations can be divided into three main time periods defined with reference to previous use of the area for the Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA): pre-DTC/C-AMA/Homesteading, DTC/C-AMA, and post-DTC/C-AMA.

The artifact concentrations dating to the DTC/C-AMA operations consist of small scatters of C- and K-ration cans and other historical-period refuse, such as beverage bottles or cans or nonstandard food cans, and are likely associated with training and maneuvers within the APE. The historic and archaeological contexts prepared for DTC/C-AMA sites identified refuse deposits as one of the property types associated with the resource. The guidance document indicated that DTC/C-AMA refuse deposits can range from "isolated artifact scatters to large trash dumps, used for long periods of time. Refuse deposits from the DTC/C-AMA period will be identifiable by the military-related artifacts present, as well as by their location" (Bischoff 2009:127). The small scatters identified within the project APE were likely associated with temporary campsites and bivouacs and were not "cleaned up by the departing soldiers," as many others were.

The DTC/C-AMA is "particularly relevant to several broad, important themes in American history," was "the largest training facility and the only one of its kind in American military history," and was "associated with several preeminent figures in the American Army" (Bischoff 2009:133–134). Nevertheless, the guidance went on to state that "whereas these resources have the potential to be considered significant under any or all of the four criteria, more often than not they will be considered primarily eligible under Criterion d for their ability to yield information important in history" (Bischoff 2009:134). Although the small sites retain aspects of integrity, it is not possible to relate them to specific military activities or units. They do not contain sufficient quantity or variety of materials to support statistically valid analyses, nor do they contain further data potential. The DTC/C-AMA sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The artifact concentrations dating to the DTC/C-AMA period are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

The artifact concentrations associated with the mid–late twentieth century represent small "wildcat" dumps, likely associated with residential areas north of the direct APE and with use of the project area for OHV or other recreational activity. The artifact concentrations are surficial deposits, lacking stratigraphic integrity and the quantity and variety of materials that would allow statistically valid analyses. These sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The dumps cannot be associated with specific households or individuals and otherwise lack context. The mid–late-twentieth-century artifact concentrations are thus recommended not eligible for listing in the NRHP or the CRHR.

A dozen artifact concentrations date to the early twentieth century. These concentrations contain a variety of domestic refuse, as well as other artifact types. Most of these scatters are highly disturbed, but three are in good condition: SRI-1024, SRI-3014, and SRI-4045.[6] No homesteads or other historical-period residential areas were identified within the direct APE. SRI-1024, SRI-3014, and SRI-4045 cannot be associated with a particular activity, residence or individual. SRI-1024 and SRI-3014 contain burn areas or campfires, and a potential association with the 1917 U.S. General Land Office (GLO) survey crew was considered. The historic context and research design for work-camp properties in California (California Department of Transportation 2013:97, 112, 114, 123, 169) listed surveyors' camps as a potential work camp property type. It is not possible, however, to make a conclusive association of these sites with activities of the 1917 survey crew. The artifact concentrations are surficial deposits, lack stratigraphic integrity, and do not contain the quantity and variety of materials that would allow statistical analyses. These sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The early-twentieth-century artifact concentrations are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

Military-Activity Sites

The nine sites associated with military activity are all related to the use of the APE as part of the DTC/C-AMA. None of these sites appears to be related to the activities of Operation Desert Strike in 1964. The sites consist of small features, including tank emplacements, vehicle tracks, or lengths of communications wire. The historic and archaeological contexts prepared for DTC/C-AMA sites identified tank tracks as one of the property types associated with the resource. The guidance document indicated that tanks were a "primary aspect of the DTC/C-AMA, and countless operations and maneuvers were conducted throughout the facility" (Bischoff 2009:127). Tank tracks, therefore, have been reported throughout the DTC/C-AMA.

Despite the relevance of the DTC/C-AMA "to several broad, important themes in American history," its role as "the largest training facility and the only one of its kind in American military history" and its association with "several preeminent figures in the American Army" (Bischoff 2009:133–134), the guidance also stated that "whereas these resources have the potential to be considered significant under any or all of the four criteria, more often than not they will be considered primarily eligible under Criterion d for their ability to yield information important in history" (Bischoff 2009:134). Although the tank emplacements, vehicle tracks, and lengths of communications wire retain aspects of integrity, it is not possible to relate them to specific military activities or units. They do not contain sufficient identifiable association, nor do they contain further data potential. The nine military-activity sites are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

Water-Well Sites

Three abandoned water well sites were recorded within the direct APE. One site (SRI-42) consists of a well casing surrounded by a disturbed area and artifact scatter. Archival research failed to disclose an association with a particular residence, agricultural use, or individual, although it was determined that the well dates to the early 1960s. The artifacts at the site date to the mid–late twentieth century. The artifact concentrations are surficial deposits, lack stratigraphic integrity, and do not contain the quantity and variety of materials that would allow statistical analyses. Two other sites (SRI-9016 and SRI-9018) each consist of a single well casing with no associated artifacts or other features. These two sites also date to the early 1960s. These wells may be associated with activities during the 1950s and 1960s related to possible development of the Palo Verde Mesa area for agricultural activities by the Palo Verde Irrigation District. The water-well sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. These three sites are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

[6] Primary numbers and trinomials for sites identified in the text only by their field numbers (SRI-*nnnn*) are contained in Appendix B.

Survey Markers

Two survey marker sites were identified within the direct APE. The first site, SRI-8085, consists of 22 survey markers and 10 linear disturbances associated with a 1917 survey by the GLO. They are small, bronze markers set on pipes or other foundations, set into the ground. The linear disturbances are approximately 2-foot-wide north–south or east–west ephemeral trails along section or quarter-section lines that were created during the survey for and placement of the markers. The number and array of markers and disturbances is related to the 1917 survey, which included setting markers at 85 locations (all section corners and centers). Although government surveys are associated with events that have contributed significantly to broad historical patterns, early-twentieth-century survey markers are common through the California desert and elsewhere, and their purpose and morphology are well documented; SRI-8085 does not meet NRHP Criterion a or c or CRHR Criterion 1 or 3. The names of all the surveyors for the 1917 survey (GLO 1917) were reviewed and researched, and none was found to be significant in our past (Lerch et al. 2016:Table 20). Based on the results of our archival research, SRI-8085 is not associated with the lives of persons significant in our past and does not appear eligible under Criterion b/2. Documentation of the site included background and archival research, field recordation, collection of a photographic record, and detailed mapping. The site was thoroughly documented during this investigation and has no further research potential under Criterion d/4. SRI-8085 is recommended not eligible for listing in the NRHP.

The other survey marker site, SRI-5063, consists of an undated USGS marker. Individual survey markers are ubiquitous features that can be found throughout California and the United States as a whole. Therefore, this site is not eligible under Criterion a/1, b/2, or c/3. Documentation of the site included background and archival research, field recordation, collection of a photographic record, and detailed mapping. The site was thoroughly documented during this investigation, and has no further research potential under Criterion d/4. Although this site is in good condition, SRI recommends it not eligible for listing in the NRHP or the CRHR.

Roads/Trails

Ten historical-period roads/trails were identified within the direct APE and are of sufficient age and integrity for consideration as historic properties. One of the sites, SRI-2333, is depicted on an early twentieth-century map. This southwest–northeast-trending road appears on the 1918 GLO plat map, drawn from survey data collected in 1917 (see Lerch et al. 2016:Figure 5). At that time, the road ended just south of the project APE, in the southwest quarter of Section 23 near a house and agricultural field outside the direct APE. From that point, the road followed its current alignment northeasterly through Sections 23 and 14 but branched northeasterly from the current alignment in the NE $^{1}/_{4}$ of Section 11. Its northern terminus at that time remains unknown. By 1952, the road continued northerly to a network of roads accessing mines in the Little Maria Mountains and had been extended southerly to connect with the Bradshaw Trail. In addition to SRI-2333, a two-track section road (P-33-014199) and two ambiguous trails (SRI-96 and SRI-129), were also discovered. Although these linear sites played roles in local and regional history as specific cultural resources related to settlement and industrial development, they did not make significant contributions to history in terms of culture, economics, politics, or technology. Another of these sites, P-33-017328, was previously recorded as a prehistoric trail segment. Further investigation revealed that this site is longer than originally recorded, is located precisely along a quarter-section line, and is likely associated with the 1917 GLO land survey and with the other features recorded as SRI-8085.

Three linear sites (SRI-121, SRI-122, and SRI-2051) appear to be associated with surveys that further subdivide the section and quarter-section subdivisions mapped by the 1917 GLO survey. The fact that these subdivisions are slightly oblique in relation to the official section divisions suggests these sites were made during another survey, possibly by a surveyor hired by a landowner, speculative owner, or claimant.

Finally, a map dated 1952 (drawn from aerial imagery dated 1948) shows a road in an east–west alignment along the north side of Section 13 that was recorded in this study as SRI-9020. Archival data from that decade shows three claimants for land in the northern part of Section 13: Don A. Allen, Elmer Cain, and Frank A. Gallender, Jr. Previously recorded road P-33-014173, which is also depicted on the 1952 map, runs east–west along the boundary between Sections 13, 14, 23, and 24. Adjacent land was claimed at that time by Ida May Cassell, Esther M. Cassell, Ralph W. Cassell, Victor A. Gudzunas, Prudence B. Anderson, Gerald A. Brinkman, John T. Scott, Minnie Van Reid, and H. L. Billson.

The roads and trails do not meet any of the NRHP- or CRHR-eligibility criteria. Despite background and archival research, origin and destination points for the linear features were not identified, nor do any of the names associated with adjacent land claims appear to be important in local or regional history. The sites were thoroughly documented during this investigation through field recordation, collection of a photographic record, and detailed mapping. However, the sites could not address any of the research questions in the research design (Kremkau et al. 2014), and further research at the sites will not yield additional information important to history. Therefore, SRI recommends the historical-period road/trail sites not eligible for listing in the NRHP.

Architectural Resources

There are no historical-period built environment resources identified within the direct APE that require evaluation regarding direct or indirect effects resulting from construction of the DQSP. However, two transmission lines, located within a utility corridor that forms the southeastern boundary of the project area, are within the indirect APE. These resources, the Pilot Knob–Blythe 161-kV transmission line (P-33-11110) and the Blythe-Niland 161-kV transmission line (P-33-012532/CA-RIV-7127H), have been determined NRHP eligible during previous projects, according to information obtained from the records search. Because the two transmission lines have been determined eligible for listing in the NRHP, they would also be considered historical resources eligible for listing in the CRHR.

Prehistoric Sites

The prehistoric sites are classified as artifact concentrations, rock-feature sites, rock features with artifact scatters, and trails.

Artifact Concentrations

Artifact concentrations are groups of artifacts scattered across the ground surface that lack features such as pits or thermal features. Two types are artifact concentrations, lithic scatters and ceramic scatters, were discovered. In total, 9 ceramic and 16 lithic scatters were identified within the direct APE. All were recorded in detail based on in-field analysis. The majority of these sites are sparse scatters (with fewer than 50 artifacts) that do not retain any integrity and lack diagnostic artifacts other than those already recorded (i.e., ceramic sherd types) (see Lerch et al. 2016:Tables 9 and 18). These artifact concentrations are recommended not eligible for listing in the NRHP or the CRHR.

Rock-Feature Sites

Thirty of the prehistoric sites in the project area are rock-feature sites. These sites consist of one or more rock features, usually with no associated artifacts. The majority of the rock features appear to be thermal features (earth ovens used for food preparation) and contain a mix of fire-altered and unaltered rock. The features vary greatly in size and integrity. Most intact features measure between 1 and 3 m in diameter and consist of between 20 and 50 pieces of rock. Most of the rock-feature sites are deflated, and the rock features retain no integrity. SRI recommends these sites not eligible for listing in the NRHP or the CRHR, because they lack integrity and cannot address any research questions.

Four sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009), however, retain some integrity and are possibly eligible for listing in the NRHP under Criterion d and CRHR under Criterion 4, pending formal evaluation. Such sites may contain important datable materials that can answer chronological questions, as Eerkens and Rosenthal (2002) have demonstrated in the northern Mojave Desert, and they may also be able to provide important information related to questions of settlement and subsistence. Although the use of earth ovens is conventionally correlated with the baking of agave or other succulent species (Castetter 1935), the scale of these particular features suggests that they may have served for the baking of small-scale plants such as geophytes (Thoms 2009). Ethnographic literature indicates that bulbs, corms, tubers, or rhizomes were traditionally gathered and subsequently processed in small earth ovens (Havard 1895). Scholze (2010) has noted that, in northern California alone, 85 percent of 73 ethnographic sources make reference to root crops, suggesting subsistence reliance. Moreover, Anderson (1993), among others, has noted that some California tribes gathered edible bulbs, corms and even replanted cormlets, bulblets, and sections of root for future use (Anderson 1993). In the anthropological literature, these plants have often been reported as "Indian potatoes" or "root-crops" (Anderson 1997:150). One geophyte plant species in particular, desert lily, was identified as common within the current survey area (see Lerch et al. 2016:Table 2) and is known to have been utilized ethnographically. Ethnographic information indicates the bulbs were eaten raw or baked in a pit oven pit by the Cahuilla (Bean and Saubel 1972:77) or eaten raw, baked, or boiled by the River Yumans (Castetter and Bell 1951:207). A geographical study of the Palo Verde Mesa noted that "during the spring months large fields of desert day lilies (*Hesperocallis undulata*) are to be found growing profusely in localized areas throughout the lower terrace" (Rumage 1956:40).

Overall, California is extremely rich in geophyte species, in comparison to the rest of the United States (Rundel 1996). Archaeobotanical investigations of earth-oven technology, as well as the study of prehistoric utilization of geophytes, are still in their infancy, and few sites have produced archaeological remains of geophytes. However, recent studies in central Texas have succeeded in developing pioneering methods for detecting archaeobotanical evidence of geophytes within earth ovens (Dering 2003). These newly introduced methods elevate the potential of these types of sites for future research, particularly for establishing links between hunter-gatherer lifestyles and settled agriculture. The gathering, replanting, and processing of wild-plant species, should this be demonstrable, may offer evidence as to why prehistoric peoples eventually adopted a sedentary lifestyle.

Rock Features with Artifact Scatters

These sites consist of one or more rock features with an associated artifact scatter. The diversity of artifacts and feature types among these sites imply that the site type was used for a variety of tasks and may indicate at least a temporary occupation. Of the 31 sites associated with this site type, 9 rock features with artifact scatters retain some level of integrity, and excavations at the sites may be able to address some of the research questions outlined in the original report (Lerch et al. 2016:Chapter 3). Four of these sites, SRI-83, SRI-2021, SRI-6034, and P-33-001821, have several intact rock features. A large scatter of calcined bone that may be a human cremation is associated with P-33-001821, and SRI-6034 is the only site within the direct APE that yielded pieces of ground stone. SRI recommends these four sites eligible for listing for the NRHP under Criterion d and the CRHR under Criterion 4, and in the case of P-33-001821, under Criteria a/1 and b/2, as well. Five other sites—SRI-17, SRI-1059, SRI-3019, SRI-4241, and SRI-6033—retain some integrity and are possibly eligible for listing in the NRHP and the CRHR, pending formal evaluation.

Trails

Three prehistoric trails were identified within the APE. The trails consist of narrow, linear features and were not associated with any artifact scatters. P-33-000343 and P-33-000772 were both previously recorded, and the current survey found them to be in generally the same condition as originally recorded. The third trail, SRI-3255, runs southwest–northeast though the direct APE. All three sites are recommended eligible for listing in the NRHP and the CRHR under Criterion d/4 and possibly under Criteria a/1 and b/2, depending on the results of tribal consultation by the BLM. Ethnographic studies based on literature review and interviews with tribal representatives have consistently noted that trails are important for both economic and spiritual reasons and were used well into the historical period (Bean and Vane 1978:6-54, 7-13–7-14; Cultural Systems Research, Inc. 1987:132–134).

Multicomponent Sites

All eight of the multicomponent sites within the direct APE are artifact concentrations. These sites contain a mix of prehistoric and historical-period artifacts. The prehistoric component of one of the larger multicomponent sites, P-33-019618, contains the largest number of flaked stone artifacts (primarily flakes and tested cobbles), has the potential to contain subsurface deposits, and may be able to address research questions. Therefore, SRI recommends P-33-019618 eligible for listing in the NRHP and the CRHR under Criterion d/4.

NRHP-/CRHR-Eligibility Summary

Four prehistoric rock features with artifact scatters (P-33-001821, SRI-83, SRI-2021, and SRI-6034), three trail sites (P-33-000343, P-33-000772, and SRI-3255), and the prehistoric component only of one multicomponent artifact concentration site (P-33-019618) are recommended eligible for listing in the NRHP and the CRHR under Criterion d/4 (Table 1). Because of their possible significance to tribes in the region, four of those sites (P-33-000343, P-33-000772, P-33-001821, and SRI-3255) may also be eligible under Criteria a/1 and b/2, pending further consultation with the tribes by BLM. Nine additional sites, including 4 prehistoric rock-feature sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009), and 5 prehistoric rock-feature sites with artifact scatters (SRI-17, SRI-1059, SRI-3019, SRI-4241, and SRI-6033), are possibly eligible for listing in the NRHP and the CRHR, but additional research is needed (see Table 1; Appendix B [Revised]). No sites recommended eligible for listing in the NRHP or the CRHR are located in the 160-acre private parcel located within the APE. Figure C.27 in the original report (Lerch et al. 2016) shows the location of the eligible and possibly eligible sites within the project area, as well as the relationship superimposed on the map of the proposed DQSP facility (solar arrays, fence lines, etc.).

Each of the sites recommended eligible or possibly eligible for listing in the NRHP is also recommended eligible or possibly eligible for listing in the CRHR. None of the sites evaluated is recommended as a unique archaeological site as defined by the CEQA (PRC §21083.2).

None of the sites within the direct APE appear to be eligible for listing in the NRHP as contributors to a district. Two previously recorded sites within the indirect APE, however, are listed in the NRHP as the Mule Tank Discontiguous Rock Art District.

Management Recommendations

Results from the archaeological survey have yielded a wealth of information that demonstrates the rich and diverse cultural landscape within the project area. This section provides management recommendations for mitigating adverse effects to cultural resources within the direct APE and within the viewshed of the project area, as well as addresses the results of the buried-site-sensitivity model presented in the original report (Lerch et al. 2016:Chapter 4) (see Table 1).

Sites Recommended Eligible

As previously mentioned, four prehistoric rock features with artifact scatters (P-33-001821, SRI-83, SRI-2021, and SRI-6034) and the prehistoric component of one multicomponent site (P-33-019618) are recommended eligible for listing in the NRHP/CRHR under Criterion d/4 and, in the case of P-33-001821, possibly under Criteria a/1 and b/2. To lessen adverse effects to these five cultural resources, the area where these sites are located should be avoided, along with a buffer area of at least 30 m. If avoidance of these areas is not practical, archaeological data recovery or other approved mitigative treatment should occur within the portions of the sites that will be affected by development of the DQSP to confirm the potential data yield of the sites, as well as recover any data that may address research questions pertaining to prehistoric themes, such as settlement and subsistence, presented in Chapter 3 of the original report (Lerch et al. 2016).

The three prehistoric trails (P-33-000343, P-33-000772, and SRI-3255) are related to prehistoric trade networks and, in the case of P-33-000343 and P-33-000772, which extend to the Mule Tank Discontiguous Rock Art District (P-33-000773) outside of the project area, the overall ceremonial landscape of the region. To mitigate cumulative impacts to these sites within the indirect APE, further investigation is recommended to trace the trail alignments on high-resolution aerial photographs and examine them carefully on the ground to document them more completely using GPS and digital photography. Decisions regarding their ultimate determinations of NRHP eligibility and treatment will be based on the results of tribal consultation by the BLM.

Table 1. Summary of National Register of Historic Places– and California Register of Historical Resources–Eligible Sites and Recommendations (Revised)

Primary Site No. (State Site Trinomial)	Field Site No.	Site Type	Age	NRHP-/CRHR-Eligibility Recommendation and Criteria	Testing and Treatment Recommendations
P-33-000343 (CA-RIV-343T)	9003	trail	prehistoric	recommended eligible; Criterion d/4, possibly Criteria a/1 or b/2	avoid; consult with tribes regarding Criteria a/1 and b/2
P-33-000772 (CA-RIV-772T)	110	trail	prehistoric	recommended eligible; Criterion d/4, possibly Criteria a/1 or b/2	avoid; consult with tribes regarding Criteria a/1 and b/2
P-33-001821 (CA-RIV-1821)	8020	rock feature with artifact scatter	prehistoric	recommended eligible; Criterion d/4, possibly Criteria a/1 or b/2	avoid; consult with tribes regarding Criteria a/1 and b/2
P-33-019618 (CA-RIV-009935)	127	multicomponent artifact concentration	prehistoric component only	recommended eligible; Criterion d/4	avoid
P-33-024719 (CA-RIV-012240)	17	rock feature with artifact scatter	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP eligibility
P-33-024283 (CA-RIV-011937)	83	rock feature with artifact scatter	prehistoric	recommended eligible; Criterion d/4	avoid
P-33-023456 (CA-RIV-011990)	1059	rock feature with artifact scatter	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024361 (CA-RIV-011995)	2021	rock feature with artifact scatter	prehistoric	recommended eligible; Criterion d/4	avoid, if feasible, or conduct data recovery
P-33-024377 (CA-RIV-012011)	3019	rock feature with artifact scatter	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024385 (CA-RIV-012019)	3039	rock feature	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024393 (CA-RIV-012027)	3237	rock feature	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024394 (CA-RIV-012028)	3255	trail	prehistoric	recommended eligible; Criterion d/4, possibly Criteria a/1 or b/2	avoid; consult with tribes regarding Criteria a/1 and b/2
P-33-024459 (CA-RIV-012091)	4085	rock feature	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024476 (CA-RIV-012108)	4241	rock feature with artifact scatter	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024496 (CA-RIV-012128)	6033	rock feature with artifact scatter	prehistoric	possibly eligible; Criterion d	conduct formal testing to evaluate NRHP and CRHR eligibility
P-33-024497 (CA-RIV-012129)	6034	rock feature with artifact scatter	prehistoric	recommended eligible; Criterion d/4	avoid, if feasible, or conduct data recovery
P-33-024511 (CA-RIV-012143)	7009	rock feature	prehistoric	possibly eligible; Criterion d/4	conduct formal testing to evaluate NRHP and CRHR eligibility

Key: CRHR= California Register of Historical Resources; NRHP = National Register of Historic Places; SRI = Statistical Research, Inc.

Possibly Eligible Sites

Nine prehistoric sites were identified as being possibly eligible for listing in the NRHP/CRHR because of overall site integrity and their potential for providing information that may help address the research questions presented in Chapter 3 of the original report (Lerch et al. 2016). As with the recommended eligible sites, these sites should be avoided to lessen adverse effects to these resources during construction of the DQSP; if avoidance is not feasible, then appropriate mitigative treatments should be implemented. For the four prehistoric rock-feature sites (SRI-3039, SRI-3237, SRI-4085, and SRI-7009) and five prehistoric rock-feature sites with artifact scatters (SRI-17, SRI-1059, SRI-3019, SRI-4241, and SRI-6033), testing and/or data recovery of the sites to confirm eligibility and to capture any information that may help address research questions is warranted.

Additional Testing of Rock-Feature Sites

Fire-affected rock features are one of the more common features within the direct APE as well as within the landscape in the vicinity of the project (Jordan and Tennyson 2011; Keller 2010). Many of the rock features associated with the sites within the direct APE appear deflated or scattered. Those with observable good integrity are indicated above as recommended eligible or possibly eligible for listing in the NRHP. Usually for sites recommended not eligible, no additional testing or mitigative treatments are recommended. However, many of these features are located in areas associated with the Orita and Rositas soil series, where there is a high potential for buried resources (see Lerch et al. 2016:110–118). Additional testing is recommended at a sample of these sites that cannot feasibly be avoided to confirm their scattered and surficial nature, as well as provide comparative information for the intact sites where testing and data recovery will occur.

Mule Tank Discontiguous Rock Art District Viewshed

Although located within the indirect APE and more than 1 mile from the direct APE, the Mule Tank Discontiguous Rock Art District (P-33-000504 and P-33-000773) is located at a higher elevation and looks out over the project area. P-33-000504 is the petroglyph locus within the district, and P-33-000773 is the geoglyph/intaglio component. These sites are listed in the NRHP and were recommended eligible, based on Criteria c and d. Therefore, any visual adverse effect the DQSP may have on the viewshed of the district must be addressed and mitigated. Using geographic information system data and aerial photography of the area, the viewshed of the district will be identified. If the DQSP area is found to create a visual adverse effect, mitigation of the adverse effect in the form of an intensive and detailed site record update involving recordation of the geoglyphs and petroglyphs within the district should occur.

Pilot Knob–Blythe and Blythe-Niland 161-kV Transmission Lines

Two transmission lines located within the indirect APE have been determined NRHP-eligible during previous projects and are also considered historical resources eligible for listing in the CRHR. These resources, the Pilot Knob–Blythe 161-kV transmission line (P-33-11110) and the Blythe–Niland 161-kV transmission line (P-33-012532/CA-RIV-7127H), are industrial, linear resources of more than 60 miles in length that parallel the southeastern boundary of the DQSP for approximately 2 miles. These sites are not located in the direct APE and thus will not be subject to direct adverse effects from the DQSP. Their locations adjacent to the DQSP and within the indirect APE require consideration of whether construction and operation of the DQSP will result in the introduction of visual, audible, or atmospheric elements that are out of character with the properties or that will alter their settings. Because both the existing resources and the proposed project represent components of energy-related industrial uses, the DQSP does not appear to represent an adverse effect to these resources, and no recommendations to mitigate impacts are made.

Buried-Site Sensitivity

The buried-site-sensitivity model (Lerch et al. 2016:Chapter 4) identified the Orita and Rositas soil series as having high potential for buried archaeological resources at depths of up to 150 cm or more below the ground surface (see Lerch et al. 2016:Figure 16, Table 19). These two soils cover a southwest–northeast swath through the central portion of the direct APE as well in the northern portion of the direct APE and along the gen-tie corridor. Smaller pockets of the soils are also located in the southern, eastern, and northeastern portion of the direct APE. Because of the sensitivity of these areas and the unknown nature of the subsurface deposits, test excavation and trenching is recommended to confirm the potential depths where buried resources may be present, especially along the gen-tie corridor and in the smaller pockets where fewer surface discoveries were made. Furthermore, although archaeological monitoring may be required for the entirety of the direct APE, earthmoving activities in areas associated with the Orita and Rositas soil series are particularly sensitive and should specifically be monitored.

Site Evaluations and National Register of Historic Places–/California Register of Historical Resources–Eligibility Recommendations

Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024804	CA-RIV-012294	SRI-2	historical period	artifact concentration	good/some	not eligible	
33-024678	CA-RIV-012209	SRI-3	historical period	artifact concentration	fair/some	not eligible	
33-024805	CA-RIV-012295	SRI-7	historical period	artifact concentration	fair/some	not eligible	
33-024810	CA-RIV-012300	SRI-9	historical period	artifact concentration	good/some	not eligible	
33-008133	CA-RIV-006043	SRI-16	prehistoric	lithic scatter	fair/some	not eligible	
33-024719	CA-RIV-012240	SRI-17	prehistoric	features with artifact concentration	good/all (some OHV tracks)	possibly eligible	Criterion d/4
33-024806	CA-RIV-012296	SRI-18	historical period	artifact concentration	good/some	not eligible	
33-024807	CA-RIV-012297	SRI-19	historical period	artifact concentration	fair/some	not eligible	
33-024808	CA-RIV-012298	SRI-21	historical period	artifact concentration	fair/some	not eligible	
33-024809	CA-RIV-012299	SRI-25	historical period	artifact concentration	fair/some	not eligible	
33-024270	CA-RIV-011924	SRI-26	historical period	artifact concentration	fair/some	not eligible	
33-024271	CA-RIV-011925	SRI-27	historical period	artifact concentration	fair/some	not eligible	
33-024272	CA-RIV-011926	SRI-29	prehistoric	rock features	good/all	not eligible	
33-024273	CA-RIV-011927	SRI-36	historical period	artifact concentration	good/some	not eligible	
33-024308	CA-RIV-011962	SRI-42	historical period	water well site	fair/some	not eligible	
33-024274	CA-RIV-011928	SRI-52	prehistoric	ceramic scatter	good/all	not eligible	
33-024275	CA-RIV-011929	SRI-58	prehistoric	rock features	good/all	not eligible	
33-024276	CA-RIV-011930	SRI-61	prehistoric	rock features	good/all	not eligible	
33-024277	CA-RIV-011931	SRI-63	historical period	artifact concentration	fair/some	not eligible	
33-024278	CA-RIV-011932	SRI-65	prehistoric	features with artifact concentration	good/all	not eligible	
33-024279	CA-RIV-011933	SRI-69	historical period	artifact concentration	fair/some	not eligible	
33-024280	CA-RIV-011934	SRI-71	multicomponent	artifact concentration	fair/some	not eligible	
33-024281	CA-RIV-011935	SRI-75	prehistoric	rock features	good/all	not eligible	
33-024282	CA-RIV-011936	SRI-81	historical period	artifact concentration	fair/some	not eligible	

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Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024283	CA-RIV-011937	SRI-83	prehistoric	features with artifact concentration	good/all (some OHV tracks)	recommended eligible	Criterion d/4
33-024284	CA-RIV-011938	SRI-96	historical period	road/trail	good/all	not eligible	
33-014147		SRI-101	historical period	military activity	fair/some	not eligible	
33-014199	CA-RIV-009098	SRI-107	historical period	road/trail	poor/none	not eligible	
33-000772	CA-RIV-000772T	SRI-110	prehistoric	trail	mostly good (partially obscured)	recommended eligible	Criterion d/4, possibly a/1 or b/2
33-024309	CA-RIV-011963	SRI-119	historical period	military activity	poor/none	not eligible	
33-024310	CA-RIV-011965	SRI-120	historical period	artifact concentration	good/some	not eligible	
33-024311	CA-RIV-011966	SRI-121	historical period	road/trail	fair/some	not eligible	
33-024312	CA-RIV-011967	SRI-122	historical period	road/trail	fair/some	not eligible	
33-024285	CA-RIV-011939	SRI-124	prehistoric	features with artifact concentration	fair/some	not eligible	
33-024286	CA-RIV-011940	SRI-125	historical period	artifact concentration	good/some	not eligible	
33-019618	CA-RIV-009935	SRI-127	multicomponent	artifact concentration/ lithic scatter	good/all (some OHV tracks and modern refuse)	recommended eligible	Criterion d/4
33-024287	CA-RIV-011941	SRI-129	historical period	road/trail	good/all	not eligible	
33-024288	CA-RIV-011942	SRI-132	historical period	artifact concentration	good/some	not eligible	
33-024289	CA-RIV-011943	SRI-133	prehistoric	features with artifact concentration	good/all	not eligible	
33-024290	CA-RIV-011944	SRI-134	prehistoric	features with artifact concentration	good/all	not eligible	
33-024291	CA-RIV-011945	SRI-137	historical period	artifact concentration	fair/some	not eligible	
33-024292	CA-RIV-011946	SRI-138	historical period	artifact concentration	fair/some	not eligible	
33-019739	CA-RIV-010053	SRI-139	prehistoric	lithic scatter	fair/some	not eligible	
33-018916	CA-RIV-010078	SRI-140	historical period	artifact concentration	poor/none	not eligible	
33-018853	CA-RIV-009649	SRI-146	historical period	artifact concentration	fair/some	not eligible	
33-024293	CA-RIV-011947	SRI-147	historical period	artifact concentration	good/some	not eligible	

Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024294	CA-RIV-011948	SRI-1001	historical period	artifact concentration	good/some	not eligible	
33-024295	CA-RIV-011949	SRI-1009	historical period	artifact concentration	good/some	not eligible	
33-021132	CA-RIV-010964	SRI-1010	historical period	artifact concentration	good/some	not eligible	
33-024296	CA-RIV-011950	SRI-1011	historical period	artifact concentration	fair/some	not eligible	
33-024297	CA-RIV-011951	SRI-1014	prehistoric	features with artifact concentration	good/all	not eligible	
33-024298	CA-RIV-011952	SRI-1021	historical period	artifact concentration	poor/none	not eligible	
33-024299	CA-RIV-011953	SRI-1024	historical period	artifact concentration	good/some	not eligible	
33-024300	CA-RIV-011954	SRI-1025	prehistoric	rock features	poor/none	not eligible	
33-024301	CA-RIV-011955	SRI-1035	historical period	artifact concentration	good/some	not eligible	
33-024302	CA-RIV-011956	SRI-1037	historical period	artifact concentration	good/some	not eligible	
33-024303	CA-RIV-011957	SRI-1043	prehistoric	rock features	good/all	not eligible	
33-024304	CA-RIV-011958	SRI-1049	historical period	artifact concentration	fair/some	not eligible	
33-024305	CA-RIV-011959	SRI-1053	prehistoric	features with artifact concentration	good/all	not eligible	
33-024306	CA-RIV-011960	SRI-1056	historical period	artifact concentration	good/some	not eligible	
33-024307	CA-RIV-011961	SRI-1058	prehistoric	features with artifact concentration	good/all	not eligible	
33-024356	CA-RIV-011990	SRI-1059	prehistoric	features with artifact concentration	fair/some (OHV and military activity, deflated features)	possibly eligible	Criterion d/4
33-024357	CA-RIV-011991	SRI-1061	prehistoric	ceramic scatter	good/all	not eligible	
33-017328		SRI-1068	historical period	road/trail	mostly good (partially obscured)	not eligible	
33-024358	CA-RIV-011992	SRI-1070	historical period	artifact concentration	good/some	not eligible	
33-014198		SRI-1073	historical period	artifact concentration	fair/some	not eligible	
33-024313	CA-RIV-011968	SRI-1076	historical period	artifact concentration	fair/some	not eligible	
33-024314	CA-RIV-011969	SRI-2001	historical period	artifact concentration	fair/some	not eligible	
33-024315	CA-RIV-011970	SRI-2007	historical period	artifact concentration	fair/some	not eligible	

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Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024316	CA-RIV-011971	SRI-2008	historical period	artifact concentration	fair/some	not eligible	
33-024317	CA-RIV-011972	SRI-2009	historical period	artifact concentration	fair/some	not eligible	
33-024359	CA-RIV-011993	SRI-2014	historical period	artifact concentration	fair/some	not eligible	
33-024360	CA-RIV-011994	SRI-2017	historical period	artifact concentration	good/some	not eligible	
33-024361	CA-RIV-011995	SRI-2021	prehistoric	features with artifact concentration	good/all (some OHV tracks)	recommended eligible	Criterion d/4
33-024362	CA-RIV-011996	SRI-2023	historical period	artifact concentration	good/some	not eligible	
33-024363	CA-RIV-011997	SRI-2029	historical period	artifact concentration	fair/some	not eligible	
33-024318	CA-RIV-011973	SRI-2030	historical period	artifact concentration	good/some	not eligible	
33-024319	CA-RIV-011974	SRI-2034	prehistoric	rock features	good/all	not eligible	
33-024364	CA-RIV-011998	SRI-2035	historical period	artifact concentration	fair/some	not eligible	
33-024365	CA-RIV-011999	SRI-2042	prehistoric	lithic scatter	good/all	not eligible	
33-024366	CA-RIV-012000	SRI-2051	historical period	road/trail	fair/some	not eligible	
33-024320	CA-RIV-011975	SRI-2066	historical period	artifact concentration	good/some	not eligible	
33-024367	CA-RIV-012001	SRI-2067	historical period	artifact concentration	good/some	not eligible	
33-024368	CA-RIV-012002	SRI-2068	multicomponent	artifact concentration/ ceramic scatter	fair/some	not eligible	
33-024321	CA-RIV-011976	SRI-2082	historical period	artifact concentration	good/some	not eligible	
33-024322	CA-RIV-011977	SRI-2088	historical period	artifact concentration	fair/some	not eligible	
33-024323	CA-RIV-011978	SRI-2094	historical period	artifact concentration	good/some	not eligible	
33-024324	CA-RIV-011979	SRI-2098	historical period	artifact concentration	good/some	not eligible	
33-024325	CA-RIV-011980	SRI-2100	historical period	artifact concentration	good/some	not eligible	
33-019740	CA-RIV-010054H	SRI-2113	historical period	artifact concentration	good/some	not eligible	
33-024369	CA-RIV-012003	SRI-2128	historical period	artifact concentration	good/some	not eligible	
33-024370	CA-RIV-012004	SRI-2135	historical period	military activity	good/all	not eligible	
33-024371	CA-RIV-012005	SRI-2136	prehistoric	ceramic scatter	good/all	not eligible	

Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024372	CA-RIV-012006	SRI-2329	prehistoric	features with artifact concentration	poor/none	not eligible	
33-024355	CA-RIV-011989	SRI-2333	historical period	road/trail	good/all	not eligible	
33-021264	CA-RIV-011057	SRI-2322	historical period	military activity	fair/some	not eligible	
33-024373	CA-RIV-012007	SRI-2582	historical period	artifact concentration	good/some	not eligible	
33-018675	CA-RIV-010077	SRI-2668	historical period	artifact concentration	fair/some	not eligible	
33-024326	CA-RIV-011981	SRI-3007	historical period	artifact concentration	fair/some	not eligible	
33-024327	CA-RIV-011982	SRI-3010	historical period	artifact concentration	fair/some	not eligible	
33-024374	CA-RIV-012008	SRI-3014	historical period	artifact concentration	good/some	not eligible	
33-024375	CA-RIV-012009	SRI-3015	multicomponent	artifact concentration	poor/none	not eligible	
33-024376	CA-RIV-012010	SRI-3017	prehistoric	rock features	good/all	not eligible	
33-024377	CA-RIV-012011	SRI-3019	prehistoric	features with artifact concentration	good/all (OHV activity, deflated features)	possibly eligible	Criterion d/4
33-024378	CA-RIV-012012	SRI-3020	historical period	artifact concentration	fair/some	not eligible	
33-024379	CA-RIV-012013	SRI-3022	prehistoric	rock features	good/all	not eligible	
33-024380	CA-RIV-012014	SRI-3027	historical period	artifact concentration	good/some	not eligible	
33-024381	CA-RIV-012015	SRI-3029	historical period	artifact concentration	good/some	not eligible	
33-024382	CA-RIV-012016	SRI-3031	historical period	artifact concentration	good/some	not eligible	
33-024383	CA-RIV-012017	SRI-3037	historical period	artifact concentration	good/some	not eligible	
33-024384	CA-RIV-012018	SRI-3038	historical period	artifact concentration	good/some	not eligible	
33-024385	CA-RIV-012019	SRI-3039	prehistoric	rock features	good/all (no disturbances)	possibly eligible	Criterion d/4
33-024386	CA-RIV-012020	SRI-3040	prehistoric	features with artifact concentration	good/all	not eligible	
33-024387	CA-RIV-012021	SRI-3041	prehistoric	features with artifact concentration	good/all	not eligible	
33-024388	CA-RIV-012022	SRI-3042	prehistoric	features with artifact concentration	good/all	not eligible	

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Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024389	CA-RIV-012023	SRI-3045	prehistoric	rock features	good/all	not eligible	
33-024390	CA-RIV-012024	SRI-3047	prehistoric	rock features	good/all	not eligible	
33-024423	CA-RIV-012055	SRI-3054	historical period	military activity	good/all	not eligible	
33-024424	CA-RIV-012056	SRI-3057	prehistoric	lithic scatter	good/all	not eligible	
33-024425	CA-RIV-012057	SRI-3059	prehistoric	ceramic scatter	good/all	not eligible	
33-024426	CA-RIV-012058	SRI-3078	historical period	artifact concentration	fair/some	not eligible	
33-024349	CA-RIV-011983	SRI-3101	prehistoric	features with artifact concentration	good/all	not eligible	
33-024350	CA-RIV-011984	SRI-3103	historical period	artifact concentration	fair/some	not eligible	
33-024351	CA-RIV-011985	SRI-3108	historical period	artifact concentration	good/some	not eligible	
33-024352	CA-RIV-011986	SRI-3115	historical period	artifact concentration	good/some	not eligible	
33-024353	CA-RIV-011987	SRI-3116	historical period	artifact concentration	fair/some	not eligible	
33-024354	CA-RIV-011988	SRI-3117	historical period	artifact concentration	fair/some	not eligible	
33-024427	CA-RIV-012059	SRI-3119	historical period	artifact concentration	fair/some	not eligible	
33-024428	CA-RIV-012060	SRI-3123	historical period	artifact concentration	fair/some	not eligible	
33-024429	CA-RIV-012061	SRI-3124	historical period	artifact concentration	fair/some	not eligible	
33-024430	CA-RIV-012062	SRI-3127	historical period	artifact concentration	fair/some	not eligible	
33-024431	CA-RIV-012063	SRI-3135	prehistoric	lithic scatter	fair/some	not eligible	
33-024432	CA-RIV-012064	SRI-3147	prehistoric	lithic scatter	fair/some	not eligible	
33-002795	CA-RIV-002795	SRI-3149	prehistoric	lithic scatter	good/all	not eligible	
33-024433	CA-RIV-012065	SRI-3155	historical period	artifact concentration	fair/some	not eligible	
33-024434	CA-RIV-012066	SRI-3156	historical period	artifact concentration	good/some	not eligible	
33-024435	CA-RIV-012067	SRI-3158	historical period	artifact concentration	good/some	not eligible	
33-024391	CA-RIV-012025	SRI-3175	prehistoric	rock features	good/all	not eligible	
33-024436	CA-RIV-012068	SRI-3186	prehistoric	ceramic scatter	poor/none	not eligible	
33-024437	CA-RIV-012069	SRI-3205	prehistoric	rock features	poor/none	not eligible	
33-024392	CA-RIV-012026	SRI-3211	prehistoric	rock features	good/all	not eligible	

Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024438	CA-RIV-012070	SRI-3224	prehistoric	rock features	good/all	not eligible	
33-024439	CA-RIV-012071	SRI-3228	prehistoric	ceramic scatter	good/all	not eligible	
33-024393	CA-RIV-012027	SRI-3237	prehistoric	artifact concentration	good/all (no disturbances)	possibly eligible	Criterion d/4
33-024394	CA-RIV-012028	SRI-3255	prehistoric	trail	mostly good (partially obscured)	recommended eligible	Criterion d/4, possibly a/1 or b/2
33-024395	CA-RIV-012029	SRI-3256	historical period	artifact concentration	good/some	not eligible	
33-024396	CA-RIV-012030	SRI-3260	multicomponent	artifact concentration/ ceramic scatter	good/all	not eligible	
33-013660		SRI-3273	prehistoric	features with artifact concentration	good/all	not eligible	
33-024440	CA-RIV-012072	SRI-3306	prehistoric	lithic scatter	good/all	not eligible	
33-024441	CA-RIV-012073	SRI-3331	prehistoric	rock features	good/all	not eligible	
33-014151		SRI-3408	prehistoric	ceramic scatter	good/all	not eligible	
33-024442	CA-RIV-012074	SRI-3487	prehistoric	rock features	fair/some	not eligible	
33-024397	CA-RIV-012031	SRI-4004	historical period	artifact concentration	good/some	not eligible	
33-024398	CA-RIV-012032	SRI-4005	historical period	artifact concentration	fair/some	not eligible	
33-024443	CA-RIV-012075	SRI-4014	prehistoric	rock features	good/all	not eligible	
33-024444	CA-RIV-012076	SRI-4016	prehistoric	features with artifact concentration	good/all	not eligible	
33-024445	CA-RIV-012077	SRI-4017	multicomponent	artifact concentration/ rock features	good/all	not eligible	
33-024446	CA-RIV-012078	SRI-4019	historical period	artifact concentration	fair/some	not eligible	
33-024447	CA-RIV-012079	SRI-4024	prehistoric	lithic scatter	good/all	not eligible	
33-024448	CA-RIV-012080	SRI-4028	historical period	artifact concentration	good/some	not eligible	
33-024449	CA-RIV-012081	SRI-4034	historical period	artifact concentration	good/some	not eligible	
33-024450	CA-RIV-012082	SRI-4041	historical period	artifact concentration	good/some	not eligible	
33-024399	CA-RIV-012033	SRI-4045	historical period	artifact concentration	good/some	not eligible	

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Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024451	CA-RIV-012083	SRI-4054	prehistoric	rock features	good/all	not eligible	
33-024452	CA-RIV-012084	SRI-4056	prehistoric	features with artifact concentration	fair/some	not eligible	
33-024453	CA-RIV-012085	SRI-4060	multicomponent	artifact concentration/ lithic scatter	good/all	not eligible	
33-024454	CA-RIV-012086	SRI-4063	prehistoric	rock features	good/all	not eligible	
33-024455	CA-RIV-012087	SRI-4078	prehistoric	ceramic scatter	fair/some	not eligible	
33-024456	CA-RIV-012088	SRI-4079	prehistoric	rock features	fair/some	not eligible	
33-024457	CA-RIV-012089	SRI-4080	historical period	artifact concentration	fair/some	not eligible	
33-024458	CA-RIV-012090	SRI-4084	prehistoric	features with artifact concentration	fair/some	not eligible	
33-024459	CA-RIV-012091	SRI-4085	prehistoric	rock features	fair/some (OHV activity, deflated features)	possibly eligible	Criterion d/4
33-024460	CA-RIV-012092	SRI-4098	historical period	artifact concentration	fair/some	not eligible	
33-024400	CA-RIV-012034	SRI-4116	historical period	artifact concentration	good/some	not eligible	
33-024401	CA-RIV-012035	SRI-4127	historical period	artifact concentration	fair/some	not eligible	
33-024402	CA-RIV-012036	SRI-4145	historical period	artifact concentration	fair/some	not eligible	
33-024403	CA-RIV-012037	SRI-4151	historical period	artifact concentration	fair/some	not eligible	
33-024404	CA-RIV-012038	SRI-4160	historical period	artifact concentration	fair/some	not eligible	
33-024405	CA-RIV-012039	SRI-4162	historical period	military activity	poor/none	not eligible	
33-024406	CA-RIV-012040	SRI-4167	historical period	artifact concentration	fair/some	not eligible	
33-019735	CA-RIV-010049	SRI-4172	prehistoric	lithic scatter	good/all	not eligible	
33-019734	CA-RIV-010048/H	SRI-4173	historical period	artifact concentration/ lithic scatter	fair/some	not eligible	
33-024461	CA-RIV-012093	SRI-4175	historical period	artifact concentration	fair/some	not eligible	
33-024462	CA-RIV-012094	SRI-4178	historical period	artifact concentration	fair/some	not eligible	
33-024463	CA-RIV-012095	SRI-4180	historical period	military activity	good/all	not eligible	
33-024464	CA-RIV-012096	SRI-4182	historical period	artifact concentration	good/some	not eligible	

Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024465	CA-RIV-012097	SRI-4185	historical period	artifact concentration	fair/some	not eligible	
33-024466	CA-RIV-012098	SRI-4186	historical period	artifact concentration	fair/some	not eligible	
33-024467	CA-RIV-012099	SRI-4191	historical period	artifact concentration	good/some	not eligible	
33-024468	CA-RIV-012100	SRI-4196	historical period	artifact concentration	poor/none	not eligible	
33-019741	CA-RIV-010055H	SRI-4203	historical period	artifact concentration	good/all	not eligible	
33-019733	CA-RIV-010047	SRI-4207	prehistoric	lithic scatter	poor/none	not eligible	
33-024469	CA-RIV-012101	SRI-4208	historical period	artifact concentration	good/some	not eligible	
33-019742	CA-RIV-010056H	SRI-4209	historical period	artifact concentration	fair/some	not eligible	
33-019736	CA-RIV-010050H	SRI-4211	historical period	artifact concentration	fair/some	not eligible	
33-024470	CA-RIV-012102	SRI-4217	historical period	artifact concentration	fair/some	not eligible	
33-024471	CA-RIV-012103	SRI-4222	historical period	artifact concentration	fair/some	not eligible	
33-024472	CA-RIV-012104	SRI-4229	historical period	artifact concentration	fair/some	not eligible	
33-024473	CA-RIV-012105	SRI-4231	historical period	artifact concentration	fair/some	not eligible	
33-024474	CA-RIV-012106	SRI-4235	historical period	artifact concentration	fair/some	not eligible	
33-024475	CA-RIV-012107	SRI-4236	historical period	artifact concentration	good/some	not eligible	
33-024476	CA-RIV-012108	SRI-4241	prehistoric	features with artifact concentration	good/all (no disturbances)	possibly eligible	Criterion d/4
33-024477	CA-RIV-012109	SRI-4242	historical period	artifact concentration	fair/some	not eligible	
33-024478	CA-RIV-012110	SRI-4248	historical period	artifact concentration	poor/none	not eligible	
33-024479	CA-RIV-012111	SRI-4250	historical period	artifact concentration	good/some	not eligible	
33-024407	CA-RIV-012041	SRI-5000	historical period	artifact concentration	fair/some	not eligible	
33-024408	CA-RIV-012042	SRI-5003	historical period	artifact concentration	good/some	not eligible	
33-024409	CA-RIV-012043	SRI-5006	historical period	artifact concentration	fair/some	not eligible	
33-024410	CA-RIV-012044	SRI-5008	historical period	artifact concentration	fair/some	not eligible	
33-024480	CA-RIV-012112	SRI-5029	historical period	artifact concentration	good/some	not eligible	
33-024481	CA-RIV-012113	SRI-5034	prehistoric	rock features	good/all	not eligible	

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Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024482	CA-RIV-012114	SRI-5035	historical period	artifact concentration	fair/some	not eligible	
33-024483	CA-RIV-012115	SRI-5054	prehistoric	rock features	good/all	not eligible	
33-024411	CA-RIV-012045	SRI-5063	historical period	survey marker	good/all	not eligible	
33-024412	CA-RIV-012046	SRI-5067	prehistoric	features with artifact concentration	good/all	not eligible	
33-024413	CA-RIV-012047	SRI-5070	historical period	artifact concentration	good/some	not eligible	
33-024414	CA-RIV-012048	SRI-5073	historical period	artifact concentration	good/some	not eligible	
33-024415	CA-RIV-012049	SRI-5076	historical period	artifact concentration	good/some	not eligible	
33-024484	CA-RIV-012116	SRI-5083	historical period	artifact concentration	fair/some	not eligible	
33-024485	CA-RIV-012117	SRI-5087	historical period	artifact concentration	good/some	not eligible	
33-024486	CA-RIV-012118	SRI-5099	historical period	artifact concentration	good/some	not eligible	
33-024487	CA-RIV-012119	SRI-5106	multicomponent	artifact concentration	fair/some	not eligible	
33-018852	CA-RIV-009648	SRI-5108	historical period	artifact concentration	fair/some	not eligible	
33-019021	CA-RIV-009810	SRI-5109	prehistoric	lithic scatter	good/all	not eligible	
33-019743	CA-RIV-010057H	SRI-5122	historical period	artifact concentration	good/some	not eligible	
33-024488	CA-RIV-012120	SRI-5132	historical period	artifact concentration	fair/some	not eligible	
33-024489	CA-RIV-012121	SRI-5135	historical period	artifact concentration	fair/some	not eligible	
33-024416	CA-RIV-012050	SRI-6003	historical period	artifact concentration	good/some	not eligible	
33-024417	CA-RIV-012051	SRI-6005	historical period	artifact concentration	fair/some	not eligible	
33-024490	CA-RIV-012122	SRI-6011	historical period	artifact concentration	good/some	not eligible	
33-024491	CA-RIV-012123	SRI-6017	historical period	artifact concentration	good/some	not eligible	
33-024492	CA-RIV-012124	SRI-6018	historical period	artifact concentration	fair/some	not eligible	
33-024493	CA-RIV-012125	SRI-6021	historical period	artifact concentration	good/some	not eligible	
33-024494	CA-RIV-012126	SRI-6022	historical period	artifact concentration	good/some	not eligible	
33-024495	CA-RIV-012127	SRI-6023	prehistoric	features with artifact concentration	good/all	not eligible	
33-008134	CA-RIV-006044	SRI-6025	prehistoric	ceramic scatter	good/all	not eligible	

Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024496	CA-RIV-012128	SRI-6033	multicomponent	features with artifact concentration	good/all (no disturbances)	possibly eligible	Criterion d/4
33-024497	CA-RIV-012129	SRI-6034	prehistoric	features with artifact concentration	good/all (no disturbances)	recommended eligible	Criterion d/4
33-024498	CA-RIV-012130	SRI-6046	historical period	artifact concentration	fair/some	not eligible	
33-024418	CA-RIV-012052	SRI-6053	historical period	artifact concentration	good/some	not eligible	
33-024499	CA-RIV-012131	SRI-6059	historical period	artifact concentration	good/some	not eligible	
33-024419	CA-RIV-012053	SRI-6075	historical period	artifact concentration	good/some	not eligible	
33-024500	CA-RIV-012132	SRI-6081	historical period	artifact concentration	fair/some	not eligible	
33-024501	CA-RIV-012133	SRI-6087	historical period	artifact concentration	good/some	not eligible	
33-024502	CA-RIV-012134	SRI-6096	historical period	artifact concentration	fair/some	not eligible	
33-024503	CA-RIV-012135	SRI-6100	multicomponent	artifact concentration	fair/some	not eligible	
33-024504	CA-RIV-012136	SRI-6104	historical period	artifact concentration	fair/some	not eligible	
33-024505	CA-RIV-012137	SRI-6114	historical period	artifact concentration	good/some	not eligible	
33-024506	CA-RIV-012138	SRI-6115	historical period	artifact concentration	fair/some	not eligible	
33-024507	CA-RIV-012139	SRI-6119	historical period	artifact concentration	poor/none	not eligible	
33-024508	CA-RIV-012140	SRI-6471	prehistoric	rock features	good/all	not eligible	
33-024509	CA-RIV-012141	SRI-6491	multicomponent	lithic scatter	fair/some	not eligible	
33-017317	CA-RIV-009007	SRI-6519	prehistoric	lithic scatter	fair/some	not eligible	
33-002796	CA-RIV-002796	SRI-6523	prehistoric	lithic scatter	good/all	not eligible	
33-024510	CA-RIV-012142	SRI-7008	prehistoric	features with artifact concentration	good/all	not eligible	
33-024511	CA-RIV-012143	SRI-7009	prehistoric	rock features	good/all (no disturbances)	possibly eligible	Criterion d/4
33-024512	CA-RIV-012144	SRI-7010	prehistoric	features with artifact concentration	good/all	not eligible	
33-024513	CA-RIV-012145	SRI-7018	historical period	artifact concentration	fair/some	not eligible	
33-024514	CA-RIV-012146	SRI-7019	prehistoric	lithic scatter	good/all	not eligible	

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Primary Site No. (P-)	State Site Trinomial	Field Site No.	Age	Site Type	Condition/Integrity[a] (Comments)	NRHP-/ CRHR-Eligibility Status	NRHP-/ CRHR-Eligibility Criterion/Criteria
33-024515	CA-RIV-012147	SRI-7020	historical period	artifact concentration	good/some	not eligible	
33-024420	CA-RIV-012054	SRI-7024	historical period	artifact concentration	good/some	not eligible	
33-024516	CA-RIV-012148	SRI-7029	prehistoric	rock features	fair/some	not eligible	
33-024517	CA-RIV-012149	SRI-7031	prehistoric	features with artifact concentration	fair/some	not eligible	
33-024518	CA-RIV-012150	SRI-7040	multicomponent	rock features	good/all	not eligible	
33-024519	CA-RIV-012151	SRI-7060	historical period	artifact concentration	poor/none	not eligible	
33-024520	CA-RIV-012152	SRI-7065	historical period	artifact concentration	good/some	not eligible	
33-024521	CA-RIV-012153	SRI-7066	prehistoric	features with artifact concentration	good/all	not eligible	
33-024522	CA-RIV-012154	SRI-7072	historical period	artifact concentration	fair/some	not eligible	
33-024523	CA-RIV-012155	SRI-7074	historical period	artifact concentration	fair/some	not eligible	
33-024524	CA-RIV-012156	SRI-7076	historical period	military activity	fair/some	not eligible	
33-024525	CA-RIV-012157	SRI-7087	historical period	military activity	fair/some	not eligible	
33-001821	CA-RIV-001821	SRI-8020	prehistoric	features with artifact concentration	good/all (OHV activity, deflated features)	recommended eligible	Criterion d/4, possibly a/1 or b/2
33-024526	CA-RIV-012158	SRI-8085	historical period	survey marker	fair/some	not eligible	
33-000343	CA-RIV-000343T	SRI-9003	prehistoric	trail	mostly good (partially obscured)	recommended eligible	Criterion d/4, possibly a/1 or b/2
33-014173	CA-RIV-009097	SRI-9013	historical period	road	fair/some	not eligible	
33-024818	CA-RIV-012307	SRI-9016	historical period	water well site	good/all	not eligible	
33-024813	CA-RIV-012303	SRI-9018	historical period	water well site	good/all	not eligible	
33-024817	CA-RIV-012306	SRI-9020	historical period	road	good/all	not eligible	
33-024421		various	historical period	isolates (Ripley 7.5-minute quadrangle)	poor/none	not eligible	
33-024527		various	historical period	isolate (Roosevelt Mine 7.5-minute quadrangle)	poor/none	not eligible	
33-024422		various	prehistoric	isolates (Ripley 7.5-minute quadrangle)	poor/none	not eligible	

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33-024528		various	prehistoric	isolates (Roosevelt Mine 7.5-minute quadrangle)	poor/none	not eligible	
33-019390		IO-7088	prehistoric	isolate	poor/none	not eligible	

[a] Condition = good, fair, or poor; integrity = all, some, or none of the integrity aspects of location, design, setting, materials, workmanship, feeling and association.
Key: CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places; OHV = off-highway vehicle.

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Technical Report 15-36B
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Riverside, CA 92501

Technical Report 15-36B
Statistical Research, Inc.
Redlands, California

April 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
Æ	Applied EarthWorks, Inc.
AMS	accelerator mass spectrometry
AMSL	above mean sea level
APE	area of potential effects
Beta	Beta Analytic, Inc.
BLM	Bureau of Land Management
CCR	*California Code of Regulations*
CEQA	California Environmental Quality Act
CFR	*Code of Federal Regulations*
CHRIS	California Historical Resources Information System
cmbs	centimeter(s) below surface
County	County of Riverside
CRHR	California Register of Historical Resources
CRIT	Colorado River Indian Tribes
CRSS	Colorado River Substation
CUP	Conditional Use Permit
DPR	Department of Parks and Recreation
DPV	Devers–Palo Verde
DQSP	Desert Quartzite Solar Project
DTC/C-AMA	Desert Training Center/California-Arizona Maneuver Area
EIC	Eastern Information Center
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FAR	fire-affected rock
First Solar	First Solar Development, Inc.
gen-tie line	generator tie line
GLO	U.S. General Land Office
HPTP	Historic Properties Treatment Plan
KOP	key observation point
MLD	Most Likely Descendant
MMCDAD	Mule Mountains Complex Discontiguous Archaeological District
MOA	Memorandum of Agreement
MW	megawatt
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966, as amended
NRHP	National Register of Historic Places
PRC	*Public Resources Code*
PV	photovoltaic
ROW	right-of-way
SBBM	San Bernardino Baseline and Meridian
SDMoM	San Diego Museum of Man

SHPO	State Historic Preservation Officer
SRI	Statistical Research, Inc.
STU	shovel-test unit
TCP	Traditional Cultural Property/Place
TCR	Tribal Cultural Resource
THPO	Tribal Historic Preservation Office
U.S.C.	*U.S. Code*
USDI	U.S. Department of the Interior
USGS	U.S. Geological Survey

Project: Desert Quartzite Solar Project (U.S. Department of the Interior Bureau of Land Management [BLM] Project No. CACA 049397, Riverside County Conditional Use Permit 3721)

Applicant: Desert Quartzite, LLC, A Wholly Owned Subsidiary of First Solar Development, Inc.

Agency: BLM, Palm Springs–South Coast Field Office

Permits: BLM Permit for Archaeological Investigations CA-16-12, Fieldwork Authorization 66.66-18-15

Project Location:

USGS 7.5-Minute Quadrangle	Township/Range (BM)	Sections
Ripley, California	7 South/21 East (SBBM)	11–14, 23, and 24
Roosevelt Mine, California	7 South/21 East (SBBM)	3–6, 9–11, 14, 15, 22, and 23

Key: BM = baseline and meridian; SBBM = San Bernardino Baseline and Meridian; USGS = U.S. Geological Survey.

Dates of Fieldwork: October 13–December 11, 2014; February 3, 2015; and April 23–26, 2018

Acreage of Direct Area of Potential Effects (APE): 5,010 for the original survey, plus 24 added, for a total of 5,034

Total Acreage Surveyed: 5,010 by Statistical Research, Inc. (SRI); 24 by BLM staff

Total Acreage Surveyed on BLM Land: 4,850; **Private Land:** 160

Acreage of Indirect APE: 18,060, less the 24 added to the direct APE, for a total of 18,036

Results: In total, 278 sites were recorded by SRI within the direct APE: 181 historical-period sites, 88 prehistoric sites, and 9 multicomponent sites. In addition, 620 isolated artifacts were recorded by SRI. To these totals were added 3 historical-period sites and 1 isolate located immediately adjacent to the direct APE by the BLM and evaluated in the draft Environmental Impact Statement/Environmental Impact Report, along with 8 other sites within the indirect APE that have been previously listed or determined eligible for listing in the National Register of Historic Places (NRHP) or that share characteristics with eligible sites, for a total of 289 sites currently evaluated for eligibility (see revised Appendix A).

Summary of Recommended Eligibility for Listing in the NRHP and the California Register of Historical Resources (CRHR): In total, 20 prehistoric sites or site components and 2 historical-period transmission lines are listed, have been previously determined eligible for listing, or are recommended eligible for listing in the NRHP. Eight of the prehistoric sites or site components are also recommended eligible as contributing resources to the Mule Mountains Complex Discontiguous Archaeological District (MMCDAD). The remaining 83 prehistoric sites or site components, the remaining 194 historical-period sites or site components, and all 621 of the isolated resources are recommended not eligible for listing in the NRHP.

Each of the sites recommended eligible for listing in the NRHP is also recommended eligible for listing in the CRHR. None of the sites evaluated is recommended as a unique archaeological site as defined by the

California Environmental Quality Act (*Public Resources Code*, Section 21083.2). None of the sites recommended not eligible for listing in the NRHP appears to meet the criteria for listing in the CRHR. All of the sites recommended not eligible for listing in the NRHP are also recommended not eligible for listing in the CRHR.

Management Recommendations: All historic properties and historical resources will be avoided by the BLM's Preferred Alternative, Alternative 2, and no direct adverse effects to historic properties or historical resources have been identified. No measures are required to mitigate direct adverse effects. The Desert Quartzite Solar Project will cause indirect visual effects to listed and eligible resources in the Mule Mountains and will result in cumulative indirect effects to the cultural landscape defined by the MMCDAD, as well as to ineligible and isolated resources. Measures to resolve these effects will be included in a Memorandum of Agreement (MOA) that will include a Historic Properties Treatment Plan and a Monitoring and Discovery Plan to address potential unanticipated discoveries that could occur during the course of project construction and operation. The MOA will be prepared by the BLM in consultation with interested tribes and will be submitted to the State Historic Preservation Officer for review and concurrence. Completion of the MOA will conclude the BLM's compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

ACKNOWLEDGMENTS

Many people contributed to the work reported in this addendum, which updates the information contained in the original 2016 archaeological survey report for the Desert Quartzite Solar Project (DQSP) to include all relevant information from subsequent studies related to the DQSP, as well as other nearby projects, to reach final recommendations regarding the potential effects of the proposed project on historic properties and historical resources.

We thank the First Solar Development, Inc., project development team for all of their support and assistance. Manager of Siting and Permitting Louis DeRosa served as overall project manager; Director of Government and Public Affairs Laura Abram facilitated tribal outreach; Project Development Lead Robert Holbrook provided technical information on project design; and Jill Yung, outside counsel, advised us on legal aspects of historic preservation.

At the Bureau of Land Management (BLM), George Kline, Palm Springs Field Office archaeologist, guided us through BLM processes and policy, as well as providing comparative data from other current projects; Brandon Anderson, Palm Springs Field Office project manager, kept us apprised of scheduling needs; Tiffany Arend, California Desert District archaeologist, provided information on eligible National Register of Historic Places districts and other compliance issues; and Tony Overly, BLM state archaeologist, advised us regarding various management options available for consideration.

We especially appreciate the comments and advice provided throughout the course of project review by tribal representatives. Among those who joined us for information meetings and field visits were Pattie Garcia-Plotkin of the Agua Caliente Band of Cahuilla Indians; Bryan Etsitty, Rena Van Fleet, and Nick Zeyouma of the Colorado River Indian Tribes (CRIT) Tribal Historic Preservation Office; Rebecca Loudbear and Toni Flora of the CRIT Attorney General's Office; Joe Ontiveros of the Soboba Band of Luiseño Indians; and Sarah Bliss of the Twenty-Nine Palms Band of Mission Indians. Others who reviewed our work and provided comments to the BLM included staff and tribal members of the Fort Mojave Indian Tribe and the Fort Yuma Quechan Tribe.

At Statistical Research, Inc. (SRI), the field staff for the limited testing of thermal features were Heather Miljour, project director, and Garnett Smith, crew chief. James Clark, SRI Redlands office director, arranged for all scheduling and logistics for staffing and laboratory analysis. Patrick Stanton served as the field director for the original survey, led several subsequent site visits, and provided ongoing project support and guidance, data review, and site-record updates. Scott Kremkau prepared the original research design and advised us on various matters during the course of the project. Steve Norris, assistant director of the Cartography and Geospatial Technologies Department, collected and analyzed geographic information systems data and prepared numerous iterations of project maps. Members of the Publications Department, led by director Maria Molina, assisted with the final-report preparation, including Beth Bishop and Jennifer Shopland, technical editors; Luke Wisner, graphic artist; and KeAndra Begay, who did the final layout and formatting. Katherine Balderrama in Accounts Receivable ably managed the budget and billing.

To all of the many people who assisted in the project, we extend our thanks.

Michael K. Lerch
April 3, 2019

CHAPTER 1

Introduction

Desert Quartzite, LLC, a wholly owned subsidiary of First Solar Development, Inc. (First Solar), is proposing to develop, construct, and operate a 450-megawatt (MW) power-generating solar photovoltaic (PV) facility in eastern Riverside County, California—the Desert Quartzite Solar Project (DQSP). At the request of First Solar, Statistical Research, Inc. (SRI), conducted a Class III archaeological survey of the project site to provide information to the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM) and the County of Riverside (County), to comply with federal and state environmental and historic-preservation laws and regulations. The BLM and the County have prepared a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the DQSP in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) (USDI BLM and County 2018).

The archaeological survey was reported in *Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California,* edited by Michael K. Lerch, Patrick B. Stanton, and Karen K. Swope (Lerch, Stanton, and Swope 2016). The purpose of the study was to identify and evaluate archaeological resources within the project's area of potential effects (APE) regarding their eligibility for listing in the National Register of Historic Places (NRHP). Of the total of 278 sites recorded in the direct APE (181 historical-period, 89 prehistoric, and 8 multicomponent sites), 7 prehistoric sites and 1 multicomponent site were recommended eligible for listing in the NRHP, and 9 additional prehistoric sites were considered possibly eligible, pending additional research and formal evaluation. The cultural resources in the project's direct APE were also evaluated for eligibility for listing in the California Register of Historical Resources (CRHR), in an addendum (Addendum 1) to the original report for the CEQA, which included a more-detailed review of potential effects of the DQSP on NRHP- and CRHR-eligible resources located within the indirect APE (Lerch 2017).

After the original archaeological survey had been completed, the electrical-generating capacity of the DQSP was increased to 450 MW, as a result of increases in PV-module efficiencies from the 300-MW capacity shown in the project's right-of-way (ROW) grant application (Standard Form 299), based on the Plan of Development filed on May 23, 2014 (Desert Quartzite, LLC 2014). The ROW-grant-application area also was increased where the generator-tie-line (gen-tie-line) corridor enters the Colorado River Substation (CRSS), adding approximately 24 acres to the APE (Skinner 2016).

The DQSP and its gen-tie-line corridor as they were configured during the archaeological survey reported by Lerch, Stanton, and Swope (2016) are depicted in Figure 1. Since then, as noted above, the western end of the gen-tie corridor has been enlarged slightly where it enters the CRSS; that additional area is shown in Figure 2.

Project Updates in Addendum 2

This second addendum to the original archaeological inventory report for the DQSP (Lerch, Stanton, and Swope 2016) includes the results of limited testing of three sites containing thermal features, to evaluate their NRHP/CRHR eligibility. These three sites were among those recommended in the original inventory

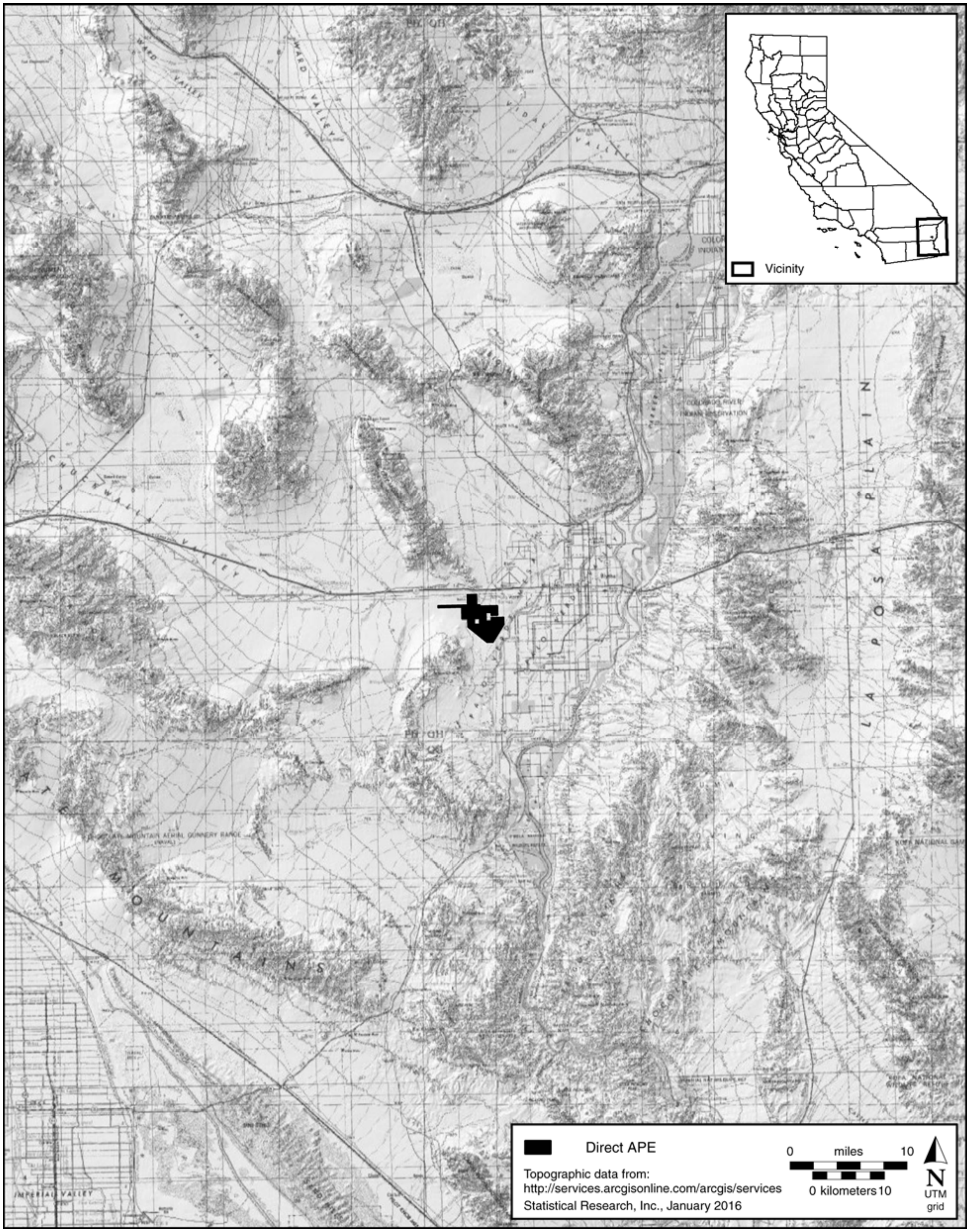

Figure 1. Vicinity map of the DQSP.

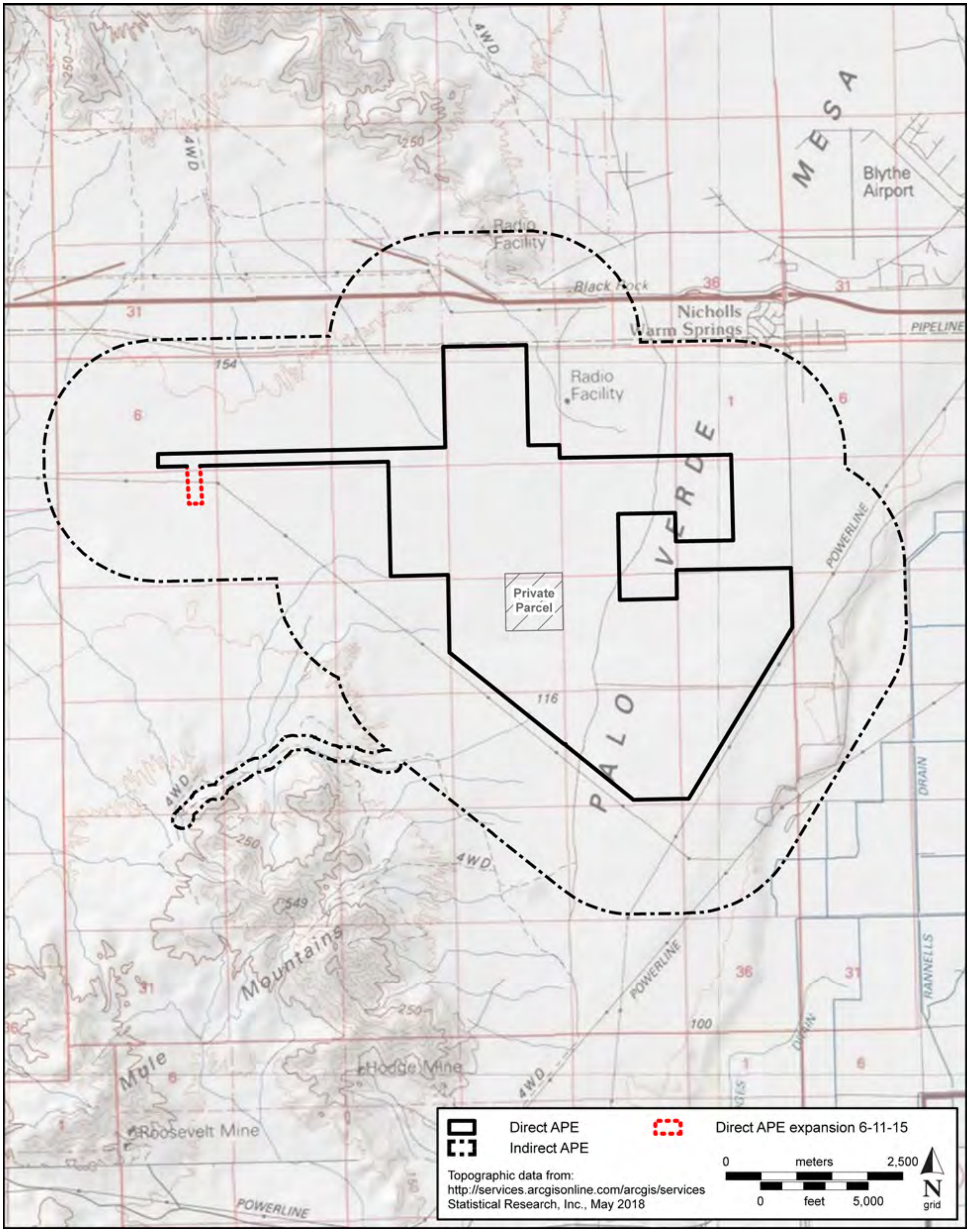

Figure 2. Project location map of the DQSP, showing the revised APE.

report as “possibly eligible” pending additional research and formal evaluation, primarily to determine whether they contained subsurface cultural deposits. This Addendum 2 also provides final recommendations of NRHP and CRHR eligibility for all sites located within or immediately adjacent to the direct APE and for sites within the indirect APE that are already listed or have been determined eligible for listing in the NRHP and CRHR and are thus subject to indirect effects.

To support the final recommendations for eligibility, we have also provided a review of ethnographic information pertaining to the Mule Mountains Complex, which contains two sites currently listed in the NRHP as a discontiguous district, to which we recommend adding seven additional sites as contributing resources, along with their individual eligibility. This second addendum is intended to support the BLM’s final determinations of eligibility and findings of effect for the DQSP, for review and concurrence by the State Historic Preservation Officer (SHPO), in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). The addendum will also provide current project information on cultural resources to interested tribes, for their review and use during consultation with the BLM regarding the DQSP.

At the end of this addendum are four appendixes. These include a table containing the final recommendations regarding the NRHP/CRHR eligibility of all sites within the direct APE and eligible sites within the indirect APE (Appendix A) and site records or updates (California Department of Parks and Recreation [DPR] 523–series forms) for three sites with tested thermal features (Appendix B), sites recommended for inclusion in the expanded Mule Mountains Complex Discontiguous Archaeological District (MMCDAD) (Appendix C), and other sites within the indirect APE that are recommended or have been previously determined eligible (Appendix D). Site and isolate records for all archaeological resources within the direct APE were included as Appendixes D and E of the original inventory report (Lerch, Stanton, and Swope 2016).

Project Location

The proposed project area is located 0.8 km (1/2 mile) south of Interstate 10 and the community of Mesa Verde and about 13 km (8 miles) west of the city of Blythe, in eastern Riverside County, California (see Figure 1). The DQSP area is located in Sections 11–14, 23, and 24 of Township 7 South, Range 21 East (San Bernardino Baseline and Meridian [SBBM]), on the Ripley, California, 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle and in Sections 3–6, 9–11, 14, 15, 22, and 23 of Township 7 South, Range 21 East (SBBM), on the Roosevelt Mine, California, 7.5-minute USGS topographic quadrangle (see Figure 2).

The project site is located on Palo Verde Mesa, in the Colorado Desert, with the McCoy Mountains to the north, the Mule Mountains to the southwest, Chuckwalla Valley to the west, and Palo Verde Valley and the Colorado River to the east. Elevations in the relatively flat project area range from approximately 330 feet (100 m) above mean sea level (AMSL) in the south to 475 feet (145 m) AMSL in the north. No sources of fresh surface water are located on Palo Verde Mesa, although ephemeral washes drain the mountains to the north and southwest. The closest perennial water is the Colorado River, approximately 10 miles east of the eastern edge of the project area. Mule Tank, a tinaja that holds freshwater for varying periods of time following rain events, is located approximately 3 miles to the west of the project area.

The DQSP area is bounded on the southwest and southeast by existing electrical transmission lines and access roads, including the Devers–Palo Verde Transmission Lines No. 1 and 2. An existing 7.5-MW solar PV project, the NRG Blythe Solar Power Plant, is located on 200 acres adjacent to the northern boundary of the DQSP site. A portion of the Blythe Mesa Solar Project, a 485-MW, 3,660-acre PV project approved by the County in 2014 and by the BLM in 2015, is located on a keyhole-shaped parcel of land that is surrounded on three sides (the north, west, and south) by the DQSP site. The DQSP is located within the Riverside East Solar Energy Zone, identified as part of the BLM’s comprehensive Solar Energy Program (the Western Solar Plan) for utility-scale solar-energy development on BLM-administered lands in six southwestern states, including California.

Project Description

The DQSP includes a PV solar-facility site of approximately 3,560 acres on BLM land and 160 acres of private land, along with a corridor for gen-tie lines that extends for 3 miles and covers an area of 58 acres, now revised to include an additional 24 acres, for a total of 82 acres. This is all situated within an original total project area of 5,010 acres, now increased to approximately 5,034 acres. The total project area was initially defined on the basis of the ROW grant application for a somewhat larger project footprint and associated buffer areas, which was proposed in earlier versions of the DQSP *Plan of Development* (Desert Quartzite, LLC 2014).

The DQSP would consist of a single unit with a generating capacity of 450 MW. The proposed facilities on BLM-managed public land and private land would include PV solar arrays, a gen-tie line, a 120-by-50-foot operations and maintenance building, an on-site substation, and ancillary facilities. The only facilities to be placed on the private land parcel would be solar arrays. The only linear facility extending out of the solar plant site would be the gen-tie line. The DQSP would use existing access roads for the most part, although a secondary access road to the southern end of the project may be added.

The DQSP would involve the installation of thin-film solar modules made by First Solar (or other PV technology), mounted on either single-axis horizontal tracker structures or fixed-tilt mounting systems, or a combination of these two mounting systems. The mounting system for the PV modules would consist of steel posts driven into the ground to depths between 1.2 and 2.1 m (4 and 7 feet), and posts for single-axis tracking structures would need to be driven up to 3.7 m (12 feet) into the ground. The solar-module assemblies would be organized into arrays. Each array would be approximately 800 feet long and 500 feet wide. The exact placement of the arrays within the DQSP area would be based on topography, hydrology, and geotechnical conditions and could also be modified to avoid cultural resources.

Applicable Regulations

Because most of the project area is on public land managed by the BLM, the project will require a BLM ROW grant (ROW No. CACA 049397). Issuance of a ROW grant for the project is considered an "undertaking," as defined by the NHPA, and therefore, the BLM must comply with Section 106 of the NHPA (*U.S. Code*, Title 54, Section 300101 [54 U.S.C. 300101]) and its implementing regulations, *Code of Federal Regulations*, Title 36, Part 800 (36 CFR 800), as well as BLM policies regarding cultural resources (USDI BLM 2004). As required by the NHPA, as the federal agency that would approve the ROW grant, the BLM "shall take into account the effect of the undertaking on any historic property. The head of the Federal agency shall afford the [Advisory Council on Historic Preservation (ACHP)] a reasonable opportunity to comment with regard to the undertaking" (54 *U.S.C.* 306108). The BLM also must comply with the requirements of the NEPA.

The portion of the project on private land will require a Conditional Use Permit (CUP) from the County (CUP 3721), along with review under the CEQA, with the County as the lead CEQA agency. The BLM and the County have prepared a joint EIS/EIR to meet the NEPA and CEQA requirements for the DQSP (USDI BLM and County 2018).

The CUP for the private-land portion of the DQSP is a "project" subject to the CEQA (*Public Resources Code*, Sections 21000 et seq. [PRC §§ 21000 et seq.]) and the CEQA guidelines (*California Code of Regulations*, Title 14, Sections 15000 et seq. [14 CCR §§ 15000 et seq.]), as amended to date. The CEQA requires that the lead agency "shall determine whether the project may have a significant effect on archaeological resources" (PRC § 21083.2), according to the CEQA guidelines for "determining the significance of impacts to archeological and historical resources" (14 CCR § 15064.5). The lead agency for the project under the CEQA is the County.

For potential impacts to an archaeological or historical resource to be considered significant under the CEQA, the resource must be determined to be a "historical resource"—that is, one listed in or determined eligible for listing in the CRHR, included in a local register of historical resources, or determined by the lead agency to be a historical resource (PRC § 21084.1). The term "historical resource" may apply to archaeological sites. For an archaeological site that does not meet the criteria for consideration as a "historical resource," however, a determination must be made as to whether it qualifies as a "unique archaeological resource" (PRC § 21083.2[g]; 14 CCR § 15064.5[c][3]).

A cultural resource property that is listed in or determined eligible for listing in the NRHP is also listed automatically in the CRHR (PRC § 5024.1[d]). Thus, for the purposes of this study, cultural resources are evaluated for significance with reference to their eligibility for listing in the NRHP, according to criteria published in 36 CFR 60.4. Cultural resources found to be not eligible for listing in the NRHP are also considered with respect to eligibility for listing only in the CRHR, because the CEQA criteria for integrity, age, and representation of local and California history set thresholds for significance that are different from those of the NHPA.

APE Definitions

Studies to identify and evaluate cultural resources must carefully establish the impact area, referred to in federal regulations as the APE for the undertaking and in the CEQA guidelines as the affected "environment," which means "the physical conditions which will be affected by a proposed project including land . . . and objects of historical or aesthetic interest" (14 CCR § 15360). We refer to the regulations implementing the NHPA for the following definition:

> *Area of potential effects* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking [36 CFR 800.16(d)].

The APE considered for this study consists of the direct APE and the indirect APE, which are defined below. Herein, when the term "APE" is used but not specified as direct or indirect, it refers to both together.

Direct APE

The direct APE was defined in the archaeological survey report (Lerch and Kremkau 2016:5) as the entire 5,010-acre area containing the BLM ROW-grant-application area then under consideration, the 160-acre County CUP area, and the gen-tie corridor. The direct APE includes 4,850 acres (plus 24 acres, for a current total of 4,874 acres) of BLM land and 160 acres of private land. The 24 acres in the slightly increased portion of the direct APE where the gen-tie corridor enters the CRSS was previously surveyed (Enright and Mirro 2011), and the results are included in the DQSP EIS/EIR (USDI BLM and County 2018). The direct APE is the area where direct effects due to the implementation of the proposed development are possible (36 CFR 800.5[a][2][i]). Such direct effects to archaeological resources evaluated as eligible for listing in the NRHP may include construction of perimeter fences and staging areas, grading for interior access roads, mowing and tilling to prepare the ground surface for installation of solar panels, trenching and excavation for electrical conduits and vaults, and construction of the gen-tie pylons and access road.

Within the direct APE, ground-disturbing activities would range in depth from 12–18 cm (5–7 inches), for the site surface preparation, to 3.7 m (12 feet), for the solar-panel-support posts; 1.2 m (4 feet), for electrical-conduit trenches; and approximately 3 m (10 feet), for electrical vaults (Desert Quartzite, LLC 2014:35–38). These depths of disturbance, or the "vertical APE," will be distributed across the project site at various locations within the direct APE. No mass grading is proposed for the DQSP.

Indirect APE

The indirect APE includes those areas outside the direct APE that may contain historic properties that could be affected by the proposed project. Analysis of the effects of the undertaking in the indirect APE takes into consideration the introduction of visual, atmospheric, or audible elements that could diminish the integrity of significant historic features of resources listed in or eligible for listing in the NRHP (36 CFR 800.5[a][2][v]). Based on the results of the literature review and the archaeological records search presented in the research design and work plan (Lerch, Stanton, and Swope 2016), the indirect APE was defined initially as a 1-mile area that contained approximately 13,000 acres extending around all sides of the direct APE. That definition was included by the BLM in its initial consultation letter to the SHPO dated August 21, 2014 (Wakefield 2014), and the SHPO concurred (Roland-Nawi 2014). However, during subsequent government-to-government consultation between BLM archaeologists and interested tribal representatives, concerns were expressed over potential effects of the DQSP on two sites that contain rock imagery and ground figures (geoglyphs) interpreted as ceremonial features and that are listed in the NRHP (George Kline, personal communication 2015), and the indirect APE was expanded to 18,060 acres to include those resources. After shifting 24 acres at the gen-tie connection to the CRSS from the indirect to direct APE, the indirect APE currently contains 18,036 acres, as shown in Figure 2.

Two NRHP-listed resources, P-33-000504 and P-33-000773,[1] listed in the NRHP as the Mule Tank Discontiguous Rock Art District, are located within the indirect APE, both more than 1 mile from the DQSP boundary and the direct APE. Two other NRHP-eligible resources, the Pilot Knob–Blythe 161-kV transmission line (P-33-11110) and the Blythe–Niland 161-kV transmission line (P-33-012532), have also been identified within the indirect APE, on the basis of the records search conducted prior to preparation of the research design and work plan for the DQSP (Kremkau, Stanton, et al. 2014) and the results of archaeological surveys from other projects conducted since the DQSP survey was reported (e.g., Gardner 2018). Potential cumulative effects of the DQSP and other previous projects in the region on these resources are considered by the BLM and the County in the DQSP EIS/EIR (USDI BLM and County 2018) and will be augmented to reflect the final recommendations of NRHP/CRHR eligibility contained in this addendum.

[1]Resources mentioned in the original survey report and later addenda are identified by several numbering systems. Generally, previously recorded sites are depicted on maps and listed in text and tables by their primary numbers, each of which consists of the prefix "P-" (for the Primary Record of the California DPR [DPR 523–series forms]), the two-digit code for the relevant county, and a sequentially assigned six-digit number (e.g., P-33-000010 refers to the tenth primary number assigned in Riverside County). Archaeological sites may also be listed by state trinomial designations. The trinomial consists of the two-letter prefix "CA-" (for California), the three-letter code for the relevant county, and a sequentially assigned number (e.g., CA-RIV-3 refers to the third trinomial assigned in Riverside County). In addition, a suffix that indicates the presence of "prehistoric" or "historical-period" materials at a recorded property may be included. The lack of a suffix for a trinomial indicates the presence of exclusively prehistoric materials, the suffix "H" indicates the presence of exclusively historical-period materials, and the suffix "/H" indicates the presence of both prehistoric and historical-period materials. Some archaeologists also use the suffix "T" to denote trail sites. Isolated archaeological resources and architectural resources are listed by primary number only. Finally, newly recorded sites are listed on maps in the original report (Lerch, Stanton, and Swope 2016) by their field numbers, indicated as "SRI-*nnnn*."

Hereinafter in the current Addendum 2, sites are referred to by their primary (P-) numbers. Site primary numbers, state trinomials (where available), and SRI field numbers (where applicable) are provided in the tables, to allow comparisons with maps and tables in previous studies. All known primary numbers, available trinomials, and applicable SRI field numbers for the recorded sites and isolates are included in the master table of site eligibility provided in the revised Appendix A.

Thermal-Feature Testing

Within the direct APE surveyed for the DQSP, 278 sites were recorded, of which 88 are prehistoric, 9 are multicomponent, and 181 date to the historical period. In addition, 620 isolated resources were recorded (157 prehistoric and 463 historical period). Based on the survey results at that time, SRI recommended 7 prehistoric sites and the prehistoric component of 1 multicomponent site eligible for listing in the NRHP. Nine additional sites were recommended possibly eligible, pending subsurface testing. Of the 9 additional sites recommended possibly eligible, 6 are planned to be avoided by the proposed project and alternatives. Three other sites, each consisting of one or more thermal features, are located in areas more difficult to avoid.

Three of the thermal-feature sites initially recommended possibly eligible (Table 1; Figure 3) were proposed for archaeological testing, to determine whether those three sites had subsurface deposits that could yield information important to prehistory, thus meeting NRHP-eligibility Criterion d (Lerch 2018). The three tested sites are described as follows in the site records on file with the BLM and at the Eastern Information Center (EIC) of the California Historical Resources Information System (CHRIS). Site records and updates are provided in Appendix B.

Table 1. Sites with Tested Thermal Features

Primary No. (P-)	State Trinomial	Field No.	Feature No.	Length (cm)	Width (cm)	Depth of Subsurface Deposits before Testing
33-024377	CA-RIV-12011	SRI-3019	3479	400	160	unknown
			3481	300	240	unknown
			3483	170	170	unknown
33-024393	CA-RIV-12027	SRI-3237	3238	110	120	unknown
			3239	170	130	unknown
			3240	120	60	unknown
			3241	160	140	unknown
33-024511	CA-RIV-12143	SRI-7009	3449	260	160	unknown

P-33-024377

This site has three rock features (Features 3479, 3481, and 3483) and one ceramic scatter (Feature 3485). The rock features consist of small concentrations of thermally altered cobbles and cobble fragments composed of quartzite, chert, basalt, rhyolite, granite, schist, and other unidentified rock, with dimensions as shown in Table 1. Feature 3485 is a 0.5-m-diameter concentration of 20 potsherds from a Topoc Buff–style jar. A single quartzite core-reduction flake was found northwest of Feature 3483. In total, 7 ceramic sherds were recorded on the southwestern side of Feature 3479. The sherds come from a Topoc Buff jar and may have eroded from Feature 3485. The Topoc Buff ceramic style dates to the Patayan II period, ca. 1000–500 B.P. (Kremkau, Mills, et al. 2016:16–17).

Map showing confidential site locations on file at BLM Palm Springs-South Coast Field Office.

Figure 3. Map showing the DQSP, including the tested thermal-feature sites and the avoided NRHP-/CRHR-eligible sites. Note that the prefix "P-" has been omitted from site primary numbers on the map.

P-33-024393

Four features were recorded at this site (Features 3238, 3239, 3240, and 3241), with dimensions as shown in Table 1. All of the features consist of small concentrations of thermally altered cobbles and cobble fragments composed of quartzite, chert, basalt, rhyolite, quartz, granite, and other unidentified lithic materials. No additional artifacts are associated with this site.

P-33-024511

The only feature associated with this site, Feature 3449, consists of a partially buried concentration of thermally altered quartzite, chert, rhyolite, granite, and quartz cobbles and cobble fragments, with dimensions as shown in Table 1. No artifacts were identified outside the feature.

Background Information and Research Questions

Of the sites identified during the initial survey, 31 were classified as rock features with artifact scatters, and 30 contained only rock features (Stanton et al. 2016:79–88). The latter were described as follows:

> Several sites were composed of isolated or clustered rock features. These rock features primarily consisted of fire-affected cobbles in a small surface or partially buried concentration ([Stanton et al. 2016:] Figure 8). One of these sites was entirely composed of manuports that were not thermally affected. Lithic material associated with these features was primarily quartzite with some chert and other miscellaneous materials (e.g., rhyolite, basalt, limestone, and granite). These sites were generally located in the central and southwestern portions of the project area. No charcoal or burned bone was observed on the ground surface for the sites with thermal features only. Some of these sites also may have a small number of prehistoric or historical-period artifacts [Stanton et al. 2016:66].

The 61 sites classified as rock-feature sites or rock features with artifact scatters contain a total of more than 150 such features. In the initial survey report, the rock-feature (only) sites were noted to

> consist of one or more rock features, usually with no associated artifacts. The majority of the rock features appear to be thermal features (earth ovens used for food preparation) and contain a mix of fire-altered and unaltered rock. The features vary greatly in size and integrity. Most intact features measure between 1 and 3 m in diameter and consist of between 20 and 50 pieces of rock. Most of the rock feature sites are deflated, and the rock features retain no integrity [Lerch, Swope, et al. 2016:127].

Because many of the rocks in these features appeared to be cracked or fire-affected, the features were interpreted as earth ovens, and the large number of them suggested that they were used to cook some locally abundant food resource. Careful review of the list of plants identified for the project site during a botanical survey conducted in 2012–2013 revealed that the only species likely to have been processed in an earth oven, or thermal feature, was the only geophyte growing in the area, which was identified as desert lily, or *Hesperocallis undulata* (Kremkau, Mills, et al. 2016:Table 2).

The use of earth ovens has been recognized globally and is often discussed in terms of a phenomenon of increased intensification culminating in a transition to settled agricultural lifestyles (Black and Thoms

2014; Thoms 2009). In the northern Mojave Desert, patterns in the use of thermal features suggest a transition from processing geophytes between 1000 and 300 B.P. to intensive seed processing after 300 B.P. (Eerkens and Rosenthal 2002; Eerkens et al. 2009). In a study of fire-affected-rock (FAR) features in the El Centro area, Schaefer et al. (2012, 2014) conducted an extensive literature review of the Colorado Desert region and prepared a cultural context for FAR features. They suggested that certain plants that are now present in the area, including desert lily and various seeds, are known ethnographically to have been processed in subsurface firepits or earth ovens, and they tested that theory on 60 such features. Their analyses of macroflora and pollen samples to identify which resources were processed in those features were inconclusive. In another recent survey near El Centro, Duke and Wolgemuth (2013) documented numerous similar features at 23 of the 26 sites they identified and concluded that the features were likely used to process desert lily corms. They recommended that the sites be evaluated and that test excavation be conducted to collect samples for radiocarbon dating and macrobotanical analysis.

Although the use of earth ovens is conventionally correlated with the baking of agave or other succulent species (Castetter 1935), the scale of these DQSP features suggests that they may have served for the baking of small-scale plants, such as geophytes (Thoms 2009). Ethnographic literature indicates that bulbs, corms, tubers, or rhizomes were traditionally gathered and subsequently processed in small earth ovens (Havard 1895). Scholze (2010) has noted that in northern California alone, 85 percent of 73 ethnographic sources make reference to root crops, suggesting subsistence reliance. Moreover, Anderson (1993), among others, has noted that some California tribes gathered edible bulbs and corms and even replanted cormlets, bulblets, and sections of root for future use. In the anthropological literature, these plants have often been reported as "Indian potatoes" or "root-crops" (Anderson 1997:150).

Desert lily, the geophyte plant species found in the DQSP area, is known to have been utilized ethnographically. Ethnographic information indicates that the desert lily was used by Yuman groups along the Colorado River and by the Cahuilla to the west. Use of the desert lily among the Yuman groups has been described as follows:

> *Desert lily.* The showy flower stalks grow from large bulbs in March and April, and the plant occurs in both Mohave and Yuma counties [in Arizona], as well as in southeastern California and probably in northwestern Sonora. These bulbs were eagerly sought by the lower Colorado [River] tribes, and eaten raw, or baked in hot ashes or boiled [Castetter and Bell 1951:208].

According to Castetter and Bell (1951:207), the Yuma (Quechan) word for desert lily is *ethoot,* or *i dut*. No Cahuilla name has been recorded, although the desert lily was used as follows:

> The tunicated bulb of the desert-lily with its garlic-like flavor was highly regarded as a food by the Cahuilla and many other Indian groups of the southwest. The plant is common to dry sandy flats and dunes on the desert, usually below 2,500 feet.
>
> Desert-lily was usually ready to eat in early spring from February to May, although it was not a dependable plant and often was available only in wet years. The bulbs were eaten raw or baked. When baked, the bulbs were placed in a stone-lined pit, covered with hot ashes and leaves, and left to bake for 12 to 24 hours [Bean and Saubel 1972:77].

A geographical study of Palo Verde Mesa noted that "during the spring months large fields of desert day lilies (*Hesperocallis undulata)* are to be found growing profusely in localized areas throughout the lower terrace" (Rumage 1956:40).

Overall, California is extremely rich in geophyte species, in comparison to the rest of the United States (Rundel 1996). Archaeobotanical investigations of earth-oven technology, as well as the study of prehistoric utilization of geophytes, are still in their infancy, and few sites have produced archaeological remains of geophytes. However, studies in central Texas have succeeded in developing pioneering methods for detecting archaeobotanical evidence of geophytes within earth ovens (Dering 2003). These newly introduced methods elevate the potential of these types of sites for future research, particularly for establishing links between hunter-gatherer lifestyles and settled agriculture. The gathering, replanting, and processing of wild-plant species, should such be demonstrable, may offer evidence of why prehistoric peoples eventually adopted a sedentary lifestyle.

Thermal features such as those at the three tested sites have the potential to provide information related to both chronology and subsistence. Eerkens and Rosenthal (2002:19) found that in the northern Mojave Desert,

> temporal patterns in [the use of] thermal features demonstrate a shift in subsistence pursuits from root, tuber, and bulb (i.e., geophytes) harvesting between 1000–300 B.P., to intensive seed processing after 300 B.P. in the area. While intensification on seeds late in prehistory appears to be a pan–Great Basin phenomenon, a focus on geophytes earlier in time appears to be more local in the Mojave Desert.

They concluded that "climate, population increase, technological innovations, and social factors are likely to account for the dietary shift." If a similar dietary shift occurred in the DQSP study area, the corresponding technological innovations might reflect the adoption of both agriculture and pottery in the Colorado River region, and that is believed to have occurred at the beginning of the Patayan period, approximately 1500 B.P. (Kremkau, Mills, et al. 2016:16–17).

To determine whether the features at the three tested sites could address the research themes and questions related to chronology and subsistence posed in the research design for the DQSP study (Kremkau, Swope, et al. 2016:48, 52–53), data requirements would involve answering the following questions:

- Do the features exhibit any definable structure, such as observable pits or rock lining?
- Do the thermal features contain subsurface cultural deposits? If so,
  - If so, do the deposits contain charcoal/other material that can be radiocarbon dated?
  - Is there any macrobotanical evidence of soil samples that can be recovered through flotation analysis to document what fuel was used?
  - Is there any macrobotanical evidence of the species processed in the earth-oven features that can be recovered through flotation analysis of soil samples?

To answer these questions, we conducted limited testing in eight thermal features at three sites, using the field and laboratory methods described below.

Methods of Data Collection

Prior to the limited testing fieldwork, a testing plan (Lerch 2018) was prepared by SRI and sent by the BLM on April 4, 2018, to consulting tribes, with an invitation to observe the fieldwork. The Colorado River Indian Tribes (CRIT) responded to the invitation and provided a tribal monitor for the fieldwork.

Field Methods

The fieldwork for the limited testing was conducted on April 23–26, 2018, under Fieldwork Authorization No. 66.66 18-15, pursuant to BLM Permit for Archaeological Investigations CA-16-12. SRI field staff included Michael K. Lerch, M.A., RPA, principal investigator; Heather J. Miljour, M.A., RPA, project director; and Garnett Smith, B.S., crew chief. They were accompanied in the field by Nicholas (Nick) Zeyouma, a monitor from the CRIT, as arranged by CRIT Acting Tribal Historic Preservation Office [THPO] Director Bryan Etsitty. The field crew was also visited by George Kline, archaeologist with the BLM Palm Springs Field Office.

A single shovel-test unit (STU) was excavated at each of the eight thermal features dispersed across the three sites. In six of the features, the STUs measured 25 by 100 cm and were positioned to provide a subsurface profile view of each feature radius, from center to edge. In two of the features that were amorphous in shape, the STUs measured 40 by 40 cm, and an STU was placed in the center of each feature. Each STU was excavated in 10-cm levels to a depth of 20–40 cm below surface (cmbs), and soils were passed through 1/8-inch-mesh screen. Soil and radiocarbon samples were collected from the features with subsurface cultural deposits. No artifacts were collected. All STUs were backfilled and restored to their original condition after testing.

Laboratory Processing

Soils from column and bulk samples were processed using a Flote-Tech flotation machine (Model No. A1A). This equipment is designed to recover paleobotanical remains as well as site microconstituents (e.g., shell beads, microdebitage, and fish bone). The heavy fraction was screened through 1/16-inch mesh. Any materials recovered from these samples were to be cataloged and analyzed, and the light fraction, if present, was to be submitted for macrobotanical analysis.

Radiocarbon Dating

Two of the features at P-33-024393, Features 3238 and 3241, yielded samples suitable for radiocarbon dating. These were submitted to Beta Analytic, Inc. (Beta), for accelerator mass spectrometry (AMS) dating.

Testing Results

As a result of the testing, all the thermal features at two sites, P-33-024377 and P-33-024511, were found to lack subsurface deposits, as were two of the four features at P-33-024393 (Table 2). Specific results for each site are as follows.

Table 2. Results of Thermal-Feature Testing, by Site

Feature No.	STU No.	STU Depth (cmbs)	Feature Depth (cmbs)	Subsurface Deposits?	Comments
	P-33-024377/CA-RIV-12011/SRI-3019				
3479	5140	30	—	no	
3481	5153	30	—	no	
3483	5161	30	—	no	
	P-33-024393/CA-RIV-12027/SRI-3237				
3238	5174	40	20	yes	soil samples collected for radiocarbon dating and flotation analysis
3239	5224	30	—	no	
3240	5250	30	—	no	
3241	5211	40	20	yes	soil samples collected for radiocarbon dating and flotation analysis
	P-33-024511/CA-RIV-12143/SRI-7009				
3449	5170	30	—	no	

Key: cmbs = centimeters below surface; STU = shovel-test unit.

P-33-024377

Three 1-by-0.25-m STUs were excavated within P-33-024377, through Features 3479, 3481, and 3483. All three STUs were excavated to a depth of 30 cmbs, all with negative results (Figure 4). FAR was observed on the ground surface in all three STU locations. Additionally, a single Tizon Brown Ware ceramic sherd (Point Provenience 5169) was recorded on the ground surface in STU 5140.

Figure 4. Example of a negative STU (P-33-024377, Feature 3481).

P-33-024393

Four STUs were excavated within P-33-024393. Two of the STUs measured 1 by 0.25 m each and were excavated through Features 3238 and 3241. The other two STUs measured 0.4 by 0.4 m each and were excavated through Features 3239 and 3240. Each STU was excavated to a depth of between 30 and 40 cmbs, depending on the contents of the unit. FAR was observed on the ground surface in STUs 5174 and 5224. Substantial ash deposits were observed below the surface within Features 3238 and 3241 (STUs 5174 and 5211, respectively). The ash deposit in Feature 3238 extended from 3–5 to 30 cmbs; the ash deposit in Feature 5211 extended from 5 to 24 cmbs (Figure 5). Flotation samples were collected from STUs 5174 and 5211. STU 5250 was completely sterile.

Figure 5. Example of a positive STU (P-33-024393, Feature 3241).

P-33-024511

One 1-by-0.25-m STU was excavated within P-33-024511, through Feature 3449. The STU was excavated to a depth of 30 cmbs, with negative results. The ground surface of the STU was covered with FAR, and a single quartzite bidirectional core was discovered at 5 cmbs. The core measured 60 (length) by 40 (width) by 35 (height) mm.

Flotation Results

The results of the flotation analysis of soil samples from the two features at P-33-024393 that contained subsurface cultural deposits (Features 3238 and 3241) were completely negative. No macrobotanical remains of fuel or remains from geophytes or other plant species were recovered. Given the fact that geophytes such as desert lily bulbs are essentially steamed in an earth-oven thermal feature and have no durable plant remains to be preserved in the soil samples, this result is not surprising. Often, when seeds are recovered during flotation, it is because they were toasted or charred by coals in a basketry parching tray, which has the effect of preserving them. Geophytes such as desert lily have no hard shells or other parts and are thus very perishable from the archaeological record.

Some bits of charcoal were recovered from the flotation, probably from creosote bush (*Larrea tridentata*), which is common in the area and the only available wood for fuel in the flat portions of Palo Verde Mesa that are away from the desert washes that drain the Mule Mountains. Unfortunately, none of the charcoal was large enough to identify. However, there was sufficient charcoal in one sample to obtain a radiocarbon date (see below).

Radiocarbon-Dating Results

Two radiocarbon samples were submitted to Beta for AMS dating. The samples were from Features 3238 and 3241 at P-33-024393. The sample from Feature 3238 had too little carbon and did not provide a date. The sample from Feature 3241, however, yielded a conventional radiocarbon age of 1320 ± 30 B.P., or 652–722 cal A.D. (see the report with the P-33-024393 site-record update in Appendix B).

NRHP-Eligibility Updates

At two of the sites (P-33-024377 and P-33-024511), the results of testing were negative. None of the four features at those two sites contained subsurface cultural deposits (see Figure 4). Because these two sites did not yield information important to prehistory, they do not meet Criterion d and thus are recommended not eligible for listing in the NRHP.

At the third site tested (P-33-024393), two of the features had no subsurface cultural deposits, and the other two (Features 3238 and 3241) did contain subsurface cultural deposits (see Figure 5). Soil samples were collected from these features for flotation analysis and radiocarbon dating. The results of the flotation analysis were negative, as were the results of the radiocarbon dating of a sample from one of the features, Feature 3238. The radiocarbon sample from Feature 3241 resulted in a radiocarbon age of 1320 ± 30 B.P. Although Feature 3241 did provide a radiocarbon date, it has exhausted its potential to yield information important to prehistory and thus does not meet NRHP-eligibility Criterion d. Feature 3238 did not provide any results from flotation or radiocarbon analysis and thus did not yield information important to prehistory.

Because two of the tested thermal-feature sites (P-33-024377 and P-33-024511) did not yield information important to prehistory, and the third (P-33-024393) has exhausted its potential to yield information important to prehistory, none of them appears to meet Criterion d for NRHP eligibility. In addition, none of them can be tied to events that have made a significant contribution to the broad patterns of our history, nor are they associated with persons significant in our past. Thus, none of the sites meets Criterion a or b. Finally, none of the tested features embodies distinctive characteristics of a type, period, or method of construction, and so, they also do not meet Criterion c. Therefore, none of the three tested thermal-feature sites is recommended eligible for listing in the NRHP.

Ethnographic Notes on the Mule Mountains Complex

Several of the tribes consulting with the BLM and the County, and meeting with First Solar, regarding potential effects of the DQSP have indicated that the Mule Mountains are important in tribal history. Located directly southwest of the DQSP, the Mule Mountains rise to an elevation of 378 m (1,240 feet) AMSL, approximately 260 m (850 feet) above Palo Verde Mesa, where the project site is located (see Figure 2). Tribal concerns about cultural resources in and around the Mule Mountains have been documented in cultural resource management studies for more than 40 years and have been noted in ethnographic literature even longer. In this chapter, we summarize ethnographic information regarding this area, so that it may be considered as part of the evaluation of sites within the APE for the DQSP discussed in the following chapter.

During the late 1970s and early 1980s, archaeological and ethnographic studies were prepared for a high-voltage-transmission-line project known as the Devers–Palo Verde (DPV) transmission line. The DPV transmission-line corridor adjoins the southwestern edge of the DQSP. The various DPV studies were among the reports of previous work in the indirect APE documented in the research design and ethnographic literature review for the original DQSP archaeological inventory report (Kremkau, Stanton, et al. 2014; Kremkau, Whelan, et al. 2014; Stanton et al. 2016:71–75). The ethnographic study prepared for the DPV project, *Persistence and Power: A Study of Native American Peoples in the Sonoran Desert and the Devers–Palo Verde High Voltage Transmission Line* (Bean et al. 1978), was based on literature and archival review, field visits, and interviews with representatives of the tribes currently consulting on the DQSP with BLM.

More recently, the gen-tie corridor for the proposed Rio Mesa Solar Electric Generating Facility also was planned to use the same route as the DPV transmission line. An ethnographic study conducted with the same tribes for the subsequently cancelled Rio Mesa project echoed similar concerns regarding the Mule Mountains and adjoining areas (Gates 2012). Along with studies conducted for other energy projects, the DPV and Rio Mesa ethnographic studies are important to understanding current tribal concerns regarding the Mule Mountains.

Mule Mountains Complex

One significant impact area identified in *Persistence and Power* (Bean et al. 1978) is the Mule Mountains Complex, located southwest of the DQSP. In their conclusions, Bean et al. (1978:7-26–7-27) described this resource as follows (with information in square brackets added for clarity):

> The Mule Mountains complex, while not directly on the [DPV] line itself, is sufficiently close to it so that indirect major impact is highly probable. This complex is of great significance, ranking in our opinion with Willow Hole and Thousand Palms. About 1938, Malcolm Rogers recorded his site C-95 [P-33-000773], where he noted a trail, a circle 119 feet in diameter, and two ground figures, one of which was a broken cross. This site is significant because it is the center of a whole main network of trails (RIV504T, 775T, 772T, 673T, 776T) crisscrossing the Study Area. A rock tank in this area [Mule Tank, P-33-000504] stores up water when it rains, and may have been a permanent water source in past years. Consequently, this is a site where travelers, traders and ritualists probably stopped

> off regularly. That it was a sacred site is demonstrated by the fact that there are petroglyphs (RIV 504) in this area. Rogers mentioned two intaglios 1 mile north of RIV 773. These would be directly on the preferred [DPV] route, and need to be located for mitigative measures to be carried out.
>
> Several recently noted ground features are also associated with these trails (RIV 773). Several ground figures of lineal circles with hollow, disc-shaped depressions where the desert pavement has been totally removed exist. There are historical sites in this area such as gun emplacements and foxholes left from U.S. Army military maneuvers during the Second World War. Consequently, this area should be thoroughly surveyed by an archaeological team and Native American consultants.
>
> This site is significant. Native Americans, archaeologists, and historians feel that it should be recommended for the National Register of Historical Sites.

Two of the sites mentioned in this description of the Mule Mountains Complex by Bean et al. (1978)—P-33-000504 and P-33-000773—were subsequently nominated in 2001 and listed in the NRHP in 2003 as the Mule Tank Discontiguous Rock Art District (Whitley 2001). The sites were listed under NRHP Criteria c and d, with a cultural affiliation of "River Yuman/Mohave/Quechan/Halchidhoma." The water source known as Mule Tank contains freshwater and has in the past been described as a spring, also (Mendenhall 1909:84). The importance of the tank is described as follows in the NRHP registration form:

> Especially important in this regard are the widely dispersed water sources, such as springs and the natural tanks that collect and store rainwater across the desert zone. These are life-givers along the trails that crossed the deserts, promoting if not allowing access to important desert resources, as well as trade and social interaction with more distant peoples. The Mule Tank Discontiguous Rock Art District provides a particularly good example of such a phenomenon. Containing a natural water source and located along an important east–west aboriginal trail, its significance to Native American peoples was only partly biological and logistical. For they marked it with an important corpus of petroglyphs (rock engravings) and earth figures (geoglyphs), products of their religious beliefs and practices and expressions of their artistic talents and concerns. Just as the rainwater that collected in the natural tank at this locale provided sustenance to their bodies in their hot treks across the desert, so too did the religious art left here provide important sustenance and meaning to their spiritual lives [Whitley 2001:6].

The Mule Tank site (P-33-000504) was described by Whitley (2001:5) as having about 65 petroglyph panels in an area of approximately 4 acres on either side of a small arroyo containing a tank of freshwater. It is the only water source for many miles. The Mule Tank site was recently resurveyed (Hanes 2018), and the updated site record by Fitzsimons (2017) indicated that it contains 143 petroglyph panels and 12 trail segments, along with 12 milling features, 1 anvil stone, and 2 ceramic scatters.

The second resource contributing to the Mule Tank Discontiguous Rock Art District is P-33-000773. It was originally recorded in 1938 by Malcom Rogers of the San Diego Museum of Man (SDMoM) and was assigned site number C-95 in the SDMoM files, as noted above by Bean et al. (1978) and by Whitley (2001). The 1938 site notes by Rogers documented two trails that converge within a 15–18-inch-wide "trod down" circle 141 feet in diameter. Subsequent recordings of the site in 1966, 1968, 1977, and 2001 gave the dimensions of the circle, sometimes called a "dance circle," as 110 and 119 feet in diameter. The site has never been mapped in detail, and the site record has not been updated since the NRHP registration form was prepared in 2001 (Whitley 2001).

Rogers also noted three additional ground figures (also called intaglios or geoglyphs) located near a trail approximately 1 mile north of P-33-000773. One was a swastika, or "whirling log" design, that measured 8 by 10 feet; another was a raincross symbol measuring 4 by 10 feet (called a "broken cross" by Bean et al. [1978:7-26]); and a third was a square shape with a protruding bar and measured 2 by 8 feet. This site has not been relocated since Rogers first recorded it in 1938 (see Rogers' site record for C-95 in the report by Whitley [2001:Appendix C]). Interestingly, this series of symbols is often associated with Navajo culture. Although the project area is not within ancestral Navajo territory, there were camps of Navajo workers along the Atchison, Topeka and Santa Fe railroad between Needles and Barstow in the late nineteenth and early twentieth centuries (Drover 1985) and along a branch that ran from Cadiz to Parker after 1907 (Myrick 1992:792). Navajo settlements were located along the Colorado River in the historical period. The Navajo have been one of the ethnic groups represented among the CRIT since the 1940s (Spicer 1962:247, 274).

Trails

As indicated above by Bean et al. (1978:7-27), the Mule Mountains Complex also includes a number of trails that are the "center of a whole main network of trails (RIV504T, 775T, 772T, 673T, 776T)." These trails come from every direction and converge at a circular ground figure located at P-33-000773. They extend east–west from the Colorado River to the Coachella Valley and north–south along the western side of the Colorado River. In addition to the trails noted in the main description of the Mule Mountains Complex, other trails in the area—such as P-33-000053, an east–west alignment known as the Coco-Maricopa Trail that crosses the northern portion of the DQSP indirect APE, and P-33-000343, another long-distance east–west trail that crosses the APE—were mentioned as significant impact areas for the DPV transmission-line project by Bean et al. (1978:7-28–7-29).

Extensive trail systems linked all the tribes of the region together in a complex network that connected important places on the landscape with surrounding areas. Among these were long-distance trade trails, such as the Coco-Maricopa Trail, as well as trails used ritually during ceremonial pilgrimages and to link allies or avoid enemies while traveling (Bean et al. 1978:5-1–5-7).

The Coco-Maricopa Trail was an important east–west trading route; it connected the groups of the Los Angeles Basin to the Maricopa, who lived along the Gila and Salt Rivers, near modern-day Phoenix. The trail was first noted as a route used by the Halchidhoma in the early 1800s to carry mail for Euroamericans from the Los Angeles area to the Colorado River. The importance of the trail had been previously documented by several early explorers to the region. Father Francisco Garcés, for example, noted in 1774 that the Halchidhoma traded with the Gabrielino, who lived along the Pacific Coast, near modern-day Los Angeles (AECOM 2013:49; Forbes 1965:109). In 1823, Captain José Romero and his entourage may have traveled the trail while attempting to reach the Colorado River from San Diego (McCarthy 1982).

An important form of ritual among the River Yumans was the ceremonial pilgrimage. One such pilgrimage trail was the Xam Kwatcan Trail (Forbes 1965; Forde 1931), which ran from the mountain Avikwalal, at the southern end of the Colorado River, to the mountain Avikwa'ame, also known as Spirit Mountain or Newberry Peak, in southern Nevada, more than 300 km (186 miles) to the north. Avikwalal was believed to be a spirit house containing the ghosts of departed ancestors. Thus, the pilgrimage began at the land of the dead and terminated at the point of creation, following the mythic path of the creator deity, Mastamho, and stopping at a number of sacred locations along the way for ceremonial dancing and recitations of stories. Concerns over the destruction of trail systems as part of earthmoving construction activities have been expressed by various tribes near the project area (Bean et al. 1978).

A more recent ethnographic study for the proposed Rio Mesa Solar Electric Generating Facility documented similar concerns among area tribes (Gates 2012). In the ethnographic report for the Rio Mesa project, which would have had its gen-tie line following the same route as that of the DPV transmission line, along the southwestern boundary of the DQSP, the author cited a study of geoglyphs associated with the Xam Kwatcan Trail by Boma Johnson for the North Baja Pipeline Project, which runs north–south along the southeastern boundary of the DQSP (Cleland and Apple 2003). Johnson (2003:175–176) noted that the "primary function of the earth figures of the Lower Colorado and Gila River valleys was to serve as a mode of communication between the Earth People (local tribal people) and the Sky People (deities and ancestral spirits).” He went on to state that

> there are three “Big Houses” related to the Xam Kwatcan Dream Trail, one of the “houses” being Palo Verde Peak. The living, interacting with the deceased along this trail, make petitions to the deceased at such earth figure sites near the Big Houses, to particularly move from this world where they may dwell in a “wandering area” on to the afterlife. Johnson suggests that the Mule Mountains is one “wandering area” [Gates 2012:56].

At a meeting held in August 2012 with representatives of the Fort Mojave Indian Tribe of Arizona, the CRIT, the Fort Yuma Quechan Tribe of the Fort Yuma Quechan Reservation, and the Chemehuevi Tribe, the ethnographer for the Rio Mesa project was told that the Mule Mountains are understood to be a spiritual training area and considered to be a place of “wandering souls” that abide in these mountains during the 1-year period between the funeral and mourning ceremonies. The Rio Mesa ethnographic study concluded that the Mule Mountains, including both the Mule Wash (P-33-000773) and Mule Tank (P-33-000504) sites, are among the landforms in the area believed to have potential cultural significance for tribes in the vicinity of the Rio Mesa project (Gates 2012:24, 57–59). Similar observations regarding the importance of the Mule Mountains Complex also were made in a report by AECOM (2013:54–55) for the McCoy Solar Project, which also cited information from Bean et al. (1978) and Johnson (2003).

The DQSP project area is within the general itinerary described by the Chemehuevi Salt Song. Song series were important elements of many of the cultures in the Colorado Desert. Each song series could include 100–200 individual but related songs. The Chemehuevi had four main song series: Bird, Salt, Deer, and Mountain Sheep (Laird 1976:38). Each of these song series mentions specific points across the landscape and recounts important events that happened at each location. These points across the landscape were linked by metaphoric trails that were followed through the course of the song series. The Salt Song tells the story of a flock of birds traveling across the Chemehuevi territory. The trail begins near Las Vegas and continues southward through the Mojave Desert until it reaches Twentynine Palms, where it heads eastward and crosses the Colorado River near Blythe. The trail then follows the river northward until it reaches the Grand Canyon (Laird 1976).

Mentions in Tribal History

People from all the Colorado River Yuman tribes, as well as the Chemehuevi, have lived in and around the Mule Mountains at various times in their histories. In addition to the contemporary Mohave, Quechan, and Cocopah, other Yuman tribes that have lived along the Colorado River and have been mentioned in early historical accounts include the Halchidhoma, Piipaash, Kohuana, Alakwisa, and Halyikwamai (Kroeber 1925:796–803; Winters 2018:xvi–xix). Some of these tribes, who were driven from their former Colorado River territories, moved to the Gila River area in the late eighteenth and early nineteenth centuries and became absorbed among the Maricopa.

In a recent study of Maricopa place names, Winters (2018:xvi) considered native place names along the Colorado River. He noted that the Colorado River was the ancient home of the tribal group known as the Piipaash and was home to the Halychduum (Halchidhoma) until about 1827–1828. Both groups together are today known as the Maricopa. The Kohwan (Kohuana), another little-known group, lived on the Colorado River for perhaps 5 years longer than the Halychduum. Prior to 1910, A. L. Kroeber recorded historical events involving the Halychduum, Kohwan, Mohave, and Quechan, at a time when some people who had learned of these events from their fathers or grandfathers were still alive. He also recorded the Mohave names of places where those events took place (Kroeber 1920, 1951; Kroeber and Kroeber 1973). With the help of Piipaash, Halychduum, Mohave, and Quechan elders, Winters (2018:97–128) has been able to document the Piipaash (Maricopa) names of a few of the places along the Colorado River. The Piipaash names differ little from the Mohave and Quechan names.

The Mule Mountains were known to the Mohave as Avi-nya-kutapaiva (Kroeber 1920:479), perhaps after the verb *tapayv=k*, which means "to lean against (something) while sitting down" (Munro et al. 1992:175, 269–271). According to Winters (2018:114–115), the Piipaash pronunciation of the Mohave words was "Vii Nya Kutpayv," which was the name of both the mountain range and a settlement near it (possibly the habitation site recorded as P-33-001821). The name Vii Nya Kutpayv means "Leaning against the Mountain" or "Leaned against the Mountain." In Piipaash, *payk* is a verb meaning "to lean on (something)." *Tpayk* means "to cause (something) to lean on (something)." To illustrate the meaning of the name for the Mule Mountains, Winters (2018:115–116, Figure 8.8) provided a photograph of the mountains with a view to the west, showing the tilted geological structures that appear to be "leaning" to the north, as pointed out to him during a field trip in October, 2017, with Quechan elder Lorey Cachorra. A *ranchería* along the foot of the Mule Mountains (possibly P-33-001821?) was known to the Quechan as Avi'kwotapai ("Leaning Mountain"), according to Wright and Hopkins (2016:103), based on their interpretations of Bean et al. (1978:5-47), Bee (1963:208), and Forde (1931:103), along with their discussions with contemporary Quechan tribal members.

The tribal history of the Mule Mountains, based on accounts by Forde (1931), Kroeber (1920:479, 1972), and Kroeber and Kroeber (1973:43), was summarized by Winters as follows:

> [T]he Parker area on the Colorado River was home to the Halychduum for a very long time, perhaps for centuries. During that time there was much fighting between them and the Mohaves. The Kohwan lived near the Halychduum in the Parker area at least toward the end of the time the Halychduum lived there. According to the Mohaves, they finally drove the Halychduum and Kohwan south, away from the Parker area. The Kohwan initially did not flee as far south as the Halychduum. The Kohwan settled for a year at two places whose Mohave names Kroeber spelled Avi-nya-kutapaiva [Mule Mountains] and Hapuvesa [near Blythe, from 'Aha Puuwes, "Quail Chicks' Watering Place" (Kroeber 1972:138)], before moving farther south. Kroeber's spellings reflect the Mohave pronunciation of these names. The Halychduum settled at Ha Kws'ily to the south of Avi-nya-kutapaiva and Hapuvesa [Winters 2018:114].
>
> [W]hen the Chemehuevi moved into the Parker area, possibly in the 1860s, they lived at Avi-nya-kutapaiva, our Vii Nya Kutpayv [Mule Mountains], where the Kohwan had temporarily lived earlier (Kroeber and Kroeber 1973:43). . . . Forde, writing of Quechan (Yuma) settlements north of Yuma, reported, "One of these northern villages was called avi'kwotapai. It was some distance south of Parker on the Californian side. Steven Kelly's father lived there." Steven (Stephen) Kelly was one of Forde's sources of information for his *Ethnography of the Yuma Indians*. See Forde (1931; pages 87 and 103) [Winters 2018:115].

From these accounts, it seems that the Mule Mountains and associated sites, such as P-33-001821, were occupied by a succession of Yuman groups, first by the Piipaash and Halchidhoma and then by the Kohuana, before they were expelled from the area by the Mohave in ca. 1828, and then followed by the Chemehuevi, a Numic group that the Mohave invited into the river area for a short time after the departure of the Halchidhoma. The Mule Mountains are at the northern extent of Quechan territory, and at least some Quechan people lived there. According to Wright and Hopkins (2016:103), a group of Quechan known as the "Blythe Group" lived for a time in the Blythe area. The community consisted of approximately 50 families, including the father of Steven Kelly (Forde 1931:103), but pressures from Anglo settlers drove them southward and closer to other Quechan communities sometime before 1890.

Since the departure of the Halchidhoma and other Yuman groups, as well as the Chemehuevi, from the Mule Mountains, the area is considered to be in Mohave territory. Palo Verde Mesa between the Mule

Mountains and the Colorado River, where the DQSP is sited, is believed by the Mohave to be the scene of battles (recounted by Kroeber [1920, 1951, 1972]) between the Mohave and the Halchidhoma before the latter were driven away from the area in 1828 (CRIT Acting THPO Director Bryan Etsitty, personal communication 2018). The Mohave within the CRIT consider the Mule Mountains and associated sites to be a cultural landscape and an important part of their ancestral "cultural footprint."

Summary

In recognition of their cultural value, the Mule Mountains were designated by the BLM as an Area of Critical Environmental Concern (ACEC) based solely on cultural resources, and a management plan was prepared "to facilitate protection of an especially unusual cluster of archaeological sites at the northern end of the Mule Mountains. The Mule Mountains ACEC contains aboriginal trails, scatters of broken pottery, rock quarries, cleared circles, a major petroglyph location, and the remains of WWII military activity" (Reed 1981:1). As a result of the management plan, fencing and interpretive information were installed at both the Mule Tanks site and the Mule Canyon site in 1981, and regular archaeological monitoring and reporting by BLM staff were begun (Reed 1981:8–13). In his review of ethnographic resources for the Rio Mesa project, Gates (2012:90–91) noted that because of the wilderness designation for the Palo Verde Mountains and Peak and the ACEC designation for the northwestern portion of the Mule Mountains, the mountains are remarkably intact and concluded that as a district, the Mule Mountains maintain integrity of location, setting, feeling, and association.

CHAPTER 4

Final National Register of Historic Places/California Register of Historical Resources Cultural Resource Evaluations

Recommendations of NRHP eligibility for all archaeological sites located within the direct APE were made in the original Class III inventory report for the DQSP (Lerch, Stanton, and Swope 2016). In the first addendum report (Lerch 2017), those recommendations were expanded to include CRHR eligibility. Based on these two sources and changes to the DQSP ROW application, the BLM modified the definition of the direct APE to include an additional 24-acre area where the gen-tie-line corridor would connect with the CRSS (see Figure 2) and made preliminary determinations of NRHP eligibility in a letter to the SHPO on June 22, 2018 (Herrema 2018). The SHPO responded on October 9, 2018, and concurred with the change in the APE definition but requested that the BLM make revisions to its documentation, to enable reviewing parties to understand the basis of its determinations of eligibility (Polanco 2018). This chapter is provided in response to suggestions by the SHPO to clarify the NRHP- and CRHR-eligibility recommendations for sites within the APE of the DQSP.

SRI has developed final NRHP- and CRHR-eligibility recommendations for all 278 sites within the direct APE, 3 sites located in or immediately adjacent to the direct APE and evaluated in the draft EIS/EIR, and 8 other sites within the indirect APE that have been previously listed or determined eligible for listing in the NRHP or that share characteristics with eligible sites, for a total of 289 sites currently evaluated for eligibility (see Appendix A, revised April 2019). Evaluation recommendations were made following the guidelines and eligibility criteria established in 36 CFR 63. The research questions and data requirements outlined in the research design (Kremkau, Stanton, et al. 2014) and presented in Chapter 3 of the inventory report by Lerch, Stanton, and Swope (2016) were used as the references for recommending site eligibility. The 289 sites are classified as either eligible or not eligible. Sites considered in the original report as possibly eligible pending additional research are now classified as eligible unless further work, such as the thermal-feature testing at 3 sites reported in Chapter 2 above, has supported a conclusion that they are not eligible.

Types of Historic Properties

The DQSP is considered an "undertaking" subject to compliance with Section 106 of the NHPA and its implementing regulations (36 CFR 800). As a federal agency, the BLM must take into account the effects of a proposed undertaking on historic properties—that is, cultural resources listed or eligible for listing in the NRHP. As defined in the NHPA and its regulations, a historic property is any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places . . ." including "artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria" (36 CFR 800.16[l][1]).

Sites and Isolates

For the DQSP, sites and isolates were defined in the research design and work plan (Lerch, Stanton, and Swope 2016) and carried forward in Chapter 3 of the original inventory report as follows:

> Cultural resources identified during the survey will be classified as sites or isolates. . . . A new site was defined as any three or more artifacts found in association with one another or a single feature recorded more than 40 m from an existing site. Isolated finds were defined as one or two artifacts or any group of artifacts more than three, if these artifacts could refit (e.g., a ceramic "pot drop" or a broken glass bottle), or from a cluster of shell casings from emptying a clip [Kremkau, Swope, et al. 2016:64].

Using the above definition, the archaeological resources identified during the DQSP survey were recorded as 278 sites and 620 isolates (Lerch, Stanton, and Swope 2016:xiii; Stanton et al. 2016:76).

Districts

The term "district" applies to properties having a number of resources that are relatively equal in importance. A district is defined in National Register Bulletin *How to Apply the National Register Criteria for Evaluation* as "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (Shrimpton 2002:Section IV). For the DQSP, two districts must be considered in the evaluation of NRHP and CRHR eligibility: the Mule Tank Discontiguous Rock Art District and the Desert Training Center/California-Arizona Maneuver area (DTC/C-AMA).

Two of the previously recorded sites located within the indirect APE are listed in the NRHP as the Mule Tank Discontiguous Rock Art District. Attributes of a discontiguous district are noted as follows, following the guidance in National Register Bulletin *How to Complete the National Register Registration Form*:

> A district may also contain individual resources that although linked by association or function were separated geographically during the period of significance, such as discontiguous archeological sites or a canal system with manmade segments interconnected by natural bodies of water. A district may contain discontiguous elements only where the historic interrelationship of a group of resources does not depend on visual continuity and physical proximity [McClelland 1997:14–15].
>
> Archeological districts may contain discontiguous elements under the following circumstances:
>
> 1. When one or several outlying sites has a direct relationship to the significance of the main portion of the district, through common cultural affiliation or as related elements of a pattern of land use, and
> 2. When the intervening space does not have known significant resources [McClelland 1997:57].

Considering the ethnographic information summarized in Chapter 3, we note that the Mule Mountains Complex as initially documented by Bean et al. (1978:7-26–7-27) included not only P-33-000504 and P-33-000773, listed in the NRHP in 2003 as the Mule Tank Discontiguous Rock Art District, but also all the trails that converge on those two sites from throughout the surrounding region. To more fully reflect the original intent of the Mule Mountains Complex as identified by tribal representatives and recorded by Bean et al. (1978), we propose renaming the currently listed NRHP district the Mule Mountains Complex Discontiguous Archaeological District (MMCDAD) and adding to it other contributing resources located within the direct and indirect APE for the DQSP. We also considered whether any of the other sites within various categories could be considered elements of a district, and we discuss those conclusions below.

Another archaeological district that pertains to the DQSP is the DTC/C-AMA, a World War II–era military training area that covered more than 18,000 square miles of the California and Arizona deserts. The DTC/C-AMA has been determined eligible for listing in the NRHP under all four eligibility criteria (Tiffany Arend, personal communication 2019) and includes property types ranging from divisional camps, airfields and airports, landing strips, and bivouacs to maneuver areas, ranges, training areas, campsites, hospitals, quartermaster depots, railroad sidings, tank tracks, and refuse deposits (Bischoff 2009:1–8).

Because it lasted only 3 years, from 1942 through 1944, and because much of the material-culture remains associated with it were cleaned up and removed when use was concluded, the sites associated with the DTC/C-AMA are ephemeral in nature (Bischoff 2009:127). The sites related to the DTC/C-AMA within the direct APE of the DQSP are primarily refuse scatters, along with a small number of other military activity sites, including tank tracks, pits, and communications wire. These are discussed and evaluated in greater detail below.

Eligibility Criteria

In the following sections, we review the criteria for eligibility of the resources within the APE for listing in the NRHP and the CRHR and also consider research potential, measures of integrity, and significance to Indian tribes.

NRHP-Eligibility Criteria

Section 106 of the NHPA requires the BLM to take into account the effects of an undertaking on "historic properties" (36 CFR 800.1), defined as cultural resources listed or eligible for listing in the NRHP (36 CFR 800.16). Determinations of NRHP eligibility for cultural resources are made prior to making findings of effects, according to the following criteria:

> The quality of significance in American history, architecture, archeology, 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
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or
>
> (c) that embody the distinctive characteristics of a type, period, 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
>
> (d) that have yielded, or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

If cultural resources do not possess integrity or do not meet the above criteria, they are not considered historic properties and are not further considered in the Section 106 review process.

In addition to the above criteria, there is a general stipulation that a historic property must be 50 years old or older (for exceptions, see 36 CFR 60.4, Criteria Considerations). The importance of information in prehistory or history is measured by a resource's ability to answer research questions

(McClelland 1997). In addition to research potential, both Native American and Euroamerican historic properties may have general-public and culture-specific values. Historic properties may also have broader public significance, such as serving to educate the public about important aspects of national, state, or local history.

CRHR-Eligibility Criteria

For purposes of the CEQA, a “historical resource” is any object, building, structure, site, area, place, record, or manuscript listed or eligible for listing in the CRHR (PRC § 21084.1). A resource is eligible for listing in the CRHR if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history [PRC § 5024.1].

The CCR (14 CCR § 4852) further provides that cultural resources of local significance are eligible for listing in the CRHR. Historical resources defined according to the CRHR criteria above (PRC § 5024.1) are eligible for listing in the CRHR and include resources determined eligible for listing in the NRHP (14 CCR § 4851[a][1]). Thus, the County may apply determinations of NRHP eligibility to its findings of historical significance under the CEQA. Cultural resources determined not eligible for listing in the NRHP may still qualify as historical resources under the CEQA, and thus, a separate determination regarding whether they are historical resources must be made by the County.

In addition to having significance, resources must retain integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired or significant individuals made their important contributions. Integrity is the authenticity of a historical resource’s physical identity, as evidenced by the survival of characteristics or historic fabric that existed during the resource’s period of significance. Simply put, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance (14 CCR § 4852).

Criteria for Unique Archaeological Resources

For projects subject to the CEQA, the County, as the lead agency, also must consider whether the project will have a significant effect on unique archaeological resources (even if they are not eligible for listing in the CRHR) and must avoid unique archaeological resources when feasible or mitigate any effects to less-than-significant levels (PRC § 21083.2). As used in the CEQA,

> a unique archaeological resource means 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.

(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Below, we discuss our evaluation recommendations, in terms of the above NRHP- and CRHR-eligibility criteria, for the archaeological resources we identified within the APE during the records search of the entire APE and the survey of the direct APE, with attention focused on two particular aspects of evaluation: research potential and integrity.

Research Potential

The research potential of any particular historic property is assessed with reference to a specific historic context or research design and themes. Historic contexts form the framework according to which much of the federal historic-preservation process is structured. A historic context is a body of information about a property, organized by three basic elements: theme, place, and time (McClelland 1997:1). Theoretically, all the historic contexts of a particular geographic area together constitute a comprehensive history of the area that could be broken down into a series of historically meaningful segments, each of which would constitute an individual historic context. Therefore, grouped together, the various historic contexts of an area form a comprehensive summary of all aspects of the area's history.

For the DQSP, the various themes that would pertain to eligibility under Criterion d/4 were addressed in the research design and work plan prepared prior to the field survey (Kremkau, Stanton, et al. 2014) and again in Chapter 3 of the original inventory report (Kremkau, Swope, et al. 2016). Among the research themes considered for resources of both prehistoric and protohistoric age are chronology, trade and regional interaction, ceremonial landscapes, technology, and settlement and subsistence. Additional themes outlined for historical-period resources include Euroamerican–Native American interactions, mining, transportation, settlement and agriculture, World War II and the Desert Training Center, and Operation Desert Strike. These themes and related research questions and data requirements are noted as appropriate in the discussions below.

Integrity

Another key determination regarding NRHP and CRHR eligibility involves the concept of integrity, which refers to the physical condition of a potential historic property or historical resource. If the physical condition of a site considered eligible for listing in the NRHP and CRHR under Criterion d/4 is such that important information about the past potentially can be derived from it, then it is said to possess good integrity. If various processes of disturbance—environmental or cultural, intentional or unintentional—have affected the property such that the qualities that make the site significant have been lost or severely damaged, then the property is said to lack integrity. The critical aspect of evaluating integrity is assessment of the nature and extent of disturbance processes. Extensive impacts by recent human activity, such as vandalism or vehicular traffic, are relatively easy to recognize and assess, but other forms of disturbance are more subtle. For example, consider an artifact concentration. If environmental processes, such as erosion, have displaced artifacts and altered the geomorphological context, the condition of the artifact concentration today might be considerably different from what it was when it was first created. Many of the artifacts may have been redeposited, and those that remain may no longer be in primary context. If subsurface deposits are present, they may no longer be spatially associated with the surface artifacts.

Significance to Indian Tribes

The scope of the original Class III archaeological inventory was limited to consideration of archaeological and architectural resources only and did not include addressing resources of tribal concern. However, the research design *did* identify the types of resources that might be considered to have cultural or religious significance to Native American tribes in the project region, based on the ethnographic literature review prepared prior to the field survey (Kremkau, Whelan, et al. 2014) and sent to the tribes recommended by the Native American Heritage Commission (NAHC). Among those were burial sites, intaglios and geoglyphs, resource-collection areas, sacred places and places of power, traditional-event sites, trails, and habitation sites (Kremkau, Swope, et al. 2016:58–61).

It became apparent during the course of information meetings and field trips with tribal representatives over the past 4 years that many of the identified archaeological sites were of concern to tribes with traditional ties to the project area. Those concerns are also reflected in a comment letter from the CRIT on the draft EIS/EIR (Patch 2018). Among the resources of concern are a site that contains a cremation locus (P-33-001821), located on private land within the indirect APE but extending into the DQSP direct APE slightly, and three Native American trails (P-33-000343, P-33-000772, and P-33-024394) located in the direct APE, as well as others previously recorded in the indirect APE.

P-33-001821 and the three trails in the direct APE were recommended eligible under NRHP/CRHR Criterion d/4 in the archaeological inventory report (Lerch, Swope, et al. 2016:Table 21) and the first addendum (Lerch 2017:Table 1), with notes that they might also be eligible under Criterion a/1 or b/2, pending consultation with the tribes by the BLM. That consultation is ongoing, and to assist with the BLM's determinations of eligibility for these sites, we prepared ethnographic notes on the Mule Mountains Complex (Chapter 3 above). The ethnographic notes summarize ethnographic background information pertaining to the two sites currently listed in the NRHP as the Mule Tank Discontiguous Rock Art District (P-33-000504 and P-33-000773) and other sites in the Mule Mountains area that also are recommended as contributing resources to the proposed expanded discontiguous district, renamed the MMCDAD.

Because the scope of the cultural resource review under this addendum addresses the significance of resources to tribes, it is appropriate to consider whether any of the identified resources qualify for consideration as Traditional Cultural Properties or Places (TCPs) under NHPA Section 106 or as Tribal Cultural Resources (TCRs) under the CEQA. A TCP is "eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1998:1). TCRs are defined in the CEQA as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" determined to be eligible for listing in the CRHR (PRC § 21074).

NRHP- and CRHR-Eligibility Recommendations

SRI's final NRHP- and CRHR-eligibility recommendations are presented below. These supersede previous eligibility recommendations presented in the original survey report (Lerch, Swope, et al. 2016:Table 21) and the first addendum report (Lerch 2017). As noted, properties that are determined eligible for listing in the NRHP by the BLM are also eligible for listing in the CRHR, as determined by the County (14 CCR 4851[a][1]). The discussions are organized by eligibility status and the site types presented in Chapter 4 of the original report (Stanton et al. 2016), as suggested by SHPO staff (Polanco 2018). A complete list of all resources, along with eligibility recommendations, is provided in Appendix A of this report. These recommendations will be used by the BLM to make its formal determinations of NRHP eligibility, with concurrence by the SHPO, and by the County to make its findings under the CEQA. A summary of the sites that are listed or recommended eligible for listing in the NRHP/CRHR is provided in Table 3.

Table 3. Summary of NRHP-/CRHR-Listed and -Eligible Sites

Primary No. (P-)	State Trinomial	Field No.	Age	Description	Land Ownership	NRHP and CRHR Status (Criteria)[a]
	Sites Previously Listed or Determined Eligible					
33-000504	CA-RIV-504	not surveyed by SRI	prehistoric	petroglyphs	BLM	listed (c/3 and d/4), as a contributing resource to the Mule Tank Discontiguous Rock Art District; eligible (a/1, c/3, and d/4, as a contributing resource to the MMCDAD
33-000773	CA-RIV-773	not surveyed by SRI	prehistoric	geoglyph/intaglio	BLM	listed (c/3 and d/4), as a contributing resource to the Mule Tank Discontiguous Rock Art District; eligible (a/1, c/3, and d/4, as a contributing resource to the MMCDAD
33-001821[b]	CA-RIV-1821/H[b]	SRI-8020	multicomponent	thermal rock features with lithic and ceramic scatters, human remains; historical-period refuse scatters	BLM, private	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD (prehistoric component only)
33-011110		not surveyed by SRI	historical period	transmission line	BLM	eligible (a/1)
33-012532	CA/RIV-7127H	not surveyed by SRI	historical period	transmission line	BLM	eligible (a/1)
	Prehistoric and Multicomponent Sites Recommended Eligible					
33-000053	CA-RIV-53T	not surveyed by SRI	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4)
33-000343	CA-RIV-343T	SRI-9003	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD
33-000650	CA-RIV-650T	not surveyed by SRI	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD
33-000673	CA-RIV-673/H-T	not surveyed by SRI	multicomponent	trails; refuse scatter	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD (prehistoric component only)
33-000772	CA-RIV-772T	SRI-110	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD
33-003803	CA-RIV-3803T	not surveyed by SRI	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4)

Primary No. (P-)	State Trinomial	Field No.	Age	Description	Land Ownership	NRHP and CRHR Status (Criteria)[a]
33-019618	CA-RIV-9935/H	SRI-127	multicomponent	lithic scatter; refuse scatter	BLM	eligible (d/4) (prehistoric component only)
33-024283	CA-RIV-11937	SRI-83	prehistoric, Patayan II/III	thermal rock features with associated artifacts	BLM	eligible (d/4)
33-024356	CA-RIV-11990	SRI-1059	prehistoric	rock feature with artifact scatter	BLM	eligible (d/4)
33-024361	CA-RIV-11995	SRI-2021	prehistoric, Patayan II/III	thermal rock features with associated artifacts	BLM	eligible (d/4)
33-024385	CA-RIV-12019	SRI-3039	prehistoric	thermal rock features	BLM	eligible (d/4)
33-024394	CA-RIV-12028T	SRI-3255	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD
33-024459	CA-RIV-12091	SRI-4085	prehistoric, Patayan II/III	thermal rock features	BLM	eligible (d/4)
33-024476	CA-RIV-12108	SRI-4241	prehistoric	thermal rock features with lithic scatter	BLM	eligible (d/4)
33-024496	CA-RIV-12128	SRI-6033	prehistoric	thermal rock features with lithic scatter	BLM	eligible (d/4)
33-024497	CA-RIV-12129	SRI-6034	prehistoric, Patayan II/III	thermal rock features with associated artifacts	BLM	eligible (d/4)
33-024719	CA-RIV-12240	SRI-17	prehistoric, Patayan II	thermal rock features with lithic scatter	BLM	eligible (d/4)

[a] NRHP-eligibility Criteria a–d correspond to CRHR-eligibility Criteria 1–4.

[b] P-33-001821 now subsumes P-33-001822, P-33-021215, P-33-021216, P-33-021217, P-33-021218, P-33-021371, P-33-021372, P-33-021373, P-33-021375, P-33-021376, P-33-021377, P-33-021378, P-33-021382, P-33-021383, P-33-022534, P-33-022536, P-33-022537, and P-33-022538 (Gardner 2018:82–83).

Copies of site records and updates (DPR 523–series forms) for listed and eligible sites located in the indirect APE and not previously provided in Appendix D of the original survey report (Lerch, Stanton, and Swope 2016) are included in Appendixes C and D of this report. The locations of the 22 sites that are listed or recommended eligible are illustrated in Figure 6, which also depicts Alternative 2, the Resource Avoidance alternative, identified as the BLM's Preferred Alternative in the DQSP draft EIS/EIR (USDI BLM and County 2018:2-32).

Sites Previously Listed or Determined Eligible

Two sites located within the indirect APE are listed in the NRHP/CRHR, and three others have been determined eligible as a result of previous undertakings, according to information provided in the records search by the CHRIS EIC prior to the DQSP field survey (Lerch, Stanton, and Swope 2016). Pertinent information from reports of studies recently conducted within the indirect APE (e.g., Gardner 2018; Hanes 2018; Nixon et al. 2011) also was considered in the discussions below.

Mule Tank Discontiguous Rock Art District: P-33-000504 and P-33-000773

The NRHP-listed sites include P-33-000773, the Mule Canyon geoglyph site, located approximately 1 mile west of the direct APE, and P-33-000504, the Mule Tank site, 1.8 miles farther to the west; together, these sites are recognized as the Mule Tank Discontiguous Rock Art District, under Criteria c and d. P-33-000504 is a petroglyph locus within the district, and P-33-000773 is a geoglyph/intaglio component (see Appendix C). The two NRHP-listed sites are now also recommended eligible under Criterion a, for their association with events that have made a significant contribution to tribal histories in the region (see further discussion below, in the MMCDAD section). Both sites are also recommended eligible for listing in the CRHR, on the basis of the NRHP listing.

Prehistoric Component of a Multicomponent Site: P-33-001821

P-33-001821 was classified as a prehistoric rock features with artifact scatter site in the original survey report and is now a multicomponent site, after its most recent update. The site is mostly located within the indirect APE, and a small portion of its eastern margin extends into the DQSP direct APE. It was recorded initially in 1980, during studies for the DPV transmission line (Carrico et al. 1982), and has subsequently been updated six times, each time with a slightly different boundary configuration (Lerch, Swope, et al. 2016:128; Stanton et al. 2016:82–86), most recently in 2017 (Gardner 2018).

The most recent update was done as a result of a field survey by Applied EarthWorks, Inc. (Æ), of selected segments of a proposed high-voltage transmission line known as the Ten West Link, which follows the same utility corridor within the indirect APE as the DPV transmission line. The results of the Æ survey expanded the documentation for P-33-001821 to include multiple other sites (n = 18) in its vicinity, including several (n = 6) with historical-period components. On the basis of the Ten West Link survey, P-33-001821 was redefined to also include sites P-33-001822, P-33-021215, P-33-021216, P-33-021217, P-33-021218, P-33-021371, P-33-021372, P-33-021373, P-33-021375, P-33-021376, P-33-021377, P-33-021378, P-33-021382, P-33-021383, P-33-022534, P-33-022536, P-33-022537, and P-33-022538 and now covers approximately 90 acres. The prehistoric component of the redefined and enlarged site was recommended eligible by Gardner (2018:83), under Criteria c and d, for the Ten West Link project (Gardner 2018:82–83; Hanes 2018:23).

The area of P-33-001821 recorded by Stanton et al. (2016:82–86) is shown in red on the Figure 6 map; the new site area, expanded by Æ (Gardner 2018), is illustrated in gray, with a red boundary. As currently recorded, P-33-001821 is an extensive multicomponent site complex containing numerous rock features, lithic- and ceramic-artifact scatters, a cremation locus, historical-period refuse scatters related to the DTC/C-AMA (Gardner 2018:82–83), and two separately recorded intersecting trails (P-33-000343 and P-33-000650).

Map showing confidential site locations on file at BLM Palm Springs-South Coast Field Office.

Figure 6. Map showing NRHP-/CRHR-eligible sites in relation to Alternative 2, the Resource Avoidance alternative. Note that the prefix "P-" has been omitted from site primary numbers on the map.

During a visit to P-33-001821 by BLM archaeologists and tribal representatives for a previous project (the gen-tie corridor of the now withdrawn Rio Mesa Electric Generating Facility passed through the site [see Nixon et al. 2011]), a suspected cremation locus that had not been previously identified was observed in the site vicinity. The locus was later relocated by SRI and BLM archaeologists on the private-land portion of the site located within the indirect APE and was formally recorded as Feature 9008 (Stanton et al. 2016:86). Based on the most recent Æ update for P-33-001821 (see Appendix C), the cremation locus is now identified as Locus 15 (Gardner 2018:82).[1]

In a 2015 site visit by archaeologists from the BLM and SRI, two fragments of a chalcedony Elko-series dart point that had apparently broken during manufacture were discovered by the author 50 m apart, in the portion of the site located in the DQSP direct APE (Stanton et al. 2016:85, Figure 11). The presence of that artifact, along with various ceramics at the site, and oral-history accounts suggest that the site has been used from at least the Late Archaic period until historical-period times, as noted in Chapter 3. Taken together, the sites now combined as P-33-001821 appear to represent the primary area of habitation in the project area. It may have served as a stopover location or staging area for people traveling from various areas along the Colorado River to the Mule Mountains for ceremonial activities at P-33-000504 and P-33-000773, using the east–west trail recorded as P-33-000343. A second, north–south trail recorded as P-33-000650 intersects the P-33-000343 trail within the boundaries of P-33-001821 (see the discussion of trails below).

P-33-001821 (at that time recorded as a prehistoric site only) was recommended eligible by Lerch, Swope, et al. (2016:128, Table 21) under NRHP Criterion d. Following the recommendation by Gardner (2018:83), the prehistoric component of the redefined and enlarged site was determined eligible by the BLM under Criteria c and d for the Ten West Link project, and the SHPO concurred in 2018 (George Kline, personal communication 2019).

Based on all the information in the record, including the ethnographic and historical accounts summarized above in Chapter 3, the prehistoric/Native American component of P-33-001821 is now recommended eligible for listing in the NRHP/CHRH under Criterion a/1, for its association with events that have made a significant contribution to tribal histories in the region; under Criterion c/3, because it represents a significant and distinguishable entity whose components may lack individual distinction, including a cremation locus, intersecting trails, subsistence-related features, and both material culture and oral history that document its occupation for more than two millennia—spanning the transition from atlatl-and-dart to bow-and-arrow hunting technology and from foraging to agricultural subsistence patterns; and under Criterion d/4, because it has yielded, and may be likely to yield, information important in prehistory and history. The historical-period components of P-33-001821 do not meet any of the eligibility criteria and are recommended not eligible for listing in the NRHP or the CRHR.

The prehistoric component of P-33-001821 also is recommended eligible for listing in the NRHP/CRHR as a contributing resource to the MMCDAD under Criterion a/1, along with NRHP-listed sites P-33-000504 and P-33-000773 and at least five trail segments (see the MMCDAD discussion below). Finally, because it contains human remains and is a key element of the cultural landscape defined by the MMCDAD, P-33-001821 appears to qualify as a TCP under NHPA Section 106, "because of its association with cultural practices or beliefs of a living community that are rooted in that community's history" (Parker and King 1998:1), and as a TCR under the CEQA, because it is a site that is part of a cultural landscape with cultural value to a California Native American tribe and is eligible for listing in the CRHR (PRC § 21074).

[1] As a follow-up to the Ten West Link field survey, the suspected cremation locus on private land at P-33-001821 was reported to the Riverside County Coroner's office by Æ, as required by California State Law (*Health and Safety Code* § 7050.5). The locus was examined in the field on August 21, 2018, by Dr. Deborah Gray, a forensic anthropologist serving as Deputy Coroner, who determined that the calcined bone fragments at the locus are human remains and referred the matter to the NAHC, pursuant to PRC § 5097.98 (Hanes 2018:23; Barry A. Price, Æ, personal communication 2018). It is unknown whether the NAHC has determined a Most Likely Descendant (MLD) or the identity of the MLD.

Transmission Lines: P-33-011110 and P-33-012532

No architectural (built-environment) resources were identified within the DQSP direct APE (Stanton et al. 2016:110). However, two historical-period transmission lines are located within the indirect APE, along the southeastern boundary of the DQSP. Both have been previously determined eligible for listing in the NRHP, according to information obtained from the CHRIS EIC during the records search for the DQSP project (Lerch 2017; Lerch, Stanton, and Swope 2016). These resources are the Pilot Knob–Blythe 161-kV transmission line (P-33-011110) and the Blythe–Niland 161-kV transmission line (P-33-012532) (see Lerch, Stanton, and Swope 2016:Figure C.2). The former, built in 1951, is a 64.4-mile-long line made of H-frame wooden poles and parallels the 2-mile-long boundary of the DQSP. The latter is a line of similar wooden-pole H-frame construction built in the same corridor in the 1940s and 1950s. Both were determined eligible under NRHP Criterion a for their association with historical events related to electrical-power generation and transmission (see Appendix D). Because the two transmission lines have been determined eligible for listing in the NRHP, they would also be considered historical resources eligible for listing in the CRHR.

Prehistoric and Multicomponent Sites Recommended Eligible

In addition to the 5 sites already listed or determined eligible for listing in the NRHP and the CRHR, 17 other sites or site components are recommended eligible on the basis of studies conducted for the DQSP (Lerch, Stanton, and Swope 2016) or discussed in the draft EIS/EIR or other studies conducted within the indirect APE (USDI BLM and County 2018). These resources are considered according to their site types as defined in the original survey report (Lerch, Stanton, and Swope 2016) and are classified as an artifact concentration, 2 rock-feature sites, 7 rock features with artifact scatters, and 7 trail segments. Two of the sites also contain historical-period components that are not recommended eligible.

Rock-Feature Sites: P-33-024385 and P-33-024459

Two sites recommended eligible are rock-feature sites recorded as P-33-024385 and P-33-024459. Both have good integrity and are similar to the thermal features tested and described in Chapter 2 above. As noted in that chapter, features such as these are believed to represent earth ovens used to process geophytes, such as the desert lily. In the original inventory report, these two sites were evaluated as “possibly eligible” pending subsurface testing (Lerch, Swope, et al. 2016:127–128). Because these two sites will be avoided by DQSP Alternative 2, the BLM’s Preferred Alternative, they were not tested, and they are now assumed eligible for listing in the NRHP/CRHR under Criterion d/4, with the potential to yield information important to prehistory related to the theme of settlement and subsistence.

Rock Features with Artifact Scatters: P-33-024283, P-33-024356, P-33-024361, P-33-024476, P-33-024496, P-33-024497, and P-33-024719

Seven sites (P-33-024283, P-33-024356, P-33-024361, P-33-024476, P-33-024496, P-33-024497, and P-33-024719) recommended eligible are rock features with artifact scatters. Containing a total of 47 rock features among them, these sites are the same as the thermal-feature sites considered above and tested as reported in Chapter 2, with the addition of small lithic or ceramic scatters. One site, P-33-024497, is distinguished as the only site identified within the direct APE to contain ground stone artifacts, including a large fragment made of schist, a nonlocal rock type. The sites all retain integrity, and some may have subsurface deposits (Lerch, Swope, et al. 2016:128; Stanton et al. 2016:86–88). As with the rock-feature-only sites, these seven sites will be avoided by Alternative 2, the BLM’s Preferred Alternative. Thus, they were not tested, and they are now assumed eligible for listing in the NRHP/CRHR under Criterion d/4, with the potential to yield information important to prehistory related to the themes of technology and settlement and subsistence.

Native American Trails: P-33-000053, P-33-000343, P-33-000650, P-33-000772, P-33-003803, and P-33-024394

Finally, six sites (P-33-000053, P-33-000343, P-33-000650, P-33-000772, P-33-003803, and P-33-024394) are recommended eligible because they consist of trail segments of Native American origin (Lerch, Swope, et al. 2016:128; Stanton et al. 2016:88). A seventh trail site (P-33-000673) is classified as a multicomponent site (see below) because it also contains a historical-period refuse scatter. Trail segments such as these and others have been repeatedly mentioned in ethnographic studies as being of concern to Indian tribes of the region (e.g., Bean et al. 1978:6-40, 6-54, 6-66; Gates 2012:51–53).

Trail-segment P-33-000053 has been identified as a portion of the historic Cocomaricopa Trail, and a nearby segment, P-33-003803, is believed to be part of the same trail network (Johnston and Johnston 1957; McCarthy 1982, 1993:70–84, 193–194). These two trail segments are located in the far-northern extent of the indirect APE, north of Interstate 10, and are not directly related to the trails within the MMCDAD.

Of the other four trail segments, three are located within the direct APE and extend into the indirect APE, and one has been recorded only in the indirect APE, along with multicomponent trail-segment P-33-000673. Three of these trail segments, as well as P-33-000673, are oriented in an east–west direction and appear to represent travel between the Colorado River and the Mule Mountains. The other two segments are aligned in a north–south direction and appear to represent travel corridors that parallel the river. (Another east–west trail segment, P-33-000775, previously recorded in the indirect APE during surveys in 1980, 2005, and 2005, was not relocated during a recent survey [Gardner 2018:70]. Thus, it is not further considered here in regard to its eligibility).

Trails represent tangible evidence in the archaeological record of contact between Native groups who lived in and traveled through the project area, and they can address a number of research questions under the research theme of trade and regional interaction. Trails in the project area also lead to and are part of the ceremonial landscape, and are considered important parts of the cultural landscape by tribes of the region. The trails in the APE for the DQSP and others in the region were mentioned by Bean et al. (1978) as important parts of the Mule Mountains Complex, as noted in Chapter 3.

Because of their places in tribal history, the fact that the networks of which they are parts represent significant and distinguishable entities whose components may lack individual distinction, and their potential to illuminate regional trade and exchange networks as well as ceremonial landscapes, all six of the Native American trails are recommended eligible for listing in the NRHP/CRHR under Criteria a/1, c/3, and d/4. Four of the trails (P-33-000343, P-33-000650, P-33-000772, and P-33-024394) lead to and from ceremonial sites in the Mule Mountains and are considered by tribal representatives to be important parts of their cultural landscapes. As such, they are also considered eligible for listing in the NRHP/CRHR under Criteria a/1, c/3, and d/4 as contributing resources to the MMCDAD (see below). One other trail, P-33-000673, is part of a multicomponent site and has also been recommended eligible in that category (see below), both individually and as a contributing resource to the MMCDAD.

Prehistoric Components of Multicomponent Sites: P-33-000673 and P-33-019618

The prehistoric components of two multicomponent sites (P-33-000673 and P-33-019618) are recommended eligible. P-33-000673 is an east–west prehistoric trail segment located in the indirect APE. As do several other east–west trail segments, it represents travel between the Colorado River and the Mule Mountains, and it is considered by interested tribes to be a part of their cultural landscape. The Native American trail component of P-33-000673 is recommended eligible for listing in the NRHP and the CRHP under

Criteria a/1, c/3, and d/4, both individually and as a contributing resource to the MMCDAD, for all of the same reasons and under the same themes as the other Native American trails discussed above.

Because a historical-period refuse scatter containing four cans was also documented adjacent to trail P-33-000673 when it was recorded, the site is classified as multicomponent. The historical-period component does not meet any of the eligibility criteria and is recommended not eligible for listing in the NRHP or the CRHR.

The prehistoric component (only) of the large, multicomponent artifact concentration recorded as P-33-019618 is also recommended eligible. Located in the far-northern portion of the direct APE, in an area of desert pavement, the prehistoric component of the site contains an extensive lithic scatter and assay/procurement areas. The site contains the largest number of flaked stone artifacts (more than 200 flakes and 30 tested cobbles of chert and quartzite) in the project area and has the potential to contain subsurface deposits (Lerch, Swope, et al. 2016:128; Stanton et al. 2016:102). The prehistoric component of the site has the potential to address research questions related to the theme of lithic technology and appears to be one of the only toolstone sources in the project area. Therefore, SRI recommends the prehistoric component of P-33-019618 eligible for listing in the NRHP/CRHR under Criterion d/4.

The historical-period component of P-33-019618 consists of a scatter of refuse (Feature 2529) that appears to be associated with the World War II–era Desert Training Center, along with more recent domestic refuse (Stanton et al. 2016:104). Feature 2529 was recorded in detail and has exhausted its research potential under Criterion d, and it does not meet any of the other criteria. Thus, the historical-period component of P-33-019618 is recommended not eligible for listing in the NRHP or CRHR.

Mule Mountains Complex Discontiguous Archaeological District

As noted above in Chapter 3, two sites within the indirect APE, P-33-000504 and P-33-000773, are listed in the NRHP as the Mule Tank Discontiguous Rock Art District. However, ethnographic studies conducted for other projects in the region indicate that these two sites are actually parts of a much larger cultural landscape known as the Mule Mountains Complex (AECOM 2013:54–55; Bean et al. 1978:7-26–7-27; Gates 2012:24, 57–59). Further, although the current Mule Tank Discontiguous Rock Art District was listed in the NRHP under eligibility Criteria c and d (Whitley 2001) because of the focus on the petroglyphs at P-33-000504 and the “dance circle” at P-33-000773, it is clear from the results of interviews conducted by Bean et al. (1978), Gates (2012), and AECOM (2013) and from a comment letter from the CRIT on the draft EIS/EIR (Patch 2018) that tribal representatives consider the ceremonial sites in the Mule Mountains and the trails leading to them important parts of their tribal history.

The 143 petroglyph panels and 12 trail segments, along with 12 milling features, 1 anvil stone, and 2 ceramic scatters, now recorded at P-33-000504 and the geoglyphs and converging trails at P-33-000773 indicate that the district has a much greater focus than “rock art,” a term that implies a spectator gallery rather than a ceremonial site (see site records and updates, Appendix C). Therefore, we propose that the existing Mule Tank Discontiguous Rock Art District be renamed the Mule Mountains Complex Discontiguous Archaeological District (MMCDAD) and that it be considered eligible for listing in the NRHP/CRHR under Criterion a/1, for its importance in tribal history, as well as under Criteria c/3 and d/4, for which it is already listed (Whitley 2001). The petroglyphs at P-33-000504 and the geoglyphs and trails at P-33-000773 meet Criterion c/3 because they embody distinctive characteristics of a type, period, or method of construction, and they meet Criterion d/4 because they have the potential to yield information important in prehistory and history under the research themes of trade and regional interaction and ceremonial landscapes (Kremkau, Swope, et al. 2016:48–50).

The proposed renamed and expanded discontiguous district, the MMCDAD, would include the following sites, all either already listed or recommended eligible individually above:

- the Mule Tanks petroglyph site (P-33-000504), previously listed;
- the Mule Canyon geoglyph site (P-33-000773), previously listed;

- P-33-001821, the prehistoric component only, an extensive site with multiple rock features, artifact scatters, and a cremation locus, previously determined eligible;
- east–west trail P-33-000343, recommended eligible;
- north–south trail P-33-000650, recommended eligible;
- east–west trail P-33-000673, the prehistoric trail component, recommended eligible;
- east–west trail P-33-000772, recommended eligible; and
- north–south trail P-33-024394, recommended eligible.

As key elements of a cultural landscape important to River Yuman tribes such as the Mohave and Quechan, as well as Numic tribes such as the Chemehuevi and Takic tribes such as the Cahuilla, all of these sites are also recommended eligible for listing in the NRHP as contributing resources to the expanded discontiguous archaeological district renamed the MMCDAD, in addition to their individual eligibility. Because the MMCDAD is a discontiguous archaeological district, the boundaries of the district are defined as the existing boundaries of the individual sites that compose the district (see Figure 6).

The trail segments associated with the Cocomaricopa Trail (P-33-000053 and P-33-003803) are important in their own right but are not considered contributing resources to the MMCDAD, because they are well north of the Mule Mountains and do not traverse that district. Likewise, the artifact concentration, two rock feature sites, and the seven rock features with artifact scatters are not considered contributing resources to the MMCDAD, because they are related to technology or settlement and subsistence but do not contain evidence that they are tied to ceremonial activities associated within the discontiguous archaeological district centered on the Mule Mountains.

With the exception of the eight sites recommended eligible as contributing resources to the MMCDAD (see above), none of the other prehistoric sites can be considered an element of a district, because they do not represent "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (Shrimpton 2002).

Ineligible Prehistoric and Multicomponent Sites

The remaining prehistoric and multicomponent sites are recommended not eligible for listing in the NRHP or CRHR because they do not do not meet the eligibility criteria or because they lack integrity, or both. They are discussed below according to their site classifications in the original survey report (Lerch, Stanton, and Swope 2016), in which each site was recorded in detail, with features and diagnostic artifacts individually mapped. All sites were recorded on the basis of in-field lithic and ceramic analyses, which allowed sites to be characterized in terms of lithic technology and dated according to defined ceramic wares (Kremkau, Swope, et al. 2016:65–66, Table 8).

Artifact Concentrations (n = 25)

Artifact concentrations are groups of artifacts scattered across the ground surface that lack features such as pits or thermal features. Two types of artifact concentrations, lithic scatters and ceramic scatters, were discovered. Of the 25 total sites of this type identified within the direct APE, 9 are ceramic scatters, and 16 are lithic scatters (see Appendix A). The majority of these sites are sparse surface scatters (with fewer than 50 artifacts each) that do not retain any integrity and that lack diagnostic artifacts other than those already recorded (i.e., ceramic-sherd types) (see Stanton et al. 2016:Tables 8, 9, and 18). The sites are not associated with important events or persons, they do not embody distinctive characteristics of their types, and they do not have the potential to yield information important to prehistory or history beyond what has already been recorded. These artifact concentrations are recommended not eligible for listing in the NRHP or the CRHR.

Rock-Feature Sites (n = 28)

Thirty of the prehistoric sites in the project area are rock-feature sites. These sites consist of one or more rock features, usually with no associated artifacts. The majority of the rock features appear to be thermal features (earth ovens used for food preparation) and contain a mix of fire-altered and unaltered rock. The features vary greatly in size and integrity. Most intact features measure between 1 and 3 m in diameter and consist of between 20 and 50 pieces of rock.

Four of the 30 rock-feature sites retain some integrity and were considered possibly eligible for listing in the NRHP under Criterion d (and for listing in the CRHR under Criterion 4) in the original survey report, pending formal evaluation (Lerch, Swope, et al. 2016:127). Two of those sites (P-33-024385 and P-33-024459) will be avoided by Alternative 2, the BLM's Preferred Alternative; they were not tested and are assumed eligible under Criterion d/4 (see above). The other two sites (P-33-024393 and P-33-024511) were among the three thermal-feature sites that were tested and recommended not eligible (see Chapter 2). The other 26 rock-feature sites are deflated, and their rock features retain no integrity.

The 2 tested rock-feature sites and the 26 deflated rock-feature sites that lack integrity are recommended not eligible for listing in the NRHP or the CRHR. The sites are not associated with important events or persons, they do not embody distinctive characteristics of their types, and they do not have the potential to yield information important to prehistory or history beyond what has already been recorded.

Rock Features with Artifact Scatters (n = 23)

These sites consist of one or more FAR rock features with an associated lithic- or ceramic-artifact scatter (Stanton et al. 2016:82, Table 11). The rock features associated with these sites are similar to the other rock features found during the archaeological survey—concentrations of primarily fire-affected quartzite and chert cobbles with a smaller number of cobbles composed of other material types—but were found in association with additional artifacts. In some cases, these artifacts were found in discrete concentrations, although generally, the additional artifacts were scattered across the site surface. As with other identified rock features, these vary in their degree of preservation and lack any observable midden or charcoal.

Of the 31 total sites associated with this site type recorded in the original DQSP survey, 7 sites classified as rock features with artifact scatters (P-33-024283, P-33-024356, P-33-024361, P-33-024476, P-33-024496, P-33-024497, and P-33-024719) retain some level of integrity and have the potential to yield information; these are recommended eligible for listing in the NRHP and CRHP (see above). Another site first recorded as this site type, P-33-001821, has since been redefined as a multicomponent site, and its prehistoric component has previously been determined eligible (see above). Of the other 23 sites classified as rock features with associated artifact scatters, one (P-33-024377) has been tested, with negative results, and recommended not eligible (see Chapter 2). The other 22 are deflated, and their rock features lack integrity.

The 1 tested site and the 22 deflated sites classified as rock-features with artifact scatters that lack integrity are recommended not eligible for listing in the NRHP or the CRHR. These sites are not associated with important events or persons, they do not embody distinctive characteristics of their types, and they do not have the potential to yield information important to prehistory or history beyond what has already been recorded.

Multicomponent Sites—Prehistoric Components (n = 7)

Ten multicomponent sites were identified within the direct and indirect APE for the DQSP, and the prehistoric components of 3 of those (P-33-000673, P-33-001821, and P-33-019618) are recommended eligible for listing in the NRHP and the CRHR (see above). The prehistoric components of the other 7 multicomponent sites are artifact concentrations with small numbers of pieces of FAR or ceramic or lithic artifacts, along with scatters of unassociated historical-period bottles and cans (Stanton et al. 2016:102, Table 17). These sites are not associated with important events or persons, they do not embody distinctive characteristics of their types, and they do not have the potential to yield information important to prehistory or history beyond what has already been recorded. Therefore, the prehistoric components of the remaining 7 multicomponent sites are recommended not eligible for listing in the NRHP or the CRHR.

Ineligible Historical-Period Sites

The historical-period sites are classified as artifact concentrations, military-activity sites, water-well sites, roads/trails, or survey markers. They are discussed below according to temporal periods that correspond to the years before, during, and after World War II, when the project area was the scene of activities associated with the DTC/C-AMA. Within each time period, the resources are summarized by site type.

The investigations for the original survey report involved substantial amounts of archival research for the background information and research design, which included a review of published and unpublished historical accounts, U.S. General Land Office (GLO) plat maps and survey notes, early USGS topographic quadrangles, census data, homestead records, water-district records, and military history. Archival repositories consulted included BLM Web sites, the County Transportation Survey Division, local and regional libraries, the Palo Verde Irrigation District, USGS records, and the U.S. National Archives and Records Administration National Archives at Riverside, California (Kremkau, Mills, et al. 2016:33–45; Kremkau, Swope, et al. 2016:62, Table 4). As a result of that research, it was possible to determine whether various historical-period sites were associated with historically significant events or persons and to exhaust the potential of sites to yield information important in history. That allowed us to evaluate significance and make recommendations for NRHP and CRHR eligibility at the inventory level of investigation.

The historical-period sites and historical-period components of multicomponent sites either did not meet any of the eligibility criteria or lack integrity, and all are recommended not eligible for listing in the NRHP or the CRHR. In addition, none of the historical-period sites can be considered elements of a district, because they do not represent "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (Shrimpton 2002).

Pre-DTC/C-AMA/Homesteading (Pre-1942) Sites (n = 15)

Fifteen historical-period sites within the direct APE are associated with land use prior to the establishment of the DTC/C-AMA (Stanton et al. 2016:88–92, Table 13). All but three of these sites are artifact concentrations associated with dumping of domestic refuse. One of the pre-1942 sites is a road, and another is a collection of survey markers and surveyors' trails from the 1917 GLO survey of Township 7 South, Range 21 East, SBBM. A previously recorded surveyor's trail that is also related to the 1917 GLO survey is the third.

Artifact Concentrations

The dozen artifact concentrations that date to the early twentieth century contain a variety of domestic refuse, as well as other artifact types. Most of the artifact concentrations are highly disturbed, but 3 are in good condition: P-33-024299, P-33-024374, and P-33-024399. However, these 3 sites could not be associated with a particular activity, residence, or individual, nor could they be tied to work camps for the 1917 GLO survey crew. The artifact concentrations are surficial deposits, lack stratigraphic integrity, and do not contain the quantity and variety of materials that would allow for statistical analyses pertinent to the research questions posed under the theme of settlement and agriculture (Kremkau, Swope, et al. 2016:55–56). These sites were thoroughly documented in the initial field survey and report, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The 12 early-twentieth-century artifact concentrations are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

Roads/Trails

Ten historical-period roads/trails were identified within the direct APE that are of sufficient age and integrity for consideration as historic properties. One of those, P-33-024355, is depicted on the 1918 GLO plat map of Township 7 South, Range 21 East, drawn from survey data collected in 1917 (see Kremkau, Mills, et al. 2016:Figure 5). On that map, the road ended just south of the project APE, in the southwestern quarter of Section 23, near a house and an agricultural field outside the direct APE. From that point, the road followed its current alignment northeastward through Sections 23 and 14 but branched northeastward from the current alignment in the NE $^1/_4$ of Section 11. Its northern terminus at that time remains unknown. By 1952, as shown on the USGS topographic map of that year (Lerch, Swope, et al. 2016:125), the road continued northward to a network of roads accessing mines in the Little Maria Mountains and had been extended southward to connect with the Bradshaw Trail.

The road recorded as P-33-024355 does not meet any of the NRHP- or CRHR-eligibility criteria. Based on the background and archival research, the route and destination for the linear feature, as well as its approximate age, are known. However, none of the names associated with adjacent land claims appears to be important in local or regional history. The site was thoroughly documented during this investigation through field recordation, collection of a photographic record, and detailed mapping. The research questions on settlement and agriculture posed in the research design (Kremkau, Swope, et al. 2016:55–56) have been addressed to the extent possible, and further research will not yield additional information important to history. Therefore, SRI recommends historical-period road P-33-024355 not eligible for listing in the NRHP or the CRHR.

Survey Markers

In addition to the artifact concentrations and the road, an array of the survey markers and linear disturbances associated with the 1917 GLO survey of the area (P-33-024526 and P-33-017328) was also identified within the direct APE. P-33-024526 consists of 22 survey markers and 10 linear disturbances associated with the survey markers. An additional linear disturbance/trail, previously recorded as P-33-017328, is part of the same resource. The linear disturbances are approximately 2 feet wide, are oriented north–south or east–west along section or quarter-section lines, and intersect at the survey markers. These disturbances originated from the survey crews' clearing of areas and walking the alignments during placement of the markers.

The number and array of markers and disturbances derive from the 1917 GLO survey, which included setting markers at 85 locations (all section corners and centers), 22 of which were found within the DQSP direct APE. Although government surveys are associated with events that have contributed significantly to broad historical patterns, early-twentieth-century survey markers are common through the California desert and elsewhere, and their purpose and morphology are well documented. P-33-017328 and P-33-024526 do not meet NRHP/CRHR Criterion a/1 or c/3. The names of all the surveyors for the 1917 survey were reviewed and researched, and none was found to be significant in local or regional history (Lerch, Swope, et al. 2016:Table 20). Based on the results of our archival research, P-33-017328 and P-33-024526 are not associated with the lives of persons significant in our past and do not appear eligible under NRHP/CRHR Criterion b/2. Documentation of P-33-017328 and P-33-024526 included background and archival research, field recordation, collection of a photographic record, and detailed mapping. The sites were thoroughly documented during this investigation and have no further research potential under NRHP/CRHR Criterion d/4. Thus, P-33-017328 and P-33-024526 are recommended not eligible for listing in the NRHP or the CRHR.

DTC/C-AMA (1942–1944) Sites (n = 103)

There are 102 historical-period sites associated with troop activities at the DTC/C-AMA recorded within the direct APE (Stanton et al. 2016:Table 14). One additional site located just outside the direct APE boundary, P-33-014148, was added by the BLM in the draft EIS/EIR, for a total of 103 sites from this period. Most of these sites (n = 94) consist of artifact concentrations, and 9 of them are military-activity sites. The

DTC/C-AMA sites were recorded in detail following the guidelines provided in the field manual for documenting resources associated with this period (Allen et al. 2011).

Artifact Concentrations

The 94 artifact concentrations are composed of K- and C-ration cans, friction-lid soluble-coffee-ration cans, and both beer and nonalcoholic-beverage bottles and cans. In some instances, sardine cans, evaporated-milk cans, and sanitary food cans were found in association with these sites. These cans may be nonstandard resources used for rations to fill supply gaps. Five of the sites were previously recorded. Two additional artifact concentrations with DTC/C-AMA components are classified as multitemporal (see below). The historical-period component of P-33-001821 (see above) is also related to the DTC/C-AMA (Gardner 2018:83).

Historical and archaeological contexts prepared for DTC/C-AMA sites identified refuse deposits as constituting one of the property types associated with the resources of this period and noted that such refuse deposits can range from "isolated artifact scatters to large trash dumps, used for long periods of time. Refuse deposits from the DTC/C-AMA period will be identifiable by the military-related artifacts present, as well as by their location" (Bischoff 2009:127). The small scatters identified in the project APE were likely associated with temporary campsites and bivouacs and were not completely "cleaned up by the departing soldiers" (Bischoff 2009:127) as many others were.

The DTC/C-AMA is "particularly relevant to several broad, important themes in American history," was "the largest training facility and the only one of its kind in American military history," and was "associated with several preeminent figures in the American Army" (Bischoff 2009:133–134). Nevertheless, the guidance states that "whereas these resources have the potential to be considered significant under any or all of the four criteria, more often than not they will be considered primarily eligible under Criterion d for their ability to yield information important in history" (Bischoff 2009:134). Although the small sites retain aspects of integrity, it is not possible to relate them to specific military activities or units, nor can they answer research questions posed under the theme of World War II and the DTC (Kremkau, Swope, et al. 2016:56–57). They do not contain sufficient quantity or variety of materials to support statistically valid analyses, nor do they contain further data potential. The DTC/C-AMA sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The artifact concentrations dating to the DTC/C-AMA period are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

Military-Activity Sites

Nine military-activity sites were identified within the direct APE. These sites primarily consist of .50- and .30-06-caliber ammunition casings, lengths of communications wire, or, in one instance, P-33-024463, an unspooled pile of steel guy wires. Another site, P-33-024370, is an array of subrectangular/circular pits arranged in a line in the western portion of the direct APE. These pits appear to be tank emplacements that were dug into the ground to provide a defensive line during maneuvers. Two of these sites, P-33-014147 (communications wire) and P-33-021264 (tank tracks), were previously recorded.

The nine sites associated with military activity are all related to the use of the APE as part of the DTC/C-AMA. None of these sites appears to be related to the activities of Operation Desert Strike in 1964. The military-activity sites consist of small features, including tank emplacements, vehicle tracks, or lengths of communications wire. The historical and archaeological contexts prepared for DTC/C-AMA sites identified tank tracks as one of the property types associated with the resource. The guidance document indicated that tanks were a "primary aspect of the DTC/C-AMA, and countless operations and maneuvers were conducted throughout the facility" (Bischoff 2009:127). Tank tracks, therefore, have been reported throughout the DTC/C-AMA.

Despite the relevance of the DTC/C-AMA "to several broad, important themes in American history," its role as "the largest training facility and the only one of its kind in American military history," and its association with "several preeminent figures in the American Army" (Bischoff 2009:133–134), the guidance also stated that "whereas these resources have the potential to be considered significant under any or all of the four criteria, more often than not they will be considered primarily eligible under Criterion d for their ability to yield information important in history" (Bischoff 2009:134). Although the tank emplacements, vehicle tracks, and lengths of communications wire retain aspects of integrity, it is not possible to relate them to specific military activities or units. They do not contain sufficient identifiable association, nor do they contain further data potential. The nine military-activity sites are therefore recommended not eligible for listing in the NRHP or the CRHR under any criteria.

As noted above, the DTC/C-AMA has been determined eligible by the BLM for listing in the NRHP under all four criteria as a district, based on the archaeological and historical context prepared for this vast region (Bischoff 2009:7–8). Although the 103 sites within this category are clearly associated both temporally and spatially with the extensive DTC/C-AMA region, none of the sites within the direct APE appears to be eligible for listing in the NRHP or the CRHR as contributors to the district. Some of the DTC/C-AMA camps have been recognized on their own as eligible sites (Tiffany Arend, personal communication 2019), and the project APE lies within the overall DTC/C-AMA activity area (Kremkau, Mills, et al. 2016:Figure 7), but no DTC-division camps were located in the DQSP vicinity, and none of the resources within the APE can be connected to a particular camp. Further, because of the ephemeral nature of the DTC/C-AMA tenure in the desert region and the postuse cleanup of much the area by departing soldiers after its use (Bischoff 2009:127), the project area sites dating to this period do not represent a "significant concentration" of resources "united . . . by plan or physical development" (Shrimpton 2002:Section IV), and there are better examples of each site type (refuse scatters/artifact concentrations and military activity sites) elsewhere in the district. Therefore, SRI recommends the DTC/C-AMA sites within the DQSP direct APE not eligible for listing in the NRHP or the CRHR as contributing resources to the NRHP-eligible DTC/C-AMA historic district under any criteria.

Post-DTC/C-AMA (Post–1942) Sites (n = 39)

Thirty-eight historical-period sites within the direct APE are associated with post-DTC/C-AMA land use (Stanton et al. 2016:Table 15). One additional site located just outside the direct APE boundary, P-33-014174, was added by the BLM in the draft EIS/EIR, for a total of 39 sites from this period. All but 3 of these sites are artifact concentrations composed of domestic refuse from the 1950s and 1960s. Three sites consist of water wells and associated features.

Artifact Concentrations

The 36 artifact concentrations associated with the mid- to late twentieth century are mostly secondary refuse scatters that are likely associated with residential areas north of the direct APE and also result from use of the project area for off-road-vehicle use or other recreational activity. Artifacts associated with these sites consist of an array of sanitary, meat, beverage, and hole-in-top cans; glass bottles and jars associated with beverages, food, and cleaning fluids; whiteware vessel fragments; aerosol cans; construction materials; toys; and other various artifacts associated with domestic or automotive activities. The artifact concentrations are surficial deposits and lack stratigraphic integrity and the quantity and variety of materials that would allow for statistically valid analyses pursuant to the research theme of settlement and agriculture (Kremkau, Swope, et al. 2016:55–56). These sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. The dumps cannot be associated with specific households or individuals and otherwise lack context. The mid- to late-twentieth-century artifact concentrations are thus recommended not eligible for listing in the NRHP or the CRHR.

Water-Well Sites

Three abandoned water-well sites were recorded within the direct APE. One (P-33-024308) consists of a well casing surrounded by a disturbed area and an artifact scatter. Archival research failed to disclose an association with a particular residence, agricultural use, or individual, although it was determined that the well dates to the early 1960s. The artifacts at the site date to the mid- to late twentieth century. The artifact concentrations are surficial deposits that lack stratigraphic integrity and do not contain the quantity and variety of materials that would allow for statistical analyses. Each of two other sites (P-33-024813 and P-33-024818) consists of a single well casing with no associated artifacts or other features. These two sites also date to the early 1960s. These wells may be associated with activities during the 1950s and 1960s related to possible development of the Palo Verde Mesa area for agricultural activities by the Palo Verde Irrigation District. The water-well sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. These three sites do not have further potential to yield information important to history related to the research theme of settlement and agriculture (Kremkau, Swope, et al. 2016:55–56) and are recommended not eligible for listing in the NRHP or the CRHR under any criteria.

General and Multitemporal Historical-Period Sites (n = 27)

Twenty-six sites (Stanton et al. 2016:Table 16) discovered during archaeological survey could not be attributed to a specific historical period, because they lack any temporally diagnostic artifacts, and archival research did not disclose specific activities at the site locations. These sites, plus 1 additional site located just outside the direct APE boundary, P-33-019797, added by the BLM in the draft EIS/EIR, total 27 sites in this category. These sites include 18 artifact concentrations, 8 roads/trails, and 1 USGS survey marker that lacks a date stamp. Of the 27 sites of this type, 25 fall into the general category, and 2 are multitemporal. Multitemporal sites are historical-period sites that consist of two or more identifiable temporal components. The two multitemporal sites are artifact concentrations (P-33-024298 and P-33-018853) consisting of scatters of artifacts that can be associated with troop activities at the DTC/C-AMA and post-DTC/C-AMA civilian land use.

Artifact Concentrations

The 18 artifact concentrations classified as general and multitemporal sites are similar to other historical-period sites in the project area—e.g., corroded collections of sanitary cans and other refuse—but the lack of makers' marks and temporally diagnostic traits prevents determining a more-precise temporal association. As noted above, most of these sites fall into the general category, and 2 of the artifact concentrations (P-33-024298 and P-33-018853) are multitemporal sites that can be associated with troop activities at the DTC/C-AMA and post-DTC/C-AMA civilian land use.

The artifact concentrations are surficial deposits that lack stratigraphic integrity and the quantity and variety of materials that would allow for statistically valid analyses pursuant to the research theme of settlement and agriculture (Kremkau, Swope, et al. 2016:55–56). These sites were thoroughly documented during this investigation, including background and archival research, field recordation, collection of a photographic record, and detailed mapping. These refuse scatters cannot be associated with specific households or individuals and otherwise lack context. The general and multitemporal artifact concentrations are thus recommended not eligible for listing in the NRHP or the CRHR.

Roads/Trails

There are eight roads/trails that fall into the general/multitemporal category. Three of them (P-33-024311, P-33-024312, and P-33-024366) are similar to the linear disturbances associated with the 1917 GLO survey, although they are slightly out of alignment with the linear disturbances at survey-marker site P-33-024526 discussed above with the pre-1942 sites. P-33-014199 is a north–south-oriented section-line road. P-33-024284 and P-33-024287 are 2-foot-wide ephemeral trails also similar to those associated with the 1917 GLO survey. P-33-014173 and P-33-024817 are both east–west-oriented roads that are depicted on the USGS 1952 7.5-minute quadrangle for the project area, which is based on aerial photographs from 1948 (Stanton et al. 2016:102). However, it is unknown how long the roads were in place prior to that date. Both roads are aligned along section lines and presumably are no older than the 1917 GLO survey.

The roads and trails do not meet any of the NRHP-/CRHR-eligibility criteria. Despite background and archival research, no origin and destination points for the linear features were identified, and none of the names associated with adjacent land claims appears to be important in local or regional history. The sites were thoroughly documented during this investigation through field recordation, collection of a photographic record, and detailed mapping. However, the sites could not address any of the research questions in the research design (Lerch, Stanton, and Swope 2016), and further research at the sites will not yield additional information important to history. Therefore, SRI recommends the general historical-period road/trail sites not eligible for listing in the NRHP or the CRHR.

Survey Marker

In addition to the 22 survey markers recorded as P-33-024526 and discussed above with the pre-1942 sites, 1 other survey-marker site, P-33-024411, consists of an undated USGS marker. Individual survey markers are ubiquitous features that can be found throughout California and the United States as a whole. Therefore, this site is not eligible under NRHP/CRHR Criterion a/1, b/2, or c/3. Documentation of the site included background and archival research, field recordation, collection of a photographic record, and detailed mapping. The site was thoroughly documented during this investigation and has no further research potential under NRHP/CRHR Criterion d/4. Although this site is in good condition, SRI recommends it not eligible for listing in the NRHP or the CRHR.

Multicomponent Sites—Historical-Period Components (n = 10)

Ten multicomponent sites were identified within the direct and indirect APE for the DQSP, and the historical-period components of them are recommended not eligible for listing in the NRHP or the CRHR. These sites consist of DTC/C-AMA or post-DTC/C-AMA artifact concentrations associated with prehistoric ceramic scatters, lithic scatters, or rock features (the eligibility of the prehistoric components is discussed separately, above). The historical-period components of the multicomponent sites are scatters of bottles and cans that are not associated with the prehistoric components (Stanton et al. 2016:102, Table 17). As discussed regarding the DTC/C-AMA or post-DTC/C-AMA artifact concentrations discussed above, these components are not directly associated with important events or persons, do not embody distinctive characteristics of their types, and do not have the potential to yield information important to history beyond what is already recorded. Therefore, they are recommended not eligible for listing in the NRHP or the CRHR.

Isolated Resources (n = 621)

In total, 620 isolated resources were identified during survey (Stanton et al. 2016:104–110), and 1 additional isolated resource was identified by BLM archaeologists during review of the enlarged APE near the gen-tie connection with the Colorado River Substation. The majority of these resources (n = 463) are associated with the historical period and are primarily ration cans associated with the DTC/C-AMA or food and beverage cans, and their associated dates range from the early twentieth century to the 1960s. In addition to the historical-period isolated resources, 157 prehistoric isolated resources were discovered during survey: 86 pot drops (Stanton et al. 2016:Table 18) and 71 flaked stone artifacts (i.e., flakes, tested cobbles, and cobble choppers). All were recorded in detail based on in-field analysis. The additional isolated resource noted by the BLM is also a prehistoric isolated resource.

None of the 621 isolated finds, including the single isolated artifact located on the 160-acre privately owned parcel within the direct APE, is recommended eligible for listing in the NRHP/CRHR, because they lack integrity of location, setting, and association and because they do not have potential to further yield information important in prehistory or history (Criterion d/4) beyond what has already been recorded for them as a result of in-field analysis.

NRHP-/CRHR-Eligibility Summary

In total, 20 prehistoric sites or site components and 2 historical-period transmission lines are listed, have been previously determined eligible for listing, or are recommended eligible for listing in the NRHP (Table 4). Eight of the prehistoric sites or site components are also recommended eligible as contributing resources to the MMCDAD. The remaining 83 prehistoric sites or site components and the remaining 194 historical-period sites or site components, as well as all 621 of the isolated resources, are recommended not eligible for listing in the NRHP.

Each of the sites already listed or recommended eligible for listing in the NRHP is also recommended eligible for listing in the CRHR. None of the sites evaluated is recommended as a unique archaeological site as defined by the CEQA (PRC § 21083.2). Finally, all of the sites recommended not eligible for listing in the NRHP do not appear to meet the criteria for listing in the CRHR and therefore are also recommended not eligible for listing in the CRHR.

Table 4. Summary of NRHP/CRHR Status and Recommendations

Resource/Site Type	Count, by NRHP/CRHR Status			Total[a]
	Listed or Eligible Individually	Eligible as a Contributor to the MMCDAD	Not Eligible	
Prehistoric sites				
Artifact concentration—ceramic scatter	—	—	9	9
Artifact concentration—lithic scatter	—	—	16	16
Ceremonial site (petroglyphs/geoglyphs)	2	2	—	2
Rock-feature site	2	—	28	30
Rock feature with artifact scatter	7	—	23	30
Trail	6	4	—	6
Multicomponent site—prehistoric component	3	2	7	10
Subtotal, prehistoric sites/site components	20	8	83	103
Historical-period sites				
Pre-DTC/C-AMA/homesteading sites (pre-1942)				
Artifact concentration	—	—	12	12
Road/trail	—	—	1	1
Survey marker	—	—	2	2
Subtotal, pre-DTC/C-AMA/homesteading sites	—	—	15	15
DTC/C-AMA sites (1942–1944)				
Artifact concentration	—	—	94	94
Military-activity site	—	—	9	9
Subtotal, DTC/C-AMA sites	—	—	103	103
Post-DTC/C-AMA sites (post-1944)				
Artifact concentration	—	—	36	36
Water-well site	—	—	3	3
Subtotal, post-DTC/C-AMA sites	—	—	39	39

continued on next page

Resource/Site Type	Count, by NRHP/CRHR Status			Total[a]
	Listed or Eligible Individually	Eligible as a Contributor to the MMCDAD	Not Eligible	
General and multitemporal historical-period sites				
Transmission line	2	—	—	2
Artifact concentration	—	—	18	18
Road/trail	—	—	8	8
Survey marker	—	—	1	1
Subtotal, general and multitemporal historical-period sites	2	—	27	29
Multicomponent site—historical-period component	—	—	10	10
Subtotal, historical-period sites/site components	2	—	194	196
Total, sites	22	8	267	289[b]
Isolated resources				
Prehistoric	—	—	158	158
Historical period	—	—	463	463
Total, isolated resources	—	—	621	621

[a] Because some sites that are listed/eligible individually are also eligible as contributors to the MMCDAD, values in the Total column do not necessarily reflect the corresponding row totals.
[b] Because multicomponent sites are counted among both the prehistoric and historical-period sites, the total number of evaluated sites is different from the sum of the subtotals in the rows above.

CHAPTER 5

Assessment of Effects and Recommendations

Cultural resources determined by the BLM to be historic properties (i.e., listed or eligible for listing in the NRHP) may be affected by federal undertakings such as the DQSP. In this chapter, we consider the potential effects of the DQSP on historic properties, based on the analysis contained in the draft EIS/EIR (USDI BLM and County 2018), and recommend measures to resolve any identified adverse effects. In compliance with CEQA, the County also must consider potential impacts to historical resources (i.e., listed or eligible for listing in the CRHR) and apply measures to mitigate any identified impacts.

Criteria of Adverse Effect

If a project alters the character-defining elements of an NRHP- or CRHR-eligible property, such as features relevant to its environment or its use, in a manner that affects the property's eligibility for listing in the NRHP or the CRHR, such an alteration is considered an adverse effect. Adverse effects can include the following:

- physical destruction, damage, or alteration of all or part of the property;
- isolation of the property from its setting or alteration of the character of its setting when that character contributes to the property's qualification for listing in the NRHP;
- introduction of visual, atmospheric, or audible elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; or
- transfer, lease, or sale of a federally owned property without adequate conditions or restrictions regarding its preservation, maintenance, or use [36 CFR 800.5(a)(2)].

If a historic property/historical resource within the APE were subjected to any of the above, that occurrence would be considered an adverse effect on the property. As noted in the definition of the APE in Chapter 1, effects such as physical destruction, damage, or alteration are sometimes termed direct effects and apply to resources located within the direct APE. Other effects, such as the last four listed above, are indirect effects, which can apply to eligible resources within the direct APE but outside the development footprint or to those within the indirect APE. In regard to indirect effects, here, we are concerned particularly with the "[i]ntroduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features" (36 CFR 800.5[a][2][v]).

Effects of the DQSP on Historic Properties/Historical Resources

The draft EIS/EIR analyzed potential direct and indirect effects of the project on historic properties and historical resources from four alternatives: Alternative 1, Proposed Action; Alternative 2, Resource Avoidance; Alternative 3, Reduced Project; and Alternative 4, No Action (USDI BLM and County 2018:4.5-1–4.5-15). Alternative 1, the Proposed Action, was defined at the time that the ROW application was submitted and prior to completion of the archaeological survey of the direct APE. After the results of the survey were available, Alternatives 2 and 3 were designed by First Solar to avoid areas containing sensitive cultural and biological resources. The BLM's Preferred Alternative is Alternative 2, the Resource Avoidance alternative. In addition to direct effects of the project on historic properties and historical resources, the draft EIS/EIR also considered indirect and cumulative effects to cultural resources in the project APE.

Potential Direct Effects

Direct effects, as considered here, are primarily those that could result in physical destruction, damage, or alteration of all or part of a historic property through ground-disturbing acivities, such as mowing and tilling in preparation for solar-panel installation, construction of perimeter fencing and interior access roads, and excavation for utility vaults. These potential effects are reviewed below for each alternative.

Alternative 1: Proposed Action

Under the Proposed Action alternative, the draft EIS/EIR concluded that the DQSP could affect up to nine prehistoric or multicomponent archaeological sites located within the project development area: P-33-001821, P-33-024283, P-33-024361, P-33-024385, P-33-024393, P-33-024394, P-33-024459, P-33-024496, and P-33-024497. One of these, P-33-024393, a rock-feature site, has since been tested and recommended not eligible for listing in the NRHP (see Chapter 2). Thus, the conclusions of the draft EIS/EIR, updated by information reported in Chapter 2, indicate that eight prehistoric or multicomponent archaeological sites could be subject to direct adverse effects from the Proposed Action alternative (see Appendix A).

In addition, the draft EIS/EIR concluded that indirect effects to historic properties and historical resources not subject to direct effects could occur as a result of increased site access that could lead to vandalism or unintentional harm to cultural resources.

Alternative 2: Resource Avoidance Alternative

Under the Resource Avoidance alternative, all historic properties and historical resources would be avoided, and no direct effects would occur (see Appendix A). However, indirect effects to historic properties and historical resources not subject to direct effects could still occur as a result of increased site access that could lead to vandalism or unintentional harm to cultural resources.

Alternative 3: Reduced Project Alternative

Under the Reduced Project alternative, all historic properties and historical resources would be avoided, and no direct effects would occur (see Appendix A). However, indirect effects to historic properties and historical resources not subject to direct effects could still occur as a result of increased site access that could lead to vandalism or unintentional harm to cultural resources.

Potential Indirect Effects

Despite the conclusion of the draft EIS/EIR that Alternative 2, the Resource Avoidance alternative and the BLM's Preferred Alternative, will not result in any direct adverse effects to historic properties and historical resources, the DQSP could nevertheless lead to indirect effects to eligible cultural resources. Indirect effects addressed for the DQSP include the introduction of visual, atmospheric, or audible elements that could diminish the integrity of a historic property/historical resource. These potential effects are considered here by applying the analysis in the draft EIS/EIR (USDI BLM and County 2018) to the results of the eligibility discussion in Chapter 4.

Visual Effects

The draft EIS/EIR reported the results of a visual analysis for the DQSP that was prepared in accordance with the BLM's Visual Resource Management Policy, developed to apply a standard visual-assessment methodology to inventory and manage scenic values on lands under BLM jurisdiction (USDI BLM and County 2018:3.19-1–3.19-6, 4.19-1–4.19-25). The analysis relied on visual simulations of the project area from eight key observation points (KOPs), one of which (KOP 4) was located at NRHP-listed P-33-000773, in the Mule Mountains, approximately 1 mile from the southwestern boundary of the DQSP. The analysis characterized viewers from KOP 4 as "dispersed recreationists," a term that could also include tribal representatives visiting the site area for cultural or ceremonial uses.

The visual analysis prepared for the draft EIS/EIR concluded that Alternative 1 of the DQSP, the Proposed Action, would result in a slight reduction in scenic quality for viewers in the Mule Mountains and that even with visual mitigation in the form of design elements to reduce form, color, line, and texture contrast, the DQSP

> would have moderate adverse impacts on visual resources due to moderate to strong visual contrast and impacts experienced within the foreground/middleground zone. Impacts in the foreground/middleground would be experienced by viewers with prolonged views (residences—KOP 6); however, most viewers (likely from higher elevations—KOPs 3 and 4) that would experience impacts would be transient [USDI BLM and County 2018:4.19-11].

Visual effects from Alternative 2, the BLM's Preferred Alternative, were determined to be somewhat less than those from Alternative 1.

The draft EIS/EIR concluded that although

> the existing visual character of the Project site is already influenced by existing transmission lines and other energy projects, Alternatives 1, 2, or 3 would result in substantial degradation of the existing visual character and visual quality of the Project site when viewed from elevated locations [such as KOP 4, in the Mule Mountains]. Mitigation Measures . . . would reduce visual contrast of Alternatives 1, 2, or 3 during construction, operation and decommissioning; however, these measures would not fully mitigate the significant visual impact of the Project. Therefore, Alternatives 1, 2, or 3 would result in a significant and unavoidable impact [USDI BLM and County 2018:4.19-18].

Because of their locations immediately adjacent to the DQSP direct APE, the visual effects as perceived from NRHP-eligible P-33-001821, on the southwestern edge of the DQSP, and transmission lines P-33-011110 and P-33-012532, on the southeastern edge of the DQSP, would be greater than the visual effects as perceived from the Mule Mountains. However, because those resources do not constitute public observation points, they are not sensitive to visual effects. Furthermore, each of those resources is already located within a utility corridor with existing industrial uses, such as transmission lines, and the addition of an adjacent industrial use, a solar facility, does not change the overall visual character in the vicinity of those or other sites for which direct adverse effects have been avoided.

Atmospheric Effects

The results of indirect atmospheric effects to the historic properties/historical resources considered here are related to the effects of windblown dust that could coat artifacts and petroglyphs, making them more difficult to recognize and damaging their integrity, or could diminish the experience of visitors to sites such as those in the Mule Mountains. Although the draft EIS/EIR did not explicitly consider atmospheric effects to cultural resources, it did consider fugitive dust in its air-quality analysis and analyzed prevailing winds in the project area in order to evaluate project effects on sand-transport corridors within the APE. The predominant wind directions in the project area are from the northwest, south, and southwest (USDI BLM and County 2018:Figure 3.1-1).

Because short-term impacts from fugitive dust during project construction will be controlled by standard measures and because prevailing winds in the area are generally from the northwest and southwest (i.e., away from historic properties/historical resources located west of the project area), except during storm events, atmospheric effects to cultural resources related to the effects of dust on artifacts, petroglyphs, and sensitive receptors, such as visitors to cultural resource sites in the Mule Mountains, could occur but are expected to be minimal.

Audible Effects

The effects of noise on cultural resources is limited to sensitive receptors (i.e., people) who are using sites for cultural or ceremonial reasons. Archaeological resources themselves would not be considered sensitive receptors. The noise analysis prepared for the draft EIS/EIR focused primarily on the effects of project noise on sensitive receptors composed of residents living in and around the community of Blythe (USDI BLM and County 2018:3.12-1–3.12-5, Figure 3.12-1). The analysis found that there could be short-term effects from noise to sensitive receptors within 1/4 mile of the project during construction but few, if any, long-term effects during project operation and maintenance (USDI BLM and County 2018:4.12-1–4.12-25, Figure 4.12-1). Neither short-term nor long-term project-related noise is expected to result in indirect audible effects to historic properties/historical resources.

Cumulative Effects

Although DQSP Alternative 2, the Resource Avoidance alternative, the BLM’s Preferred Alternative, will not result in any direct adverse effects to historic properties and historical resources, it will have an indirect visual effect on NRHP-listed sites in the Mule Mountains and could nevertheless result in cumulative indirect effects. The draft EIS/EIR analyzed cumulative effects to cultural resources in the region from seven other large-scale renewable-energy projects, along with the DQSP (USDI BLM and County 2018:4.5-12–4.5-14). The cumulative-effects analysis concluded that under Alternative 2, proposed construction, operation, maintenance, and decommissioning of the DQSP could permanently affect up to 153 archaeological sites and 621 isolates by damaging and displacing artifacts and features.

The draft EIS/EIR also concluded that the “DQSP could result in a cumulative effect on visual resources in combination with other past, present, or reasonably foreseeable future actions” (USDI BLM and County 2018:4.19-20). The draft EIS/EIR further concluded that the

> DQSP, in combination with other projects, would make the valleys surrounding the Mule and McCoy Mountains appear increasingly industrialized, and could substantially diminish

> the remote and isolated character of the landscape. While use levels in the mountains surrounding the DQSP are generally low, the remote and isolated character of the landscape is highly valued by its users. . . . [This would result in] a significant and unavoidable impact for dispersed recreation users in the surrounding, higher-elevation mountains [USDI BLM and County 2018:4.19-24].

The conclusions of the draft EIS/EIR were echoed in a comment letter submitted by the CRIT, which indicated that the tribe is also concerned with the project's cumulative indirect effects on the cultural landscape, as defined here by the MMCDAD, as well as on ineligible and isolated resources. The tribe is further concerned that the DQSP and other large projects in the region have the cumulative effect of incrementally erasing its cultural footprint (Patch 2018).

Management Recommendations

Because all historic properties and historical resources will be avoided by the BLM's Preferred Alternative, Alternative 2, no direct adverse effects to historic properties and historical resources have been identified, and there are no measures required to mitigate direct adverse effects. However, because the DQSP, even under the BLM's Preferred Alternative (Alternative 2, Resource Avoidance), will cause indirect visual effects to listed and eligible resources in the Mule Mountains and will result in cumulative indirect effects to the cultural landscape defined by the MMCDAD, as well as to ineligible and isolated resources, recommendations to resolve these effects are presented below. These recommended measures should be included in a Memorandum of Agreement (MOA) that will include a Historic Properties Treatment Plan (HPTP) and a Monitoring and Discovery Plan to address potential unanticipated discoveries that could occur during the course of project construction and operation. As noted in the draft EIS/EIR, the MOA

> will be developed by the BLM in consultation with the ACHP, SHPO, the Applicant, Riverside County, interested Native American Tribes, and any other consulting parties, as appropriate. The MOA will describe the adverse effects to . . . historic properties, will include measures to resolve the adverse effects, and must be executed prior to the BLM's issuance of the ROD. Specific measures to resolve adverse effects will be developed in a HPTP and included as an attachment to the MOA. Execution of the MOA will conclude the Section 106 process [USDI BLM and County 2018:4.5-3].

On the basis of information contained in the original survey report (Lerch, Stanton, and Swope 2016), the draft EIS/EIR (USDI BLM and County 2018), and reports from other projects in the area and Native American concerns as summarized in this addendum, SRI makes the following recommendations, to be included as appropriate in the MOA, the HPTP, and the Monitoring and Discovery Plan:

- Update the NRHP-registration form for the Mule Tank Discontiguous Rock Art District (Whitley 2001) to reflect its expanded scope and revised name as the MMCDAD, to include at a minimum current documentation for P-33-000343, P-33-000504, P-33-000650, P-33-000673, P-33-000772, P-33-000773, P-33-001821, and P-33-024394. The site records for all but one of these have been updated recently in the course of other projects; however, detailed mapping and recording is still needed for P-33-000773.
    - Update the site record for P-33-000773 to include a detailed site map prepared using low-level aerial photography, Native American consultation and fieldwork participation, and current literature review.

- Using the results of the low-level aerial photography prepared for site mapping, prepare a virtual-reality exhibit that will allow tribal elders and the public to visualize the site features in relation to the topography of the area.

- Conduct geoarchaeological trenching, mapping, and other fieldwork as needed to verify the buried-site-sensitivity model prepared for the original survey report (Lerch, Swope, et al. 2016:131; Stanton et al. 2016:110–117) and incorporate the results, as appropriate, into the Monitoring and Discovery Plan.

- Provide for archaeological and Native American monitoring of all ground-disturbing activities during construction and operation of the DQSP.

- Avoid all eligible and ineligible cultural resources to the extent possible during construction and operation of the DQSP. If any artifacts must be collected and curated, consider designating a repository managed by a Native American tribe that meets the requirements of 36 CFR 79, or that can be upgraded to meet those requirements, based on review by and approval of the BLM Palm Springs Field Office manager.
  - Develop a curation agreement among the BLM and all interested tribes that recognizes that the designated repository is curating any collections resulting from the DQSP on behalf of all tribes that are party to the agreement.

- Prepare a report of the results of all monitoring activities conducted during construction.
  - Conduct a postconstruction condition assessment of historic properties/historical resources that have been avoided, and document the results in the monitoring report prepared for the project.

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APPENDIX A

Site Evaluations and NRHP–/California Register of CRHR–Eligibility and Effects Recommendations

Revised and Updated April 2019

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
	Sites Previously Listed or Determined Eligible							
33-000504	CA-RIV-504	not surveyed by SRI	prehistoric	petroglyphs	BLM	listed (c/3 and d/4), as a contributing resource to the Mule Tank Discontiguous Rock Art District; eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD	cumulative indirect	cumulative indirect
33-000773	CA-RIV-773	not surveyed by SRI	prehistoric	geoglyph/intaglio	BLM	listed (c/3 and d/4), as a contributing resource to the Mule Tank Discontiguous Rock Art District; eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD	cumulative indirect	cumulative indirect
33-001821[c]	CA-RIV-1821/H[d]	SRI-8020	multicomponent	thermal rock features with lithic and ceramic scatters, human remains; historical-period refuse scatters	BLM, private	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD (prehistoric component only)	direct adverse effect	no direct adverse effect; cumulative indirect effect
33-011110		not surveyed by SRI	historical period	transmission line	BLM	eligible (a/1)	no effect	no effect
33-012532	CA/RIV-7127H	not surveyed by SRI	historical period	transmission line	BLM	eligible (a/1)	no effect	no effect
	Eligible Prehistoric and Multicomponent Sites							
33-000053	CA-RIV-53T	not surveyed by SRI	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect

continued on next page

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-000343	CA-RIV-343T	SRI-9003	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-000650	CA-RIV-650T	not surveyed by SRI	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-000673	CA-RIV-673/H-T	not surveyed by SRI	multicomponent	trails; refuse scatter	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD (prehistoric component only)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-000772	CA-RIV-772T	SRI-110	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-003803	CA-RIV-3803T	not surveyed by SRI	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-019618	CA-RIV-9935/H	SRI-127	multicomponent	lithic scatter; refuse scatter	BLM	eligible (d/4) (prehistoric component only)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024283	CA-RIV-11937	SRI-83	prehistoric, Patayan II/III	thermal rock features with associated artifacts	BLM	eligible (d/4)	direct adverse effect	no direct adverse effect; cumulative indirect effect
33-024356	CA-RIV-11990	SRI-1059	prehistoric	rock feature with artifact scatter	BLM	eligible (d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024361	CA-RIV-11995	SRI-2021	prehistoric, Patayan II/III	thermal rock features with associated artifacts	BLM	eligible (d/4)	direct adverse effect	no direct adverse effect; cumulative indirect effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024385	CA-RIV-12019	SRI-3039	prehistoric	thermal rock features	BLM	eligible (d/4)	direct adverse effect	no direct adverse effect; cumulative indirect effect
33-024394	CA-RIV-12028T	SRI-3255	prehistoric	trail	BLM	eligible (a/1, c/3, and d/4), individually and as a contributing resource to the MMCDAD	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024459	CA-RIV-12091	SRI-4085	prehistoric, Patayan II/III	thermal rock features	BLM	eligible (d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024476	CA-RIV-12108	SRI-4241	prehistoric	thermal rock features with lithic scatter	BLM	eligible (d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024496	CA-RIV-12128	SRI-6033	prehistoric	thermal rock features with lithic scatter	BLM	eligible (d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024497	CA-RIV-12129	SRI-6034	prehistoric, Patayan II/III	thermal rock features with associated artifacts	BLM	eligible (d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
33-024719	CA-RIV-12240	SRI-17	prehistoric, Patayan II	thermal rock features with lithic scatter	BLM	eligible (d/4)	no direct adverse effect; cumulative indirect effect	no direct adverse effect; cumulative indirect effect
	Ineligible Prehistoric and Multicomponent Sites: Artifact Concentrations							
33-002795	CA-RIV-2795	SRI-3149	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-002796	CA-RIV-2796	SRI-6523	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-008133	CA-RIV-6043	SRI-16	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-008134	CA-RIV-6044	SRI-6025	prehistoric, Patayan II	ceramic scatter	BLM	not eligible	no effect	no effect
33-014151		SRI-3408	prehistoric, Patayan II/III	ceramic scatter	BLM	not eligible	no effect	no effect
33-017317	CA-RIV-9007	SRI-6519	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-019021	CA-RIV-9810	SRI-5109	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-019733	CA-RIV-10047	SRI-4207	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-019735	CA-RIV-10049	SRI-4172	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-019739	CA-RIV-10053	SRI-139	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024274	CA-RIV-11928	SRI-52	prehistoric, Patayan I/II	ceramic and lithic scatter	BLM	not eligible	no effect	no effect
33-024357	CA-RIV-11991	SRI-1061	prehistoric, Patayan I/II	ceramic scatter	BLM	not eligible	no effect	no effect
33-024365	CA-RIV-11999	SRI-2042	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024371	CA-RIV-12005	SRI-2136	prehistoric, Patayan I/II	ceramic scatter	BLM	not eligible	no effect	no effect
33-024424	CA-RIV-12056	SRI-3057	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024425	CA-RIV-12057	SRI-3059	prehistoric, Patayan II/III	ceramic scatter	BLM	not eligible	no effect	no effect
33-024431	CA-RIV-12063	SRI-3135	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024432	CA-RIV-12064	SRI-3147	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024436	CA-RIV-12068	SRI-3186	prehistoric, Patayan II/III	ceramic scatter	BLM	not eligible	no effect	no effect
33-024439	CA-RIV-12071	SRI-3228	prehistoric, Patayan II/III	ceramic and lithic scatter	BLM	not eligible	no effect	no effect
33-024440	CA-RIV-12072	SRI-3306	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024447	CA-RIV-12079	SRI-4024	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024455	CA-RIV-12087	SRI-4078	prehistoric, Patayan II	ceramic scatter	BLM	not eligible	no effect	no effect
33-024509	CA-RIV-12141	SRI-6491	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
33-024514	CA-RIV-12146	SRI-7019	prehistoric	lithic scatter	BLM	not eligible	no effect	no effect
				Ineligible Rock-Feature Sites				
33-024272	CA-RIV-11926	SRI-29	prehistoric	rock feature with associated artifacts	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024275	CA-RIV-11929	SRI-58	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024276	CA-RIV-11930	SRI-61	prehistoric	thermal rock feature with associated artifact	BLM	not eligible	no effect	no effect
33-024281	CA-RIV-11935	SRI-75	prehistoric	thermal rock features with associated artifact	BLM	not eligible	no effect	no effect
33-024300	CA-RIV-11954	SRI-1025	prehistoric	FAR scatter	BLM	not eligible	no effect	no effect
33-024303	CA-RIV-11957	SRI-1043	prehistoric	thermal rock feature with associated artifact	BLM	not eligible	no effect	no effect
33-024319	CA-RIV-11974	SRI-2034	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024376	CA-RIV-12010	SRI-3017	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024379	CA-RIV-12013	SRI-3022	prehistoric	thermal rock feature with associated artifact	BLM	not eligible	no effect	no effect
33-024389	CA-RIV-12023	SRI-3045	prehistoric	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024390	CA-RIV-12024	SRI-3047	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024391	CA-RIV-12025	SRI-3175	prehistoric	thermal rock features	BLM	not eligible	no effect	no effect
33-024392	CA-RIV-12026	SRI-3211	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024393	CA-RIV-12027	SRI-3237	prehistoric, Patayan III	thermal rock features	BLM	not eligible	no effect	no effect
33-024437	CA-RIV-12069	SRI-3205	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024438	CA-RIV-12070	SRI-3224	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024441	CA-RIV-12073	SRI-3331	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024442	CA-RIV-12074	SRI-3487	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024443	CA-RIV-12075	SRI-4014	prehistoric	thermal rock features	BLM	not eligible	no effect	no effect
33-024451	CA-RIV-12083	SRI-4054	prehistoric	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024454	CA-RIV-12086	SRI-4063	prehistoric	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024456	CA-RIV-12088	SRI-4079	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024481	CA-RIV-12113	SRI-5034	prehistoric	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024483	CA-RIV-12115	SRI-5054	prehistoric	thermal rock feature with associated artifact	BLM	not eligible	no effect	no effect
33-024508	CA-RIV-12140	SRI-6471	prehistoric	FAR scatter	BLM	not eligible	no effect	no effect
33-024511	CA-RIV-12143	SRI-7009	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024516	CA-RIV-12148	SRI-7029	prehistoric	thermal rock feature	BLM	not eligible	no effect	no effect
33-024518	CA-RIV-12150	SRI-7040	prehistoric	thermal rock feature with associated artifact	BLM	not eligible	no effect	no effect
	Ineligible Rock Features with Artifact Scatters							
33-013660		SRI-3273	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024278	CA-RIV-11932	SRI-65	prehistoric, Patayan III	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024285	CA-RIV-11939	SRI-124	prehistoric, Patayan II	thermal rock feature with ceramic scatter	BLM	not eligible	no effect	no effect
33-024289	CA-RIV-11943	SRI-133	prehistoric, Patayan III	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024290	CA-RIV-11944	SRI-134	prehistoric	thermal rock feature with lithic scatter	BLM	not eligible	no effect	no effect
33-024297	CA-RIV-11951	SRI-1014	prehistoric, Patayan II	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024305	CA-RIV-11959	SRI-1053	prehistoric, Patayan III	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024307	CA-RIV-11961	SRI-1058	prehistoric, Patayan I/II	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024349	CA-RIV-11983	SRI-3101	prehistoric, Patayan I/II	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024372	CA-RIV-12006	SRI-2329	prehistoric, Patayan II	FAR scatter with associated artifacts	BLM	not eligible	no effect	no effect
33-024377	CA-RIV-12011	SRI-3019	prehistoric, Patayan II	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024386	CA-RIV-12020	SRI-3040	prehistoric	thermal rock features with lithic scatter	BLM	not eligible	no effect	no effect
33-024387	CA-RIV-12021	SRI-3041	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024388	CA-RIV-12022	SRI-3042	prehistoric	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024412	CA-RIV-12046	SRI-5067	prehistoric	thermal rock features with lithic scatter	BLM	not eligible	no effect	no effect
33-024444	CA-RIV-12076	SRI-4016	prehistoric, Patayan II	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024452	CA-RIV-12084	SRI-4056	prehistoric	thermal rock features with lithic scatter	BLM	not eligible	no effect	no effect
33-024458	CA-RIV-12090	SRI-4084	prehistoric	FAR scatter with associated artifacts	BLM	not eligible	no effect	no effect
33-024495	CA-RIV-12127	SRI-6023	prehistoric, Patayan II	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024510	CA-RIV-12142	SRI-7008	prehistoric, Patayan II	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024512	CA-RIV-12144	SRI-7010	prehistoric	thermal rock feature with associated artifacts	BLM	not eligible	no effect	no effect
33-024517	CA-RIV-12149	SRI-7031	prehistoric, Patayan II	thermal rock features with associated artifacts	BLM	not eligible	no effect	no effect
33-024521	CA-RIV-12153	SRI-7066	prehistoric	thermal rock features with lithic scatter	BLM	not eligible	no effect	no effect
	Ineligible Multicomponent Sites—Prehistoric Components							
33-019734	CA-RIV-10048/H	SRI-4173	multicomponent	lithic scatter; refuse scatter	BLM	not eligible	no effect	no effect
33-024368	CA-RIV-12002/H	SRI-2068	multicomponent	ceramic scatter; refuse scatter	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024375	CA-RIV-12009/H	SRI-3015	multicomponent	lithic scatter; refuse scatter	BLM	not eligible	no effect	no effect
33-024395	CA-RIV-12029/H	SRI-3256	multicomponent	ceramic scatter; refuse scatter	BLM	not eligible	no effect	no effect
33-024396	CA-RIV-12030/H	SRI-3260	multicomponent	ceramic scatter; refuse scatter	BLM	not eligible	no effect	no effect
33-024445	CA-RIV-12077/H	SRI-4017	multicomponent	rock feature; refuse scatter	BLM	not eligible	no effect	no effect
33-024453	CA-RIV-12085/H	SRI-4060	multicomponent	lithic scatter; refuse scatter	BLM	not eligible	no effect	no effect
Historical-Period Sites, Pre-DTC/C-AMA/Homesteading Sites								
33-014198		SRI-1073	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-017328		SRI-1068	historical period, pre-1942	road/trail	BLM	not eligible	no effect	no effect
33-024277	CA-RIV-11931H	SRI-63	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024279	CA-RIV-11933H	SRI-69	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024299	CA-RIV-11953H	SRI-1024	historical period, pre-1942	campfire with artifact concentration	BLM	not eligible	no effect	no effect
33-024302	CA-RIV-11956H	SRI-1037	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024304	CA-RIV-11958H	SRI-1049	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024355	CA-RIV-11989H-T	SRI-2333	historical period, pre-1942	road/trail	BLM	not eligible	no effect	no effect
33-024364	CA-RIV-11998H	SRI-2035	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024369	CA-RIV-12003H	SRI-2128	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024374	CA-RIV-12008H	SRI-3014	historical period, pre-1942	campfire with refuse scatter	BLM	not eligible	no effect	no effect
33-024399	CA-RIV-12033H	SRI-4045	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024414	CA-RIV-12048H	SRI-5073	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024465	CA-RIV-12097H	SRI-4185	historical period, pre-1942	refuse scatter	BLM	not eligible	no effect	no effect
33-024526	CA-RIV-12158H	SRI-8085	historical period, pre-1942	survey markers with associated linear features and artifacts	BLM	not eligible	no effect	no effect
	DTC/C-AMA Sites							
33-014147		SRI-101	historical period, 1942–1944	communications wire	BLM	not eligible	no effect	no effect
33-014148		not surveyed by SRI	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-018675	CA-RIV-10077H	SRI-2668	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-019741	CA-RIV-10055H	SRI-4203	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-019742	CA-RIV-10056H	SRI-4209	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-019743	CA-RIV-10057H	SRI-5122	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-021264	CA-RIV-11057H	SRI-2322	historical period, 1942–1944	tank tracks	BLM	not eligible	no effect	no effect
33-024270	CA-RIV-11924H	SRI-26	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024271	CA-RIV-11925H	SRI-27	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024273	CA-RIV-11927H	SRI-36	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024291	CA-RIV-11945H	SRI-137	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024294	CA-RIV-11948H	SRI-1001	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024296	CA-RIV-11950H	SRI-1011	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024301	CA-RIV-11955H	SRI-1035	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024309	CA-RIV-11963H	SRI-119	historical period, 1942–1944	communications wire	BLM	not eligible	no effect	no effect
33-024310	CA-RIV-11965H	SRI-120	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024313	CA-RIV-11968H	SRI-1076	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024314	CA-RIV-11969H	SRI-2001	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024317	CA-RIV-11972H	SRI-2009	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024318	CA-RIV-11973H	SRI-2030	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024320	CA-RIV-11975H	SRI-2066	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024321	CA-RIV-11976H	SRI-2082	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024322	CARIV-11977H	SRI-2088	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024323	CA-RIV-11978H	SRI-2094	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024324	CA-RIV-11979H	SRI-2098	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024325	CA-RIV-11980H	SRI-2100	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024351	CA-RIV-11985H	SRI-3108	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024352	CA-RIV-11986H	SRI-3115	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024353	CA-RIV-11987H	SRI-3116	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024362	CA-RIV-11996H	SRI-2023	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024363	CA-RIV-11997H	SRI-2029	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024367	CA-RIV-12001H	SRI-2067	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024370	CA-RIV-12004H	SRI-2135	historical period, 1942–1944	military pits	BLM	not eligible	no effect	no effect
33-024373	CA-RIV-12007H	SRI-2582	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024378	CA-RIV-12012H	SRI-3020	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024380	CA-RIV-12014H	SRI-3027	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024382	CA-RIV-12016H	SRI-3031	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024383	CA-RIV-12017H	SRI-3037	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024384	CA-RIV-12018H	SRI-3038	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024397	CA-RIV-12031H	SRI-4004	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024400	CA-RIV-12034H	SRI-4116	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024402	CA-RIV-12036H	SRI-4145	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024404	CA-RIV-12038H	SRI-4160	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024405	CA-RIV-12039H	SRI-4162	historical period, 1942–1944	communications wire	BLM	not eligible	no effect	no effect
33-024406	CA-RIV-12040H	SRI-4167	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024407	CA-RIV-12041H	SRI-5000	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024408	CA-RIV-12042H	SRI-5003	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024409	CA-RIV-12043H	SRI-5006	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024410	CA-RIV-12044H	SRI-5008	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024413	CA-RIV-12047H	SRI-5070	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024415	CA-RIV-12049H	SRI-5076	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024416	CA-RIV-12050H	SRI-6003	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024418	CA-RIV-12052H	SRI-6053	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024419	CA-RIV-12053H	SRI-6075	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024423	CA-RIV-12055H	SRI-3054	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024426	CA-RIV-12058H	SRI-3078	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024427	CA-RIV-12059H	SRI-3119	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024428	CA-RIV-12060H	SRI-3123	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024429	CA-RIV-12061H	SRI-3124	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024430	CA-RIV-12062H	SRI-3127	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024433	CA-RIV-12065H	SRI-3155	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024434	CA-RIV-12066H	SRI-3156	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024435	CA-RIV-12067H	SRI-3158	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024446	CA-RIV-12078H	SRI-4019	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024449	CA-RIV-12081H	SRI-4034	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024450	CA-RIV-12082H	SRI-4041	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024461	CA-RIV-12093H	SRI-4175	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024463	CA-RIV-12095H	SRI-4180	historical period, 1942–1944	guy wire	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024464	CA-RIV-12096H	SRI-4182	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024467	CA-RIV-12099H	SRI-4191	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024468	CA-RIV-12100H	SRI-4196	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024470	CA-RIV-12102H	SRI-4217	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024471	CA-RIV-12103H	SRI-4222	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024472	CA-RIV-12104H	SRI-4229	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024473	CA-RIV-12105H	SRI-4231	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024474	CA-RIV-12106H	SRI-4235	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024475	CA-RIV-12107H	SRI-4236	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024477	CA-RIV-12109H	SRI-4242	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024480	CA-RIV-12112H	SRI-5029	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024482	CA-RIV-12114H	SRI-5035	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024484	CA-RIV-12116H	SRI-5083	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024486	CA-RIV-12118H	SRI-5099	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024489	CA-RIV-12121H	SRI-5135	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024498	CA-RIV-12130H	SRI-6046	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024499	CA-RIV-12131H	SRI-6059	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024500	CA-RIV-12132H	SRI-6081	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024502	CA-RIV-12134H	SRI-6096	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024503	CA-RIV-12135H	SRI-6100	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024504	CA-RIV-12136H	SRI-6104	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024505	CA-RIV-12137H	SRI-6114	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024506	CA-RIV-12138H	SRI-6115	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024513	CA-RIV-12145H	SRI-7018	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024515	CA-RIV-12147H	SRI-7020	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024520	CA-RIV-12152H	SRI-7065	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024522	CA-RIV-12154H	SRI-7072	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024523	CA-RIV-12155H	SRI-7074	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024524	CA-RIV-12156H	SRI-7076	historical period, 1942–1944	communications wire	BLM	not eligible	no effect	no effect
33-024525	CA-RIV-12157H	SRI-7087	historical period, 1942–1944	communications wire	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024678	CA-RIV-12209H	SRI-3	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024805	CA-RIV-12295H	SRI-7	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024808	CA-RIV-12298H	SRI-21	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024810	CA-RIV-12300H	SRI-9	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-078916	CA-RIV-10078H	SRI-140	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
				Post-DTC/C-AMA Sites				
33-014174		not surveyed by SRI	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-018852	CA-RIV-9648H	SRI-5108	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-019740	CA-RIV-10054H	SRI-2113	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-021132	CA-RIV-10964H	SRI-1010	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024280	CA-RIV-11934H	SRI-71	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024282	CA-RIV-11936H	SRI-81	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024286	CA-RIV-11940H	SRI-125	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024288	CA-RIV-11942H	SRI-132	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024293	CA-RIV-11947H	SRI-147	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024295	CA-RIV-11949H	SRI-1009	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024306	CA-RIV-11960H	SRI-1056	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024308	CA-RIV-11962H	SRI-42	historical period, post-1944	wells and associated artifacts	BLM	not eligible	no effect	no effect
33-024315	CA-RIV-11970H	SRI-2007	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024316	CA-RIV-11971H	SRI-2008	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024326	CA-RIV-11981H	SRI-3007	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024327	CA-RIV-11982H	SRI-3010	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024358	CA-RIV-11992H	SRI-1070	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024359	CA-RIV-11993H	SRI-2014	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024360	CA-RIV-11994H	SRI-2017	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024381	CA-RIV-12015H	SRI-3029	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024398	CA-RIV-12032H	SRI-4005	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024420	CA-RIV-12054H	SRI-7024	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024457	CA-RIV-12089H	SRI-4080	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024469	CA-RIV-12101H	SRI-4208	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024479	CA-RIV-12111H	SRI-4250	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024487	CA-RIV-12119H	SRI-5106	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024490	CA-RIV-12122H	SRI-6011	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024491	CA-RIV-12123H	SRI-6017	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024492	CA-RIV-12124H	SRI-6018	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024493	CA-RIV-12125H	SRI-6021	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024494	CA-RIV-12126H	SRI-6022	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024507	CA-RIV-12139H	SRI-6119	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024519	CA-RIV-12151H	SRI-7060	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024804	CA-RIV-12294H	SRI-2	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024806	CA-RIV-12296H	SRI-18	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024807	CA-RIV-12297H	SRI-19	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024809	CA-RIV-12299H	SRI-25	historical period, post-1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024813	CA-RIV-12303H	SRI-9018	historical period, post-1944	well	BLM	not eligible	no effect	no effect
33-024818	CA-RIV-12307H	SRI-9016	historical period, post-1944	well	BLM	not eligible	no effect	no effect

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Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
	General and Multitemporal Historical-Period Sites							
33-014173	CA-RIV-9097H-T	SRI-9013	historical period	road/trail	BLM	not eligible	no effect	no effect
33-014199	CA-RIV-9098H-T	SRI-107	historical period	road/trail	BLM	not eligible	no effect	no effect
33-018853	CA-RIV-9649H	SRI-146	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-019736	CA-RIV-10050H	SRI-4211	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-019797	CA-RIV-10080H	not surveyed by SRI	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024284	CA-RIV-11938H-T	SRI-96	historical period	road/trail	BLM	not eligible	no effect	no effect
33-024287	CA-RIV-11941H-T	SRI-129	historical period	road/trail	BLM	not eligible	no effect	no effect
33-024292	CA-RIV-11946H	SRI-138	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024298	CA-RIV-11952H	SRI-1021	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024311	CA-RIV-11966H-T	SRI-121	historical period	road/trail	BLM	not eligible	no effect	no effect
33-024312	CA-RIV-11967H-T	SRI-122	historical period	road/trail	BLM	not eligible	no effect	no effect
33-024350	CA-RIV-11984H	SRI-3103	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024354	CA-RIV-11988H	SRI-3117	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024366	CA-RIV-12000H-T	SRI-2051	historical period	road/trail	BLM	not eligible	no effect	no effect
33-024401	CA-RIV-12035H	SRI-4127	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024403	CA-RIV-12037H	SRI-4151	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024411	CA-RIV-12045H	SRI-5063	historical period	survey marker	BLM	not eligible	no effect	no effect
33-024417	CA-RIV-12051H	SRI-6005	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024448	CA-RIV-12080H	SRI-4028	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024460	CA-RIV-12092H	SRI-4098	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024462	CA-RIV-12094H	SRI-4178	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024466	CA-RIV-12098H	SRI-4186	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024478	CA-RIV-12110H	SRI-4248	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024485	CA-RIV-12117H	SRI-5087	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024488	CA-RIV-12120H	SRI-5132	historical period	refuse scatter	BLM	not eligible	no effect	no effect

Primary No. (P-)	Trinomial	Field No.	Age	Description	Land Ownership	NRHP-/CRHR-Eligibility Status (Criteria)[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-024501	CA-RIV-12133H	SRI-6087	historical period	refuse scatter	BLM	not eligible	no effect	no effect
33-024817	CA-RIV-12306H-T	SRI-9020	historical period	road/trail	BLM	not eligible	no effect	no effect
	Ineligible Isolated Resources							
33-019390		IO-7088	prehistoric	isolate		not eligible	no effect	no effect
33-024421		various	historical period	isolates (Ripley 7.5-minute quadrangle)		not eligible	no effect	no effect
33-024422		various	prehistoric	isolates (Ripley 7.5-minute quadrangle)		not eligible	no effect	no effect
33-024527		various	historical period	isolates (Roosevelt Mine 7.5-minute quadrangle)		not eligible	no effect	no effect
33-024528		various	prehistoric	isolates (Roosevelt Mine 7.5-minute quadrangle)		not eligible	no effect	no effect

Key: CRHR = California Register of Historical Resources; DTC/C-AMA = Desert Training Center/California-Arizona Maneuver Area; FAR = fire-affected rock; MMCDAD = Mule Mountains Complex Discontiguous Archaeological District; NRHP = National Register of Historic Places; SRI = Statistical Research, Inc.

[a] Source: *Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California*, edited by Michael K. Lerch, Patrick B. Stanton, and Karen K. Swope, Technical Report 15-36, Statistical Research, Redlands, California, 2016. Submitted to the USDI BLM, Palm Springs–South Coast Field Office, Palm Springs, California.

[b] Source: *Desert Quartzite Solar Project Draft Plan Amendment, Environmental Impact Statement/Environmental Impact Report*, USDI BLM and County of Riverside, California, 2018. Available online, https://eplanning.blm.gov/epl-front-office/projects/nepa/68211/153590/188106/Desert_Quartzite_Draft_EIS-EIR_080118_508.pdf, accessed February 25, 2019.

[c] P-33-001821 subsumes previously recorded sites P-33-001822, P-33-021215, P-33-021216, P-33-021217, P-33-021218, P-33-021371, P-33-021372, P-33-021373, P-33-021375, P-33-021376, P-33-021377, P-33-021378, P-33-021382, P-33-021383, P-33-022534, P-33-022536, P-33-022537, and P-33-022538.

[d] CA-RIV-1821/H subsumes previously recorded sites CA-RIV-1822, CA-RIV-11012, CA-RIV-11013/H, CA-RIV-11014, CA-RIV-11015, CA-RIV-11159, CA-RIV-11160, CA-RIV-11161, CA-RIV-11163/H, CA-RIV-11164, CA-RIV-11165/H, CA-RIV-11166/H, CA-RIV-11170/H, CA-RIV-11171, CA-RIV-11543, CA-RIV-11545H, CA-RIV-11546, and CA-RIV-11547.

Date: April 22, 2019

To: George E. Kline, Archaeologist
Bureau of Land Management (BLM), Palm Springs–South Coast Field Office

From: Michael K. Lerch, Principal Investigator, Statistical Research, Inc. (SRI)

Subject: Cultural Resources Assessment of the Gen-tie Corridor Realignment: Addendum 3 to Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California (SRI Technical Report 15-36C)

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The archaeological survey for the Desert Quartzite Solar Project (DQSP) covered a direct area of potential effects (APE) of 5,010 acres, of which 58 acres comprised the generator tie line (gen-tie line) corridor to connect the DQSP substation with the Colorado River Substation (CRSS), as noted in the original DQSP survey report (Lerch et al. 2016:4, Figure 2). The gen-tie line was later expanded on its western end to provide a "plug-in" location at the CRSS. The revised APE added 24 acres to the gen-tie corridor portion of the direct APE (Lerch 2019:1, 6, Figure 2). In April, 2019, the BLM determined that the gen-tie line for DQSP would require a realignment to accommodate other renewable energy project gen-tie lines using the same corridor. Most of the realignment area is within the originally surveyed direct APE; however, a new "plug-in" location at the CRSS will require a second addition to the direct APE at the western end of the gen-tie line, again with an area of approximately 24 acres (Figure 1).

To address the potential effects of the gen-tie realignment on cultural resources, we mapped the 160-foot-wide by 0.25-mile-long realigned gen-tie line and added a 200-foot buffer on each side. We then compared the resulting corridor with the cultural resources database for the DQSP and determined that the gen-tie realignment could affect 14 site locations (Figure 2), along with 32 isolated resources (10 prehistoric and 22 historical-period). Of the 14 sites, 11 were previously recorded by SRI in the original survey of the DQSP direct APE (Lerch et al. 2016), and were recently evaluated for eligibility for listing in the National Register of Historic Places (NRHP), as discussed in Addendum 2 of the original report (Lerch 2019:30–48, Appendix A).

Three sites at the western end of the new gen-tie alignment where it will connect to the CRSS are located within the indirect APE of the original survey and were not previously recorded and evaluated by SRI. These site locations were visited in the field on April 17, 2019, by SRI field director Patrick Stanton, to update their condition and evaluate their NRHP eligibility. The results of the review of the existing data and field updates are summarized in Table 1, and the three updated sites are described in detail below. Site records and updates are appended.

SRI archaeologist Patrick Stanton surveyed the segment of the new gen-tie alignment and buffer area that was located outside of the area previously surveyed by SRI in 2014. The footprint of the new alignment was surveyed in 15-m transects, with the locations of the towers surveyed more intensively due to the higher likelihood of ground disturbance at these locations. Most of the 24-acre survey area appeared to be intact, with little disturbance observed. The major exception is terminal end of the segment where the gen-tie line will connect with the CRSS. In that area, an access road has been constructed through the survey area and the hillslope leading down to the substation has been recontoured and possibly replanted.

Three archaeological sites were previously recorded within or immediately outside of the survey area. These sites (P-33-019676, P-33-019714, and P-33-019797) were visited to determine whether the previously recorded cultural constituents of these sites were still present and, if so, whether any artifacts were located within the project area. The results of the site visit are presented below; no new cultural materials were identified during the current survey.

P-33-019676

This site was recorded in 2010 as a scatter of 15 lower Colorado Buffware body sherds, located south of the survey area within the footprint of the substation. No components of this site were relocated and it is highly likely that this site is no longer extant, having been destroyed during the construction of the substation. Because the site appears to have been destroyed, it was not evaluated for NRHP eligibility.

P-33-019714

This site was recorded in 2010 as a multicomponent scatter of historical-period refuse (ration, sanitary, and evaporated milk cans, milled lumber, and D-cell batteries) and as well as a single quartzite core or tested cobble. This site is located outside of the survey area in the vicinity of an existing pole. Much of the site area appears to have been impacted by the construction of the pole. The 2010 site record indicates that subsurface metal artifacts were identified previously with metal detectors. Thus, even though no artifacts were observed on the surface, some artifacts may still be buried in the area. However, no artifacts were visible on the surface within the space between recorded the site boundary and the survey area. Because the site appears to have been destroyed, it was not evaluated for NRHP eligibility.

P-33-019797

This site was recorded in 2011 as a small refuse scatter consisting of five ration cans and is almost entirely located within the survey area. Although no signs of disturbances were observed, none of the previously recorded artifacts were relocated. Several small sand dunes are present within the site boundary, and it is possible that the cans have been buried by blow-sand since the initial recordation. Because the site appears to have been destroyed, it was not evaluated for NRHP eligibility.

Summary

The 11 sites located within the previously surveyed direct APE have all been recommended as not eligible for listing in the NRHP. The recorded locations of sites P-33-019676, P-33-019714, and P-33-019797 were visited to assess their current conditions and determine whether they would be affected by the DQSP gen-tie realignment. All three sites appear to have been destroyed, or had most or all of the artifacts removed since they were original recorded in 2011. Therefore, none was evaluated for NRHP eligibility, and the proposed gen-tie realignment will have no effect on historic properties.

References Cited

Lerch, Michael K., Patrick B. Stanton, and Karen K. Swope (editors)
2016 *Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California.* Technical Report 15-36. Statistical Research, Red-lands, California. Submitted to the U.S. Department of the Interior Bureau of Land Management, Palm Springs–South Coast Field Office, Palm Springs, California.

Lerch, Michael K.
2019 *Thermal Features Testing and Final NRHP/CRHR Cultural Resource Evaluations: Addendum 2 to Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California.* Technical Report 15-36B. Statistical Research, Redlands, California. Submitted to the U.S. Department of the Interior Bureau of Land Management, Palm Springs–South Coast Field Office, Palm Springs, California.

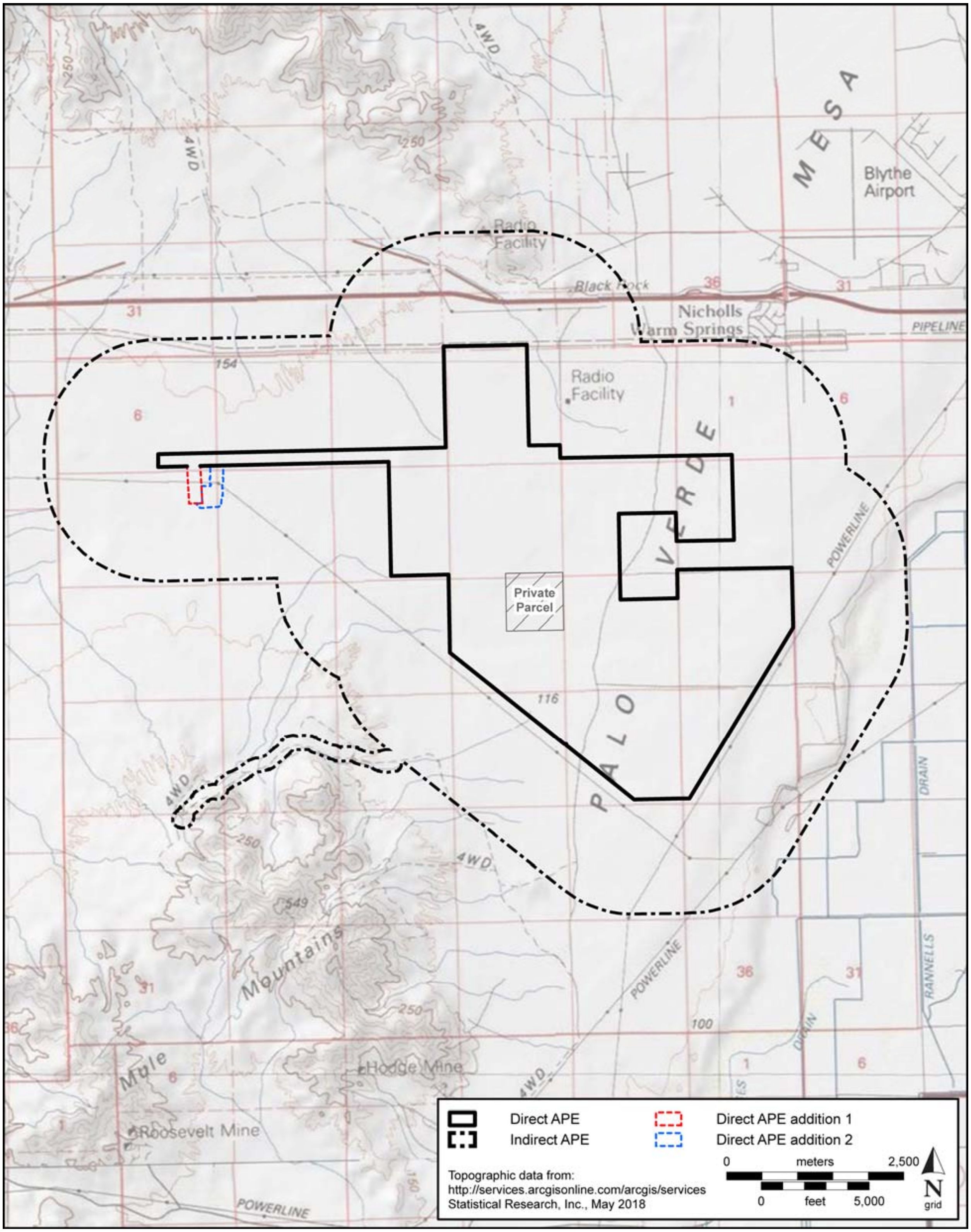

Figure 1. Map showing the Desert Quartzite Solar Project Area of Potential Effects with Direct APE Additions 1 and 2.

Map showing confidential site locations on file at BLM Palm Springs-South Coast Field Office.

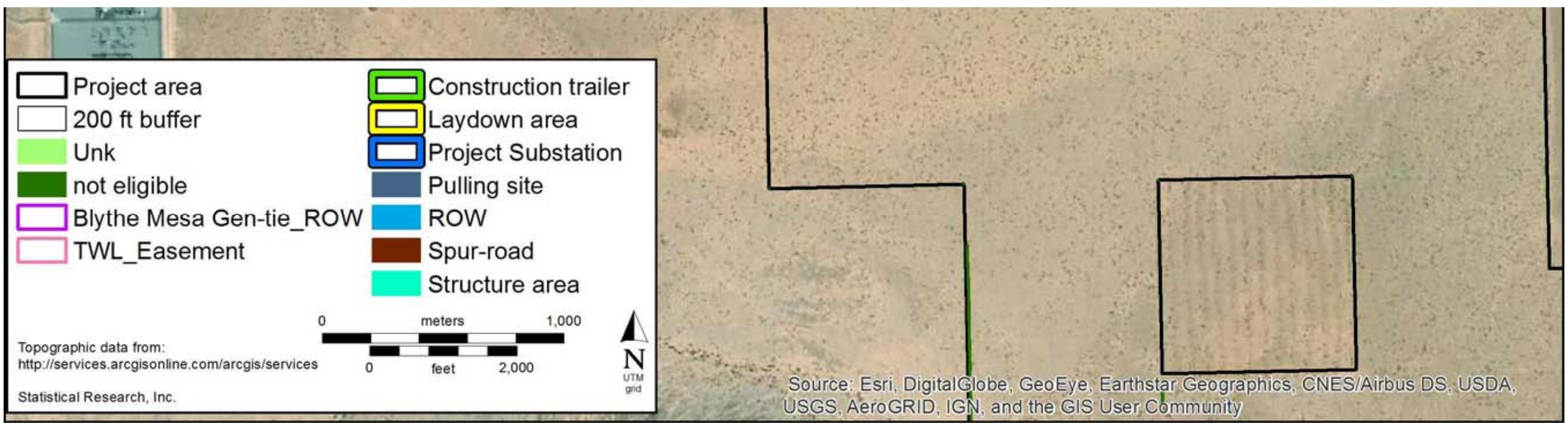

Figure 2. Map showing site locations along the DQSP gen-tie realignment corridor.

Table 1. DQSP Gen-tie Realignment Determinations of Eligibility and Findings of Effect

Primary No. (P-)	Trinomial	Temporary No.	Age	Description	Land Ownership	NRHP- and CRHR-Eligibility Status/Criteria[a]	Effects Determination, Proposed Project[b]	Effects Determination, Alternatives 2 and 3[b]
33-018916	CA-RIV-10078	SRI-140	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-019676	CA-RIV-09991	SRI-10004	prehistoric	ceramic scatter	BLM	destroyed	no effect	no effect
33-019714	CA-RIV-10028/H	SRI-10005	multicomponent	1942–1944 refuse scatter, lithic scatter	BLM	destroyed	no effect	no effect
33-019797	CA-RIV-10080	SRI-10006	historical period, 1942–1944	refuse scatter	BLM	destroyed	no effect	no effect
33-024371	CA-RIV-12005	SRI-2136	prehistoric, Patayan I/II	ceramic scatter	BLM	not eligible	no effect	no effect
33-024526	CA-RIV-12158	SRI-8085	historical period, pre-1942	survey markers with associated linear features and artifacts	BLM	not eligible	no effect	no effect
33-024370	CA-RIV-12004	SRI-2135	historical period, 1942–1944	military pits	BLM	not eligible	no effect	no effect
33-024373	CA-RIV-12007	SRI-2582	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024423	CA-RIV-12055	SRI-3054	historical period, 1942–1944	refuse scatter (ammunition)	BLM	not eligible	no effect	no effect
33-024428	CA-RIV-12060	SRI-3123	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024429	CA-RIV-12061	SRI-3124	historical period, 1942–1944	refuse scatter	BLM	not eligible	no effect	no effect
33-024280	CA-RIV-11934	SRI-71	historical period, post-1944	debris scatter	BLM	not eligible	no effect	no effect
33-024366	CA-RIV-12000	SRI-2051	historical period	road/trail	BLM	not eligible	no effect	no effect
33-024462	CA-RIV-12094	SRI-4178	historical period	refuse scatter	BLM	not eligible	no effect	no effect

Key: CRHR = California Register of Historical Resources; DTC/C-AMA = Desert Training Center/California-Arizona Maneuver Area; EIS = Environmental Impact Statement; FAR = fire-affected rock; MMCDAD = Mule Mountains Complex Discontiguous Archaeological District; NRHP = National Register of Historic Places; SRI = Statistical Research, Inc.

[a] Source: *Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California*, edited by Michael K. Lerch, Patrick B. Stanton, and Karen K. Swope, Technical Report 15-36, Statistical Research, Redlands, California, 2016. Submitted to the USDI BLM, Palm Springs–South Coast Field Office, Palm Springs, California.

[b] Source: *Desert Quartzite Solar Project Draft Plan Amendment, Environmental Impact Statement/Environmental Impact Report*, USDI BLM and County of Riverside, California, 2018. Available online, https://eplanning.blm.gov/epl-front-office/projects/nepa/68211/153590/188106/Desert_Quartzite_Draft_EIS-EIR_080118_508.pdf, accessed February 25, 2019.

DPR 523 Site Record and Update Forms
for sites
P-33-019676, P-33-019714, and P-33-019797

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Palm Springs South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262
www.blm.gov/california

In Reply Refer To:
2800 (P)
CACA-49397
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MAY 8 2019

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RETURN RECEIPT REQUESTED

Julianne Polanco
State Historic Preservation Officer
Attn: Brendon Greenaway, Assistant State Archaeologist
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

RE: National Historic Preservation Act (NHPA) Section 106 consultation on determinations of National Register of Historic Places (NRHP) eligibility and findings of effect for the proposed Desert Quartzite Solar Project, Riverside County, California

Dear Ms. Polanco:

Thank you for your October 9, 2018, response letter to the Bureau of Land Management (BLM) regarding the determinations of NRHP eligibility and findings of effect on the proposed Desert Quartzite Solar Project (DQSP). In your letter, you specify that you do not concur with the BLM's determinations of eligibility and findings of effect due to the following concerns:

- The information BLM sent you on June 22, 2018, lacks information on BLM's evaluation of the historic significance of individual resources, such as important events or patterns of events that resources within the area of potential effects (APE) are associated with and/or important information the resources might yield that would significantly add to our understanding of history or prehistory.
- The recommendations and sites presented in the BLM Class III report and addendums do not correlate to the site summary table enclosed with the correspondence.
- The BLM correspondence does not discuss sites the BLM has determined ineligible.
- You recommend providing summaries of the views expressed by consulting parties that BLM considered in its determinations pursuant to 36 CFR § 800.11 (e)(6), specifically where additional consultation with Indian tribes is identified as a recommendation in BLM supporting documentation.

The purpose of this letter is to: (1) notify you of a modification to the Direct Effects APE to accommodate a newly proposed gen-tie line alternative consistent with 36 CFR 800.4 (a)(1); (2) clarify the BLM's proposed determinations of eligibility pursuant to 36 CFR 800.4 (c); (3) provide the BLM's proposed findings of effect for historic properties within the APE pursuant to 36 CFR 800.5 (a); and (4) request your concurrence on the Agency's proposed detenninations and findings pursuant to 36 CFR 800.4 (d) and 800.5 (b), pending any possible BLM changes as a result of the final outreach to tribes (see below).

Area of Potential Effects

To summarize, the BLM is reviewing an application for a right-of-way (ROW) grant and proposed Plan of Development (POD) submitted by First Solar, to construct, operate, maintain, and decommission a 450 Megawatt (MW) photovoltaic (PV) solar electrical generating facility on approximately 3,616 acres of public lands managed by the BLM. The proposed Project would be located south of Interstate 10, approximately 8 miles southwest of the city of Blythe in Riverside County, California. The proposed Project area is bounded on the southwest and southeast by existing electrical transmission lines and access roads, including the Devers–Palo Verde Transmission Lines No. 1 (DPV1) and No. 2 (DPV2). An existing 7.5-MW solar PV project, the NRG Blythe Solar Power Plant, is located on 200 acres adjacent to the northern boundary of the DQSP site. A portion of the Blythe Mesa Solar Project, a 485-MW, 3,660-acre PV project approved by the County in 2014 and by the BLM in 2015, is located on a keyhole-shaped parcel of land that is surrounded on three sides (the north, west, and south) by the DQSP site. The Project is located within the Riverside East Solar Energy Zone (SEZ), and within a Development Focus Area (DFA) as identified in the Desert Renewable Energy Conservation Plan (DRECP).

The BLM has worked with the Applicant to develop multiple alternatives for review and consideration through the BLM's National Environmental Policy Act (NEPA) compliance. The proposed project, as identified above, represents Alternative 1. Alternative 2, the Resource Avoidance Alternative, and BLM's Preferred Alternative, was developed to maintain a proposed 450 MW facility while also avoiding identified resources, including cultural resources identified during the BLM Class III surveys. Alternative 3, the Reduced Project Alternative, would reduce the overall project size to achieve further resource avoidance.

The BLM has previously consulted with you on the APE for the DQSP in our letters dated August 21, 2014 and June 22, 2018. You concurred with the APE and revised APE in your responses of September 30, 2014 and October 9, 2018. The BLM is adding a 160 foot by 0.25 mile long section (24 acres total) to the direct effects APE, which will allow for a newly proposed gen-tie alignment alternative (Direct APE Addition 2). A map of the updated APE is provided in Enclosure 1.

Identification and Evaluation Efforts

BLM previously provided a summary of the BLM Class III survey efforts within the direct effects APE and provided copies of both the final BLM Class III survey report and an addendum report addressing CEQA findings. Those survey efforts resulted in the identification of 278 sites (88 prehistoric, 9 multicomponent, and 181 historical-period) and 620 isolate resources (157 prehistoric, 463 historical-period). See Enclosure 2 for a summary of the resources within the APE.

APE addition 2 was previously surveyed by Applied Earthworks in 2010 and 2011 for the Colorado River Substation, and a portion of APE addition 2 was also included in the BLM Class III survey for DQSP in 2016. The additional area outside of the 2016 BLM Class III survey area was re-surveyed in April 2019. Of the 14 archaeological sites previously identified, 11 were relocated and were recently evaluated as part of the DQSP evaluation efforts summarized in Addendum II to the Class III Archaeological Report. Three of the previously identified archaeological sites were not relocated, and only one new isolated resource was identified. The results of these identification efforts are summarized in a letter report entitled *Cultural Resources Assessment of the Gen-tie Corridor Realignment: Addendum 3 to Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California (SRI Technical Report 15-36C)* (Lerch 2019), and is included here as Enclosure 3.

Since our previous consultation with your office, the BLM has evaluated all 281 archaeological sites and 621 isolates within the direct effects APE. In addition, the BLM assessed effects to eight properties within the indirect effects APE that have been previously listed, or determined eligible for listing, in the NRHP. The results of these evaluation and assessment efforts are summarized in a report entitled: *Thermal-Features Testing and Final NRHP/CRHR Cultural Resource Evaluations: Addendum 2 to Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California* (by Michael K. Lerch, Technical Report 15-36B, Statistical Research, Inc. (SRI), Redlands, California, April 2019) (Addendum 2) (Enclosure 4).

SRI prepared an indirect effects study, which reconsidered the Mule Tank Discontiguous Rock Art District (District) listing criteria (listed under Criteria C and D) in Addendum 2 based on letters received from tribes during the consultation for this Project, and to assess effects to the District. SRI recommended that the District and six additional sites nearby are related and could be part a larger District than that previously listed on the NRHP. SRI further recommended that the current District be expanded to include sites P-33-001821, P-33-000343, P-33-000650, P-33-000673, P-33-000772, and P-33-024394, and that the District should be renamed the Mule Mountains Complex Discontiguous Archaeological District (MMCDAD). SRI also recommends that the MMCDAD is also eligible under Criterion A for its importance in tribal history.

The BLM and Contractor agree that the Mule Mountains, the District, and the resources identified are significant to the tribes. The consultant recommends expanding the boundaries of the District to include six additional sites, and further recommends the District be considered eligible under Criterion A for its importance in tribal history. After BLM professional staff review of the available documentation, the BLM feels that the analysis falls short of justifying an expansion of the existing District and of justifying an alteration to the significance criteria. BLM feels that additional documentation would be necessary to expand the boundaries and eligibility criteria of a listed National Register site.

Furthermore, the information presented in Addendum 2, and information shared by tribes during the consultation for this Project, identifies no clear link to significant events, patterns, or trends in prehistory or to people significant in tribal history that supports the recommendation of eligibility under Criterion A. Concurrently with this letter, the BLM is requesting any additional information the tribes may have that would allow the BLM to reconsider Criterion A eligibility. The BLM is requesting that tribes provide this information by June 5, 2019. The BLM will immediately forward any additional information to you that is received from tribes during this period.

The BLM has also concluded that the six additional archaeological sites should be evaluated on their own merits. The BLM does agree that the five trail segments within the proposed expansion likely were related to the District in some way since they appear to represent multiple transportation features leading to/from the major archaeological features of the District. The consultant has recommended that the sites are individually eligible under Criteria A, C and D. The Contractor and the BLM recognize the importance of this site to the tribes, however, the BLM maintains that there is no clear link between habitation site P-33-001821 and either the proposed ceremonial significance of the expanded District, or the significance of the listed District. The consultant has recommended that site P-33-001821 is individually eligible under Criteria A, C and D. As with the District, the currently available information identifies no clear link to specific events or people significant in tribal history to support the recommendation of eligibility under Criterion A.

Tribal Consultation

The BLM notified and invited Indian tribes to consult on the proposed project by letter dated August 21, 2014, at the earliest stages of application review. The BLM, is currently consulting with fifteen federally recognized Indian tribes including the Agua Caliente Band of Cahuilla Indians, Augustine Band of Cahuilla Indians, Cabazon Band of Mission Indians, Cahuilla Band of Mission Indians, Chemehuevi Indian Tribe, Cocopah Indian Tribe, Colorado River Indian Tribes (CRIT), Fort Mojave Indian Tribe, Fort Yuma Quechan Tribe, Morongo Band of Mission Indians, Ramona Band of Mission Indians, San

Manuel Band of Mission Indians, Soboba Band of Luiseño Indians, Torres-Martinez Desert Cahuilla Indians, Twenty-nine Palms Band of Mission Indians.

BLM held a site visit for consulting Tribes on June 12, 2015, attended by representatives of CRIT and the Fort Yuma Quechan Tribe. The Class III archaeological survey report was made available to the tribes on April 20, 2016. The BLM invited the Tribes to participate when SRI tested several thermal features on April 23-26, 2018. The CRIT participated in the archaeological testing of the thermal features. Letters to Tribes were sent on July 30, 2018, regarding preliminary determinations of eligibility and findings of effect. There have been no written responses received to date on the determination of eligibility and finding of effect. The BLM held government-to-government meetings with two tribes who requested such meetings, including the Cahuilla Band of Mission Indians on November 1, 2018 and the Twenty-Nine Palms Band of Mission Indians on November 14, 2018.

In support of the BLM's NEPA compliance process, the BLM held a public meeting in Palm Desert, California on September 26, 2018 and another public meeting in Blythe, California on September 27, 2018, to solicit public comments on the DQSP Draft EIS/Environmental Impact Report (EIR). The CRIT attended the public meeting on September 27, 2018. CRIT and Agua Caliente provided comments on the Draft EIS/EIR

As discussed above, the BLM is concurrently notifying the tribes of the Agency's proposed determinations and findings, and making another request to the tribes to provide the BLM with any additional information regarding the Mule Tank Discontiguous Rock Art District, and six additional sites that are associated with the District, that may support Criterion A recommendations made in Addendum 2. The BLM understands that the Mule Mountains hold a special significance for the tribes. The BLM also recognizes that the presence of the rock art and other significant features in that place are significant, as was cited as part of the listing of the District under Criterion C and D. The BLM is again requesting any additional information from the tribes that identify a link between these significant features and significant events, patterns, or trends in prehistory, or to better understand the role the Mule Mountains may play in historically rooted beliefs, customs, and practices of the tribes. The BLM requests the Tribes provide this information by June 5, 2019. The BLM will immediately forward any tribal responses received to your office for your consideration in the review of the proposed determinations and findings presented here.

Agency Determinations of NRHP Eligibility
Based on the recommendations of the cultural resources consultants, BLM staff review, and pursuant to 36 CFR 800.4 (c), the BLM has made the following determinations regarding NRHP eligibility (see summary table in Enclosure 2):

- Sites P-33-000504 and P-33-000773 are currently listed in the NRHP as the Mule Tank Discontiguous Rock Art District under Criteria C and D. At this time, the BLM does not propose to modify this listing.
- Sites P-33-011110 and P-33-012532, historical-period transmission lines, were previously determined eligible for listing in the NRHP under Criterion C and D. The BLM concurs with and reaffirms those previous determinations.
- The prehistoric component of site P-33-001821 was previously determined eligible for listing in the NRHP under Criteria C and D. The BLM concurs with and reaffirms the previous determination.
- The BLM determines that two rock-feature sites (P-33-024385 and P-33-024459), seven rock feature sites with artifact scatters (P-33-024283, P-33-024356, P-33-024361, P-33-024476, P-33-024496, P-33-024497, and P-33-024719), and the prehistoric component of site P-33-019618 are

eligible for the NRHP under Criterion D for their potential to contain information significant to prehistory;

- The BLM determines that Six prehistoric archaeological trail sites (P-33-000053, P-33-000343, P-33-000650, P-33-000772, P-33-003803, and P-33-024394) and the prehistoric trail component of site P-33-000673 are eligible for the NRHP under Criteria C and D;
- The BLM determines that 83 prehistoric sites and prehistoric components of multicomponent sites are not eligible for listing in the NRHP under all four criteria.
- BLM determines that all 621 isolates are not eligible for listing in the NRHP.

Agency Findings of Effect

Based on the recommendations of the cultural resources consultants, BLM staff review, and pursuant to 36 CFR 800.5 (a), the BLM has made the following findings of effect regarding the 22 historic properties identified within the project APE (see summary table in Enclosure 5):

- The BLM finds that Alternative 1 (Proposed Project) would result in a direct adverse effect to historic properties. The BLM has worked with the Applicant to develop two feasible alternatives that would avoid direct effects to historic properties (Alternative 2 and 3). Should Alternative 1 become the selected alternative, the BLM will consult to resolve the adverse effect and complete the Section 106 of the NHPA process through development of a Memorandum of Agreement prior to the Record of Decision.
- The BLM finds that there are no direct adverse effects to historic properties from Alternative 2 (Resource Avoidance Alternative and BLM's Preferred Alternative);
- The BLM finds that there are no direct adverse effects to historic properties from Alternative 3 (Reduced Project Alternative).
- The BLM finds there would be no indirect adverse effects to historic properties from any Alternative.

As noted at the outset, the purpose of this letter is to: (1) notify you of a modification to the Direct Effects APE to accommodate a newly proposed gen-tie line alternative consistent with 36 CFR 800.4 (a)(1); (2) clarify the BLM's proposed determinations of eligibility pursuant to 36 CFR 800.4 (c); (3) provide the BLM's proposed findings of effect for historic properties within the APE pursuant to 36 CFR 800.5 (a); and (4) to request your concurrence on the Agency's proposed determinations and findings pursuant to 36 CFR 800.4 (d) and 800.5 (b), pending any possible BLM changes as a result of the final outreach to tribes.

We appreciate your attention to our request and look forward to continuing our consultation on the proposed undertaking. For information about this request, please contact George E. Kline, Field Office Archaeologist, at (760) 833-7135 or gkline@blm.gov. You can also contact me directly at (760) 833-7100 or dherrema@blm.gov.

Sincerely,

D Herrema

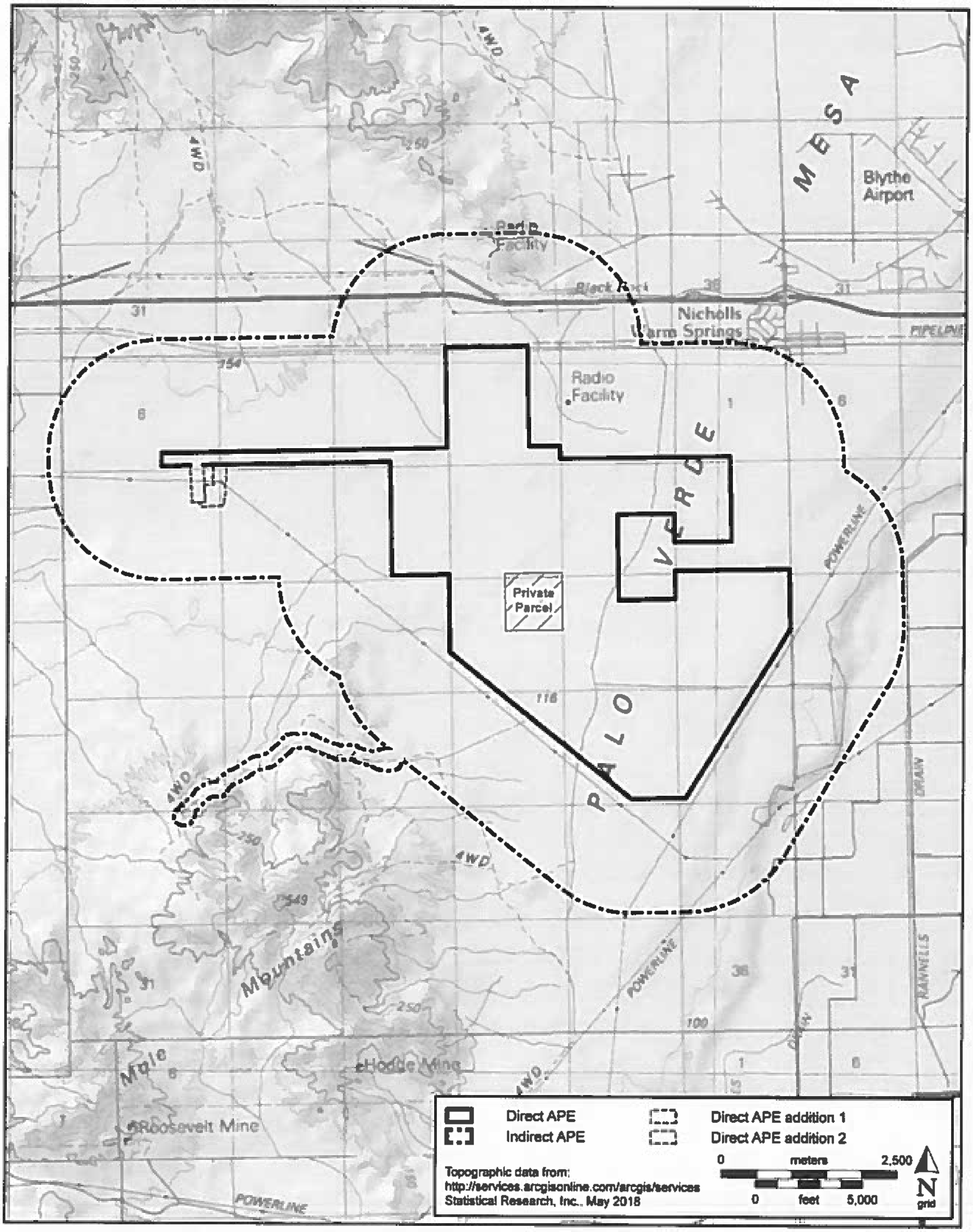
Douglas J. Herrema, JD
Field Manager

Enclosures (5):

1. Map Showing the Desert Quartzite Solar Project Area of Potential Effects.
2. Summary of Desert Quartzite Solar Project Determinations of Eligibility
3. *Cultural Resources Assessment of the Gen-tie Corridor Realignment: Addendum 3 to Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California,* by Michael K. Lerch, Technical Report 15-36C, Statistical Research, Inc., Redlands, California, April 22, 2019.
4. *Thermal-Features Testing and Final NRHP/CRHR Cultural Resource Evaluations: Addendum 2 to Class III Archaeological Survey of the Desert Quartzite Solar Project, Palo Verde Mesa, Riverside County, California,* by Michael K. Lerch, Technical Report 15-36B, Statistical Research, Inc., Redlands, California, April 2019 (on compact disc).
5. Summary of National Register of Historic Places Eligibility and Effects Determinations

Electronic Copies (CC):

Brandon Anderson, BLM Project Manager (bganderson@blm.gov)
Tony Overly, BLM California State Archaeologist (soverly@blm.gov)
Tiffany Arend, BLM California Desert District Archaeologist (tarend@blm.gov)
George Kline, BLM Palm Springs Field Office Archaeologist (gkline@blm.gov)



Enclosure 1. Map showing the Desert Quartzite Solar Project Area of Potential Effects with Additions 1 and 2.