APPENDIX F

Cultural Resources

Appendix F1 – Cultural Resources Inventory and Monitoring Report for the North Haiwee Dam No. 2 Project, Inyo County, California

Appendix F2 – Potential Fossil Yield Classification Report

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Appendix F1

Cultural Resources Inventory and Monitoring Report for the North Haiwee Dam No. 2 Project, Inyo County, California

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CULTURAL RESOURCES INVENTORY REPORT FOR THE NORTH HAIWEE DAM NO. 2 PROJECT, INYO COUNTY, CALIFORNIA:

VOLUME I: TECHNICAL REPORT

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EXECUTIVE SUMMARY

A seismic stability evaluation report on North Haiwee Dam No. 1 (existing Dam or NHD), prepared by Los Angeles Department of Water and Power (LADWP) in 2001, concluded that the existing earthfill dam, completed in 1913, could experience structural failure during a controlling maximum credible earthquake (MCE) scenario. NHD is an essential component of the Los Angeles Aqueduct (LAA) system, which transports water from the Owens Valley through North Haiwee Reservoir (NHR) and South Haiwee Reservoir (SHR) to the City of Los Angeles (City). Based on the evaluation report, the California Department of Water Resources, Division of Safety of Dams (DSOD) directed LADWP to operate NHR at a restricted maximum surface water elevation of 3,757.5 feet (ft.), to prevent an uncontrolled release of water and flooding in the event of dam failure resulting from an MCE. To resume operations of NHR, LADWP is proposing the North Haiwee Dam No. 2 Project (Project), which includes the construction of North Haiwee Dam No. 2 (new Dam or NHD2) to the north of the existing Dam to serve as a backup dam in the event NHD is damaged by an earthquake event, thereby ensuring public health and safety.

The Project encompasses municipal (LADWP) and federally administered (Bureau of Land Management [BLM]) land. As a governmental agency within California, LADWP, acting as the lead agency on behalf of the City, is required to comply with the California Environmental Quality Act (CEQA) for its direct undertaking of governmental action (CEQA Guidelines Section 15002[b]). The approval to construct on federal land is a federal action requiring compliance with the National Environmental Protection Act (NEPA).

To comply with state and federal legislation regarding identification and protection of cultural resources, since 2002 LADWP has sponsored a number of inventory, limited testing, and/or monitoring studies to support Project-related activities. The Project's Area of Potential Effects (APE) encompasses a one-square-mile area surrounding the existing Dam, as well as lengths of two existing road segments, including the Southern California Edison (SCE) transmission line road (SCE Road) and the LAA access road. The APE for the SCE Road includes a 2,000-foot long segment, while that of the LAA Access Road comprises a 3,000-foot long segment.

Cultural resources studies conducted within the Project APE have identified a broad array of prehistoric and historic-period-era archaeological sites and isolated finds. Overall, 92 resources have been recorded, consisting of 34 archaeological sites, 3 built environment resources, and 55 isolated finds. Archaeological sites consist of 12 prehistoric, 5 historic-period, and 17 multiple component (prehistoric and historic) resources. Obsidian lithic scatters characterize most prehistoric site components, although one site contains mostly prehistoric pottery fragments. Collectively, the prehistoric components document over 6,000 years of human land use. Two deeply buried prehistoric fire hearths identified at Site CA-INY-2243/5703, both associated with the middle Holocene (Little Lake period [5950–3150 B.P)], provide some of the earliest evidence of land use within the Project APE. A small group of artifacts provides additional evidence for Little Lake period associations. Time-sensitive prehistoric artifacts noted among a majority of prehistoric components indicate continued and expanded land use during the late Holocene, beginning as early as the Newberry period (3150–1350 B.P.) and extending, although ephemerally, into the Haiwee (1350 – 650 B.P.) and Marana (650 B.P.–Historic) periods.

Historic-period archaeological components largely reflect post-1910 land use, with site associations tied to construction of the First Los Angeles Aqueduct (LAA1), the existing Dam, and NHR; homesteading activities; general refuse disposal; and ore-processing activities. In addition, present within the Project APE are three built environment resources that remain in active use: the LAA, NHD, and a LADWP caretaker's residence.

Isolated find locations include prehistoric and historic-period resources. Most locations are of prehistoric origin, comprised of one to three lithic flakes and/or an isolated flaked stone tool. Historic-period isolates include small quantities of domestic debris, such as glass fragments, tin cans, and other metal, as well as a rock feature and wooden posts.

National Register of Historic Places (NRHP) recommendations for the 34 archaeological sites indicate that 6 sites are NRHP-eligible, 15 sites are not eligible, and 7 sites are unevaluated for the NRHP; evaluation of 6 additional sites is in

progress. In addition to archaeological sites, two built environment resources are NRHP-eligible properties, while one other is not eligible.

Additional treatment measures are recommended for six NRHP-eligible properties comprised of two built environment resources (the LAA1 and NHD) and four archaeological sites. For the LAA1 (CA-INY-4591H) and existing NHD (P-14-012173), proposed measures include Level II Historic American Engineering Record (HAER) recordation for these structures. BLM has also recommended consideration of completion of a NRHP nomination to list the LAA1 on the National Register.

As currently designed, several project components would directly affect four NRHP-eligible archaeological sites: CA-INY-2243/5703, -6580, -9345, and -9347. To reduce adverse effects and mitigate the loss of significant archaeological deposits, Phase III data recovery investigations are recommended for three historic properties: CA-INY-2243/5703, -6580, and -9347. In addition, CA-INY-9345 lies within a proposed access road corridor and has the potential to be affected by road construction activities and associated laydown areas. Flag and avoidance procedures are currently planned for this site to eliminate adverse effects.

Phase II evaluations previously conducted at archaeological site CA-INY-6931/7276 documented that its NRHP values exist within the historic-period LAA1 labor camp area. Although widening of access roads are proposed across the periphery of the site, such activities would not adversely affect those portions that contribute to its NRHP eligibility, precluding the need for Phase III data recovery. It is recommended, however, that a professional archaeologist monitor road-widening activities to ensure that inadvertent discoveries within these areas do not change the recommendation of no adverse effect.

Site CA-INY-7816 consists of remnants of old Highway 23 and its stage road precursor that have been recorded from the NHR area to north of Cartago. The road served as the Eastern Sierra's principal north-south route from the mid-1860s (stage road) to the early 1930s, when it was superseded by, or incorporated into – State Route 23, which was constructed through this area between 1929 and 1931. Before the 1860s, this linear feature also served as a trail that brought the earliest European American explorers to Owens Valley. This site is recommended NRHP-eligible for its contribution to the development and growth of Inyo County via a series of road developments that provided economic, social, and political developments to the region. As currently designed, Project activities will largely occur outside the road segments that comprise the recorded area of Site CA-INY-7816. Two segments, Segment K and Segment L, comprise part of a well-maintained, graded dirt road that crosses the Project Site. Although changes to this portions of this road would occur as part of the Project, such activities would not include the Segment K and Segment L areas, both of which would remain intact in their current location. No treatment measures are recommended for these two road segments, both of which lack contextual integrity, particularly with regard to aspects of design, workmanship, feeling, and materials.

Sixteen resources, comprised of 15 archaeological sites and 1 built environment resource, have been assessed as not eligible for the NRHP due to their lack of informational potential. These resources include: CA-INY-2242, -6574, -6575, -6576, -6583, -6584, -6586, -6587, -6933/7278, -7615, -9343, DD-02, JA-02, JM-01/RB-01, MK-01, and RB-05. Because of their lack of research potential, no further measures are advanced for these resources.

Seven archaeological sites (CA-INY-6932/7277, -7279, DD-01, DD-02, DD-04, JA-01, and RB-04) are unevaluated resources that would not be affected by project-related activities. Thus, no further measures are recommended for these resources.

Finally, the NRHP evaluation of six sites, CA-INY-6577, -6578/6579, -6581, -6582, -7616, and RB-03 is currently being assessed through Phase II testing. Pending the completion of analyses and reporting, the NRHP evaluation for these sites is still in progress.

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A.D.	anno Domini
ACHP	Advisory Council on Historic Preservation
amsl	above mean sea level
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
ATV	All-terrain vehicle
BA	bucket auger boring
B.C.	before Christ
bgs	below ground surface
BLM	Bureau of Land Management
B.P.	before present
ca.	circa
CARIDAP	State of California's Archaeological Resource Identification and Data Acquisition Program
C&C	Carson & Colorado Railroad
CCR	California Code of Regulations
CCS	cryptocrystalline silicate
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of Los Angeles
cm	centimeter
cmbs	centimeters below surface
CPT	cone penetration test
CRHR	California Register of Historic Resources
CVF	Coso Volcanic Field
DPR	Department of Parks and Recreation
DSOD	California Department of Water Resources, Division of Safety of Dams
EDAW	EDAW, Inc.
EIC	Eastern Information Center
EMP	edge-modified piece(s)
existing Dam	North Haiwee Dam No. 1
EU	excavation unit(s)
FLAAHAD	First Los Angeles Aqueduct Historical Archaeological District
ft.	feet

ft^2	square feet
GLO	Government Land Office
GPS	global positioning system
HSA	hollow stem auger boring
HABS	Historic American Building Record
HAER	Historic American Engineering Record
in.	inch(es)
JSA	Jones & Stokes Associates
km	kilometer(s)
km^2	square kilometer(s)
kV	kilovolt
LAA	Los Angeles Aqueduct
LAA1	First Los Angeles Aqueduct
LAA2	Second Los Angeles Aqueduct
LADWP	Los Angeles Department of Water and Power
LRN	Legislative route number
MCE	maximum controlling event
m	meter
m^2	square meter(s)
m^3	cubic meter(s)
mm	millimeter
MMRP	Mitigation Monitoring and Reporting Program
MW	monitoring well
MWD	Metropolitan Water District
NAGPRA	Native American Graves Protection and Repatriation Acct
NAHC	Native American Heritage Commission
NEPA	National Environmental Protection Act
new Dam	North Haiwee Dam No. 2
NHD	North Haiwee Dam No. 1
NHD2	North Haiwee Dam No. 2
NHR	North Haiwee Reservoir
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
OW	observation well

PRC	Public Resources Code
PVC	polyvinyl chloride
PW/PWO	pumping well
RECON	Regional Environmental Consultants
ROW	right-of-way
RW	mud rotary wash
SB	sonic boring
SCE	Southern California Edison
SHPO	State Historic Preservation Officer
SHR	South Haiwee Reservoir
SPT	standard penetration test
SR	State Route
STU	shovel test unit(s)
URS	URS Corporation
US	U.S. Highway
USC	United States Code
VW	vadose well

CHAPTER 1 – INTRODUCTION

This report summarizes the results of cultural resources studies conducted between 2002 and 2016 for the Area of Potential Effects (APE) associated with the North Haiwee Dam No. 2 Project (Project), located in the North Haiwee Reservoir (NHR) area of Owens Valley, Inyo County, California (Figure 1-1 and 1-2). The Project is proposed by the City of Los Angeles (City), Los Angeles Department of Water and Power (LADWP), in cooperation with the Bureau of Land Management (BLM), to build a new dam to improve the seismic reliability of NHR. LADWP owns and operates the North Haiwee Dam (existing Dam or NHD), an existing earthfill dam completed in 1913. NHD is an essential component of the Los Angeles Aqueduct (LAA) system, which transports water from the Owens Valley through the Haiwee Reservoirs to southern California and the City of Los Angeles. The LAA, composed of the First (LAA1) and Second (LAA2) aqueducts, provides approximately 35 percent of the annual average water supply for the City, such that if the NHD should fail, the City's water supply would be cut off from Owens Valley.

In July 2001, LADWP's Dam Analysis and Geophysical Engineering Squad prepared a seismic stability evaluation report on NHD. This report (Davis and Roux 2001) found that the existing Dam would be seismically unsound during a controlling maximum credible earthquake (MCE) scenario. Maintaining NHD, and its attendant reservoir for continuous service following an earthquake, is critical to the transport of aqueduct water from Owens Valley to the City. Subsequent to the 2001 report, LADWP conducted a preliminary engineering investigation of possible alternatives to improve NHD's performance. Alternatives included construction of a new dam, termed North Haiwee Dam No. 2 (NHD2), to be located about 800 feet (ft.) north of the existing Dam, or reconstruction of NHD at its current location.

The California Department of Water Resources, Division of Safety of Dams (DSOD), has directed LADWP to operate the NHR at a restricted maximum surface water elevation of 3,757.5 feet (ft.) above mean sea level (amsl), instead of the previous unassisted maximum elevation of 3,760 ft. amsl, to prevent flooding in the event of an MCE. These restrictions placed on operations of the NHR provide a narrow range of elevations that meet the requirements of DSOD while still allowing the LAA system to operate effectively. To resume operations of NHR to the previous unassisted maximum elevation, LADWP needs to comply with DSOD requirements, including demonstration of continuous progress on seismic improvements. Therefore, LADWP is proposing the Project, which includes construction of NHD2 to the north of the existing Dam to serve as a backup dam in the event NHD is damaged by an earthquake event. Other planned Project components include realignment of a 1,900-foot-long segment of the LAA1 (LAA Realignment); realignment of Cactus Flats Road (Cactus Flats Road Realignment); excavation of Borrow Site 10[1]; purchase of materials from Borrow Site 15; development of construction staging and stockpile areas; construction of a basin, diversion structure and channel, and berms; and roadway improvements. Borrow Site 10 refers to the LAA Excavation Area and Borrow Site 15 refers to the existing Mine in Keeler in the Draft Environmental Impact Report/Environmental Assessment.

The Project's APE encompasses a one-square-mile area surrounding the existing Dam, as well as lengths of two existing road segments, including the Southern California Edison (SCE) transmission line road (SCE Road) and the LAA access road (Figure 1-3). The APE for the SCE Road includes a 2,000-foot long segment, while that of the LAA Access Road comprises a 3,000-foot long segment. Table 1-1 provides the legal descriptions for the Project APE.

[1] Borrow Site 10 refers to the LAA Excavation Area and Borrow Site 15 refers to the existing mine in Keeler in the Draft EIR/EA.

Figure 1-1. Regional map.

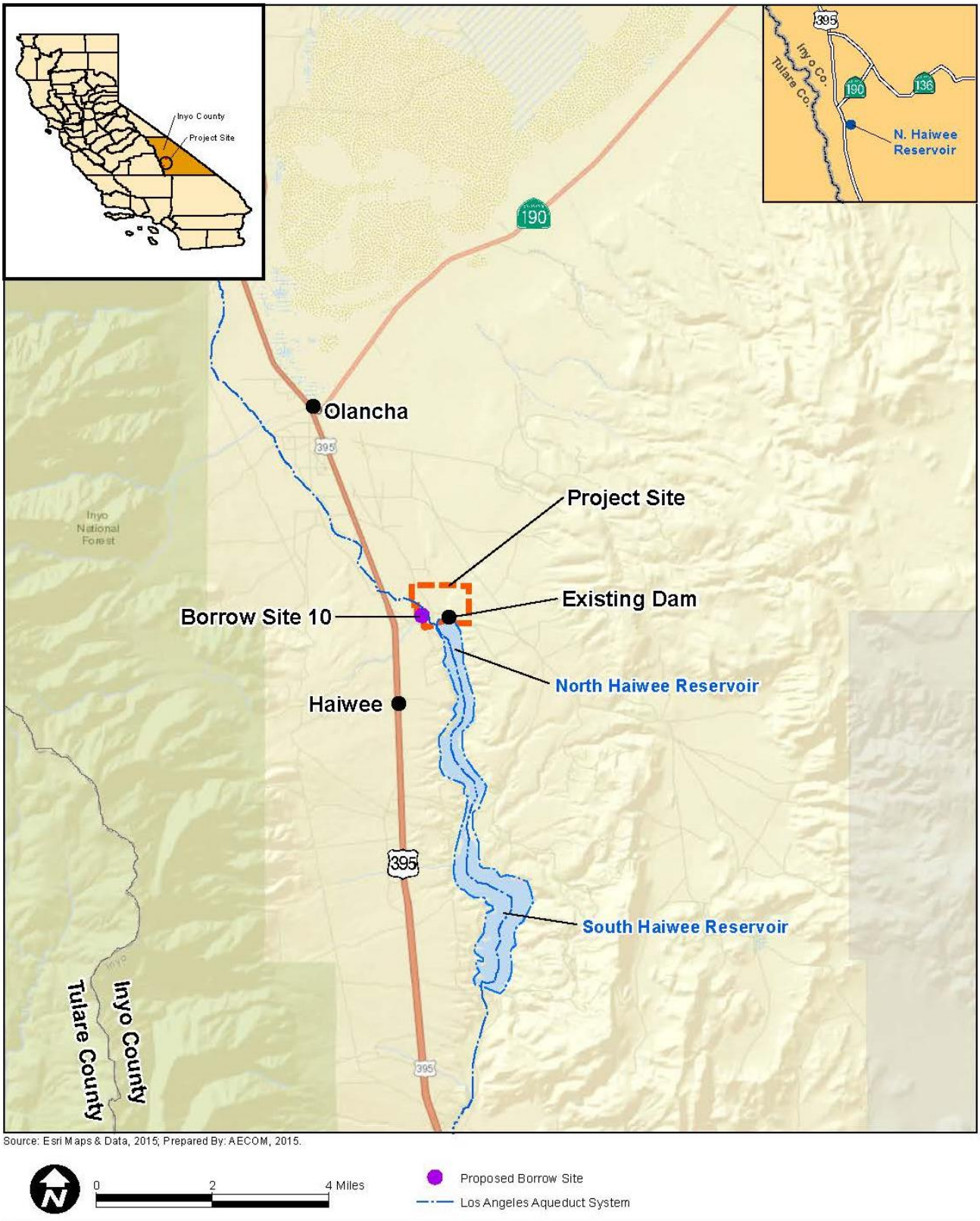


Figure 1-2. Project vicinity map.

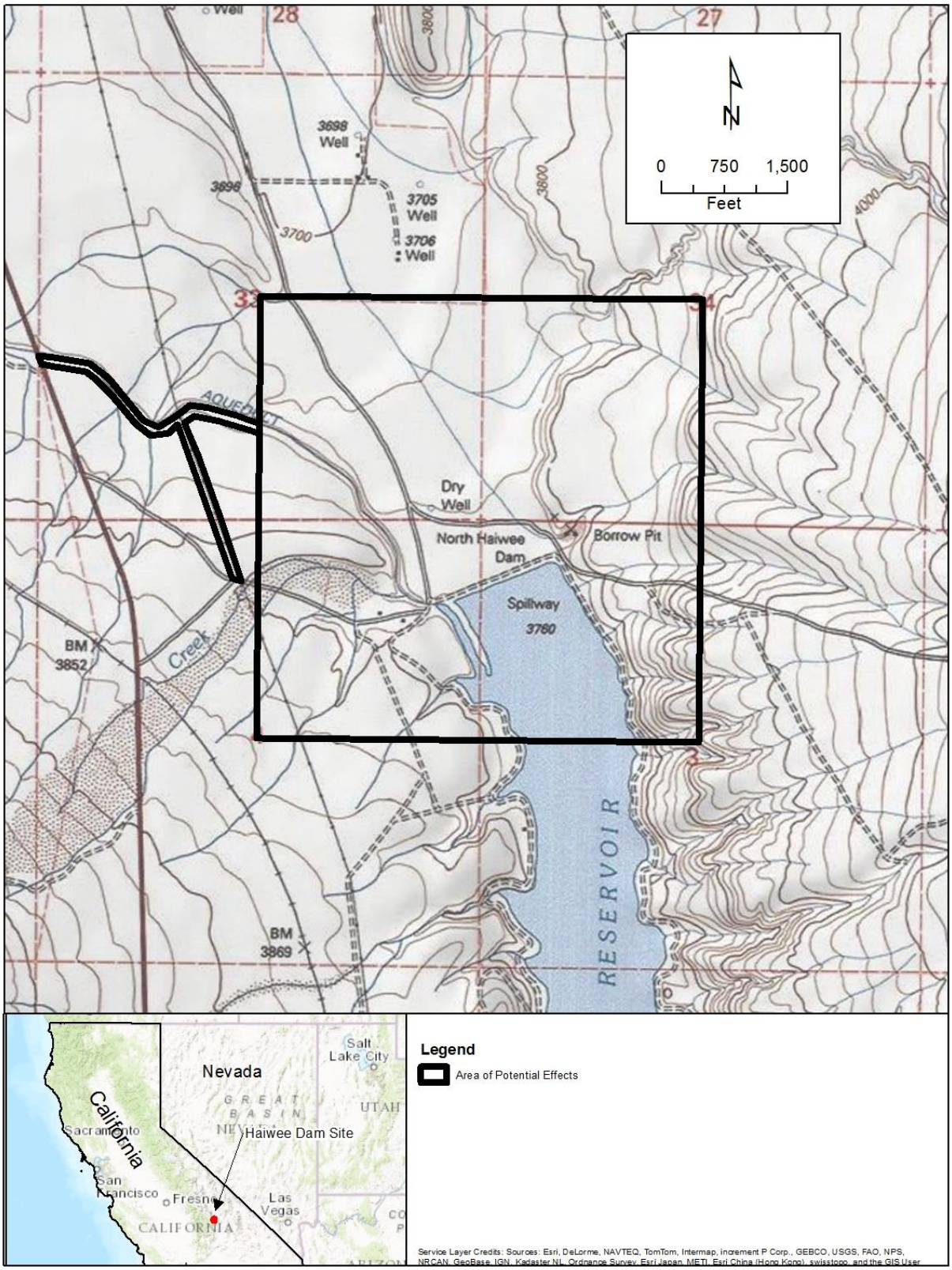


Figure 1-3. Project APE.

Table 1-1. Legal Descriptions for the Project APE.

APE Area	Township	Range	Quarter Section
1-mile square	19 South	37 East	SE ¼ of Section 33 and the SW ¼ of Section 34
1-mile square	20 South	37 East	NW ¼ of Section 3 and the NE ¼ of Section 4
LAA Access Road	19 South	37 East	SW ¼ and the SE ¼ of Section 33
SCE Haul Road	19 South	37 East	SE ¼ of Section 33

To comply with federal and state legislation regarding identification and protection of cultural resources, between 2002 and January 2017, LADWP sponsored various cultural resources studies within the APE to support Project-related activities, including archaeological inventories, limited site testing, Phase II evaluative testing, and monitoring of ground disturbance activities. These studies encompassed varied project developments, including the Project Site (incorporating the proposed NHD2; LAA Realignment; Cactus Flats Road Realignment; and Basin areas), Borrow Site 10, and road widening areas. In addition, further cultural resources studies have been conducted within other areas of the APE where project-activities are not currently planned. This report summarizes the results of cultural resources studies conducted within the Project APE, including those undertaken specifically for the Project Site and Borrow Site 10 (Nilsson 2007, 2010, 2011, 2012, 2016; Nilsson and Bevill 2015, 2016a, 2016b; Shaver 2003, 2008; URS 2010), and other areas (this report).

PROJECT LOCATION

The Project area is located in the southern Owens Valley in unincorporated areas of Inyo County, California (Figure 1-1 and 1-2). The Owens Valley is generally a dry landscape that extends 100 miles from north to south and 6 to 20 miles from east to west. It is bordered by the Sierra Nevada on the west, Chalfant Valley on the north, Inyo Mountains on the east, Coso Range on the southeast, and Rose Valley on the south. Communities located within the Owens Valley include Bishop, Big Pine, Aberdeen, Haiwee, Independence, Lone Pine, and Olancha.

Project Site

The Project Site is defined as the primary construction area that includes the existing Dam, the proposed NHD2, the existing LAA, proposed LAA Realignment, the proposed Cactus Flats Road Realignment, Basin, and staging areas (Figure 1-4 and 1-5). The Project Site is at the north end of Haiwee Reservoirs, a 7.5-mile-long water basin built by the City between 1907 and 1913 to regulate monthly variation in flood flow associated with the LAA1 (City of Los Angeles 1907:37; 1911:18). The Project Site occupies a relatively narrow, dry, flat basin and its adjoining side slopes that gently incline towards Owens Lake (dry), located roughly five miles to the north. The Project Site encompasses both LADWP and BLM land within portions of Township 19 South, Range 37 East, Sections 33 and 34, and Township 20 South, Range 37 East, Sections 3 and 4. Project Site elevations reach a maximum of 4,100 ft. on the eastern slopes, 3,800 ft. on the western slopes, and 3,700 ft. on the basin floor.

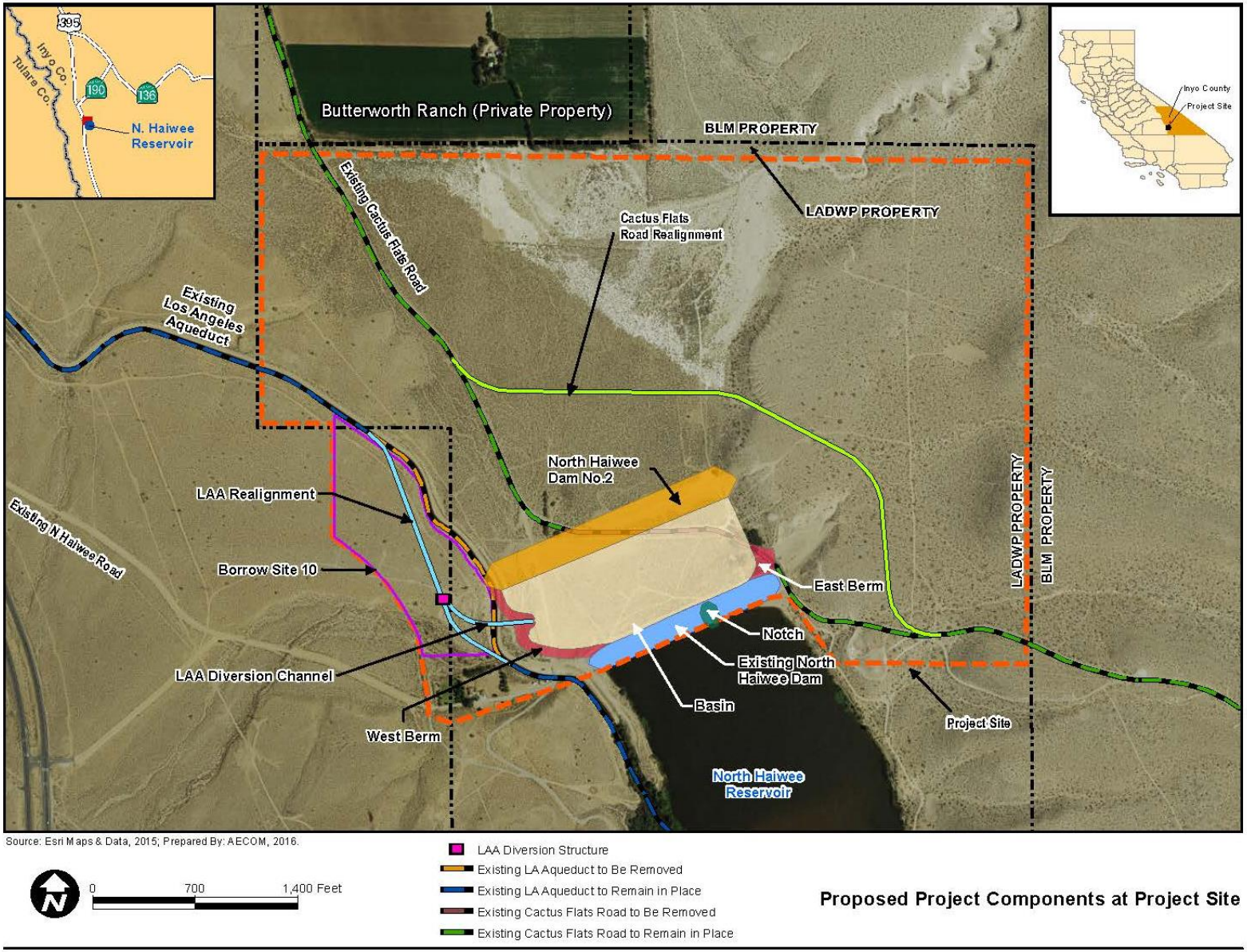


Figure 1-4. Project Site.

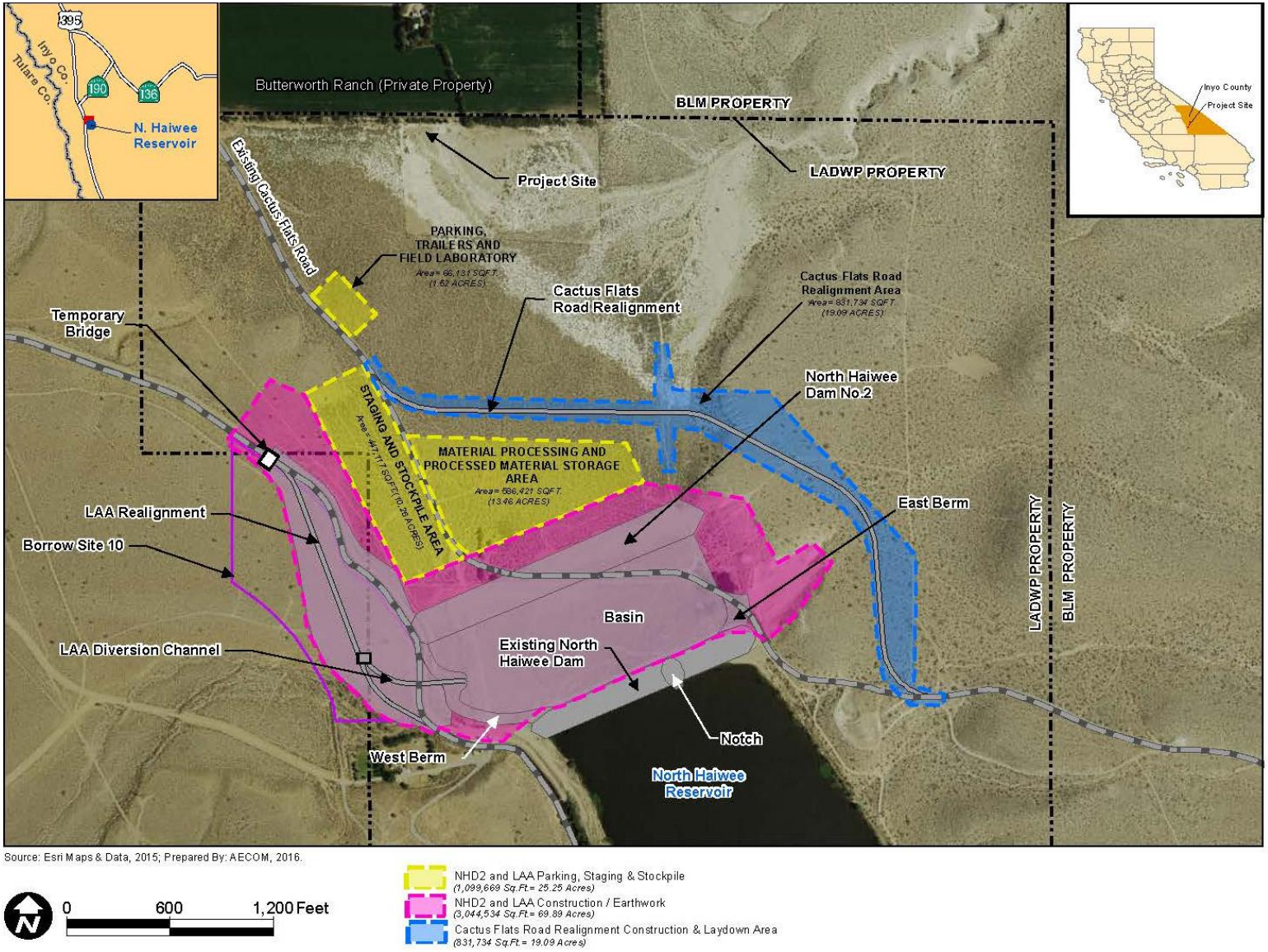


Figure 1-5. Construction staging and stockpile areas.

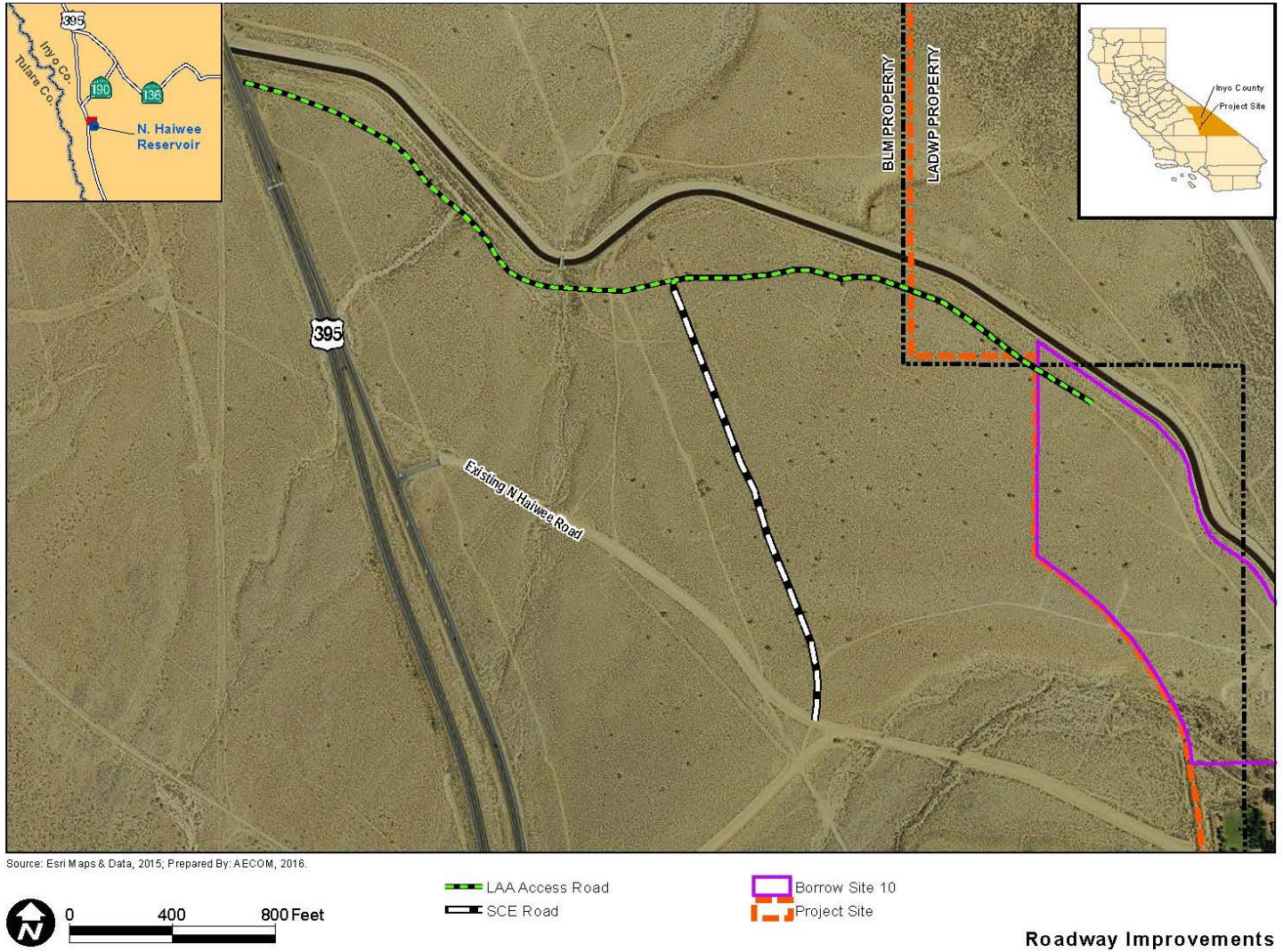


Figure 1-6. Roadway improvements.

NHD and NHD2

As shown in Figure 1-2, NHD is located approximately five miles southeast of the community of Olancha. The Project Site is bordered on the south by NHR, on the east by undeveloped LADWP-owned property, on the north by the privately owned Butterworth Ranch, and on the west by undeveloped BLM-owned land (Figure 1-4). The existing Dam is located at the north end of NHR approximately 0.7 miles east of U.S. Highway (US-) 395 and is accessed via the partially paved North Haiwee Road from the west and via the partially paved Cactus Flats Road from the north and east. NHD forms the northern dyke of NHR that, along with SHR, comprises the 63,800-acre-foot Haiwee Reservoirs system. The Haiwee Reservoirs impound the former Haiwee Meadows, a broad, oval-shaped valley, slightly less than 1-mile in diameter, which was surrounded by hills and interspersed with numerous springs (Whitney 1872). The meadows served as an overflow outlet for a former, larger, and deeper Owens Lake, of which the present-day lake is the only existing remnant (Gale 1914:253).

The existing Dam crests about 34 ft. above the former Haiwee Meadows and measures about 1,500-feet-long (east-west) and 66- to 74-feet-wide (north-south). Along this length, NHD stretches east-west across the flat basin to anchor on the low slopes of high terraces that edge the basin on the east and west. The existing Dam possesses no outlets or spillways, and its reservoir is solely fed by water from the open, concrete-lined, LAA1 channel that enters the reservoir at its northwestern edge.

The proposed NHD2 would be constructed on LADWP property north of the existing Dam. The NHD2 axis will be located approximately 800 ft. north and roughly parallel to the existing Dam's axis. Figure 1-4 depicts the new Dam's location relative to the location of the existing Dam. The new Dam would be zoned earthen embankment dam (comprised of shell, core, filter, and drain materials) based on design specifications, and the type of borrow materials available. The proposed NHD2 location provides a basin and a new accessible length of aqueduct channel between the existing Dam and NHD2 that may be utilized for water quality and sediment management purposes or storage. Construction of NHD2 would occur in four primary stages, including earth removal and excavation, base compaction, new dam construction, and embankment grading. Also required would be material storage and the processing and blending of NHD2 fill material on-site. Borrow materials would be stockpiled on-site.

Los Angeles Aqueduct

A roughly 1,900-foot long portion of the LAA1 in the Project Site is located within both LADWP and BLM properties (Figure 1-4). The LAA1 approaches NHR from the northwest, and enters NHR approximately 0.25 miles south of the existing Dam. CA-INY-4591H designates the LAA1's water conveyance system and related features located within Inyo County. The LAA1 segment that traverses the Project Site is the terminal section of the 40-mile-long open, concrete-lined canal that extends south from the Alabama Hills (near Lone Pine) to NHR.

The existing LAA1 is an open flow channel with continuous water flows. The westerly abutment of NHD2 would encroach upon a portion of the existing LAA. To construct NHD2 and maintain operations of the LAA1, the Proposed Project would realign approximately 1,900 ft. of the existing LAA. The cross-section of the proposed LAA Realignment would match the existing LAA's cross-section. The LAA Realignment would consist of a trapezoidal concrete channel, with an approximate width of 32 to 35 ft. and approximate depth of 12 to 15 ft. The concrete liner would be approximately 6 to 10 inches (in.) thick with steel reinforcement.

Site preparation for the LAA Realignment would require selective clearing and grubbing of the site before the start of excavation along the proposed alignment. Debris generated because of the site preparation would be temporarily stockpiled on-site and later hauled off the site for disposal.

To provide a haul route to bring materials to the stockpile area, a temporary bridge would be constructed over the existing LAA. A back-out would be excavated to reach the grade of the proposed LAA Realignment, and the trapezoidal channel would then be excavated and graded along the proposed alignment for approximately 1,900 ft. until reaching the northern and southern connection points with the existing LAA channel.

Reinforcing steel and concrete forms would be placed along the new channel alignment and then concrete for the LAA Realignment would be poured. Once the new portion of the LAA is constructed, the flow of water through the existing LAA would be halted temporarily to connect the newly built LAA Realignment to the existing LAA. After the LAA Realignment is connected, the obsolete LAA segment would be demolished and backfilled.

Cactus Flats Road Realignment

The existing Cactus Flats Road is a partially paved Inyo County-maintained road that approaches from the northwest, near a private agricultural property (Butterworth Ranch), and crosses the Project Site approximately 800 ft. north of the existing Dam (Figure 1-4). It then continues eastward, providing access for LADWP personnel and the public, including mining vehicles and other motorists.

Construction of NHD2 would intersect the existing Cactus Flats Road, as shown on Figure 1-4. To maintain access to this public road, the existing Cactus Flats Road would need to be realigned to accommodate the new Dam. The Cactus Flats Road Realignment would occur within LADWP-owned land. Construction of the proposed Cactus Flats Road Realignment would include site preparation, excavation, and grading tasks. Initial site preparation would include selective clearing and grubbing to remove trees and plants along the path of the new road. The existing Cactus Flats Road would not be demolished, except where the new Dam would be located. The remaining portions of the existing road would be retained by LADWP to provide access to the dam structures. Debris generated from the site preparation work would be temporarily stockpiled on-site and later hauled off-site for disposal. Excavation and grading would occur in a corridor ranging from 28 ft. wide to 155 ft. wide along the length of the Cactus Flats Road Realignment. The Cactus Flats Road Realignment would have a 28-foot right-of-way (ROW). The Cactus Flats Road Realignment would be constructed of compacted base material and asphalt paving. Two two-foot-by four-foot concrete culverts would provide drainage.

Construction Staging and Access

Construction staging would occur on the Project Site as shown in Figure 1-5. Material from the borrow sites, construction equipment, and haul trucks would be stored on-site within the Project Site. The Project Site would be accessed via North Haiwee Road, the LAA access road, SCE haul road, or Cactus Flats Road from US-395. The construction staging areas adjacent to the new Dam construction area would be accessed via the existing Cactus Flats Road. This portion of Cactus Flats Road would be permanently closed to the public, but would not be demolished as it would provide access to the new and existing Dams. The Cactus Flats Road Realignment would be opened to the public before construction of NHD2 and closure of the existing Cactus Flats Road. Two roadways, the LAA Access Road and the SCE haul route, would be widened to accommodate truck traffic (Figure 1-6).

Basin

The area between the existing Dam and the proposed NHD2 would be utilized as a basin (proposed Basin). Water would travel from the realigned LAA into the Basin, and then through a notch in NHD into the existing NHR. To construct the Basin component, several new components would be needed, including:

- Construction of a proposed Diversion Structure to allow water diversion from the LAA into the proposed Basin.
- Leveling, dewatering, and berm construction within the proposed Basin, followed by installation of geomembrane on the bottom of the proposed Basin;
- Construction of a diversion channel to convey water from the proposed LAA Realignment through the Diversion Structure into the proposed Basin.
- Construction of a bridge over the proposed Diversion Channel.
- Slope protection measures for NHD, to include removal of one to two ft. of soil on the downstream face followed by installation of measures to protect the slope, including geomembrane.

- Notching of NHD to connect the proposed Basin and NHR.

The proposed Diversion Structure, Diversion Channel, and Notch would match the design parameters for the proposed LAA Realignment. The proposed Diversion Channel would be built during construction of the LAA Realignment and would be approximately 675 ft. long. Soil generated during construction of these proposed Project components would be used on-site.

The bottom of the proposed Basin would be graded to create a level bottom during earthwork for NHD2. The proposed West and East Berms would be constructed to prevent water from flooding out of the proposed Basin, either due to failure of NHD (prior to completion of the proposed Basin) or due to regular operations of the proposed Basin once filled with water. The proposed Berms would be constructed using soil generated by Borrow Site 10, the proposed LAA Realignment, and leveling of the proposed Basin.

After construction of NHD2, the Diversion Channel and bridge would be constructed and other modifications would be made to NHD. One to two ft. of soil would be removed from the northern side of NHD and a combination of filter layer and geomembrane would be installed on the downstream face to protect the slope once the proposed Basin is operational and NHD is mostly submerged. A geomembrane would also be placed on the bottom of the proposed Basin. These measures would help to prevent water quality and erosion issues once the proposed Basin is filled.

The proposed Notch in NHD would be excavated to provide a connection for water to flow from the proposed Basin to NHR. LADWP proposes to temporarily lower the water elevation in NHR to below 3,750 ft. amsl to expose NHD sufficiently to construct the proposed Notch. The proposed Notch would be constructed through mechanical excavation. Once excavated, the area would be reinforced with 6 to 8 in. of concrete with weld wire reinforcement.

The proposed Basin would not be filled with water until all of the construction activities described above are completed. Upon completion of construction, water would be diverted into the proposed Basin to test the performance of NHD2, and upon completion of testing, the proposed Basin would operate as part of the LAA system. Generally, operations of the proposed Basin would require minimal maintenance, and would be similar in scale to operations of the existing NHD, NHR, and LAA. However, water that flows into the Basin from the LAA would settle in the Basin before flowing into NHR; as such, sediments may accumulate in the proposed Basin over time, and it is anticipated that dredging would be required every 10 to 15 years to remove sediments.

Borrow Site 10

The construction of NHD2 would require various materials to create the new earthen dam. These materials would be sourced from one or more borrow sites, locations identified as sources of riprap, gravel, and/or sand that would be used to build the new Dam. Two borrow sites have been identified for the Proposed Project, with Borrow Site 10 being within the Project APE. Borrow material would be hauled to the Project Site by dump trucks or trailers and stockpiled at the Project Site. Borrow material may include gravel and sand. Final selection of borrow material is dependent on practicality of excavation and transport, quantity and quality of materials, final NHD2 design, and potential for significant environmental impacts.

Borrow Site 10 is adjacent to the western side of NHD, and consists of land that is owned by both LADWP and BLM. It is not an active mine site, but portions have been previously disturbed by construction of the existing LAA and borrowing of fill materials for the existing NHD. Borrow Site 10 is located within and around the Project Site. Access to the Borrow Site 10 would be via North Haiwee Road.

REGULATORY CONTEXT

The Project APE encompasses both municipal (i.e., LADWP) and federally managed (i.e., BLM) lands. The cultural resources studies conducted to support the Project have been consistent with requirements set forth by both the National Historic Preservation Act (NHPA), for federal land, and the California Environmental Quality Act (CEQA), for private land.

Cultural resources are historic and prehistoric archaeological sites, historic architectural and engineering features and structures, and sites and resources of traditional cultural significance to Native Americans and other groups. Archaeological and architectural resources (buildings and structures) are protected through the NHPA of 1966 (16 United States Code [USC] §§ 470f) and its implementing regulations, protection of Historic Properties (36 Code of Federal Regulations [CFR] Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979, as amended. If a Federal permit of any kind is needed (such as, in the case of the Project, a Cultural Resources Fieldwork Authorization from the BLM), the NHPA and its implementing regulations (16 USC § 470 et seq., 36 CFR § 800, 36 CFR § 60, and 36 CFR § 63) apply. The NHPA establishes the federal government's policy on historic preservation and the programs, including the National Register of Historic Places (NRHP), through which that policy is implemented.

Both Section 106 of the NHPA and BLM policy (8100 Manual) require federal agencies, before implementing an "undertaking" (e.g., issuing a federal permit), to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing on the NRHP. If significant (i.e., National Register eligible) resources are identified, then federal agencies are directed to take prudent and feasible measures to avoid or reduce adverse impacts. Under the NHPA, historic properties include *any* prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP (16 USC §§ 470w (5)).

Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a tribe to be determined eligible for inclusion in the NRHP. Cultural institutions, lifeways, culturally valued viewsheds, places of cultural association, and other valued places and social institutions must also be considered under the National Environmental Protection Act (NEPA), Executive Order 12898, and sometimes other authorities (Executive Order 13006, Executive Order 13007, Native American Graves Protection and Repatriation Act [NAGPRA]).

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

Under State of California legislation, the CEQA review requires a determination if a project will have a significant effect on archaeological sites or a property of historic or cultural significance to a community or ethnic group. Lead agencies are required to identify any historical resources that may be affected by any undertaking involving state or county lands, funds, or permitting. A historical resource for purposes of CEQA compliance is defined as a resource listed in or determined eligible for listing in the California Register of Historical Resources (CRHR) (Public Resources Code [PRC] § 5024.1, Title 14 California Code of Regulations [CCR], Section 4852).

In addition, the significance of such resources that may be affected by the undertaking must be evaluated using the criteria for listing on the CRHR. The CRHR lists properties that are to be protected from substantial adverse change and includes properties that are listed, or have been formally determined to be eligible for listing, in the NRHP, State Historic Landmarks, and eligible Points of Historical Interest.

Other state-level requirements for cultural resources management are within the California PRC, Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency. The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the PRC and fall within the jurisdiction of the Native American Heritage Commission (NAHC). If human remains are discovered, the County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found.

Because this project invokes compliance with Section 106 of the NHPA due to federal permitting from the BLM, discussions of site significance presented below follow NRHP criteria (36 CFR § 60.4) and terminology which, notwithstanding, provide little distinction from those used for assessing resource eligibility under the CRHR.

REPORT OUTLINE

This report summarizes the cultural resources inventory and monitoring studies conducted within the Project APE between 2002 and 2016. Chapter 1 provides an introduction, including a Project description, its location, and regulatory context. Chapter 2 presents the environmental and cultural context of the Project area, including an overview of local and regional archaeology, ethnography, and history. Chapter 3 summarizes the results of the various records searches and cultural resources inventory and monitoring studies conducted to support Project-related activities. Chapter 4 provides an overview of the cultural resources identified within the APE, including archaeological sites, built environment resources, and isolated finds. Descriptions are provided for each archaeological site and built environment resource, along with information regarding recordation history and Project-related activities conducted within the resource's boundary; a comprehensive listing of isolated finds follows. Chapter 5 provides a discussion of NRHP eligibility and management recommendations. The report concludes with references cited and five confidential technical appendices. Appendix A includes State of California archaeological site record and built environment resource forms, while Appendix B provides State of California primary records for isolated finds. Appendix C provides a map depicting the location of each archaeological site and built environment resource, while Appendix D includes a map with the location of isolated finds. Finally, Appendix E includes a project component map depicting the location of archaeological sites and built environment resources.

CHAPTER 2 – ENVIRONMENTAL AND CULTURAL CONTEXT

ENVIRONMENTAL SETTING

The Project area is within Owens Valley, a long, narrow landform in east-central California that spans a distance of more than 100 miles, reaching north to the Volcanic Tablelands and south beyond the Haiwee Reservoirs. The largest towns in Owens Valley are Independence, Big Pine, Lone Pine, and Bishop. Owens Valley, which measures 6- to 20-miles-wide, is a deep, block-faulted trough formed by uplift of the Sierra Nevada Mountains to the west and the Inyo and White Mountains to the east. Elevations range from 1,328 meters (m) (4,356 ft.) near Bishop to 1,090 m (3,575 ft.) at Owens Lake. The Sierra Nevada Mountains rise to an elevation of 4,418 m (14,495 ft.) at Mt. Whitney, while the Inyo-White Mountains to the east rise to a height of 4,342 m (14,246 ft.) at White Mountain.

Extreme volcanic activity characterizes the geology of Owens Valley. Local sands and gravels are composed of decomposed igneous rocks and granites. Magma flows and granite outcrops dot the flanks of the Sierra Nevada Mountains and cover significant portions of the valley in several southern and northern locations. Tectonic activity continues to shift, fault, and uplift the Sierra Nevada and Inyo-White mountains. Such cataclysmic events appear to have dramatically affected the faunal, floral, and human environments (Hall 1983).

Figure 2-1. NHR, facing south.

The Owens River is the principal watercourse that drains into, and through, Owens Valley. Before 1900, the Owens River meandered unimpeded through the valley, but this changed significantly with the onset of water diversion activities associated with construction of the LAA1. Today, the Owens River enters the valley from the north at Owens Gorge, flows east along the Volcanic Tablelands, and then moves south through a deeply incised channel down the center of the valley, terminating at Owens Lake, south of Lone Pine. The river's 183-mile-long course encompasses a watershed of 2,600 square miles (6,700 square kilometers [km^2]), drawing from numerous

tributary streams that enter from various points along the eastern Sierra Nevada. During Pleistocene times, overflow from the Owens Lake ran south through what is now Haiwee Reservoirs (previously Haiwee Meadows), Rose Valley, and into Indian Wells Valley, where it entered China Lake (Delacorte and McGuire 1993:6). Owens Lake once encompassed 260 km^2, measured up to 9 m (30 ft.) deep, and served as a stopover for millions of migratory waterfowl. Seasonal streams, such as Summit Creek and other unnamed courses, define the hydrology of the Project area. These streams, which largely remain dry year-round, provide drainage for the terrace areas and side slopes north and east of the existing Dam.

The Project area is within a Desert Scrub habitat (Figure 2-1), a zone characterized by a mix of shadscale (*Atriplex confertifolia*), saltbush (*Atriplex* sp.), big sagebrush (*Artemisia tridentata*), bud sage (*A. spinescens*), greasewood (*Sarcobatus vermiculatus*), Nevada ephedra (*Ephedra nevadensis*), rabbitbrush (*Chrysothamnus* sp.), spiny hopsage (*Grayia spinosa*), and blackbrush (*Coleogyne ramosissima*).

Resident fauna of Owens Valley include species from several different biogeographic regions, including the Mojave Desert, Great Basin, and the neighboring Sierra Nevada and Inyo-White mountains. Fauna of economic importance to Native American groups included freshwater mollusks, fish, migrant waterfowl, pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), mountain sheep (*Ovis canadensis*), and black-tailed jackrabbit (*Lepus californicus*), which continue to occupy the valley. Other resident animals include bear (*Ursus americanus*), bobcat (*Lynx rufus*), mountain lion (*Felis concolor*), Audubon's cottontail (*Sylvilagus audubonii*), porcupine (*Erethizon dorsatum*), badger (*Taxidea taxus*), grey fox (*Urocyon cinereoargenteus*), striped skunk *(Mephitis mephitis*), ground squirrel (*Spermophilus* spp.), wood rat (*Neotoma lepida*), and many other rodents and birds (Steward 1933, 1938). Also present is a variety of reptiles, including the western rattlesnake (*Crotalus viridis*).

The high mountain peaks of the Sierra Nevada Mountains block westerly precipitation, creating a rain shadow effect in Owens Valley. Climate is characterized by cool, wet winters and warm, dry summers, with most annual precipitation occurring between the months of November and March. A fair number of days during the winter months fall below freezing, while dry summer days frequently exceed 100°F. Driest conditions occur during the months of July and August, although thunderstorms may occur at this time. Although the valley receives less than 6 inches (in.) of annual precipitation, runoff from the Sierra Nevada Mountains snow pack into the Owens River results in riparian and wetland environments, but xeric conditions exist across broad areas.

PREHISTORIC SETTING

The prehistory of Owens Valley and east-central California has been the subject of archaeological, ethnographical, and anthropological inquiry since the early 1930s, and studies have provided evidence of some 10,000 years of human use. The first research focused on documenting regional ethnography (Steward 1933, 1934, 1936), spearheaded by the seminal work of Julian H. Steward (1938), who sought to determine the effects of ecology and social features on cultural processes and Basin-Plateau aboriginal sociopolitical groups.

Archaeological investigations in the Owens Valley were initiated in the 1940s and 1950s (Campbell 1949; Campbell and Campbell 1940; Harrington 1957; Meighan 1955; F. Riddell 1958; H. Riddell 1951; Riddell and Riddell 1956). Following the epistemological approach of that time, these studies focused on reconstructing the antiquity and chronology of human occupation through identification of hallmark artifacts and features. Two of the first sites investigated in the valley were prehistoric villages near the Project area, including CA-INY-30 and CA-INY-2, the Cottonwood Creek site (H. Riddell 1951). Both sites contained numerous house pits, small Desert series projectile points, portable and non-portable milling equipment, Owens Valley Brown Ware ceramics, and historic glass trade beads.

During the 1950s and 1960s, excavations were carried out at the Stahl site (Harrington 1957) and at the Rose Spring site (Lanning 1963). The Stahl site was interpreted as a very early occupation, while the Rose Spring site (CA-INY-372) contained a deep, stratified deposit with as many as four cultural units. The Rose Spring site provided the temporal sequence to which both the Cottonwood Creek site and the Stahl site could be linked (Warren 1984:374). Lanning (1963) correlated this sequence with other local sites and formulated a cultural chronology for the

northwest Mojave Desert and Owens Valley that has served as the basic temporal framework for the larger Mojave Desert and much of the western Great Basin (Warren 1984:375).

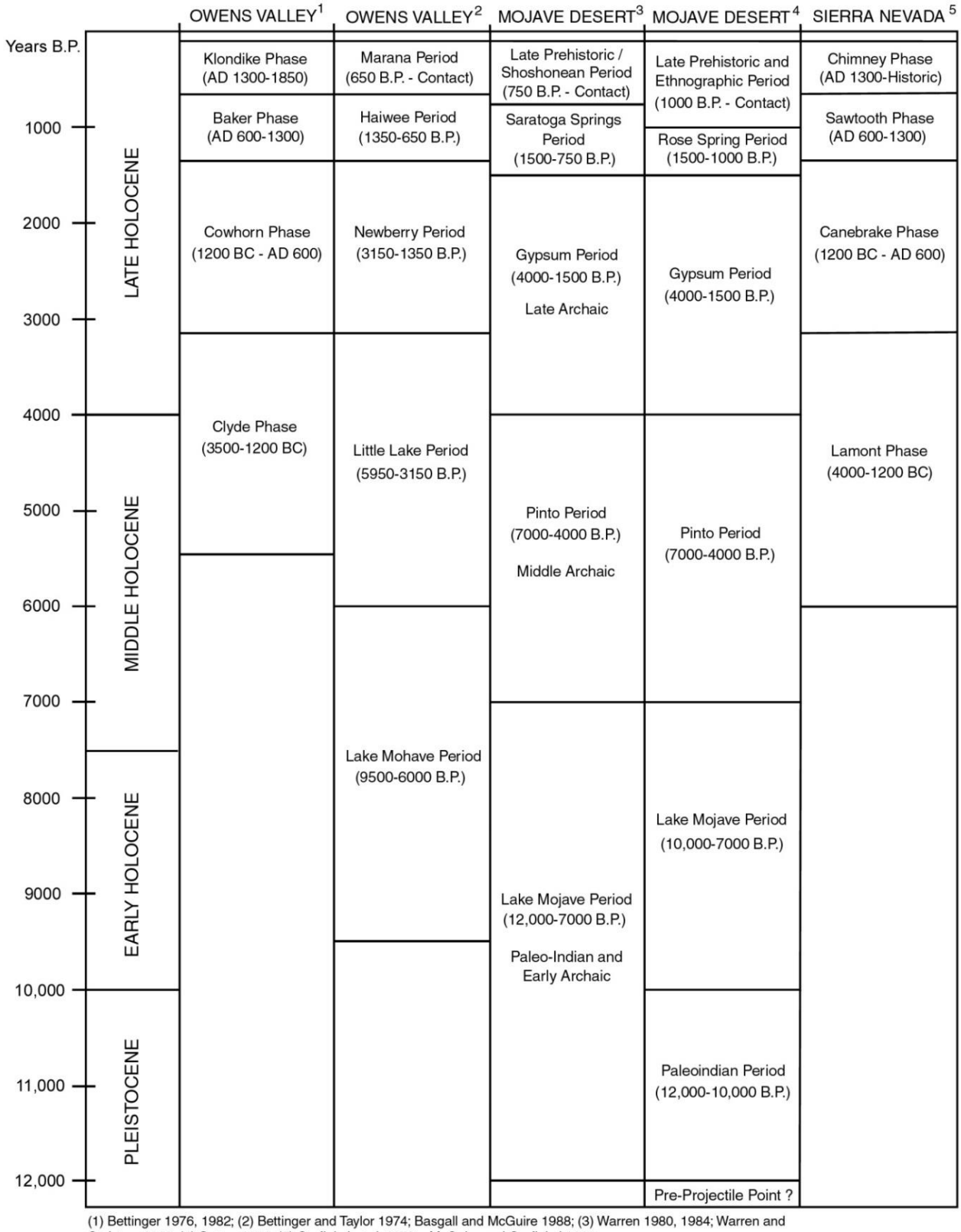
Within the past 40 years, Owens Valley prehistory has been extensively studied in response to various academic and cultural resources management projects. In contrast to earlier investigations, these works have concentrated on modeling diachronic prehistoric adaptations and cultural evolution, and have revealed a multi-faceted and dynamic prehistory of human settlement (Gilreath 1995:16).

In the early 1970s, Bettinger and Taylor (1974) suggested revisions to Owens Valley chronological sequence, identifying a five-phase classification that remains the primary temporal construct for the region (Table 2-1). These phases include the initial Lake Mohave period (predating 7500 before present [B.P.]), Pinto/Little Lake period (7500–3500 B.P.), Newberry period (3500–1350 B.P.), Haiwee period (1350–650 B.P.), and the Marana period (post-650 B.P.). Later, in the mid-to-late 1970s and early 1980s, Bettinger (1975, 1976, 1977a, 1979, 1982) conducted a systematic regional surface survey near Big Pine, California, with the intent of reconstructing diachronic prehistoric settlement and subsistence patterns (Bettinger 1976:84). Establishing a chronological sequence was not Bettinger's primary objective, however, Bettinger instead focused on testing models of cultural-ecological relationships and the application of ethnographic models to Great Basin prehistory. Using ethnographic accounts provided by Steward (1933, 1934, and 1938) and others, Bettinger reconstructed historic settlement-subsistence patterns and duplicated, where possible, settlement types recognized from ethnographic accounts. On this basis, he identified five categories of settlements: (1) lowland occupation sites; (2) piñon camps; (3) riverine temporary camps; (4) desert scrub temporary camps; and (5) upland temporary camps. Sites were dated through time-sensitive projectile points using Bettinger and Taylor's (1974) five-phase cultural sequence. For each prehistoric phase, simple models of settlement and subsistence were constructed and compared with each other and with the historic Owens Valley Paiute system described by Steward (Bettinger 1977a:5, 13–14).

Using this approach, Bettinger identified diachronic elements of change and continuity. In particular, he noted that lowland occupation sites served as base camps and were the primary focus of activities in the spring, summer, early fall, and most winters throughout the period of prehistoric occupation. Subsistence patterns in every phase revolved around the exploitation of lowland root and seed resources, while animal foods contributed little to the annual diet. In contrast to these stable patterns, Bettinger's study indicated that three important changes had occurred in the prehistoric settlement-subsistence patterns. These changes include: (1) a shift in the emphasis of plant exploitation from riverine to desert scrub species between 1500 before Christ (B.C.) and anno Domini (A.D.) 600, evidenced by a change in the location of lowland occupation sites from predominately riverine settings to desert scrub localities; (2) the inception of regular piñon exploitation for food between A.D. 600 and 1000, shown by the appearance of piñon camps at this time; and (3) a decrease in large game hunting after circa (ca.) A.D. 1000, reflected by the disuse of upland and desert scrub temporary camps employed as hunting stations after that date (Bettinger 1977a:14–15).

Bettinger (1977a) concluded that prehistoric adaptation in Owens Valley was highly variable, and that climatic shifts were related to at least two of the three adaptive shifts reconstructed from the archaeological data. These shifts included: (1) only after A.D. 600 were pine nuts an important staple; and (2) before A.D. 600, the subsistence system was specialized toward intensive use of lowland rather than upland resources. The temporal variations in local subsistence adaptations, the climatically induced changes in human ecology, and the development of specialized subsistence strategies were all viewed as important factors in the changing Owens Valley settlement-subsistence systems. In addition, population growth due to intrinsic increases, population movements, and the development of food production were noted as crucial variables in explaining adaptive shifts subsistence systems (Bettinger 1977a:15–16). While Bettinger's work has been noted as containing some weaknesses (Basgall and McGuire 1988:17), it has also stimulated a great deal of ongoing regional research.

Table 2-1. Chronological Sequences for the Owens Valley, Mojave Desert, and Southern Sierra Nevada.



(1) Bettinger 1976, 1982; (2) Bettinger and Taylor 1974; Basgall and McGuire 1988; (3) Warren 1980, 1984; Warren and Crabtree 1986; (4) Sutton 1996; (5) Garfinkel et al. 1979a; McGuire and Garfinkel 1980.

Archaeological investigations conducted within Owens Valley also include smaller-scale excavations and surveys in the northern area (e.g., Cowan and Wallof 1974; Garfinkel 1980; Hall 1982) and even further north in the Long Valley and Mono Basin regions (Bettinger 1977b; Davis 1964; Enfield and Enfield 1964; Garfinkel and Cook 1979; Hall 1983). During the 1980s, work in the neighboring Coso Volcanic Field increased, providing important data regarding its sites as well as technological and obsidian profiles for tool stone sources (Cleland et al. 1988; Clewlow 1986a, 1986b; Clewlow et al. 1980; Elston and Zeier 1984; Gilreath 1987, 1988; Gilreath and Hildebrandt 1988, 1997; Kelly et al. 1987; and Whitley et al. 1987, among others).

In the late 1980s, multiple phases of excavations began at CA-INY-30, on Lubkin Creek, near Lone Pine (Basgall et al. 1986; Basgall and McGuire 1988). This site contained an extensive deposit of prehistoric cultural materials, including artifact concentrations, features, and several midden deposits. Bedrock milling features; buried house features; flaked stone, ground stone, ceramic, and bone tools; and ornaments provide evidence for a long occupational period spanning the last 7,000 to 9,000 years. At least four occupational components were identified (Basgall and McGuire 1988), consistent with the chronological sequence defined by Bettinger and Taylor (1974) for the larger Owens Valley region. Other investigations conducted during this time include work at the Partridge Ridge site (Bettinger et al. 1984) and the Sawmill Road site (Bouscaren 1985).

During the early 1990s, and into the twenty-first century, regional research intensified, prompted by various contract cultural resources management projects, many related to upgrades and improvements to State Highway 395. Within the last 25 years, archaeological investigations have focused on numerous prehistoric sites in Owens Valley, including several near Alabama Gates (Delacorte 1999; Delacorte et al. 1995), the Aberdeen/Blackrock area (Zeanah and Leigh 2002), Ash Creek (Gilreath 1995), between Big Pine and Little Lake (Delacorte and McGuire 1993), Big Pine (King et al. 2001), near Bishop (Basgall and Delacorte 2012; Basgall et al. 2003; Eerkens and King 2002; Leigh et al. 2001), Division Creek (Nilsson et al. 2008); Haiwee Reservoirs (Nilsson et al. 2007; Nilsson and Bevill 2015, 2016b); Independence (Basgall and Delacorte 2003, 2011), Olancha (Byrd and Hale 2003), Owens Lake (Byrd and Hale 2003; Garcia and Associates 2012; Jones & Stokes 2002b), and between Owens Valley, California and Walker Basin, Nevada (Hall 1990), among others. Slightly further afield, investigations have also been conducted in the Volcanic Tablelands of Inyo and Mono counties (Basgall and Giambiastiani 1992), other areas of Mono County (Goldberg et al. 1990; Jurich et al. 2000), and within the Coso region (Gilreath and Hildebrandt 1990, 1993, 1995, 1997). Additionally, Yohe (1992) re-examined the Rose Spring site, located near the southern end of Little Lake, which was originally investigated in the 1950s, while Jones & Stokes Associates, Inc. re-examined areas of CA-INY-30 (Jones & Stokes 2002a).

Archaeological sequences for the Great Basin and Mojave Desert regions are grouped into Late Pleistocene and Early, Middle, and Late Holocene periods, with definitions varying by region. These chronological divisions correlate with climatic and environmental changes and are continually being refined as new data are collected and dating techniques are improved.

Late Pleistocene

Paleoindian Period (Pre-8000 B.P.)

Little is known about the human occupation of this region during the Late Pleistocene. Fluted projectile points characteristic of the Paleoindian period have been documented in scattered locations throughout the western Mojave Desert and southwestern Great Basin, but with few exceptions these points have been found as isolates in non-dated surface contexts, and therefore have been associated with the Paleoindian period solely on the basis of their morphological similarity to securely dated Clovis projectile points from the Great Plains and Southwest regions (Dillon 2002:115; Sutton 1996). Excavations at China Lake during the 1970s uncovered fluted points associated with burned, extinct megafauna material (Davis 1975), providing convincing evidence for human occupation in the region during the terminal Pleistocene. Examples of fluted Paleoindian projectile points have also been recovered from BLM managed land on the northwestern edge of Owens Lake and in the Rose Valley area, south of Owens Lake (Dillon 2002: Table 1; Greg Haverstock, BLM, personal communication 2014; Yohe 1992).

Other tools associated with the Paleoindian period are large side scrapers, blades struck from prepared cores, and a mixture of expedient flaked tools (Justice 2002:73).

Extinct lakeshore and wetland environments are of particular interest to archaeologists studying the late Pleistocene and early Holocene. Bryan and Tuohy (1999) assert, "an economic adaptation to the presence of an existing shallow freshwater lake and the bioresources available in and around it clearly was the most important factor in the organization of the annual round followed by early prehistoric occupants of the Great Basin." During the wet, cool Pleistocene, basin-and-range topography caused most Great Basin lakes to follow a sequence of fluctuations punctuated by overflows, rather than to exist as a steady-state system of continuously incoming and outgoing streams. Lakes along the eastern edge of the Sierra Nevada Mountains were arranged as a chain, and during times of high precipitation and glacial melt, each lake would fill up to its overflow point and spill downriver to the next lake in the chain. Lake Russell (which encompassed the present-day Mono Lake) was the farthest north in the chain; water would flow south in turn through Adobe and Owens lakes, through Rose Valley to China and Searles lakes, and then up north into Panamint Lake (Grayson 1993). Highstand dates for these lakes are not identical, which emphasizes the regional nature of the early Pleistocene climatic swings. Sediment investigations have shown that Owens Lake last overflowed sometime before 15,300 B.P., or before the earliest evidence of humans in the area (Bacon et al. 2006).

Early Holocene

Lake Mohave Period (9500-6000 B.P.)

The Native American communities that lived in the western Mojave Desert and southwestern Great Basin were profoundly affected by environmental changes during the gradual Pleistocene-Holocene transition. Temperatures became warmer but remained cooler and moister than today, and the region became marked by shallow lakes and marshes that were biologically very productive, surrounded by desert vegetation typical of later time periods, especially white bursage and later creosote bush (Grayson 1993:199). Some low-elevation locales retained juniper and sagebrush habitats. By the early Holocene, warmer temperatures, reduced precipitation, and the eventual dehydration of the pluvial lakes likely led to irregularities in the distribution and abundance of resources (Sutton et al. 2007:237).

Evidence of early Holocene human occupation of Owens Valley is scant, with most representative sites concentrated near the Owens River delta, along the northern edge of the basin (Basgall and Biorn 2011; Basgall and Delacorte 2012:2-8). Representative assemblages have been identified at the Komodo site in Long Valley (Basgall 1987), the Stahl site (Harrington 1957; Meighan 1981; Schroth 1992; see Basgall and Delacorte 2012:10-5 for an alternative interpretation); a basal component at CA-INY-30 (Basgall and McGuire 1988); and CA-INY-6249/H (Basgall and Delacorte 2012). Further afield, early Holocene materials have also been noted in the Lake China Basin (Basgall 2007), Volcanic Tablelands (Basgall and Giambiastiani 1995), the Owens River area (Larson 2009), and in some upland areas (Basgall 1989; Hall 1990; Jurich et al. 2000) (Basgall and Delacorte 2012:2-8).

Early Holocene populations are viewed as representing small, highly mobile groups that focused on a varied range of subsistence resources (Basgall and Delacorte 2012; Gilreath 1995:16). Hallmark artifacts consist of Great Basin Stemmed and Concave-base projectile points and some highly formalized flake tools such as scrapers, gravers, bifaces, and occasionally crescents. Unifacial, plano-convex cores, flake cores, and battered stone tools, as well as unshaped handstones and thin-or thick-slab millingstones have been found in association with early land-use in the China Lake Basin (Basgall 2007:170). Flaked stone technologies indicate high raw material diversity, corresponding with procurement as part of a transhumant and variable settlement pattern defined by brief occupations. Subsistence data reflect minimal reliance on seed resources and procurement of large and small terrestrial game. Diverse, locally available raw material profiles infer wide-ranging, annually variable settlement systems (Basgall and Delacorte 2011:14).

Middle Holocene

Little Lake Period (5950-3150 B.P.)

The Middle Holocene climate although arid compared to the periods before and after, was still highly variable, with multiple oscillations between wetter and drier conditions occurring throughout. Although the lakes and marshes of the early Holocene receded during the early part of the period, streams and springs in the region may have still maintained water flow from nearby ranges, providing suitable water sources to sustain human activity, albeit at low densities (Basgall 2000; Jenkins and Warren 1984; Sutton 1996). Vegetation communities capable of supporting large game animals became limited to a few isolated areas. Settlement patterns adapted, shifting to upland settings where sources of water still existed (Sutton 1996). The latter part of the Little Lake period was punctuated by a cool and moist interval around 3800 B.P., when several hydrographically closed lakes (including Mono, Pyramid, Searles, Diamond Pond, Silver, and likely Owens lakes) reached their Holocene high stands (Stine 2003).

The archaeological record for middle Holocene occupation of east-central California and Owens Valley is more widespread, although not entirely robust. Sites occur within a wide range of physiographic settings, including in lake basins, riparian corridors, and upland contexts. A reduction in the archaeological visibility of the middle Holocene has been noted (Basgall 2009), although the area was not abandoned and population levels may have remained constant (Basgall and Delacorte 2012:2-8). Instead, it appears that settlement activities were reoriented and occupational duration decreased. Sites with archaeological evidence representative of middle Holocene occupation minimally include the Stahl site (Harrington 1957; Meighan 1981); the Little Lake, Fish Slough, and Deep Springs playa areas (Basgall and Giambiastiani 1995; Delacorte 1990; Harrington 1957); CA-INY-30 (Basgall and McGuire 1988); a group of sites near the Alabama Gates (Delacorte et al. 1995); several sites near Bishop (Basgall and Delacorte 2012); and the Waterson Trough site (Cowan and Wallof 1974).

Maintaining a pattern established during the early Holocene period, middle Holocene populations also practiced a high mobile settlement pattern focused on exploiting a wide selection of plants and animals (Basgall and Hall 1993, 1994; Bouey and Mikkelsen 1989; Delacorte 1999). Some evidence exists, however, that while short-term encampments were the norm, residential sites may also have been established, as represented by domestic features discovered at the Birch Creek site. Tool stone diversity continued, formalized flake tools remained the primary artifacts, and more specialized forms appeared such as scraper-planes and choppers (Gilreath 1995:17). A notable increase occurred in the use and abundance of milling equipment, particularly prepared basins, and the use of thin slab pieces of non-local stone is noted, with both features suggesting intensification of plant exploitation. Very small artifact assemblages and only occasional time-markers typify many middle Holocene sites (Basgall and Delacorte 2012:2-8). Faunal remains continued to focus on large and small terrestrial game, with the addition of fish (Delacorte et al. 1995; Gilreath 1995:17).

As originally conceived by Bettinger and Taylor (1974), the transition from the early Holocene (Lake Mojave period) to middle Holocene (Little Lake period) was marked by Little Lake and Pinto series projectile points. Recent research conducted by Basgall and Delacorte (2011) has suggested that two distinct types of bifurcate, indented base dart points were employed in Owens Valley during the middle Holocene: a robust form of Pinto affinity (ca. 8000 B.P) and gracile forms akin to Gatecliff Split-stem points (ca. 5500 B.P.). Other similarly ancient point styles include varied side- and corner-notched forms such as Fish Slough Side-notched (Basgall et al. 1995) and “thick Elko” forms identified by Gilreath and Hildebrandt (1997). The early and middle Holocene periods remain a focus of ongoing archaeological research, and it has been noted that the culture history of these periods (pre-3150 B.P.) would benefit from significant revisions (Basgall and Delacorte 2011, 2012).

The procurement of obsidian from lag quarry deposits in the Coso Volcanic Field, located 8.5 miles (13.5 kilometers [km]) southeast of the Project area, began during the Lake Mohave period and extended through the Little Lake period. Quarry areas show evidence of core and early-stage biface production resulting in a wide variety of tool types, indicating “a rather generalized, opportunistic approach to the acquisition of obsidian” (Gilreath and Hildebrandt 1997:177).

Late Holocene

The climate of the prehistoric late Holocene approximates that of today, with cooler and moister conditions than the middle Holocene but drier than the early Holocene. Plant communities took on their modern distribution, but as in the middle Holocene, the climate was highly variable, and many lake levels fluctuated, at times dramatically, throughout the period. At least two major droughts likely occurred within the Sierras, at ca. 1050 to 840 B.P. and 740 to 600 B.P., resulting in low lake levels throughout the western Great Basin (Stine 1994, 2003). These droughts were followed by a cooler and wetter period from 600 to 200 B.P., which raised Owens Lake to its second highest stand of the late Holocene (Cleland and Spaulding 1992; Stine 2003). Increases in population, trade, and social complexity accompanied the more favorable climate, and evidence of restricted seasonal movement and larger settlements appears early in this period (Bettinger 1999; Sutton et al. 2007).

Newberry Period (3150–1350 B.P.)

The Newberry period reveals that significant cultural change had occurred across east-central California, focused on shifting settlement-subsistence systems and resource intensification. Few data exist marking the first 1,500 years of this period, with those present inferring that the middle Holocene adaptive pattern of small, highly mobile groups remained unchanged (Gilreath 1995). Newberry period settlements near Bishop (Bettinger et al. 1984) and near Lone Pine, (Basgall and McGuire 1988) reveal lowland settlements defined by midden accumulations, diversified artifact and ecofact assemblages, and house structures used as seasonal base camps by multiple households (Basgall and Delacorte 2012:2-9). Temporary camps exist in both lowland and upland contexts, typified by a narrow range of hunting or plant procurement activities. Wide-ranging mobility patterns are witnessed by high obsidian material variability and abundant use of exotic toolstone. Settlement shifts appear organized along a north-south axis that traversed the length of Great Basin valleys, including Owens Valley (Basgall and Delacorte 2012:2-9; see Basgall 1989; Basgall and McGuire 1988; Delacorte 1990, 1999; Delacorte et al. 1995), with logistical forays made to nearby mountain areas.

The early Newberry period (ca. 3150–2000 B.P.) archaeological record derives primarily from sites situated with reference to water, including lakeside areas near Olancha (Byrd and Hale 2003) and streamside deposits along McGee Creek (Basgall et al. 2003). Associated cultural assemblages stem from smaller deposits, houses are rare or absent, and occupational intensity remains similar to that inferred for the middle Holocene (Basgall and Delacorte 2012:2-9). The early Newberry period witnessed the onset of significant obsidian biface manufacture associated with the region's extensive sources, such as Casa Diablo, Coso, and Bodie Hills, possibly reflecting the beginning of a formal trans-Sierran exchange practice (Gilreath 1995:17).

The late Newberry period (ca. 2000–1350 B.P.) marks the emergence of a logistically and well-organized adaptive pattern that included regularized use of long-term residential bases; smaller, serially reoccupied transient camps; communal hunting/butchering localities; quarry and stone working camps; and hunting and gathering stations (Basgall and Delacorte 2011, 2012; Basgall and McGuire 1988; Bettinger 1989, 1991; Delacorte 1990, 1991, 1999; Delacorte and McGuire 1993; Delacorte et al. 1995; Gilreath 1995; Yohe 1992; Zeanah and Leigh 2002). Evidence is present for the construction of elaborate hunting facilities, well-built houses, and caches of non-portable or specialized gear. Lithic resources focused on obsidian, to the near-absence of earlier (early and middle Holocene) materials, such as microcrystalline, basalt, and rhyolite. Technological patterns suggest the use of curated bifaces procured from both local and distant sources, coincident with larger foraging patterns (Gilreath 1995). Hallmark artifacts include Elko, Humboldt, and Gypsum series dart points (Basgall and Delacorte 2012; Bettinger and Taylor 1974; Gilreath 1995).

Settlement and subsistence data reveal that specialized task groups made short- and long-term logistical forays to procure food resources. Animal remains provide evidence of a broadening subsistence base, with an emphasis on small and large mammal and waterfowl. Plant resources remain an important resource, as evidenced by large quantities of well-fashioned milling equipment and paleobotanical remains, including pine nuts and other seeds. A second, competing model of late Newberry period settlement has been recently proposed (Hildebrandt and McGuire 2002; McGuire and Hildebrandt 2005), suggesting that groups practiced minimal residential mobility,

instead residing in permanent villages for much of the year. Long-distance, resource gathering forays were the norm and were practiced by multiple family groups who occupied the villages. Toolstone diversity reflected conveyance relationships that linked distant groups of similar structure and organization, rather than on direct procurement. Results of recent investigations (Basgall and Delacorte 2011, 2012), however, call this model into question on several counts. Primary among these are domestic structures indicating associations with multiple occupations, arguing against the use of permanent villages; variability in artifact content and condition between domestic structures, signaling non-contemporaneous occupation; diversity in faunal and floral remains suggestive of residential mobility; paleobotanical remains that suggest many separate occupations, not single or few long-term occupations; and obsidian toolstone profiles (Basgall and Delacorte 2012:10-7).

The north-to-south orientation of the Newberry period settlement and subsistence pattern is underscored by tool stone sourcing data. Basgall and Delacorte (2011) demonstrated that Newberry site components, located north of Lone Pine, contained almost equal proportions of Long Valley and Coso obsidian, and suggest that these quarries mark the general northern and southern extent of the annual round. Obsidian exploitation of the Coso Volcanic field remained confined to lag quarries for the first half of the Newberry period, but after approximately 2300 B.P., the economic importance of obsidian exchange networks expanded dramatically. Obsidian production shifted focus to the mining of primary, high-quality seams in a limited number of quarries. Large bifacial cores and early-stage bifaces were produced at the quarries and reduced to biface blanks and tool preforms at off-quarry biface production sites. These bifaces were traded heavily with neighboring groups, and were ultimately used by groups throughout southern California, particularly in Los Angeles and Ventura counties, the Kern Plateau, and the southern Sierra Nevada Mountains (Gilreath and Hildebrandt 1997).

Haiwee Period (1350–650 B.P.)

The adaptive changes of increasing settlement centralization, subsistence intensification, and sociopolitical complexity adopted during the Newberry period continued into the ensuing Haiwee period. Hallmark artifacts associated with the Haiwee period include small, corner-notched Rose Spring and Eastgate series projectile points, while biface types prevalent during the Newberry period decrease significantly, being replaced by abundant, simple flake tools (Gilreath 1995:18). Obsidian remains the principal tool stone, being derived from the nearest source. Ground stone tools reveal a similar trend toward more casual, unshaped artifacts. Collectively, these artifact data suggest a shift to more expediently manufactured tool kits that were less functionally diverse and dependable, implying that Haiwee period groups were less mobile and foraged more intensively around one or a few locales, lessening the need for tool transport (Gilreath 1995:18). A decline in, and subsequent abandonment of, logistical hunting camps infers that most hunting and other resource procurement was conducted from few, relatively fixed settlements (Gilreath 1995:18).

Evidence for resource intensification during the period is prevalent, complementing the pattern of increased settlement centralization. Also noted have been high-cost extractive and storage strategies for pine nuts, ricegrass, and other seeds; selective hunting of certain small mammals and birds; and intensive use of previously marginal habitats such as the Owens Lake shoreline. New settlement types were established based on expanded procurement practices, including piñon camps, alpine villages, and lowland occupation sites in areas minimally used before. Winter settlements were situated in frequently specialized settings to exploit single or multiple local resources, an adaptation that ultimately proved short-lived (Basgall and Delacorte 2012:10-9). The presence of marine shell ornaments, coupled with the localized trading of finely crafted chert bifaces manufactured and distributed between groups in northern Owens, Deep Springs, and other valleys, suggests increasingly complex intra- and inter-regional interaction (Bettinger 1989; Delacorte 1991, 1999; Gilreath 1995:18). A substantial Haiwee period structure discovered at CA-INY-3812 (Delacorte and McGuire 1993) implies complex sociopolitical organization during this period.

In contrast to earlier times, during the Haiwee period a limited number of groups appear to have enjoyed relatively exclusive access to obsidian quarries and exchange networks. The overall number of quarries mined at the Coso Volcanic Field shrank greatly during this period, yet Coso obsidian was still commonly used in the outlying areas, suggesting control of the quarries by a few local groups (Gilreath and Hildebrandt 1997).

Marana Period (650 B.P.–Historic Times)

The final prehistoric period defined for the Owens Valley is the Marana period, which witnessed few changes over the previous Haiwee period. Notable differences are marked by further intensification of certain subsistence activities, namely the exploitation of mussel, and evidence for additional population growth (Basgall and Delacorte 2012; Gilreath 1995:18). Seasonal forays for animal hunting and vegetal procurement (e.g., pine nut, seed crops, and roots) occurred from specialized sites in specific habitat environments. Settlement systems included both seasonally-occupied temporary camps and semi-permanent winter encampments, the latter sited with reference to fuel, water, multiple habitat types for foraging, and access to cached resources such as seeds, pine nuts, and other crops (Basgall and Delacorte 2012:10-9). Evidence for east-west travel has been noted, focused on trans-valley movement of both people and materials, possibly in response to periodic failures or local resource shortfalls (Basgall and Delacorte 2011, 2012:10-10).

Desert Side-notched and Cottonwood projectile points and Owens Valley Brown Ware pottery (Eerkens 2001, 2003) are the hallmark artifacts of Marana period sites, which generally co-occur with Haiwee period components, revealing little, if any, change in assemblage composition (Gilreath 1995:18). Adaptive trends characterizing the late prehistoric record note the establishment of larger, more sedentary populations and the hypothesized expansion of Numic speakers across the Great Basin about 1000 B.P. (Bettinger and Baumhoff 1982). Between 1000 and 600 B.P., obsidian exports from the Coso Volcanic Field appear to have essentially ended (Gilreath and Hildebrandt 1997). These changes may be partly related to a series of droughts that began about 1,000 years ago and affected much of the area east of the Sierra Nevada range (Stine 1994).

ETHNOGRAPHIC SETTING

The Project area lies in an interface zone, within the southwest portion of the vast homeland territory ascribed to the Western (Koso) Shoshone, near the southern boundary of the Northern (Owens Valley) Paiute (Figure 2-2). Ethnographic information (Steward 1938:81) places the boundary of these two groups at the community of Olancha, located four miles northwest of the Project area, where a shared village existed, and where Paiute and Shoshone intermarried. Because of this shared proximity to the study area, the ethnographic setting discussed below includes both groups.

Western Shoshone

Western Shoshone territory extended from Death Valley, California, northeast across Nevada, and into northwest Utah and southern Idaho (Thomas et al. 1986). Steward (1937, 1938) identified as many as 48 Western Shoshone subgroups within this area, and linguistic information indicates that several varieties of Central Numic languages were spoken. Sources of ethnographic data regarding the Western Shoshone include the works of Steward (1936, 1937, 1938, 1939a, 1939b, 1940, 1941, 1943, 1955, 1970) and Eggan (1980), as well as a summary by Thomas and colleagues (1986).

Western Shoshone settlements near the Project area were encompassed within the Little Lake and Koso (Coso) Mountains district (*Kuhwiji)*, a large subsistence area encompassing some 1,000 square miles surrounding the Coso Mountains (Steward 1938:81). Steward (1938:81) identified four main villages in the district, with two near the Project area. The closest village, *Pakwa sí,* was at present-day Olancha. This village was shared with the Owens Valley Paiute, and Steward (1938:81) noted that the Paiute and Shoshone intermarried there. The second nearby village, *Pagunda*, was a Western Shoshone settlement at Little Lake, which was reported as having a population of 50 to 60 persons in 1870 (Steward 1938:81). The remaining two villages included *Müá ta*, at Coso Hot Springs, and *Üyuwum'ba,* at Cold Spring, south of Darwin. Other Western Shoshone locales near the Project area included *Hugwata* at Haiwee Springs, now under Haiwee Reservoirs, and *Tunahada* at Rose Spring (Steward 1938:81).

Due to their mobile lifeways, Western Shoshone habitation structures tended to be simple. The typical winter house was a conical hut of poles and bark, sometimes held in place by rocks. Lighter brush structures were used as

dwellings and/or shades in warmer months, and some groups employed circular or domed wickiups. Conical sweathouses were common to all Western Shoshone, and most groups employed menstrual huts.

Western Shoshone social organization was apparently fluid, primarily due to the high residential mobility, small group size, and disproportionate resource distribution throughout their territory. Small territories were loosely defined around winter villages. Valleys were occupied by several family groups that hunted and gathered within and between various ecological zones, as seasonal resources became available. Several families would winter together at a central village, the composition of which could vary from year to year. An informal headman was recognized at the winter village, but such individuals had little authority. The Western Shoshone apparently enjoyed relatively congenial relations with neighboring groups.

Western Shoshone subsistence practices were based on exploitation of varied floral and faunal resources procured during frequent moves within a territory. Small family groups relied primarily on the gathering of plant foods, including seeds, piñon nuts, greens, roots, and berries. Resource emphasis varied, however, depending upon the seasonality and local availability of specific plants. In winter, the Little Lake and Coso Mountain families dwelt in pit houses, eating stored seeds and hunting rabbits. In April, some moved to Haiwee Springs, where they spent one or two months finishing stored goods and gathering greens. By June, families moved to Cold Spring, where some wintered and hunted rabbits, while others joined for a communal antelope hunt (Steward 1938:81). Piñon nut harvests occurred in the fall, and stored nut reserves provided the bulk of the diet during winter months. Families camped in the Coso Mountains for pine nut collecting or, if yields were low, traveled to the Panamint Mountains (Steward 1938:82). In the westernmost zones, mesquite pods constituted an important dietary staple, while sage (*Salvia*, not to be confused with sagebrush) seeds, cactus, crucifers, agave, and gourds provided significant subsistence resources for groups in the south (Thomas et al. 1986). The gathering of plant foods was supplemented by hunting of large and small game. Prey included bighorn sheep, deer, antelope jackrabbit, cottontail, pocket gophers, ground squirrels, reptiles, and birds. Steward (1938:83) noted that the relative scarcity of animals made meat a minor food, except during periods of seed shortage. Bighorn sheep were hunted by individuals in the Coso Mountains or Sierra Nevada through ambush or chance encounters (Steward 1938), while deer were procured from the Sierra Nevada through intercept hunting or stalking (Thomas et al. 1986:268).

Antelope were most numerous in Indian Wells Valley, near Brown, about 10 miles south of Little Lake, but some also roamed just south of Owens Lake (Steward 1938:81–82). Eight to 10 men drove antelope into a corral built of posts and covered with brush. Once inside, archers stationed between the posts dispatched the animals. Jackrabbit drives occurred in Rose Valley and at Little Lake and Olancha, among other areas. Rabbits were driven into large nets and were dispatched using clubs. Cottontail rabbits were procured with snares and deadfalls (Thomas et al. 1986:268). Burrowing rodents were caught using rodent skewers, or flooded and smoked out (Thomas et al. 1986:268). Other animals that were eaten included bear, badger, chuckwalla, gophers, eagles, hawks, crows, snakes, mountain lions, and wildcats, but not coyotes, wolves, frogs, magpies, or grasshoppers (Steward 1938:83). Families traveled to Owens Lake to hunt ducks and procure larvae (Steward 1938:82). Communal waterfowl hunts were conducted at Little Lake, where caterpillars were also collected. Fish were taken in Rose Valley and, with poison, in Little Lake.

Material culture included the use of sinew-backed bows, animal-skin quivers, arrows of willow and reed, hunting nets, flaked stone tools, milling stones, and digging sticks. The gathering and processing of plant foods was facilitated by the use of coiled baskets, twined seed beaters and winnowing trays, and twined conical burden baskets. Ceramics were manufactured from local clays and were of low quality. The outer surface was occasionally decorated with indentations (Thomas et al. 1986:270).

Several trappers and explorers traversed Western Shoshone territory in the early 1800s, including Jedediah Smith, Peter Skene Ogden, and John C. Frémont. Later development of homesteads, settlements, and mining ultimately ended traditional Western Shoshone lifeways. The wave of emigrants rushing to California after the discovery of gold in 1848, and the subsequent discovery of the Comstock Lode in Nevada in 1859, resulted in conflicts between European Americans and the Western Shoshone, culminating in raids on travelers. Several treaties were signed in 1863 to end hostilities, develop commerce, pay reparations, and establish reservations. Implementation of such

measures was not forthcoming, however, and many Western Shoshone refused to submit to reservation life. After 1900, federal lands reserved for the Western Shoshone were more widely occupied by tribal members, marking a significant shift away from their traditional way of life.

Owens Valley Paiute

Owens Valley and its surrounding uplands were the homelands of the Owens Valley Paiute, a people who spoke dialects of the Mono language, a division of the Western Numic segment of the Numic Branch of the Uto-Aztecan language family (Liljeblad and Fowler 1986). Their territory extended from the Sierra Nevada on the west, to the Inyo Mountains on the east, north to the Benton Range and Long Valley, and south to the southern shore of Owens Lake. Population estimates vary between 1,000 and 2,000 (Liljeblad and Fowler 1986:414-415). They have been identified as the Eastern Mono by Kroeber (1925:584-586) and as the Owens Valley Paiute, the southernmost branch of the Northern Paiute, by Steward (1933:235; 1938:50).

The primary ethnographic accounts of the Owens Valley Paiute are those of Steward (1933, 1934, 1938), with additional data provided by Parcher (1930) and Chalfant (1933). Steward's earlier work (1933) was the result of fieldwork conducted in 1927, 1928, and 1931, and focused largely on the inhabitants of northern Owens Valley. His later study (Stewart 1938), conducted in 1935 and 1936, involved informants in both the northern and southern portions of the valley. The ethnography and ethnohistory of the Owens Valley Paiute was recently studied by McCarthy and Johnson (2002), who examined published and unpublished literature as well as conducted interviews with Elders of the local Paiute tribe to provide an updated context of the traditional lifeways.

The Owens Valley Paiute were separated into true composite landholding bands or districts, the territories of which were related primarily to the streams emanating from the Sierra Nevada (Steward 1933: Maps 1-2). A district consisted of a single large village, or group of smaller allied villages (Steward 1933). Each was a communal organization directed by hereditary headmen, and held rights to seed gathering, hunting, and fishing within their territories (Steward 1933:305). Lowland villages were occupied by 25 to 250 individual and were inhabited throughout much of the year. In the northern part of the valley, where streams are clustered, groups of neighboring villages comprised single bands, such as those at Bishop (*Pitanapatü)*, Hot Springs (*Ūtü'ütüwitü*), Big Pine (*Tovowohamatü*), and Fish Springs (*Panatü*) (Steward 1938:50). In the south, streams are more widely spaced and often had only a single independent village. These villages were situated near the lower edge of the alluvial fans that spread out from the mouth of each canyon, affording an abundance of water and a central location with reference to resource areas, and were usually two to four miles from the Owens River.

As with most Native California groups, the Owens Valley Paiute settlement system was intricately tied to their seasonal subsistence round. By early summer, the Paiute left the winter villages for neighboring hills where seeds of herbaceous and other plants had begun to ripen. Trips for plant resources, available at some distance, occasionally involved the use of temporary camps as collecting stations for family-sized groups. Such camps were established for communal fishing in the spring, communal animal drives in the fall, and hunting in the summer and early fall. The fall pine nut harvest required formal settlement, with entire families moving to upland camps in proximity to locales, which offered an abundant crop (Steward 1938:20). Crops were highly erratic, with no guarantees in quantity or location. If a good crop was found, nuts were processed and stored in the mountains and winter camps established nearby in proximity to timber for houses or fuel (Steward 1938:28). In years of poor quantities or failure, groups returned to their lowland villages. By late winter or early spring, stored food was typically exhausted and groups abandoned winter settlements to search for spring greens, which occurred along streams, near lakes, and in low hills where snow had disappeared, thereby renewing their annual subsistence cycle.

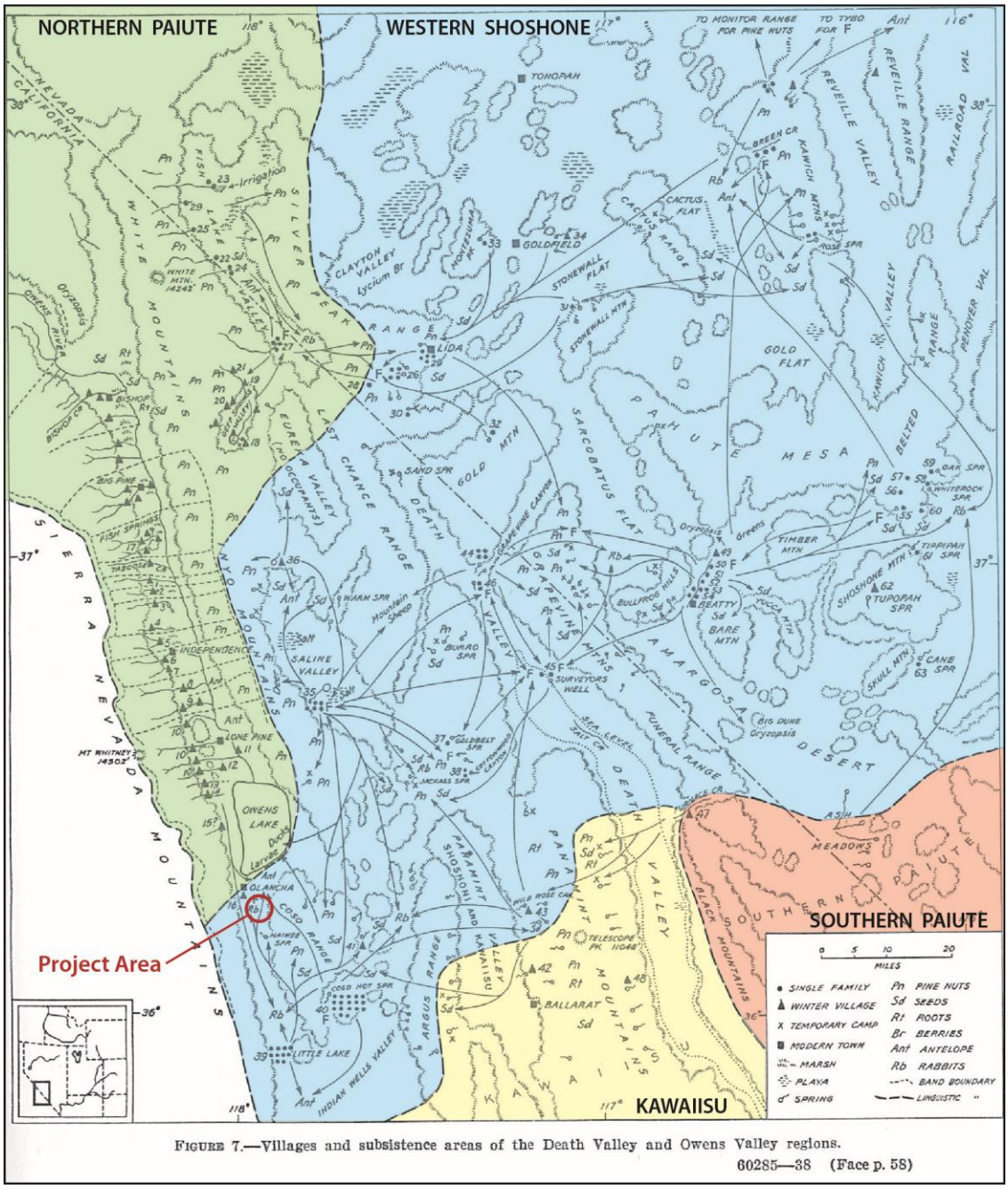


Figure 2-2. Ethnographic villages and subsistence areas of the Death Valley and Owens Valley regions.
(Map adapted from Steward 1938: Figure 7).

In contrast to the neighboring Paiute in the Mono Lake Basin and Shoshone groups to the east and south of Owens Lake, the Owens Valley Paiute can be characterized as more sedentary and logistically organized. Households remained isolated throughout much of the year, with the nuclear family comprising the essential societal unit (Steward 1938). Each band had a chief, whose duties were to direct irrigation, animal drives, fall festivals and mourning ceremonies, and seasonal movements into the mountains for pine nut harvesting (Steward 1938:55). Multiple family winter camps varied annually both in size and composition. Although members of a winter village tended to go to the same localities, they often separated and joined people from other villages when food was too

scarce or already gathered (Steward 1938:20). This pattern allowed for adaptive flexibility, particularly within an environment where subsistence resources could be widely dispersed and unpredictable from year to year.

Resource procurement was carried on primarily within a band's own territory, roughly a long, rectangular-shaped tract of land stretching across Owens Valley from the summit of the Sierra Nevada to the summit of the Inyo-White Mountains (see Figure 2-2). These areas embraced various life zones, providing a wide variety of food resources, usually within 20 miles of the villages (Steward 1938:50-52). The Paiute encouraged the growth of wild plants via a system of irrigation whereby streams were dammed and diverted to flood low-lying meadows during early summer, thereby increasing the productivity of the natural vegetation (Liljeblad and Fowler 1986:417). Steward (1933) originally considered this artificial irrigation as aboriginal in origin, but subsequently suggested that some possibility existed for its introduction by Americans or Spaniards (Steward 1938:53).

Procurement strategies involved concentrating populations at lowland occupation sites during the spring, summer, and early fall. During these seasons, major activities consisted of the gathering, processing, and storing of a variety of desert scrub seeds and roots and some riverine seeds and roots, all of which could be obtained in large quantities within a two hour walk of the occupation sites. Gilreath (1995; Table 4) provides a comprehensive list of plants of economic importance to the Owens Valley Paiute.

Seed resources formed a key element of the Paiute diet, and these were procured from band-owned areas. At least 41 varieties were collected representing a broad array of grasses, weedy annuals, and certain wood shrubs (Steward 1938:19). Seeds occurred in almost every biotic community but were most abundant in Desert Scrub and Riparian settings during spring and summer months (Gilreath 1995:12; Steward 1933).

Various bulbs and edible roots were also collected from June through May and included wild onion, sego lily, wild hyacinth, yellow nutgrass, and spikerush among others (Gilreath 1995: Table 4; Steward 1938:19). These plants provided important carbohydrate resources over the lean winter months. Upland and lowland fruits and berries were exploited during summer and early fall and were sometimes stored (Steward 1938:65). Several greens and young shoots were exploited to provide an important boost against early springtime starvation when food supplies were exhausted and few other resources available (Steward 1938:19)

During the fall months, small groups of one to three families occupied mountain piñon camps while harvesting pine nuts. Pine-nut areas were primarily in the Inyo Mountains and White Mountains (Steward 1938:52). These areas were subdivided into family plots and bounded by natural landmarks known to all band members. In years with unusually abundant harvests, habitation at these camps might last through winter. More often, however, these settlements were abandoned immediately after the piñon harvest was completed and the winter was spent at lowland occupation sites (Bettinger 1977a:6-7). Some pine nuts were carried back to the permanent village in the valley, while others were cached for use as needed.

Individual and communal hunting was practiced by each band, but game was of relatively minor importance to the diet. Band ownership of hunting territory was mostly employed among the northern groups, fading out gradually in the southern part of the valley. Given the general aridity of the area, large game was naturally scarce and limited grasslands precluded species that occur in great herds (Steward 1938:33). Deer were hunted by individuals or small groups of men using stalking or ambush tactics along migration routes or near reliable water sources; however, several men might also engage in driving animals past concealed huntsmen (Steward 1938). Mountain sheep, which roamed the rugged uplands, were taken with difficulty, pursued by hunters who often used dogs (Steward 1938:37).

Antelope, which typically formed in small-to-large herds, were captured through communal hunting (Steward 1938). Valley herds were driven along V-shaped, brush fence lines into wooden corrals where they were killed by archers. Drives were managed by a shaman who had received special supernatural power in a vision to charm antelope (Steward 1938:34). Antelope were also hunted by individual hunters through stalking or luring them into range with a flag (Steward 1941:218-219).

Small game supplemented the Owens Valley Paiute diet and focused principally on rabbit, including both black-tailed jackrabbits and cottontails. In addition to providing meat, the animal's skins were essential for weaving blankets or robes, the single most important winter garment (Steward 1938:38). Rabbits were sometimes taken with bow and arrow; snares were also set on game trails. As with antelope, communal jackrabbit drives were an important capture method, resulting in hundreds of animals being caught. Rabbit drives typically occurred after the fall pinyon harvest along the flat portion of the valley near the Owens River (Steward 1938:53). Large groups of men, women, and children gathered to drive the animals into long, U-shaped nets placed end to end to form a large, semicircular fence hundreds of yards in diameter (Steward 1938:38).

In addition to rabbit, marmots were valued for food and their fur for robes. Similarly, badgers were also hunted for food during lean times, and their skin was used for moccasins. The Owens Valley Paiute diet also incorporated small burrowing rodents, which occurred in colonies in valley flats, especially in fertile localities where they fed on roots (Steward 1938:40). Principal among these were pocket gophers, ground squirrels, chipmunks, and packrats. Capture methods included use of a digging stick, pulling with a rodent skewer, smoking or flooding burrows, or deadfall traps. Reptiles, primarily snakes and chuckwallas, were also consumed.

In the northern Owens Valley, fishing places were incorporated within hunting territories, but in the southern area, they were available to anyone. Fish were not a principal food resource, but they were procured along the Owens River and its tributaries by both men and women (Steward 1938:44). Resident Owens River fish included the sandbar sucker, lake chub, black minnow, and spotted pursy minnow (Steward 1938:40-41). Fishing was typically an individual effort, but in the spring, communal groups built weirs and captured large quantities of fish in open-twined baskets or with the aid of poison and spears (Steward 1933). Fish were also taken by diverting streams and stranding, stupefying, shooting, spearing, hooking, basketing, and netting (Steward 1933:251-252; 1938:41).

Extensive trade was carried out across the Sierra Nevada between Owens Valley Paiute and Western Mono peoples, and between the inhabitants of Mono Lake and the Miwok (Steward 1933:235-237, 257-258, 294-296; 1938:50-57). Principally, the Owens Valley Paiute traded rabbit-skin blankets, tobacco, baskets, buckskins, salt, pine nuts and other seeds, and obsidian for shells, acorns, baskets, and manzanita berries (Steward 1933, 1938). Acorns were of particular importance to the Owens Valley Paiute as a trade item and were considered a prized food of many California Indians. Acorns were prepared in bedrock mortars and leached in the same fashion as done by other California tribes. Glass beads later replaced shell beads as a prime exchange item (Steward 1933:257-258). This trade network has been proposed as an explanation for the complex settlement and social systems found in Owens Valley (Bettinger and King 1971).

The making of pottery was a notable technology employed by the Owens Valley Paiute. This technology was apparently adopted during the mid-seventeenth century and was employed for some 200 years, disappearing by the late 1920s (McCarthy and Johnson 2002:33). Like basket making, the production of pottery was carried out exclusively by women. Reddish clay with a natural sand temper was quarried, pulverized, and sifted. It was then moistened and pounded in bedrock mortars to make it viscid. The clay was then formed into vessels by coiling and allowed to dry in the sun. Afterwards, vessels were fired in an open pit for a day or more and sealed to make them nonabsorbent. A variety of pottery shapes was produced, typically modeled after basketry forms. Pots commonly had a pointed base with a flaring top to allow a fire to be built around them. Pottery was used for cooking and boiling foods, and ceramic items may also have served as storage vessels (Liljeblad and Fowler 1986:420-422).

The earliest contact between Owens Valley Paiute and European Americans dates to the early 1800s with the passing of fur trappers through the valley. In 1834 Joseph Walker led a company of trappers northward through the valley (Hoover et al. 1970). In 1826, Jedediah Smith led a band of fur trappers through the Great Basin and into southern California. After leaving Mission San Gabriel, Smith and his men passed through the Mojave Desert, Tehachapi Mountains, and San Joaquin Valley (Boyd 1972:10). Joseph Walker, for whom Walker Pass is named, traveled from the Mojave Desert to the San Joaquin Valley in 1833. On his return trip to the east in 1834, Walker led a company of trappers south through the San Joaquin Valley, then to Kern River and over a pass to the Mojave Desert and Owens Valley. This pass, west of Freeman Junction, became known as Walker Pass (Boyd 1972:11; Hoover et al. 1970). Walker later advanced a party of emigrants over this same route in 1841. John C. Frémont led

several exploratory parties through this same region during the 1840s, and he is credited with naming Owens Lake and Owens River after Richard Owens, a member of the 1845-1846 expedition (Gudde 1969:232).

After the discovery of gold on the American River in 1848, a group of prospectors led by Jefferson Hunt crossed the Great Basin heading for southern California. Some of the members of this party ended up in Death Valley—not all survived the passage. Those who did live became known as the Death Valley Forty-niners. Some went south to San Fernando Valley by way of Willow Springs, while others headed west to San Joaquin Valley by way of Indian Wells and Walker Pass (Bailey 1962:68; Boyd 1972:12-13). During the late 1850s, miners began searching the remote eastern Sierra Nevada region and made discoveries of gold at Bodie, Aurora, and Monoville. Many passed through Owens Valley, and during this time, merchants Hobart & Reed established a general merchandise store at Little Lake to serve the needs of the early travelers (Chalfant 1933:201). Frémont also reportedly crossed Bird Spring Pass in March of 1854, using this trail as an alternative to Walker Pass due to its heavy snowdrifts. On this trip, Frémont camped at Bird Spring before making his way to San Joaquin Valley (Bailey 1962:80).

Within Owens Valley, gold was discovered on the Coso ledges southeast of Mono Lake and in the White Mountains on the eastern flank of Owens River. Although mining during this time was minimal, prospecting brought settlers to the area and numerous homestead claims were filed within the Owens Valley by the early 1860s (Costello and Marvin 1992:6). The discovery of gold and silver in northern and western Nevada also led to an influx of prospectors into the west during the 1860s and later into the California deserts.

A number of prospectors likely scoured the hills surrounding Owens Valley during the 1850s Gold Rush, and a military reconnaissance of the valley occurred in 1859. This expedition, dispatched from Fort Tejon, was sent to Owens Valley to investigate reported livestock theft by Indians. Captain J.W. Davidson reported that no evidence of Indian involvement could be found. He also noted the irrigation practices of the local Paiute, and recommended that a tract of land be set-aside for them. No reserve, however, was established (Wilke and Lawton 1976).

Permanent European American settlement of Owens Valley began in 1861 near the community of Laws (Eggum 1940). A number of ranches were quickly established resulting in the disturbance of meadowlands and piñon groves used by local Indians. This resulted in a number of skirmishes between Whites and Indians, and, in 1862, Camp Independence was established as a military outpost. By 1863 more than 900 Indians were forced to leave the valley and settle near Fort Tejon. These Indians soon returned to Owens Valley and took up residence near the newly formed towns, mining camps, and ranches. From that time on, many Paiute found work as laborers. After 1900, small reservations were established near Lone Pine, Independence, Bishop, and Big Pine. By the early 1930s, most land within Owens Valley had been purchased by the City of Los Angeles, and the Indian people found themselves without work as the ranches and farms were abandoned. The City of Los Angeles, however, did hire a number of Indians to work on maintenance crews for city-owned properties. In 1937, Congress approved an agreement between the U.S. Department of the Interior and the City of Los Angeles involving a series of land exchanges, including the exchange of Indian reservation lands at Bishop, Lone Pine, and Big Pine for lands elsewhere. The Fort Independence Reservation, however, remained unchanged (Liljeblad and Fowler 1986:429-431).

Lone Pine Paiute–Shoshone Reservation

By Executive Order in 1912, Inyo County established reservations for Paiute and Shoshone people at Lone Pine, Big Pine, and Bishop. However, in 1939, formation of the current 237-acre federally recognized Lone Pine Paiute–Shoshone Reservation occurred through a cooperative land swap between the City of Los Angeles and the U.S. Department of the Interior. The Lone Pine Paiute–Shoshone Reservation has a current population of about 350 residents. Today, there are three other Paiute-Shoshone reservations in Inyo County, including Independence, Big Pine, and Bishop (Velarde Tiller 1996).

HISTORIC SETTING

Early Exploration

Although European Americans first arrived on the California coast in 1542 (Holliday 1999), the earliest documented entry into the Owens Valley and Mojave Desert regions by non-indigenous people occurred much later. During the eighteenth century, a handful of Spanish and Mexican explorers, including Father Francisco Garcés in 1776, traveled through this region, the San Joaquin Valley, and Tehachapi Mountains during exploratory trips or missions (Boyd 1972:3; Coues 1900; Holliday 1999).

Initial European American excursions into northern Owens Valley dates to the early 1800s and is marked by the explorations of fur trappers. Mountain man Jedediah Smith led a band of fur trappers through the Great Basin and into southern California in 1826. After leaving Mission San Gabriel, Smith and his men passed through the Mojave Desert, Tehachapi Mountains, and San Joaquin Valley (Boyd 1972:10). Joseph Walker, for whom Walker Pass is named, traveled from the Mojave Desert to the San Joaquin Valley in 1833. On his return trip in 1834, Walker led a company of trappers south through the San Joaquin Valley, to the Kern River, and then over a pass to the Mojave Desert and Owens Valley. This pass, west of Freeman Junction, became known as Walker Pass (Boyd 1972:11; Hoover et al. 1970). Walker later advanced a party of emigrants over this same route in 1841. Captain John C. Frémont led several exploratory parties through this same region during the 1840s. Frémont is credited with naming Owens Lake and Owens River after Richard Owens, a member of his 1845–1846 expedition. Ed Kern, for whom Kern County was named, was also in this party (Gudde 1969:232).

Mining

Following the early exploration period, and after the discovery of gold on the American River in 1848, a group of prospectors led by Jefferson Hunt crossed the Great Basin and headed for southern California. Most members of the Hunt party ended up in Death Valley, but not all survived the passage. Those who did became known as the Death Valley Forty-niners. Other followers went south to the San Fernando Valley by way of Willow Springs, while others headed west to San Joaquin Valley by way of Indian Wells and Walker Pass (Bailey 1962:68; Boyd 1972:12–13). During the late 1850s, miners began searching the remote eastern Sierra Nevada region and made discoveries of gold at Bodie, Aurora, and Monoville. Many passed through Owens Valley and, during this time, merchants Hobart & Reed established a general merchandise store at Little Lake to serve the needs of the early travelers (Chalfant 1933:201). Frémont also reportedly crossed Bird Spring Pass in March 1854, using this trail as an alternative to Walker Pass due to its heavy snowdrifts.

During the 1850s, gold was discovered on the Coso ledges southeast of Mono Lake; in the Inyo-White Mountains, on the eastern flank of Owens River; and in the Alabama Hills, west of Lone Pine. Although mining was minimal during this time, prospecting brought settlers to the area and numerous homestead claims were filed by the early 1860s (Costello and Marvin 1992:6). The discovery of gold and silver in northern and western Nevada also led to an influx of prospectors into the West during the 1860s, and later into the California deserts. In 1865, rich silver ores were discovered high in the Inyo Mountains, near the summit of Buena Vista Peak, at an isolated outpost that became known as Cerro Gordo, a Spanish term for “fat hill”– fat with silver. The first real effort to develop a claim at Cerro Gordo occurred in 1866 at the San Lucas mine. In April 1866, the Lone Pine mining district was established and, by January 1, 1870, some 999 locations had been filed for record (Chalfant 1933:278).

By 1871, some 4,800 people lived at Cerro Gordo, and production that year was 2,200 tons of ore. Ore was initially transported by pack animals to the Silver Sprout Mill west of Independence, but a toll road was quickly established. By 1872, 11 mines were producing between 100 and 150, 83-pound bars of silver-lead each day, and ore was being smelted at a plant at Swansea, on Owens Lake. So much silver was extracted that a small steamer, the *Bessie Brady*, was built in 1872 by James Brady and D.H. Ferguson to ferry the bullion across Owens Lake from Swansea to Cartago Landing, thereby reducing reliance on mule transport. From Cartago Landing, the ore was freighted to Los Angeles by stage. Cartago Landing, a few miles north of Olancha, was built in 1872 by John Baptise Daneri. This settlement included a warehouse, store, and wharf to land the *Bessie Brady*, the first boat launched on

any western lake (Olson 1997:25). The ferry operation became known as the Owens Lake Steam Navigation Company, but it was short-lived due to harsh winter conditions that hindered distribution of silver by the teams, and the entire endeavor quickly failed.

In 1873, Cerro Gordo mine owners and Remi Nadeau, a well-known freighter, organized the Cerro Gordo Freighting Company to re-establish bullion shipments to Los Angeles (Serpico 2006:67). The freighting system and route were redesigned and quickly became a dominant feature in county-wide transportation, remaining so until the coming of the Carson & Colorado (C&C) Railroad in 1883 (Chalfant 1933:280). In 1873, a sawmill was established at the head of Carroll Creek to provide lumber for Cerro Gordo's numerous buildings and wood to turn into charcoal at the kilns on the western shore of Owens Lake. By July 1888, Cerro Gordo was a deserted town, with claims resorting to small individual enterprises.

Early Settlements

The flurry of gold mining precipitated the first permanent European American settlement of Owens Valley in 1861, near the community of Laws (Eggum 1940). A number of ranches were quickly established and, in 1862, the town of Bishop Creek was founded to support the need for beef in the flourishing mining camp of Aurora, Nevada, some 80 miles to the north. Aurora was believed to be on the California side of the border at the time and, from 1861 to 1864, was the county seat of Mono County, California. In 1861, cattlemen drove herds of cattle 300 miles from the San Joaquin Valley, through Walker Pass, up the Owens Valley, and then through Adobe Meadows to Aurora. Along the way, some of the cattlemen noticed that the unsettled northern Owens Valley was ideal livestock land. To avoid the long journey from the other side of the mountains, the valley was settled.

Driving some 600 head of cattle and 50 horses, Samuel Bishop, his wife, and several hired hands arrived in the Owens Valley on August 22, 1861 from Fort Tejon in the Tehachapi Mountains. Bishop was one of the first white settlers in the valley. Establishing a homestead, the San Francis Ranch (California Historical Landmark No. 208), along the creek that still bears his name, Bishop set up a market to sell beef to the miners and business owners in Aurora. By 1862, the settlement of Bishop Creek was laid out just east of the San Francis Ranch. Bishop and his family returned to Fort Tejon a few years after settling in the Owens Valley, but the small settlement he left continued to grow.

Increasing numbers of white settlers soon created problems for the area's Native American inhabitants. After some Owens Valley Paiute butchered a few head of livestock (which they viewed as wild game), a rancher retaliated by killing a Paiute warrior. This event led to a number of conflicts between the white settlers and the Indians. At the request of the new settlers, Colonel George Evans led a military expedition to this site on July 4, 1862, which eventually became 'Camp Independence.' Shortly after, Indian hostilities ceased and the camp closed. Conflicts resumed again in 1865, when the camp was reoccupied as Fort Independence (California Historical Landmark No. 349) until its abandonment in 1877. After the cessation of Indian hostilities, and with the gold and silver mines played out in Aurora, and the settlement of Bishop Creek flourished as the main supplier of beef and mutton to Bodie, the latest boomtown in the eastern Sierras, just across the border from Aurora. In 1889, the town decided to drop "Creek" from its name and the community became known simply as Bishop.

Other Owens Valley communities developed during the late 1800s, including Lone Pine, Manzanar, Independence, Big Pine, Cartago (discussed above), and Olancha. In 1860, members of the Thomas Hill mining party camped by a tall pine tree along the edge of a small stream flowing through the Alabama Hills. Lone Pine Creek, and the town of Lone Pine, derive their name from this tree, which stood until it was blown down in a windstorm in February 1882. A post office was established in Lone Pine on April 15, 1870 (Frickstad 1955:52).

In 1861, Charles Putnam built the first permanent dwelling in the Owens Valley, about four miles west of the Owens River, just south of Little Pine Creek (Babb 1999:13). His stone building also served as a trading post, hospital, and fort for the early settlers, and came to be known as Putnam's. In 1863, Thomas Edwards and his family brought a large cattle herd to the valley and purchased the trading post and its surrounding property.

Edwards laid out a townsite, changing its name to Independence, in honor of the military camp two miles to the north. By 1866, Independence had become the county Seat of the newly organized Inyo County. By 1883, a narrow gauge railroad served the area. Gradually more settlers arrived, giving birth to a prosperous farming community by the turn of the century. Conflict over the building of the LAA1 (1907–1913), coupled with the arrival of Hollywood moviemakers in the Alabama Hills, changed the character of the town by the 1920s.

Farmers established Manzanar, "the place of the apple," in 1910 on the fertile ground north of George's Creek, between Lone Pine and Independence. Here, they planted extensive apple and pear orchards and, by 1912, the community had a large packing plant, general store, meeting hall, and its own post office, established on May 11, 1911 (Frickstad 1955:52). The orchards reached their peak of production in the 1920s, but these were abandoned once the City purchased surrounding lands and water rights. In 1942, a World War II relocation camp was established at Manzanar, one of 10 such facilities where Japanese American citizens and resident Japanese aliens were interned until the war's end in 1945. The Manzanar War Relocation Center has been designated a California Historical Landmark (No. 850), a National Historic Landmark, and a National Historic Site.

In 1859, Captain J.W. Davidson led an expedition from Fort Tejon to Owens Valley, camping in an area between Baker and Big Pine creeks (Babb 1999:24). Large stands of yellow pine trees lined the length of the creeks, prompting the establishment in 1864 of a sawmill, which provided lumber to miners and valley residents. As the settlement developed, all but one tree was harvested, providing the name for the town of Big Pine.

The townsite of Olancha, closest to the Project area, was established by miner Minnard H. Farley, who came to the area in 1860 to find the Lost Gunsight Mine, a legendary mountain of silver said to lie east of Owens Lake and west of Death Valley (Olson 1997:19). Although the mine was never found, Farley discovered promising ore in the Coso Range, and subsequently secured financial resources and partners, organizing the Coso Silver Mining Company. In 1861, he constructed a small mill (California Historic Landmark No. 796) to process ore from his mine in the Coso Mountains at a site he referred to as Olanche, which was close to a stream, building stone was abundant, and was located near (18 miles) the mines. Mexican prospectors likely brought the name Olancha to the area, although claims have been made that the name is derived from a Shoshone or Yokuts village (Gudde 1969:227; Taylor 1982:195). By December 1863, Farley's mill site, built on the southern side of Olancha Creek, included an 8-stamp mill, with five amalgamating pans, sawmill, and blacksmith shop (Olson 1997:22). In 1867, the mill was burned during an Indian uprising and was never rebuilt.

Transportation

As mining and ranching operations mushroomed during the 1860s and 1870s, a need developed for transportation of goods, people, livestock, food, and mined ore. A number of trails and stagecoach lines were developed from existing Native American trails. Indian's Big Trail, also called Owens River Road (Warren and Roske 1981), the Midland Trail, Camino Sierra, and the Bullion Road (Pracchia 1994), all connected the northern Mojave and Owens Valley area with Los Angeles, via links with the Tehachapi Pass road and Walker Pass. The Cerro Gordo Freighting Company was founded by Remi Nadeau in 1873 with the purpose of transporting silver and supplies between Owens Valley and Los Angeles (Pendleton and Gross 1996:8). A number of stage stops and watering holes were established along these routes, including, from north to south, Fish Slough (also a Pony Express station); Olancha, Haiwee Meadows, and Little Lake (closest to the Project area); Ninemile Canyon; Indian Wells; Panamint Station; Coyote Holes; Ricardo; Desert Springs Station; and Willow Springs.

Located within the Project vicinity, the way station at Olancha included an adobe building, and served as a stage stop where teamsters could water their livestock, buy a meal, or spend the night (Bateman et al. 1962:21). During the 1870s, Olancha housed large corrals for housing freight teams for the Cerro Gordo Freighting Company. In the 1880s, numerous cottonwood trees were transplanted to Olancha from neighboring Cottonwood Creek. Describing his travels during 1908, LAA1 physician Dr. R. Taylor (1982:24) mentions that the old stage stop at Olancha was marked by a ranch house and a grove of cottonwood trees.

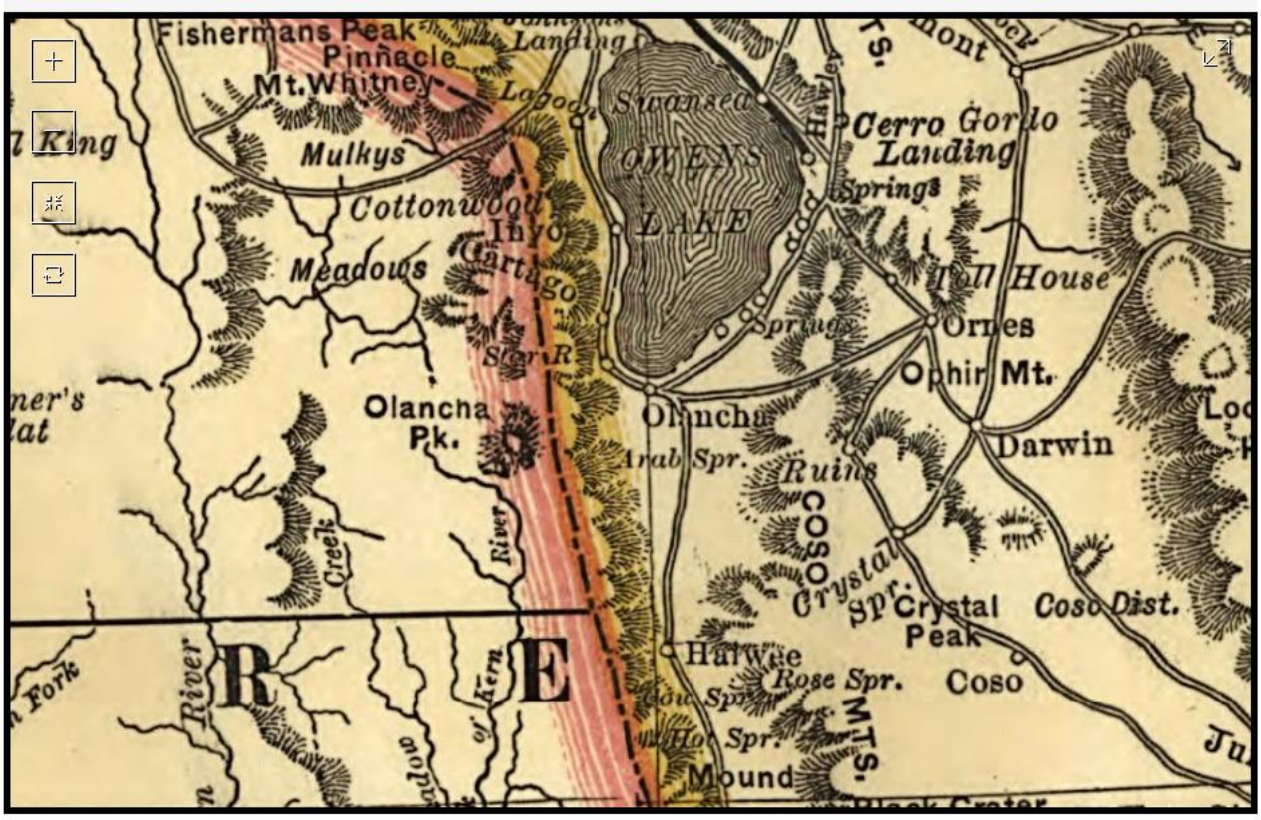


Figure 2-3. Rand McNally and Company Map (1883) showing railroad station and post office locations.
Source: Library of Congress https://www.loc.gov/resource/g4361p.rr001890.

A man named McGuire, together with his wife and six year old son, settled Haiwee Meadows, also spelled Haiwai or Hayway, in 1864. There they established a way station on the trail between Owens Valley and Visalia, which remained until 1908 (Taylor 1982:32). On January 1, 1865, the McGuire home was reportedly attacked by Indians, forcing several family members to flee. Mrs. McGuire and her son stayed behind, however, and died from numerous arrow wounds. Both victims were buried at Lone Pine. On January 6, 1865, a group of settlers from Lone Pine retaliated by attacking an Indian village near the mouth of Owens River, killing 41 Indians (Chalfant 1933:222–224). A post office was established at Haiwee in February 1906, but it was rescinded in July of the same year (Figure 2-3). The post office was reopened in December 1906 and remained in operation until April 1913, at which time mail was transferred to Olancha (Frickstad 1955:51). The old stage stop at Haiwee was still present in 1908 (Taylor 1982:32).

At Little Lake passage, merchants Hobart & Reed built a general merchandise store that served the early travelers, including miners and ranchers (Chalfant 1933:201). Freight wagons traveling between Owens Valley and Los Angeles passed through Little Lake, until the mines played out in the late 1870s. A post office was opened at Little Lake in May 1909 to serve the nearby LAA1 and railroad camps. At this time, the old stage station remained. In July 1911, it was moved to Narka, a Southern Pacific Railroad (Southern Pacific) camp at the eastern end of Fivemile Canyon. The post office was then relocated from Narka back to Little Lake in July 1913 (Frickstad 1955:52), where it remained opened until 1997. In later years, a commercial resort, including a hotel, was operated at Little Lake.

The Southern Pacific Railroad (Southern Pacific), controlled by the “Big Four” of Leland Stanford, Collis Huntington, Mark Hopkins, and Charles Crocker, was a holding company formed in the early 1870s. The company consisted of 19 railroads, including a northern outlet to Oregon and a southern outlet through the San Joaquin Valley (Wood and Bush 1963:78). As the Southern Pacific line expanded across the west, towns were required to provide land for

a depot, a generous right-of-way, and a guaranteed amount of actual cash if they wanted the railroad to pass through. If these terms were not met, the railroad would be detoured around the town.

By 1872, the Southern Pacific had pushed a line south to Tipton in the San Joaquin Valley, approximately 25 miles south of Visalia. From here, travel to Los Angeles, some 250 miles away, was by stagecoach (Murphy 1958:121). The Southern Pacific reached as far south as Bakersfield in 1874 (Boyd 1972:43), with plans to cross the Tehachapi Range and the Mojave Desert. As work progressed toward Tehachapi Valley, Southern Pacific crews from Los Angeles excavated a 7,000-foot-long tunnel through the mountains near San Fernando, which was completed in 1876 (Hutchinson 1969:230). By August 1876, the railroad from Tehachapi reached the Southern Pacific construction camp of Mojave and, in the following month, it met the line from Los Angeles at a place called Lang's, near Soledad Canyon (Murphy 1958:121). Before this time, the chief communication and freight connection between Los Angeles and San Francisco was by boat. Completion of the line established the first link for Los Angeles with the overland route to the east.

William Sharon, Hume Yerington, and Darius Mills formed the C&C Railroad Company in 1880 with the intent of running a narrow gauge railway from a point near Carson City and Virginia City, Nevada, to the Colorado River. Construction began that year on the C&C Railroad line, which passed along the eastern side of Walker Lake and extended southward as far as Keeler, California, near the northern shore of Owens Lake. In 1900, the C&C Railroad was sold to Southern Pacific for a price of $2,750,000. Shortly after, additional gold discoveries in the area of Tonopah, Nevada, led to another mining boom. The new mines continued the demand for produce and supplies shipped from Owens Valley. Not only was produce shipped north to Nevada, but it was also transported west from the Carson City area to central California, reaching as far as San Francisco.

In April 1905, Southern Pacific organized the Nevada and California Railway for the purposes of replacing the older narrow gauge C&C tracks from Carson City to Mina, Nevada, with standard gauge. Southern Pacific also had plans to connect the C&C line at Owens Valley with their railroad to the south, which at that time reached to Mojave (Inyo County Board of Supervisors 1966:57). This became a reality in 1908, when the Southern Pacific began construction on a 123-mile-long standard gauge railway from Mojave to Owenyo, known as the "Jawbone," linking with the old C&C narrow gauge line and allowing a direct route south to Los Angeles. This new standard gauge line was built to haul equipment and supplies necessary for the LAA1 construction. Before it served as a busy railroad junction, Owenyo began as a community in 1902 when a socialist group formed the William Penn Colonial Association. The colony existed near Owenyo, although it moved at least two times, before it finally went bankrupt in 1905.

The Southern Pacific began operations to Olancha on March 19, 1910, where a car body depot served briefly as an agency and office of communications (Serpico 2006:64). In 1941, the railway post office was discontinued through the valley, with rail service halted by the early 1980s. Near the Project area, the Jawbone branch also included a station at Haiwee, on the western side of what is now Haiwee Reservoirs. Haiwee (Milepost 484.1), or Siding #25, was an important supply point on the railroad, strategically located at the Haiwee Tufa Mill, which was built and operated by the City to produce cement for construction of the LAA1 channel and Haiwee Reservoirs and its dams. Railroad operations began at the Haiwee Siding on November 17, 1909 and continued until ca. 1954 (Serpico 2006:63–64). In 1910, a 65,000-gallon water tank was built, and water was gravity fed through a pipeline from Hogback Creek. The station served as a water stop from late 1910 until about 1954. By 1914, structures at the Haiwee Siding included a section house, comprised of two 8-x-28-ft. car bodies, four car body bunkhouses; and a tool house (Serpico 2006:64). In 1921, a freight shed was built, but it was later destroyed by fire.

Figure 2-4. El Camino Sierra (Highway 395 precursor) through Little Lake.
Source: http://www.owensvalleyhistory.com/little_lake/page95.html
Fotocards courtesy of the Rich McCutchan Archives

With the creation of Haiwee Reservoirs in the early 1910s, the portion of the Owens River stage road that once extended from Haiwee Meadows to Olancha, formerly named the Three Flags Trail, was routed to the west, between what is now Dunmovin' and Olancha (Olson 1997:63). This road, which once connected the valley's settlements and ranch houses, served as the main north-south artery from the mid-1860s to the early 1930s. Also known as the El Camino Sierra (Figure 2-4), Bullion Road, and the Owens River Road/Los Angeles-Owens Valley Road, the route was superseded by, or incorporated into the state route system in 1927 as State Route 23 (Mojave to Independence), which was constructed through this area between 1929 and 1931 (Olson 1997:64; Shapiro et al. 2008). By 1931, steady improvements resulted in a paved highway uniting Bishop and Los Angeles (Shapiro et al. 2008, citing Hart 1966). During the 1930s, US 395 was extended from Spokane, Washington, to San Diego, California, over the Camino Sierra, using several existing state routes, including State Route 23. The ease of travel afforded by State Highway 23 resulted in decreased train travel, prompting Southern Pacific to terminate its passenger only service the following year, although a mixed service of passenger, express, freight and mail continued in the 1940s (Olson 1997:64).

Water and Power

By the late 1800s, the growing, ranching, and agricultural industries in the Owens Valley region required a larger supply of water than the landscape could easily support. Farmers began to construct irrigation ditches and canals to divert water into their fields, and the area around Bishop became laced with dozens of canals and ditches feeding water from Bishop Creek and the Owens River to the many farms that had been established, where alfalfa, wheat, corn, oats, and potatoes were grown. The first large-scale irrigation projects in Owens Valley were developed in 1878, including the McNally Ditch near Laws, the Bishop Creek Ditch, the Big Pine Canal, and the Lone Pine Ditch (Costello and Marvin 1992:8). In 1887, construction began on the Owens River Canal, the Inyo Canal, and the Stevens Ditch. Portions of these canal and ditch systems were eventually incorporated into the LAA1 system. To offset these losses, by 1910 artesian wells were also contributing much-needed water for irrigation.

First Los Angeles Aqueduct

Similar to the fate of the growing, ranching, and agricultural industries in the Owens Valley region, a population boom in Los Angeles during the early 1900s, coupled with a highly unreliable water source, prompted water shortages across the fledgling city. Soon, plans were developed to construct the 233-mile-long LAA1 to tap the abundant water supplies of the Sierra Nevada Mountains and Owens Valley. Construction of the LAA1 was the fourth largest engineering project in American history, surpassed in scope and complexity only by the building of the Panama Canal, the New York Aqueduct, and the Erie Canal (Kahrl 1982:158). Subsequent expansions of the LAA1 in 1940 extended the system 105 miles north to the Mono Basin. To enhance the system's capacity, the LAA2 was completed in 1970.

From the time that Los Angeles was founded in 1781, the small town was dependent for its water supply upon the Los Angeles River, whose tributaries in the San Gabriel, Santa Monica, and Santa Susana mountains, fed the groundwater reservoirs of the San Fernando Valley. The 11 families that established the first settlement, *El Pueblo de Nuestra Señora la Reina de Los Angeles de Porciúncula* (The Town of Our Lady the Queen of the Angels of Porciúncula), dammed the river and built a system of canals to irrigate nearby fields. Under Spanish colonial policy, the pueblo was invested with an exclusive right to the water of the river, a communal interest very different from the riparian principles of English common law. Decades later, when the City was incorporated in 1850, the population of 1,610 inherited all of the rights of the Pueblo, including those to the water of the Los Angeles River. As the City grew following the American conquest, however, it faced increasing problems with the management of its water system. By 1854, the primitive water system was large enough to become a City department under the charge of a "zanjero," or water overseer (Kahrl 1982:7–8; LADWP 2002).

In 1868, the expanded water system was leased to a private company, the Los Angeles City Water Company. Ten years later, in 1878, the company hired a young, 23-year old Irish immigrant by the name of William Mulholland as a ditch tender at a rate of $1.50 per day, a decision that would be instrumental in shaping the City's future water supply system. By the time Mulholland had been hired, the system had progressed from ditches and hollow logs to include a domestic water structure with reservoirs and water mains. The original "zanjas," or ditches, continued to serve the City for another 35 years, carrying water to waterwheels, which lifted the water for gravity flow to homes and fields. In 1886, at the age of 31, Mulholland became superintendent of the Los Angeles City Water Company, succeeding Fred Eaton, and overseeing a system that included 300 miles of mains, six major reservoirs, infiltration galleries, and pumping plants. Three years later, at Mulholland's insistence, the company installed its first water meter. As Los Angeles grew, however, it soon became apparent that the small, meandering Los Angeles River could not meet future water needs (LADWP 2002; Mulholland 2000:21–23, 30–37).

In 1898, the 30-year lease granted to the Los Angeles City Water Company expired. Popular sentiment at the time favored public ownership of the water system, and Mulholland found himself caught between private sympathy for a publicly owned system and public loyalty to his employer, the private company. The City Council entered arbitration with the company, which included long and drawn-out legal proceedings. Mulholland himself spent some six weeks on the witness stand, earning a reputation for honesty and fair-mindedness. The issue was not resolved until 1901, when a bond measure was passed permitting the City to purchase the water system. Mulholland was retained as superintendent, largely due to his knowledge of the existing system (Mulholland 2000: 61–65; 75–83).

In an annual report prepared in 1902, Mulholland noted that, with an estimated population of 85,000, the City reached the "astounding consumption" of over 26-million-gallons of water per day, or about 306 gallons per capita. Metering led to reduced consumption, saving some three million gallons per day, but growth continued as the primary issue. By 1903, per capita consumption was down to 200 gallons per day. Over the same period, however, the City had grown to over 175,000 people (LADWP 2002).

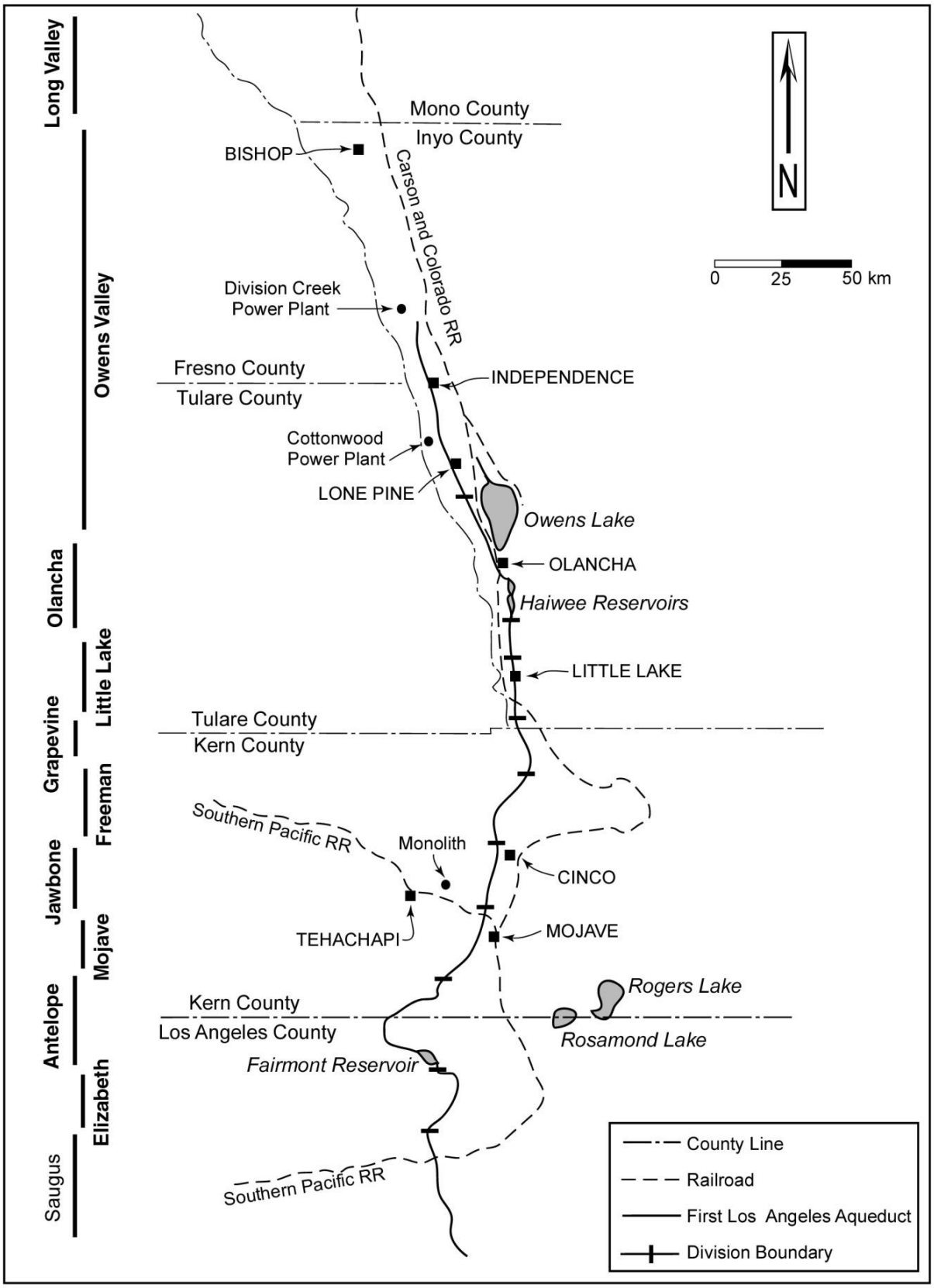


Figure 2-5. LAA1 divisions map.

In July 1904, Mulholland's concerns about the City's inadequate water supply were realized. For about two years, the flow of the Los Angeles River had been about 30 percent below normal. Water demands created by the City's uncontrolled growth surpassed the supply and, for 10 days in July 1904, daily consumption exceeded inflow into the reservoirs by almost four million-gallons. Mulholland began efforts to determine what the City's actual needs would be, using a per capita demand of 150 gallons per day and an estimated population growth based on the previous 10 years. Following his estimates, by 1925 Los Angeles would be a city of 390,000 people using more than 58 million gallons of water per day. When Mulholland's search for a new water supply to meet this demand turned up no local sources, he concluded that Los Angeles would have to look elsewhere (LADWP 2002).

In 1904, Fred Eaton, who had preceded Mulholland as superintendent of the Los Angeles City Water Company, and later became City Engineer, joined his friend, J. B. Lippincott, and others on a camping trip to Yosemite Valley and other locations in the Sierra Nevada. When the group reached Tioga Pass, they decided to descend the eastern Sierra slopes to reach the Mono Lake area. At Mono Lake, a smaller group that included Eaton and Lippincott decided to head south to Bishop for supplies (LADWP 2002). This excursion into Owens Valley would mark the first step in the vision of the LAA1 and in securing the City a new and plentiful water source.

Aware that Mulholland was searching for an additional supply of water for the City, Eaton persuaded him to return to the Owens Valley in 1905. Eaton was certain that the Owens River was the source of water needed by the City. Draining the eastern Sierra for more than 150 miles, the river followed a natural course south toward Los Angeles. Below the small lava flow at the southern end of the basin, Eaton pointed out the old river channel. Mulholland saw the channel as a direct route to the mountains north of Los Angeles, which was the only major barrier to delivering a new water supply to the City. He soon began to plot an alignment, devising an aqueduct and reservoir system to transport the water entirely by gravity flow (LADWP 2002).

In 1907, voters gave their overwhelming endorsement to Mulholland's "big ditch," approving a $23 million bond measure for construction of the LAA1 system (LADWP 2002). To acquire sufficient water rights for operation, maintenance, and protection of the LAA1, the City bought 124,929 acres of land in the Owens River drainage basin, 4,300 acres near Tehachapi, 69 acres for construction yards at Mojave, and 5,818 acres for reservoir sites, exclusive of canal right-of-ways (City of Los Angeles 1916:21). Collectively, these 135,116 acres equated to an area double the total area of the City at that time.

The LAA1 work was initially distributed across 14 divisions for administrative purposes (Figure 2-5). These divisions included Long Valley (No. 1), Owens Valley (No. 2), Olancha (No. 3), Rose Valley (No. 4), Grapevine (No. 5), Freeman (No. 6), Jawbone (No. 7), Mojave (No. 8), Antelope Valley (No. 9), Elizabeth (No. 10), Saugus (No. 11), Railroads (No. 12), Cement Works (No. 13), and Power Plants (No. 14).

Before construction could begin, an elaborate infrastructure was needed to support the multitude of activities required to build the LAA1 system. The organizational structure included electric power, telegraph and telephone lines, water lines, cement plants, and a transportation network. Survey of the proposed LAA1 route was conducted in 1906 and 1907, but preliminary work was needed before aqueduct building could begin (City of Los Angeles 1907). An important precursor was electric power, which was required to operate the equipment necessary to construct power plants and 218 miles of power transmission lines (Layne 1952:114). Power required between San Fernando Reservoirs and the Fairmont Tufa Mill was provided by a 40-mile-long, 30,000-volt transmission line from the Castaic substation of the Southern California Edison Company. At the northern end of the proposed LAA1, in Owens Valley, three power plants were built, including two at Division Creek and a third at Cottonwood Creek.

Installation of private telephone lines was also necessary to ensure communication between City offices, LAA1 division headquarters, and the numerous field camps. A main line was established, beginning in Los Angeles, and was extended 240 miles along the length of the proposed LAA1, ending in Independence. The telephone system consisted of two No. 10 copper wires stretched on 4-x-6-inch (in.) redwood poles (City of Los Angeles 1916:86). In total, some 377 miles of telephone and telegraph lines was installed as part of the support system (Taylor 1982:165).

Another critical element was installation of water lines to provide water to the numerous camps and for construction purposes (Taylor 1982:165). The need for water was considered one of the most difficult problems associated with aqueduct construction (City of Los Angeles 1916:85), and the City eventually built 230 miles of water conduit to supply the camps. Water was delivered from 11 spring wells bored in Owens Valley and from streams in the higher mountains. Many streams carried runoff from the Sierra Nevada Mountains, with surface water flowing to a point above the canyon mouth before disappearing beneath sand and rock. To tap such water, steel pipes were extended up canyons, while water boxes were installed at springs. Water was piped to a main line that paralleled the LAA1 and then stored in portable tanks. Water was allowed to accumulate in the tanks during the night for use the next day.

Four reservoirs were initially constructed for storage and regulation of water flow. These included large reservoirs at Haiwee (1913–present; 63,800-acre-feet), and Fairmont (1913–1982; 7,620-acre-feet), while a small reservoir was built at Dry Canyon (1913–1966; 1,325-acre-feet) below Elizabeth Tunnel within the Saugus Division. Finally, San Fernando Reservoir (23,000-acre-feet) was built at the southern end of the LAA1 system, within San Fernando Valley. In subsequent years, additional reservoirs were built to provide water control. These reservoirs include Grant Lake (1940–present), Long Valley (1941–present), Pleasant Valley (1956–present), Tinemaha (1929–present), Fairmont No. 2 (1982–present), St. Francis (1926–1928), Bouquet (1934–present), Drinkwater (1913–1966), Upper Van Norman (1921–1971), Lower Van Norman (1915–1971), and Los Angeles (1977–present).

The final piece of infrastructure was a system of access roads, trails, aerial tramways, railways, and other means of transportation to haul freight and transport labor crews. North of Mojave, it was estimated that 210,000 tons of freight would have to be moved an average distance of 65 miles (City of Los Angeles 1916:92). Some 218 miles of roads and trails were built leading to the numerous construction camps, many situated on rugged hillsides. Such roads included the Gray Ridge Road and S.B. Road in the Jawbone Division, steep grades in San Francisquito Canyon south of Elizabeth Tunnel, and roads in the Grapevine and Little Lake divisions.

Construction of a railway system had been included in the original plans for the LAA1, but had been eliminated for cost reasons. Construction superintendents considered hauling materials by wagon, but road construction and maintenance of mule teams was too expensive. Because of the large amount of freight that needed to be hauled, the great expense involved in feeding freight teams, and the limited distance freight teams could travel in a day, it was decided that a railroad would be necessary to transport supplies north of Mojave. At the initiation of LAA1 construction, there was no railroad line to the Owens Valley from the south, although a narrow gauge track from Nevada (the C&C) reached the northern end of the valley. Thus, a railroad leading from the Southern Pacific line at Mojave north to Owens Valley was surveyed in 1906 and 1907, and a report of requirements and conditions was prepared. Much of the proposed line would parallel the LAA1, while a spur line was needed at Red Rock Canyon. Since the City would be forced to abandon such a line after completion of the LAA1, it was decided that a private railroad corporation should build it.

City officials approached several rail companies about providing service from Mojave to Owens Valley (City of Los Angeles 1907:55). City engineers justified construction costs by estimating freight totals of 14 million tons. Southern Pacific expressed great interest in building a standard gauge railway to Owens Valley, since it already controlled the old narrow gauge C&C Railroad that led to Owens Valley from the north. Other railroad companies offered lower bids than the Southern Pacific, but Mulholland needed the Southern Pacific's cooperation in gaining a right-of-way across a thousand acres of land controlled by the company along the line of the LAA1. In exchange for the City's lucrative contract to haul freight for the project, the Southern Pacific made these lands available at a nominal price of $5 an acre (Kahrl 1982:151–152).

In April 1908, the City and Southern Pacific entered into a contract for construction of a 118-mile-long railroad line from Mojave to Lone Pine, at a cost of over $1 million. This new branch became known as the California and Nevada Railway. In addition, Southern Pacific was to provide transcontinental transportation of freight (City of Los Angeles 1916:93). Actual construction began on May 5, 1908 and proceeded rapidly. Camps were spread out along the railroad line, some housing from 100 to 150 men (Widney 1931). Stations or sidings were established at such

as places Cantil, Inyokern, Brown, Narka, and Sykes. Southern Pacific completed the railroad in 1910, nearly one year ahead of the contract schedule.

In September 1908, a contract was given to Southern Pacific to build the Red Rock Railroad, a nine mile-long spur line that extended from Cantil, up Red Rock Canyon, to a point where the LAA1 crossed Dove Spring Canyon. Although earlier wagon roads had been established in this area, most freight to the mining country was transported up Jawbone Canyon, since the road in Red Rock Canyon was characterized by deep sand. The Red Rock Railroad, completed in January 1909, operated for a period of 22 months. A severe washout of the spur line during this time resulted in the loss of rolling stock valued at $96,810 and $15,000 in repair costs. In December 1910, the spur line was dismantled and sold to the U.S. Reclamation Service.

Construction of the LAA1 system began in the fall of 1907 with the opening of the Elizabeth Tunnel portals; elsewhere work started in October 1908. Work crews blasted and drilled 164 tunnels totaling 51.7 miles in length; laid 12 miles of steel and concrete pipeline; built 24 miles of open, unlined channel and 37 miles of concrete lined channel; and cast in place 98 miles of covered conduit (LADWP 2002). Numerous construction camps were established along the route and good roads were constructed to reach them. Tents and bunks were furnished to laborers, who numbered 3,900 individuals at the peak of construction (Kahrl 1982:159; LADWP 2002). Some 2,291 buildings were erected, including bunkhouses, cottages, and engineer's residences (248); machine shops (10); compressor plants (23); barns and hay sheds (33); warehouses (36); office buildings (25); hospitals (8); sawmills (7); powder magazines (50); garages (1); tents (1,600); and miscellaneous small shops, sheds, and corrals (250), exclusive of the buildings at the Monolith Cement Mill (City of Los Angeles 1916:89).

The LAA1 is distinguished by numerous engineering features, including reservoirs, dams, tunnels, canals, conduits, and sag pipes. Hydroelectric features were also constructed, using gravity flow to bring both water and power to the City. On average, one mile of completed aqueduct was built per week (Heinly 1913:6). The first 23 miles of the LAA1, from its intake near Blackrock Springs to the Alabama Hills, was built as an unlined concrete channel dug with floating, suction dredges (Dredge No. 1 and Dredge No. 2). Earth was liquefied using hydraulic pressure guns, pulled up through chutes, and discharged on either side of the channel, creating earthen mounds along the route (National Park Service 2001). Dredges were operated electrically and supplied with energy from the LAA1 hydroelectric power plants at Division and Cottonwood creeks (City of Los Angeles 1916:160).

The next 40 miles, extending south from the Alabama Hills to Haiwee Reservoirs, was concrete-lined (Figure 2-6), but not covered, owing to the porous nature of the ground through which the ditch was built. At SHD, water exited the Haiwee Reservoirs into a covered, box-shaped, concrete conduit, which continued south across the desert for 135.26 miles to Fairmont Reservoir, eventually crossing over the San Gabriel Mountains, and into San Fernando Reservoir for distribution into the City water system.

After a seven-year construction period, the LAA1 was completed in May 1913. On November 5, 1913, dedication ceremonies were held at the Cascades, site of the San Fernando Reservoir. The commemorative handout described the LAA1 construction process as "8 years of ceaseless application of brain and brawn and 24.5 million dollars." The San Fernando Valley Chamber of Commerce distributed bottles of Owens River water to 30,000 spectators who arrived by car, wagon, or buggy. Mulholland unfurled an American flag, a signal to General Adna R. Chaffee, President of the Board of Public Works during the LAA1 construction period, to open the gate valves. Five men put their weight to great wheels that would lift the gates and release water into the canal. Hundreds of cups were dipped into the water as Mulholland turned over the LAA1 to the Mayor, J.J. Rose, stating simply, "There it is, Mr. Mayor. Take it." Mulholland had predicted that Los Angeles would have a population of almost 260,000 the day that the LAA1 opened. By 1913, however, the City's populace had reached 485,000. Within 10 short years, Mulholland would again be looking for water (LADWP 2002).

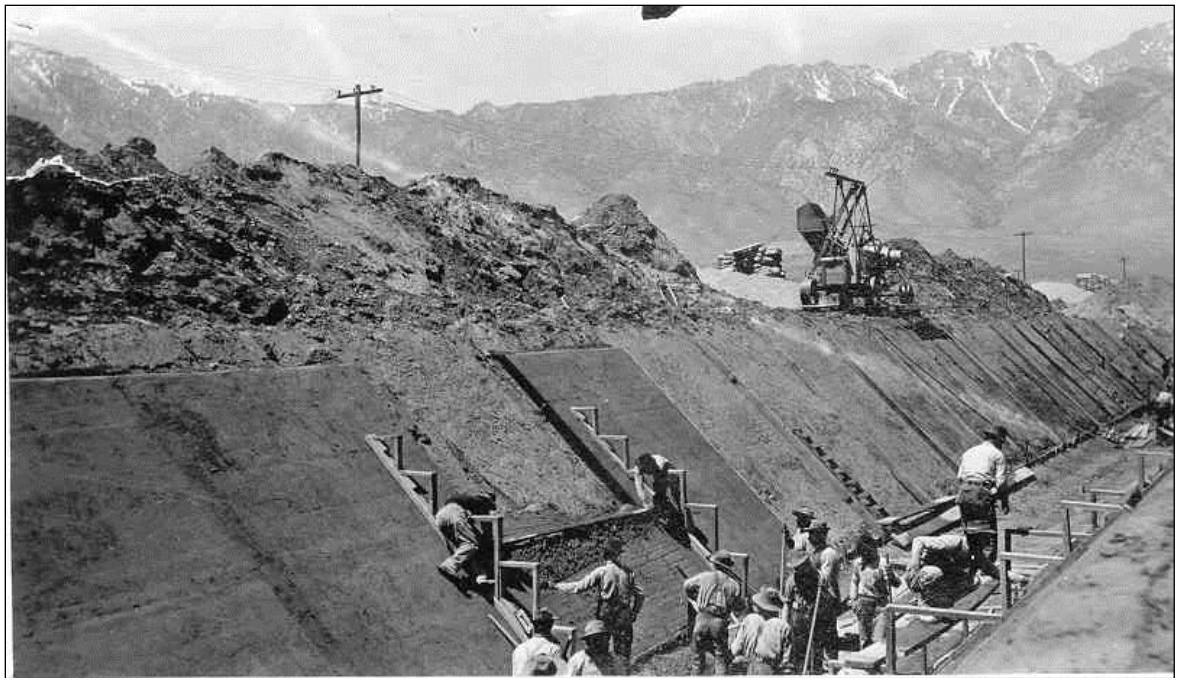


Figure 2-6. Setting concrete forms, Olancha Division.
(Undated; LADWP historical photograph collection).

Historical Overview of NHD and Haiwee Reservoirs

The Project APE is within the LAA1's Olancha Division, which spanned a distance of 25.4 miles and included 6.8 miles of reservoir (Haiwee Reservoirs), 18.4 miles of canal, and 0.2 mile of tunnel. The division extended south from the Cottonwood Creek Power Plant to South Haiwee Reservoir Dam (Power Drop). The northern half of the LAA1 within this division traversed along the western side of Owens Lake, crossing Ash, Braley, Cartago, Olancha, and Summit creeks before reaching NHR. Work on the Olancha Division began April 1, 1908 with excavation of the conduit northward from the upper end of NHR (City of Los Angeles 1908:33), and was conducted the direction of Mr. O.W. Peterson, division engineer.

The existing Dam impounds the northern end of NHR[2], one of four basins created to store the waters of the LAA1. The reservoir site, 60 miles south of the LAA1 intake, and just north of Little Lake, occupies a remnant of an eroded summit valley (Haiwee Meadows) through which the pre-Holocene Owens River once flowed. Combined, the North Haiwee and South Haiwee reservoirs, which measure roughly 7.5 miles long, provide a capacity of 63,800-acre-feet (19,551,000 gallons of water) and encompass a water surface area of 3.33 square miles (Figure 2-7). Lacking a drainage basin of their own, the reservoirs are used to regulate the flow of water from a variable supply into a steady flow (City of Los Angeles 1907:37; 1911:18). During the LAA1 construction period, the emerging reservoirs also served to store water, channeled from the Owens River and Cottonwood Creek, for conduit construction further to the south, where little water occurred naturally and was required for the making of concrete (*Los Angeles Times* August 4, 1907).

[2] Before 1965, Haiwee Reservoir was noted in historical records as Haiwee "Reservoirs" (plural), as depicted in Figure 2–7. In 1965, the Merritt Diversion Structure was built near the center of Haiwee, separating the body of water into two reservoirs (North Haiwee and South Haiwee). Consequently, NHD retains the north end of the NHR (singular).

The Haiwee Reservoirs were designed and constructed over a seven-year period, between 1907 and 1913. The reservoirs were built by a hydraulic process, using large capacity power shovels, centrifugal pumps, piping, and sluice boxes aimed at the removal of some 530,000-cubic-yards of material from the summit valley. The existing Dam was erected by the hydraulic-fill method, whereby water from the nearby LAA1 canal was passed to a jetting pump and forced through it into hydraulic giants against an earthen bank. The toes of NHD were established using fill material that had been deposited by steam shovels, onto wagons, for transport to the site.

SHD was built using material excavated from a clay pit by a Model 60 Marion steam shovel, which was loaded in boxcars and transported about 1,000 ft. to the dam site over a narrow gauge (3-ft.) belt-line railroad circuit (Figure 2-8). Three trains were operated, each with an 18-ton Vulcan steam locomotive and seven 4-yard dump cars. An auxiliary tufa cement plant was established on the Southern Pacific line near the Haiwee Siding, on the western side of the reservoir. Rock was transported from a nearby tufa quarry, over a distance of ¾-mile, to the plant by electric locomotive and trolley line (Layne 1952:127).The Haiwee tufa plant produced an average of 7,500 barrels of cement per month during 1911 for use on the LAA1 line and the Haiwee Reservoirs (City of Los Angeles 1911:20; Layne 1952:127).

Layout for the Haiwee Reservoirs began in the early 1900s. By 1907, the topographic survey of Haiwee Reservoirs was complete, its two earthen dam sites were located, and specifications for their construction were prepared (City of Los Angeles 1907:52). In April of that year, a survey party led by T. B. Downer plotted the course of a wagon road to run atop the bluff on the western side of the reservoirs. The line began at a point between the upper and lower reservoir sites, extending north to a point about four miles south of Olancha (Board of Public Works 1907a). By May, a construction camp was established at the reservoir, and work began on installation of a water pipeline to support hydraulic sluicing (Board of Public Works 1907a). In June 1907, J.D. Hooker & Company was awarded a contract for the purchase of 18,000 ft. of riveted steel pipe to be used for hydraulic sluicing to construct the Haiwee Reservoir dams (Board of Public Works 1907b; *Los Angeles Times* 1907). The following month, a survey party led by D. L. Reaburn made detailed surveys of the NHD and SHD sites and eight miles of the Haiwee and Hogback ditch (pipeline). By August 1907, pick and shovel work was initiated to dig trenches, and in September, the Haiwee Creek pipeline was extended 490 ft. (Board of Public Works 1907c; *Los Angeles Times* 1907).

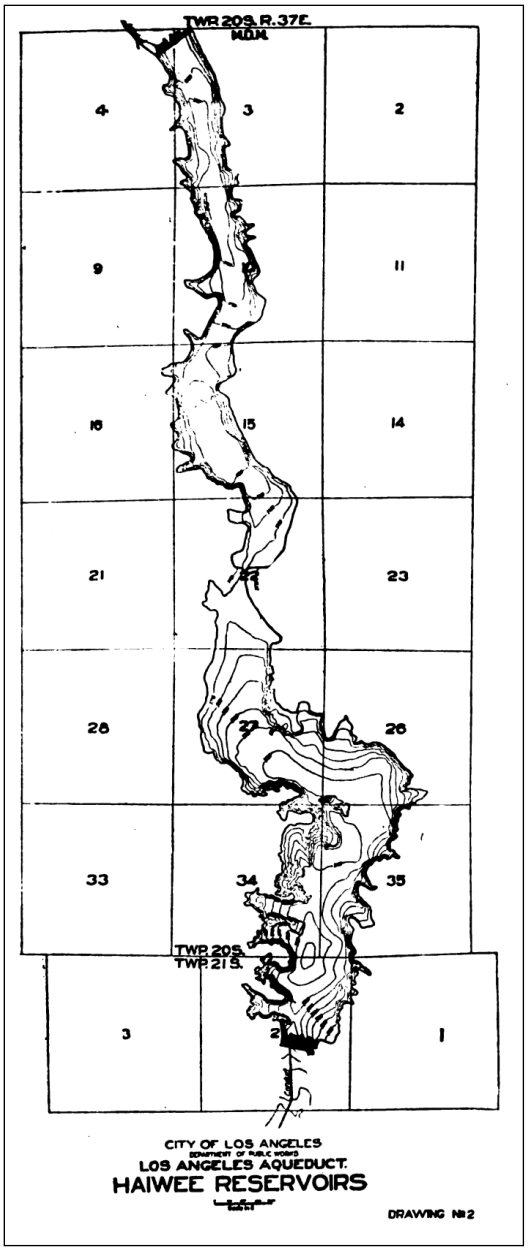


Figure 2-7. Topographic Map of Haiwee Reservoirs.
(Excerpted from City of Los Angeles 1907:13)

Figure 2-8. Construction of SHD, 1911.
(Water Bureau photograph #466, LADWP historical photograph collection).

Figure 2-9. Construction of NHD, facing east.
Red oval represents a portion of the Project Site.
Note the hydraulic monitor in the lower left corner of the photograph.
(Undated Water Bureau photo, LADWP historical photograph collection).

During 1908, preliminary work continued on the reservoirs and focused on finalizing engineering plans, including the decision as to what method would be used for constructing the small dam at the reservoir's northern end (NHD) (City of Los Angeles 1908:34). In March 1908, the Sierra National Forest issued a Special Use Agreement to the City for construction and use of a pipeline to convey water from Haiwee Creek to the LAA1 and Haiwee Reservoirs. As described, the pipeline would begin at a point near the center of Section 2, T21S, R37E (within the project vicinity) and extend west a distance of 17,375 ft. to a point in the NE¼ of NW¼ of Section 5, then south 1,250 ft., and then southwest for 1,875 ft. to Haiwee Creek. In December, it was reported that the construction of the reservoir would require one full year and would begin in spring 1909, as the Southern Pacific would be completed to Haiwee Siding by March 1, 1909 to transport construction materials and other supplies (*Los Angeles Times* 1908).

Little progress was made in 1909 on the construction of Haiwee Reservoirs and its dams. As the endeavor required the use of steam shovels, a decision was reached to defer work until such equipment was released from the Mojave Division to offset additional costs (City of Los Angeles 1908:11). By the spring of 1909, work began on the SHD under the supervision of Phil Wintz. To furnish fill for SHD, three trains were required, each composed of an 18-ton Vulcan locomotive hauling seven dump cars, which operated over a short, 3 ft. wide track (Myrick 1992:205). In December 1909, J. H. Robinson, superintendent of the Mojave Division, was transferred to Haiwee to establish a large camp and manage staff and workers for two years while the reservoir was being built (*Los Angeles Times* 1909).

Work on the existing Dam was further delayed in 1910, but some progress was made at SHD, where experimental and exploration work was initiated to construct an impervious concrete "curtain" to prevent water loss by underflow (City of Los Angeles 1910:10). Sufficient water for conducting hydraulic operations was also secured from Hogback and Haiwee creeks.

During 1911, about 18 miles of conduit was excavated and cemented to drain the water from Cottonwood, Ash, Cartago, and Olancha creeks into Haiwee Reservoir. This water was subsequently used to construct the existing Dam by a hydraulic process. By July 1911, preliminary exploration work began at the NHD and focused on the sinking of three test wells placed down the axis of NHD (City of Los Angeles 1911:19). At SHD, construction plans were revised to include obtaining building material from the bottom of the reservoir site. These materials were loaded by steam shovel into three trains of cars (7 to 9 cars each), which were then hauled by steam locomotives, deposited on opposite sides of the dam, and washed with hydraulic water jets dispelled from floating barges towards the center.

Construction of NHD and SHD ensued in earnest in 1912 under the supervision of W.P. Taylor. The work of erecting equipment for NHD (also referred in the historic literature as a dyke) began on April 11, 1912, while construction of SHD was 80 percent complete in July 1912 (City of Los Angeles 1916). At NHD, construction began by excavating a cutoff trench into the native alluvium, followed by placement of hydraulic fill. The cutoff trench, located at the base of the existing Dam, along its center axis, was built as an alternate to a more expensive impervious curtain wall at SHD. The cutoff trench extended about 120-ft. to bedrock, based on information obtained from the three test wells. The general method for placing hydraulic fill was to transport soil suspended in water through pipes to the existing Dam, where it was discharged, letting the soil settle out and the water flow to a pond in the dam's center (Davis and Roux 2001:4). Most water used for the fill construction was diverted from Cottonwood Creek (13 miles north) and transported south through the completed portion of the LAA1 to a sump. If sufficient quantities of water were not available, then it was supplemented with recycled water clarified from the pond (Davis and Roux 2001). The hydraulic process involved pumping the sump water into steel water pipe using a 100-psi jetting pump. Water was discharged against the natural earth banks through 2 in. diameter fire nozzles connected to the steel mains by 4 in. diameter canvas hoses (Davis and Roux 2001). The fire nozzles were mounted on iron tripods with swivels and were used to wash-down the earth banks to erode the soil (Figure 2-8). The water and soil matrix then ran down an iron flume to a 10-ft. diameter concrete sump, where it was picked up by a mud pump and discharged through a 12-in.diameter pipeline to be deposited on the existing Dam (Davis and Roux 2001:4).

NHD's hydraulic work required material extractions from several neighboring borrow locations. Borrow Site 1, located west of the existing Dam (Figure 2-10), was used between April and October 1912, resulting in the removal of 57,000 cubic yards of earthen material (Davis and Roux 2001). Following extraction, the soil was redeposited to form the lower portion of the existing Dam. By October 1912, it was determined that Borrow Site 1 contained too much sand for continued dam construction purposes, and it was abandoned. Borrow Site 2 was subsequently established at the eastern edge of the existing Dam and was used from October 1912 through completion of the dam filling process in December 1912 (Davis and Roux 2001). A third borrow site was established during the interval between Borrow Site 1 and 2 to make up for lost time. This new borrow location (termed the Wagon Borrow) used wagonloads of soil removed from near the northwest area of the existing Dam. This linear borrow site would eventually become a portion of the concrete-lined LAA1. The Wagon Borrow produced roughly 26,137 cubic yards of fill. All dam fill was completed by the end of December 1912.

NHD construction was completed in February 1913 (Davis and Roux 2001), and LAA1 water quickly began filling the 21-billion-gallon Haiwee Reservoir (Heinly 1913). Seven months later, on September 25, 1913, the gates of Haiwee Reservoir were lifted and the waters of the Owens River and its tributary stream began their southward passage, through the LAA1, to the City (Heinly 1913). The completed NHD rises to an elevation of 3,767.7 ft., with a maximum height of roughly 34 ft. above the original streambed. It has a crest length of about 1,500 ft., while its crest width varies from 66 to 74 ft., the latter a result of the original plan to increase the maximum height to about 41 ft.

In 1951, a 4-in. thick concrete overlay was placed on the upstream slope of the existing Dam to help stabilize deterioration of the original facing. In 1972, surface ponding of water that seeped from Haiwee Reservoirs during high water periods necessitated the placement of fill material (blanket fill area), with a maximum thickness of 7 ft. at the northeast corner of the existing Dam (Davis and Roux 2001).

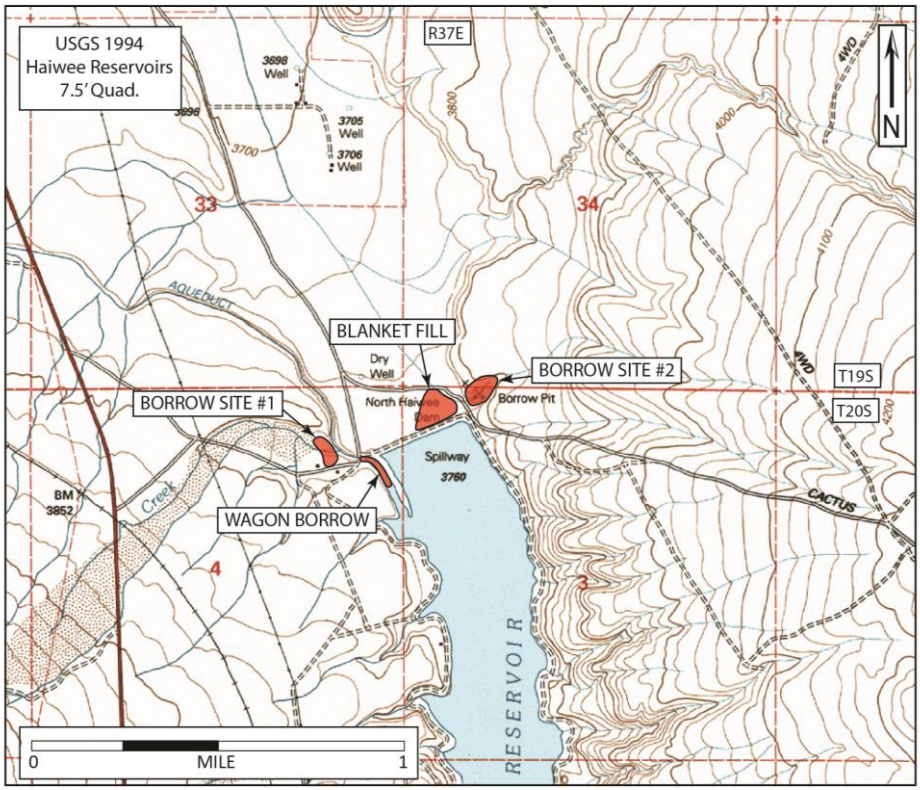


Figure 2-10. Location of NHD's construction period borrow sites.
(Map adapted from Davis and Roux 2001).

Post-Aqueduct Conflict in Owens Valley

The 1920s brought unprecedented growth to Los Angeles, with homes and businesses springing up across the Los Angeles basin. Concurrently, the eastern Sierra Nevada area was experiencing several years of lower than normal rainfall, and water use on private lands in the Owens Valley was increasing. Consequently, by the spring of 1923, both Los Angeles and the Owens Valley were facing water shortages. The City lacked a dam and reservoir to collect water above the LAA1 intake near Independence and, the best site for a new dam, at Long Valley, remained in private ownership. Between Long Valley and Independence, miles of irrigation canals diverted water to farms and ranches. To increase their water supply for the LAA1 system, the City began pumping groundwater in Owens Valley, acquiring additional groundwater rights north of Independence. Witnessing these changes, Owens Valley residents became alarmed, and local opposition groups formed. A series of escalating confrontations ensued, with farmers occasionally diverting water illegally and leaving the LAA1 canal dry. On May 21, 1924, the first violence erupted when 40 men dynamited the Lone Pine Aqueduct spillway gate. No arrests were made and the two sides stalemated. Many residents felt the City should buy out the entire area, which the City found an unreasonable proposition (LADWP 2002).

Mark and Wilfred Watterson were owners of the Inyo County Bank and financial leaders in Inyo County. They organized valley residents into a unified opposition through the formation of an irrigation district. When the City proposed a plan that would leave 30,000 acres in the Bishop area free of City purchases, and to promote the construction of a state highway to the area, thereby creating a local tourist economy, the Owens Valley Irrigation District rejected the proposal. On November 16, 1924, Mark Watterson led 60 to 100 people to occupy the Alabama Gates near Lone Pine, closing the LAA1 by opening the emergency spillway. Negotiations ended the occupation and the conflict became completely centered on the issues of farm purchases and reparations to townspeople. Attacks on the LAA1 began again in April 1926, and by the following July, there had been 10 instances of dynamiting. The controversy was at its height when the Watterson's closed all branches of their Inyo County Bank, declaring bankruptcy. Later, they were tried and convicted of 36 counts of embezzlement, an act that severely undermined continued resistance (LADWP 2002).

In response to the collapse of the Owens Valley economy, the City sponsored a series of maintenance and repair programs for LAA1 facilities, stimulating local employment. They also continued to purchase private land holdings and water rights to meet increasing demands and guarantee a constant water supply to the City. This need, together with the fear of continued insurgency, prompted development of an extensive reservoir system, at a sufficient distance from Owens Valley, to provide protection from violent acts to the LAA1. From 1921 to 1929, seven new reservoirs were constructed, including Tinemaha, on the Owens River; Upper San Fernando (Van Norman); St. Francis; Drinkwater; Stone Canyon; Encino; and Hollywood. The City water system was also expanded, incorporating hundreds of miles of new mains and thousands of new service connections (LADWP 2002).

Additional Water Sources

As the City continued its unprecedented growth in the 1920s, Mulholland turned to the Colorado River as a new source of water, beginning four years of survey to find another aqueduct alignment to transport water to the City. In 1925, when the LADWP was established, City voters passed a $2 million bond issue to provide for engineering for the Colorado River Aqueduct. LADWP brought the cities of the region together in 1928 to form a special state district, and an act of the state legislature created the Metropolitan Water District of Southern California (MWD). MWD's purpose was to supply supplemental water to southern California, and in 1931, voters approved a $220 million bond issue for construction of the Colorado River Aqueduct, a 300-mile-long water conveyance system, which was built between 1932 and 1939. Additional facilities were constructed to distribute water to the member agencies and cities, and water reached customers in 1941.

Mono Basin Project

In the 1930s, Los Angeles voters continued to approve financing for water projects and the City soon implemented plans to begin the Mono Basin Project to obtain a larger and more dependable flow of water for the LAA1. The LADWP planned to extend the LAA1 an additional 105 miles north to channel water from Parker, Walker, Lee Vining, and Rush creeks. Permits for diverting these sources had been applied for in 1923. In 1935, the City applied to the Division of Water Resources to construct Grant Lake Dam, south of Mono Lake, to store water from the creeks. The City had also finally acquired the reservoir site at Long Valley, and in 1936, applied to build a dam there. An 11-mile-long tunnel was drilled through Mono Craters to tap the waters of the creeks, increasing the capacity of the LAA1 system 35 percent to about 300-million-gallons per day. Long Valley Dam created Crowley Lake Reservoir, the largest reservoir in the City's water system. To compensate for fish losses from the two dams, the state Fish and Game Commission required the City to fund the Hot Creek Fish Hatchery, one of the most productive hatcheries in the state (LADWP 2002).

Second Los Angeles Aqueduct

Although the City had taken its full Mono Basin entitlement between 1941 and 1970, it established that it could not divert the full amount authorized by the 1940s water rights permits on a long-term basis without constructing additional conveyance facilities downstream from Mono Basin. The Water Rights Board and the Department of Water Resources urged the City to take advantage of its full entitlement or risk the potential that other appropriations might be granted by the Water Rights Board (LADWP 2002). Concurrently, a 1963 U.S. Supreme Court decision allocated more water from the Colorado River to Arizona, reducing MWD's entitlement of water by more than 50 percent. Water provided by MWD was also more expensive than water from the eastern Sierras, given the high-energy costs involved in its delivery. This, in addition to the higher quality of the eastern Sierra water, led to a decision to bring more water from the Owens Valley to Los Angeles via a second aqueduct (LADWP 2002).

After five years of construction (1965–1970), the LAA2 was completed in 1970 at a cost of $89 million. This conduit, measuring 137 miles in length, begins at the southern end of Haiwee Reservoirs and largely parallels the course of the LAA1. Because of improved construction equipment, easier transportation, and the lower cost of steel pipe, the LAA2 was considerably easier to build. It required 64 miles of concrete conduit, 69 miles of steel pipeline, and four miles of other facilities, which collectively added another 50 percent capacity to the system. Both aqueducts provide about half of the City's water supply, with local groundwater basins supplying another 15 percent, and MWD the final 35 percent. From a system of ditches and waterwheels in the 1780s, the City's water system now encompasses many hundreds of miles of aqueducts, pipelines, canals, and 105 reservoirs, including four major reservoirs along the LAA1 and LAA2 systems (LADWP 2002).

Completion of the LAA2, together with the City's plan to augment the flow with groundwater from the Owens Valley, prompted another wave of resistance from Owens Valley residents. The issue focused on groundwater extraction and its impact on the valley environment. In 1970, California passed the CEQA, a law to assist agencies and governments in assessing the impacts of project activities on the environment. Inyo County, concerned about the groundwater issues, sued the City under CEQA, requesting an Environmental Impact Report. Two such reports prepared by the City were rejected by the courts as inadequate, resulting in court actions on both sides of the issue. In 1982, the City and Inyo County took the first steps toward resolution, signing a memorandum of understanding establishing an advisory committee. Agreements were reached providing for long-term management of groundwater, as well as for implementation of numerous enhancement and mitigation projects, some of which continue today. Land management policies were also established, and 80 percent of the 312,000 acres owned by LADWP in the Owens Valley region is leased for farming and ranching activities. The City's land use policies require that 75 percent of these leased lands remain open to the public for recreational use. This policy, along with federal management of public lands in the surrounding areas, has helped preserve much of the remaining natural setting of the region (LADWP 2002).

CHAPTER 3 – CULTURAL RESOURCES STUDIES

This chapter provides an overview of the cultural resources studies conducted within Project APE and their associated archaeological and built environment resources. Included are discussions of the associated records searches, cultural resources inventories and monitoring projects, and limited archaeological testing at select sites.

RECORDS SEARCHES

Between 2003 and 2016, three record searches encompassing the Project APE and adjacent areas were completed in advance of cultural resources inventories conducted by EDAW, Inc. (EDAW), Jones & Stokes Associates (JSA), and URS/AECOM. These record searches were undertaken to identify historically documented archaeological, historical, and architectural resources within a 0.5-mile or 1-mile radius of planned survey areas. National, state, and local inventories of architectural and historic resources were examined to identify significant local historical events and personages, development patterns, and unique interpretations of architectural styles.

The EDAW records search (Shaver 2003) was completed as part of a 425-acre cultural resources inventory of LADWP and BLM lands comprising the Project APE and adjacent areas. This records search, conducted at the Eastern Information Center (EIC), University of California, Riverside, sought to determine the level of past survey and the types of cultural resources recorded within a 1-mile radius of the EDAW survey area. EDAW also contacted the NAHC to obtain information regarding the presence of any known sacred lands or Traditional Cultural Properties in or around the Project area, neither of which was identified by the NAHC. The EDAW records search revealed that three cultural resources surveys (IN-00081, -00170, and -00581) had been undertaken with the Project APE (Table 3-1), with four archaeological sites having been identified (Table 3-2).

JSA (Shaver 2008) conducted a second records search to support the inventory of an additional 469 acres of BLM land as part of Project expansion. This records search, also completed at the EIC, included a 1-mile radius around the expanded boundary. The JSA records search identified that 16 previous cultural resource investigations had been completed within a 1-mile radius of the expansion area, with 9 studies having occurred within the Project APE (IN-00081, -00170, -00581, -00724, -00783, -00838, -00840, -00844, Nilsson et al. 2007; Table 3–1). The records search also revealed nine previously documented archaeological sites within the JSA survey area, including four in the Project APE (Table 3-2).

The 2016 AECOM records search was completed to support the inventory of areas within the Project APE that were not subject to previous inventory (termed supplemental areas). These supplemental areas included: (1) a 64.5-acre parcel of BLM land located in the southwest portion of the APE (Survey Area 5); (2) four small survey parcels (Areas 1-4) along the northern or eastern boundary of the APE; (3) the SCE haul route; and (4) the LAA access road. This records search, conducted as two separate requests, was also completed at the EIC. Both requests focused on a 0.5-mile radius of the four designated areas. The records search identified that 13 previous cultural resource investigations had been conducted within a 0.5-mile radius of the supplemental areas, with 7 of these studies (IN-00081, -00783, -00838, -00840, -00844, -00846, and -01014) having occurred within the Project APE (Table 3–1). The records search also revealed nine previously documented archaeological sites within the JSA survey area on BLM land, including four in the Project Site (Table 3-2).

Table 3-1. Cultural Resources Studies Conducted within 0.5-mile or 1-mile of the Project APE.

EIC Report No.	Report Title and Firm	Report Reference	Report Noted as Part of a Records Search (Reference)	Study Conducted within the Project APE	Study Conducted Specifically for the Project
IN-00081	Archaeological Examination of Five Drill Hole Sites in the Owens Lake/Rose Valley Region, East Central California. Archaeological Research Unit, University of California, Riverside.	Wilke 1979	EDAW 2003 JSA 2008 AECOM 2016	Yes	No
IN-00170	A Cultural Resource Overview of the Eureka, Saline, Panamint, and Darwin Region; East Central California. Regional Environmental Consultants (RECON), San Diego.	Norwood et al. 1979	EDAW 2003 JSA 2008	Yes	No
IN-00208	Archaeological Investigation of the Frandsen Development Parcels, Owens Valley, Inyo County, California. Archaeological Research Services.	Kuffner 1984	JSA 2008	No	No
IN-00241	Negative Archaeological Survey Report, P.M. 30.9/31.3, Route 395, Inyo County, California. Caltrans District 9, Bishop.	Proctor 1986	JSA 2008 AECOM 2016	Yes	No
IN-00242	Archaeological Survey Report for a Proposed Highway Widening Project in Inyo County, California, 9-INY-395, P.M. 26.3/30.9, 09201 -209100. Caltrans District 9, Bishop.	Mone and Proctor 1985	JSA 2008 AECOM 2016	No	No
IN-00303	An Archaeological Survey of the Contel Bishop to Inyo Kern Fiber Optics Line, Inyo and Kern Counties, California. Trans-Sierran Archaeological Research.	Burton 1990	JSA 2008 AECOM 2016	No	No
IN-00462	Cultural Resources Report: Bone Dry Brewery Project near Olancha, Inyo County, California. CRM Tech.	Love 1995	JSA 2008 AECOM 2016	No	No
IN-00501	Negative Archaeological Survey Report-First Supplement Proposal to Construct Drainage Improvements in the Area West of US 395 and North of Summit Creek Wash. Caltrans District 9, Bishop.	Laylander 1996	JSA 2008 AECOM 2016	No	No
IN-00552	Cultural Resources Survey of a Portion of the Former Southern Pacific Mojave-Owenyo Branch Railroad, Inyo and Kern Counties, California. Caltrans District 9, Bishop.	Hall 1992	JSA 2008 AECOM 2016	No	No
IN-00581	An Archaeological and Paleontological Survey of the Olancha Water Development Project, Inyo County, California. Brian F. Smith and Associates.	Smith 1999	EDAW 2003 JSA 2008	Yes	No

Table 3-1. Cultural Resources Studies Conducted within 0.5-mile or 1-mile of the Project APE.

EIC Report No.	Report Title and Firm	Report Reference	Report Noted as Part of a Records Search (Reference)	Study Conducted within the Project APE	Study Conducted Specifically for the Project
IN-00724	Archaeological Survey Report: Cartago-Olancha Four-lane Project, U. S. Route 395 Inyo County, California. California State University, Bakersfield.	Parr et al. 2001	JSA 2008 AECOM 2016	No	No
IN-00783	A Cultural Resources Inventory of a 7.5-mile Segment of the Long Valley-Haiwee Transmission Line, Inyo County, California. URS Corporation, Chico.	Nilsson and Kelly 2006	JSA 2008 AECOM 2016	Yes	No
IN-00838	Cultural Resources Inventory for a 425-Acre Survey at North Haiwee Reservoir, Inyo County, California. EDAW, Inc. San Diego.	Shaver 2003	JSA 2008 AECOM 2016	Yes	Yes
IN-00840	Archaeological Inventory of the First and Second Los Angeles Aqueducts and Selected Access Roads, Kern, Inyo, and Los Angeles Counties, California. URS Corporation, Chico.	Nilsson et al. 2006	JSA 2008 AECOM 2016	Yes	No
IN-00844	Cultural Resources Mitigation and Monitoring Report, Geotechnical Investigations for the North Haiwee Dam No. 2 Project, Inyo County, California. URS Corporation, Chico.	Nilsson 2007	JSA 2008 AECOM 2016	Yes	Yes
IN-00846	Results of a Phase I Archaeological Survey on BLM Land for the North Haiwee Dam Project, Inyo County, California. Jones & Stokes Associates, San Diego.	Shaver 2008	AECOM 2016	Yes	Yes
—	Phase 2 Investigations, Long Valley-Haiwee Transmission Line Project, Inyo County, California. URS Corporation, Chico.	Nilsson et al. 2007	JSA 2008	Yes	No
—	Cultural Resources Monitoring Report, Geotechnical Investigations for the North Haiwee Dam No. 2 Project, Inyo County, California. URS Corporation, Chico.	Nilsson 2010	No	Yes	Yes
—	North Haiwee Dam Seismic Improvement Project Technical Report: Biological and Archaeology Surveys to Support Geotechnical Investigations. URS Corporation, Los Angeles.	URS 2010	No	Yes	Yes
IN-01014	Cultural Resources Monitoring Report, 2011 Geophysical Investigations for The North Haiwee Dam Seismic Improvement Project, Inyo County, California. URS Corporation, Chico.	Nilsson 2011	AECOM 2016	Yes	Yes

Table 3-1. Cultural Resources Studies Conducted within 0.5-mile or 1-mile of the Project APE.

EIC Report No.	Report Title and Firm	Report Reference	Report Noted as Part of a Records Search (Reference)	Study Conducted within the Project APE	Study Conducted Specifically for the Project
—	Comprehensive Cultural Resources Inventory and Monitoring Report for the North Haiwee Dam Seismic Improvement Project, Inyo County, California. URS Corporation, Chico.	Nilsson and Bevill 2015, 2016a	No	Yes	Yes
—	Phase II Archaeological Investigations for the North Haiwee Dam No. 2 Project, Inyo County, California. AECOM, Chico	Nilsson and Bevill 2016b	No	Yes	Yes
—	Cultural Resources Monitoring Letter Report for 16 Soil Bore Locations for the North Haiwee Dam Seismic Improvement Project, Inyo County, California. AECOM, Chico.	Nilsson 2016	No	Yes	Yes

PREVIOUSLY RECORDED RESOURCES

Collectively, the three records searches conducted identified 144 previously recorded resources, consisting of 88 prehistoric, 30 historic-period, and 26 multiple component resources. These 144 resources include 74 archaeological sites, 3 built environment resources, and 67 isolated finds (Table 3-3).

Archaeological sites consist of 35 prehistoric, 13 historic-period, and 26 multiple component properties. The prehistoric sites comprise 27 lithic scatters defined by flaked stone debitage, some with an occasional tool; 3 properties with flaked stone, ground stone and pottery artifacts; 1 lithic scatter with a handstone; 2 lithic scatters with bedrock milling features; 1 locale with a single bedrock milling feature; and 1 area of fire-affected rock.

The historic-period sites consist of late-nineteenth or early-twentieth century properties, including the Southern Pacific Railroad's Owenyo-Mojave branch line; a railroad work camp; a wooden post utility line; water pipeline; the Bernard H. Sears homestead; and a segment of the Three Flags Trail stage road, later referred to as the Los Angeles-Owens River Road and State Highway 23. Other historic-period sites include a four refuse scatters, two bulldozer push scars, and a cobble feature.

The multiple component sites include prehistoric lithic scatters or isolated prehistoric tools as well as historic-period artifacts and features. Such features include a former homestead location, historic reservoir, ore-processing complex, communication line, and several LAA1 labor camps.

Three primary numbers reflect built environment resources, including the LAA and two numbers assigned to the NHD.

Table 3-3. Previously Recorded Resources by Resource Type and Component.

Resource Type	Component			Total
	Prehistoric	Historic	Multiple	
Site	35	13	26	74
Built Environment		3		3
Isolate	53	14		67
Total	88	30	26	144

The 67 isolated finds include 53 prehistoric and 14 historic-period resources. Prehistoric isolates include 44 locations with a single flake or flaked stone tool, 5 locations with 2 flakes, 1 location with 3 flakes, 2 areas with a flake and a projectile point fragment, and 1 locale with 1 millingstone and 2 handstones. The EIC assigned two Primary Numbers to several prehistoric isolates, thus double-counting artifacts. The comments column in Table 3-2 notes this discrepancy.

The historic-period isolates consist of five locations with a wooden post, one well casing, one area with automotive vehicle parts, and seven areas with one or two pieces of refuse. The EIC assigned two Primary Numbers to several historic-period isolates, thus double-counting artifacts. The comments column in Table 3-2 notes this discrepancy.

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-000323	CA-INY-323	Site	Multiple	Prehistoric flaked stone, ground stone, and pottery scatter with bedrock milling features and historic-period rock-lined trail			X	No	
P-14-002242	CA-INY-2242	Site	Prehistoric	Lithic scatter	X			Yes	Site not relocated since originally recorded
P-14-002243	CA-INY-2243	Site	Multiple	Prehistoric flake scatter and historic-period homestead and artifact scatter	X	X	X	Yes	
P-14-004591	CA-INY-4591H	Built Environment	Historic	LAA1	X	X	X	Yes	
P-14-004607	CA-INY-4607	Site	Historic	Southern Pacific's Owenyo-Mojave Branch Railroad			X	No	
P-14-004931	CA-INY-4835	Site	Prehistoric	Lithic scatter			X	No	
P-14-004933	CA-INY-4837	Site	Prehistoric	Lithic scatter			X	No	
P-14-006011	CA-INY-5703	Site	Prehistoric	Lithic scatter	X		X	Yes	
P-14-006995	CA-INY-5953H	Site	Historic	Bernard H. Sears homestead			X	No	
P-14-006996	CA-INY-5954/H	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter, roads, and berms			X	No	
P-14-006998	CA-INY-5956	Site	Prehistoric	Bedrock milling feature			X	No	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-007823	CA-INY-6497	Site	Prehistoric	Lithic scatter			X	No	
P-14-007824	CA-INY-6998	Site	Prehistoric	Lithic scatter			X	No	
P-14-007825	CA-INY-6499	Site	Multiple	Prehistoric lithic scatter and historic-period reservoir, berms, and artifact scatter			X	No	
P-14-007955/ P-14-007956/ P-14-008211	CA-INY-6574	Site	Multiple	Prehistoric lithic scatter and historic-period mining site			X	Yes	
P-14-008212	CA-INY-6575	Site	Historic	Refuse scatter			X	Yes	
P-14-008213	CA-INY-6576	Site	Prehistoric	Lithic scatter			X	Yes	
P-14-008214	CA-INY-6577	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter		X	X	Yes	
P-14-008215	CA-INY-6578	Site	Prehistoric	Lithic scatter			X	Yes	
P-14-008216	CA-INY-6579	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter		X	X	Yes	
P-14-008217	CA-INY-6580	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter and features			X	Yes	
P-14-008218	CA-INY-6581	Site	Prehistoric	Lithic scatter			X	No	
P-14-008219	CA-INY-6582	Site	Multiple	Prehistoric lithic scatter and historic-period communication line		X	X	Yes	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-008220	CA-INY-6583	Site	Multiple	Prehistoric isolate and historic-period artifact scatter			X	Yes	
P-14-008221	CA-INY-6584	Site	Historic	Cobble feature			X	Yes	
P-14-008222	CA-INY-6585	Site	Prehistoric	Lithic scatter			X	No	
P-14-008223	CA-INY-6586	Site	Multiple	Prehistoric flake and historic-period artifact scatter			X	Yes	
P-14-008224	CA-INY-6587	Site	Prehistoric	Lithic scatter			X	Yes	
P-14-008225		Isolate	Prehistoric	One flake			X	Yes	Located within the updated boundary for CA-INY-2243/5703
P-14-008226		Isolate	Prehistoric	One flake			X	Yes	Located within the updated boundary for CA-INY-2243/5703
P-14-008227		Isolate	Prehistoric	One flake			X	Yes	
P-14-008228		Isolate	Prehistoric	Projectile point			X	No	
P-14-008229		Isolate	Prehistoric	One flake			X	Yes	Located within the updated boundary for CA-INY-6932
P-14-008230		Isolate	Prehistoric	One flake and one possible projectile point fragment			X	No	
P-14-008231		Isolate	Prehistoric	One flake and one possible projectile point fragment			X	Yes	Located within the updated boundary for CA-INY-6577
P-14-008232		Isolate	Historic	One glass fragment			X	No	
P-14-008233		Isolate	Prehistoric	One flake			X	Yes	Located within the updated boundary for CA-INY-6577

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-008234		Isolate	Historic	Refuse scatter			X	Yes	Located within the updated boundary for CA-INY-6577
P-14-008235		Isolate	Prehistoric	One flake			X	Yes	
P-14-008236		Isolate	Prehistoric	One flake			X	Yes	Located within the updated boundary for CA-INY-6577
P-14-008237		Isolate	Historic	Vehicle parts			X	Yes	Located within the updated boundary for CA-INY-7616
P-14-008238		Isolate	Prehistoric	One flake			X	Yes	
P-14-008239		Isolate	Prehistoric	One flake			X	Yes	
P-14-008240		Isolate	Prehistoric	One flake			X	Yes	
P-14-008241		Isolate	Prehistoric	One flake			X	Yes	
P-14-008242		Isolate	Prehistoric	One flake			X	Yes	
P-14-008243		Isolate	Historic	Well casing			X	Yes	
P-14-008222	CA-INY-6585	Site	Multiple	Prehistoric lithic scatter and historic-period earthen dam		X	X	No	
P-14-008774	CA-INY-6887	Site	Prehistoric	Lithic scatter and handstone			X	No	
P-14-008819	CA-INY-6931	Site	Multiple	Prehistoric lithic scatter and LAA1 labor camp and road		X	X	No	
P-14-008820	CA-INY-6932	Site	Prehistoric	Lithic scatter		X	X	No	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-008821	CA-INY-6933	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter		X	X	Yes	
P-14-008822	CA-INY-6934	Site	Prehistoric	Lithic scatter and bedrock milling feature			X	No	
P-14-008823	CA-INY-6935	Site	Historic	Refuse scatter			X	No	
P-14-008826	CA-INY-6938	Site	Historic	Refuse scatter			X	No	
P-14-009324		Isolate	Historic	Two tin cans			X	No	
P-14-009325		Isolate	Historic	One tin can			X	No	
P-14-009326	CA-INY-7273	Site	Multiple	Prehistoric lithic scatter with pottery and historic-period artifact scatter			X	No	
P-14-009329	CA-INY-7276	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter			X	Yes	Located within the boundary of CA-INY-6931
P-14-009330		Isolate	Historic	Metal spike and bucket			X	Yes	
P-14-009331		Isolate	Prehistoric	Two flakes			X	Yes	
P-14-009332	CA-INY-7277	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter			X	No	Located within the boundary of CA-INY-6932
P-14-009333	CA-INY-7278	Site	Prehistoric	Lithic scatter			X	Yes	Located within the boundary of CA-INY-6933
P-14-009334	CA-INY-7279	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter and rock ring			X	Yes	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-009335	CA-INY-7280	Site	Multiple	Prehistoric projectile point and historic-period artifact scatter			X	No	
P-14-009336		Isolate	Prehistoric	One flake			X		
P-14-009337	CA-INY-7281	Site	Historic	Artifact scatter			X	No	
P-14-009338		Isolate	Historic	Can and metal object			X		
P-14-010007	CA-INY-7615	Site	Prehistoric	Flaked stone, ground stone, and pottery scatter			X	Yes	
P-14-010008	CA-INY-7616	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter			X	Yes	
P-14-010081	CA-INY-7665	Site	Prehistoric	Fire-affected rock			X	No	
P-14-010082	CA-INY-7666	Site	Historic	Bulldozer push scar and wooden post			X	No	
P-14-010083	CA-INY-7667	Site	Historic	Bulldozer push scar			X	No	
P-14-010084	CA-INY-7668	Site	Prehistoric	Lithic scatter			X	No	
P-14-010085	CA-INY-7669	Site	Prehistoric	Lithic scatter			X	No	
P-14-010086		Isolate	Historic	Wooden post			X	No	
P-14-010087		Isolate	Historic	Wooden post			X	No	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-010088		Isolate	Historic	Wooden post			X	No	
P-14-010089	CA-INY-7670	Site	Prehistoric	Lithic scatter			X	No	
P-14-010090	CA-INY-7671	Site	Prehistoric	Lithic scatter			X	No	
P-14-010091		Isolate	Historic	Wooden post			X	No	
P-14-010092		Isolate	Prehistoric	One flake			X	Yes	
P-14-010093		Isolate	Prehistoric	One flake			X	Yes	
P-14-010094		Isolate	Prehistoric	One flake			X	No	
P-14-010095		Isolate	Prehistoric	One projectile point			X	No	
P-14-010096		Isolate	Prehistoric	One flake			X	No	
P-14-010097		Isolate	Prehistoric	Two flakes			X	Yes	
P-14-010098		Isolate	Prehistoric	One flake			X	No	
P-14-010099		Isolate	Prehistoric	Two flakes			X	No	
P-14-010100		Isolate	Prehistoric	One flake			X	No	
P-14-010101		Isolate	Historic	One bottle			X	No	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-010102		Isolate	Prehistoric	One flake			X	Yes	
P-14-010103		Isolate	Prehistoric	One flake			X	Yes	
P-14-010104		Isolate	Prehistoric	One flake			X	Yes	
P-14-010105		Isolate	Prehistoric	Two flakes			X	Yes	
P-14-010106		Isolate	Prehistoric	One flake			X	Yes	
P-14-010211	CA-INY-7718	Site	Prehistoric	Lithic scatter			X	No	
P-14-010212	CA-INY-7719	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter			X	No	
P-14-010213	CA-INY-7720	Site	Prehistoric	Lithic scatter			X	No	
P-14-010214	CA-INY-7721	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter and rock feature			X	No	
P-14-010215	CA-INY-7722	Site	Prehistoric	Lithic scatter and bedrock milling stations			X	No	
P-14-010216	CA-INY-7723	Site	Prehistoric	Lithic scatter			X	No	
P-14-010217	CA-INY-7724	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter			X	No	
P-14-010218	CA-INY-7725	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter			X	No	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-010219	CA-INY-7726	Site	Prehistoric	Lithic scatter			X	No	
P-14-010220	CA-INY-7727	Site	Prehistoric	Lithic scatter			X	No	
P-14-010222		Site	Historic	Wooden utility line and artifact scatter			X	No	
P-14-010223	CA-INY-7729	Site	Prehistoric	Lithic scatter			X	No	
P-14-010224	CA-INY-7730	Site	Prehistoric	Lithic scatter			X	No	
P-14-010225	CA-INY-7731	Site	Historic	Southern Pacific Owenyo-Mojave Branch work camp			X	No	
P-14-010226	CA-INY-7732	Site	Multiple	Prehistoric flake stone, ground stone and pottery scatter with milling features. Historic-period artifact scatter			X	No	
P-14-010227	CA-INY-7733	Site	Prehistoric	Flaked stone, ground stone and pottery scatter			X	No	
P-14-010228	CA-INY-7734	Site	Prehistoric	Flaked stone, ground stone and pottery scatter			X	No	
P-14-010229	CA-INY-7735	Site	Multiple	Prehistoric lithic scatter and historic-period artifact scatter with features			X	No	
P-14-010295	CA-INY-7816	Site	Historic	Three Flags Trail stage road; Los Angeles-Owens River Road; Highway 23			X	Yes	
P-14-010302	CA-INY-7806	Site	Historic	Water pipeline			X	No	

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-010488		Isolate	Prehistoric	One millingstone and two handstones			X	No	
P-14-012158	CA-INY-9343	Site	Prehistoric	Lithic scatter			X	Yes	
P-14-012161	CA-INY-9346	Site	Prehistoric	Lithic scatter			X	Yes	
P-14-012162	CA-INY-9347	Site	Prehistoric	Lithic scatter			X	Yes	
P-14-012163		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012934
P-14-012165		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012936
P-14-012166		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012937
P-14-012167		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012938
P-14-012168		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012939
P-14-012169		Isolate	Prehistoric	One biface fragment			X	Yes	Located in Site CA-INY-6578/6579
P-14-012178		Built Environment	Historic	North Haiwee Dam			X	Yes	Same as P-14-012887
P-14-012271		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012933
P-14-012273		Isolate	Prehistoric	One flake			X	Yes	
P-14-012887		Built Environment	Historic	North Haiwee Dam			X	Yes	Same as P-14-012178

Table 3-2. Previously Recorded Cultural Resources Identified by the Record Searches.

Primary No.	Trinomial	Resource Type	Component Age	Resource Description	Record Search Reference			In the Project APE?	Comments
					Shaver 2003	Shaver 2008	AECOM 2016		
P-14-012927		Isolate	Prehistoric	Crescent tool			X	Yes	
P-14-012928		Isolate	Prehistoric	Two flakes			X	Yes	
P-14-012929		Isolate	Prehistoric	Three flakes			X	Yes	
P-14-012930		Isolate	Prehistoric	One flake			X	Yes	
P-14-012931		Isolate	Historic	Wooden post claim marker			X	Yes	
P-14-012932		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012273
P-14-012933		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012271
P-14-012934		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012163
P-14-012935		Isolate	Prehistoric	One flake			X	Yes	
P-14-012936		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012165
P-14-012937		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012166
P-14-012938		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012167
P-14-012939		Isolate	Prehistoric	One flake			X	Yes	Same as P-14-012168
P-14-012940		Isolate	Prehistoric	One biface			X	Yes	Same as P-14-012169

PREVIOUS CULTURAL RESOURCES STUDIES

The combined record searches identified that 17 previous cultural resources studies have been conducted within a 0.5-mile or 1-mile radius of the Project Site (Table 3-1). Of these, seven studies (IN-00208, -00242, -00303, -00462, -00501, -00552, and -00724) were undertaken outside the Project APE. Ten additional studies examined areas within the Project APE (IN-00081, -00170, -00241, -00581, -00783, -00838, -00840, -00844, -00846, -01014), including four studies conducted specifically for the Project (IN-00838,-00844, -00846, and -01014). In addition, Phase 2 archaeological investigations were conducted for the Long Valley-Haiwee Transmission Line Project (Nilsson et al. 2007), including three sites in the Project APE. This report has not received an EIC report number and it was not listed in AECOM's 2016 records search results.

Six additional cultural resources studies have been completed for the Project, each encompassing portions of the Project APE. These studies were not included within the 2016 records search results, and have been added to Table 3-1 to provide a comprehensive list of previously conducted studies. These studies include three geotechnical monitoring projects conducted by URS Corporation (URS) or AECOM within the Project APE (Nilsson 2010, 2016; URS 2010), Phase II investigations (Nilsson and Bevill 2016b), and two comprehensive reports summarizing inventory, limited testing, and monitoring projects conducted specifically for the Project (Nilsson and Bevill 2015, 2016a). Although the results are pending, one additional Phase II investigation was conducted in 2016 and 2017, a summary of which is also provided.

Presented below, in two sections, are summaries of the cultural resources studies conducted within the Project APE between 2003 and January 2017. The first section, entitled *Non-North Haiwee Dam Related Projects*, discusses the studies that, while occurring within the Project APE, are not associated with the Project. The second section, entitled *North Haiwee Dam Projects*, focuses on the investigations conducted within the Project APE in direct support of proposed Project activities. Figure 3-1 provides a map depicting the location of the various cultural resources inventories completed within the Project APE, which has received 100 percent coverage.

Non-North Haiwee Dam Related Projects

In 1979, Regional Environmental Consultants (RECON; Norwood et al. 1979) surveyed a small segment of the southern portion of the Project APE as part of a statistical sampling survey for the BLM of the Eureka, Saline, Panamint, and Darwin regions. This survey identified two sites within the Project APE: CA-INY-2242 and CA-INY-2243. The first site, CA-INY-2242, was recorded as a dense, prehistoric lithic scatter, of about 150 flakes in a 20-x-5-m area (Farrell 1977a). CA-INY-2243 was documented as an early twentieth-century historic homestead and one prehistoric obsidian flake (Farrell 1977b). Cultural remains at this latter site included a well and cabin foundation with associated refuse, the latter consisting of wood, glass, metal, ceramic, tin cans, and nails (Farrell 1977b).

Also in 1979, Philip J. Wilke conducted a cultural resources inventory of five drilling locations in the Owens Lake/Rose Valley area (Wilke 1979). One of the five locations was on the eastern terrace of the Project APE; however, no cultural resources were noted at that time.

In 1986, Caltrans (Proctor 1986) conducted a cultural resources inventory of a segment of State Highway 395 between milepost 30.9 and 31.3. This segment, which began at the intersection of the LAA1 and Highway 395, proceeded south for a distance of 0.4 mile to the North Haiwee Road. No cultural resources were identified during the survey.

Brian F. Smith and Associates (Pierson 1999a; Smith 1999) revisited CA-INY-2243 in January 1999 as part of the Olancha Water Development Project, a pipeline alignment survey along Cactus Flats Road. This survey (Pierson 1999b) identified a widely dispersed prehistoric lithic scatter (CA-INY-5703) about 200 m northwest of CA-INY-2243.

In 2002, URS conducted an archaeological inventory of the LAA1 and LAA2 systems and selected access roads that focused on portions within the BLM Ridgecrest Field Office area (Nilsson et al. 2006). This corridor survey extended for 113 miles from Olancha, in Inyo County, to the Kern/Los Angeles County line. The inventory identified 188 archaeological sites, including two sites within the Project APE: CA-INY-2243/5703 and CA-INY-4591H, the Inyo County segment of the LAA1.

In 2006, URS conducted a 7.5-mile-long archaeological survey of the Long Valley-Haiwee Transmission Line, part of which crossed the western margin of the Project APE (Nilsson and Kelly 2006). This survey recorded 33 prehistoric and historic-period sites, three of which (CA-INY-6931, CA-INY-6932, and CA-INY-6933) are within the Project APE. Site CA-INY-6931 was identified as a LAA1 construction labor camp (1907–1913), as defined by a scatter of metal, glass, and shell artifacts, as well as faunal remains, contained within three primary concentrations. Site CA-INY-6932 was recorded as a sparse prehistoric lithic scatter containing at least 40 obsidian core and biface reduction flakes. Site CA-INY-6933, a multiple component property, included a large, sparse prehistoric lithic scatter and a small historic-period artifact deposit. The prehistoric component contained at least 50 obsidian and 1 CCS flake, as well as 1 Type 2 obsidian biface, 1 obsidian Rose Spring Corner-notched projectile point, 1 obsidian split-stem projectile point, and 1 schist ovate-shaped bifacial tool. The historic-period component included glass insulators, numerous evaporated/condensed milk cans, large sanitary cans, and a cigarette tin. The historic-period artifacts were noted as likely associated with the 1927 construction of the Long Valley-Haiwee Transmission Line Nilsson and Kelly 2006:35–36).

In 2007, URS undertook limited Phase II investigations at 23 sites associated with the Long Valley-Haiwee Transmission Line Project (Nilsson et al. 2007). Included among the sites were CA-INY-6931, CA-INY-6932, and CA-INY-6933. Site CA-INY-6931 was recommended eligible for inclusion to the NRHP as a contributing element to the First Los Angeles Historical Archaeological District (FLAAHAD) (Nilsson et al. 2006; Nilsson et al. 2007). The study concluded that sites CA-INY-6932 and CA-INY-6933 were not eligible for the NRHP due to a lack of data potential (Nilsson et al. 2007).

North Haiwee Dam Projects

EDAW Cultural Resources Inventory (2002 to 2003)

Cultural resources studies for the Project were initiated by EDAW in 2002 to support the first phase of geotechnical investigations. These investigations were designed to examine 7 trench locations, 53 soil borings, and installation of 17 observation wells, with access roads and laydown areas near the proposed NHD2 site. The cultural resources study (Shaver 2003) focused on inventory of 425 acres of land north of the existing Dam, including 332 acres owned by the LADWP and 103 acres administered by the BLM (Figure 3-1). The inventory identified 14 newly recorded archaeological sites, additional observations at 2 previously identified sites, and discovery of 19 isolated artifacts or artifact clusters (Table 3-4). The 14 newly identified sites included 3 historic-period sites, 5 prehistoric sites, and 6 multiple component sites. The isolated finds consisted of prehistoric lithic debitage and historic bottles and car parts. In addition, the survey revealed that previously recorded sites CA-INY-2243 and CA-INY-5703 were linked by a low-density artifact scatter. The boundaries of these two sites were expanded to include 15 distinct cultural loci covering an area measuring 1,050 by 60 m. The merger of these properties resulted in the adoption of a new designation for these combined sites: CA-INY-2243/5703. Based on preliminary assessment, which was derived from surface observations, all sites were noted as potentially significant resources (Shaver 2003). EDAW recommended that sites be avoided, where feasible. Where this was not possible, it was suggested that impacts from the proposed geotechnical borings on LADWP property could be reduced to a less than significant level through archaeological and Native American monitoring to avoid artifact concentrations and features (Shaver 2003). EDAW also recommended that if Project components could not be sited to avoid the noted resources, then Phase 2 evaluations would be needed before ground disturbance occurred (Shaver 2003).

URS Cultural Resources Inventory and Site Monitoring (2006)

In 2004, the LADWP developed a Mitigation Monitoring and Reporting Program (MMRP) for the Project. The MMRP specified completion of four tasks to avoid or minimize damage to cultural resources during geotechnical

investigations. These tasks included: (1) conduct of additional pedestrian survey of trenching, boring, and well locations in areas outside of previously surveyed locales; (2) flag for avoidance all archaeological site boundaries near proposed areas of subsurface disturbance (trenching and boring locations); (3) conduct of limited shovel testing within site boundaries at soil borings, observation wells, trenches, and access roads; and (4) an on-site archaeological monitor during ground-disturbing activities within the boundaries of recorded sites. In May 2005, URS was retained to conduct these four tasks, and field investigations followed in June 2006 with the onset of geotechnical investigations (Nilsson 2007).

JSA Cultural Resources Inventory (2007)

The LADWP's 2006 geotechnical trenching investigations discovered a series of potentially active faults on the eastern shore of NHR, about 0.5-mile north of the existing Dam. This finding prompted LADWP to determine that additional studies were needed, resulting in a program of seismic reflection and refraction surveys to investigate the depth of the faulting. Two cultural resources studies were conducted in association with the seismic reflection survey. The first study, completed in 2007, consisted of a cultural resources inventory by JSA, which focused on 469 acres of BLM-administered land along the western and eastern edges of the Project APE and beyond (Shaver 2008) (Figure 3-1). The second study was a cultural resources inventory and monitoring program conducted by URS in 2008 and 2009 (Nilsson 2010), the results of which are presented below in the section entitled *URS Cultural Resources Monitoring 2008 and 2009*.

JSA's 2007 inventory was conducted to support additional geophysical surveys that would be needed for construction of NHD2 and the realignment of the LAA1 channel. Based on the result of the JSA records search, at least 50 acres of the 469 acres proposed for archaeological survey had been surveyed within the past five years (Shaver 2008). Since the previous investigations were considered adequate, these 50 acres were not resurveyed; the remaining 419 acres, consisting of both BLM land and LADWP land was inventoried.

The proposed geophysical studies would focus on examination of four seismic survey lines (Lines 1–4), with three of these originating on LADWP land and extending along a roughly straight axis outward onto BLM land. The survey documented 11 isolated finds and 7 new archaeological sites. Additional features and artifacts were observed at three previously recorded sites (CA-INY-6931, CA-INY-6932, and CA-INY-6933), necessitating the preparation of updated site record forms for these properties.

The 11 isolated artifacts consisted of six locations with obsidian or cryptocrystalline silicate (CCS) flakes (JSA-WE-3i, -5i, -6i, -7i, -8i, and -11i), one obsidian stemmed projectile point (JSA-WE-4i), one amethyst medicine bottle (JSA-WE-10i), and three locations with wooden post markers (JSA-WE-10Hi, -11Hi, and -12Hi). All isolates lacked association with other artifacts, cultural features, or deposits and offered no data potential other than each artifact's physical description. Therefore, the isolates were recommended as not eligible for listing in the CRHR or NRHP (Shaver 2008).

Two historic-period sites were identified on BLM land, CA-INY-7666 and CA-INY-7667H, both representing bulldozer cuts. Based on site type and surface characteristics, the presence of a subsurface component at each of the identified historic-period sites was viewed as unlikely. It was noted, however, that each site appeared to retain integrity, although little gain was anticipated from a formalized testing program. Instead, archival research was suggested to ascertain data not obtained through a testing program (Shaver 2008).

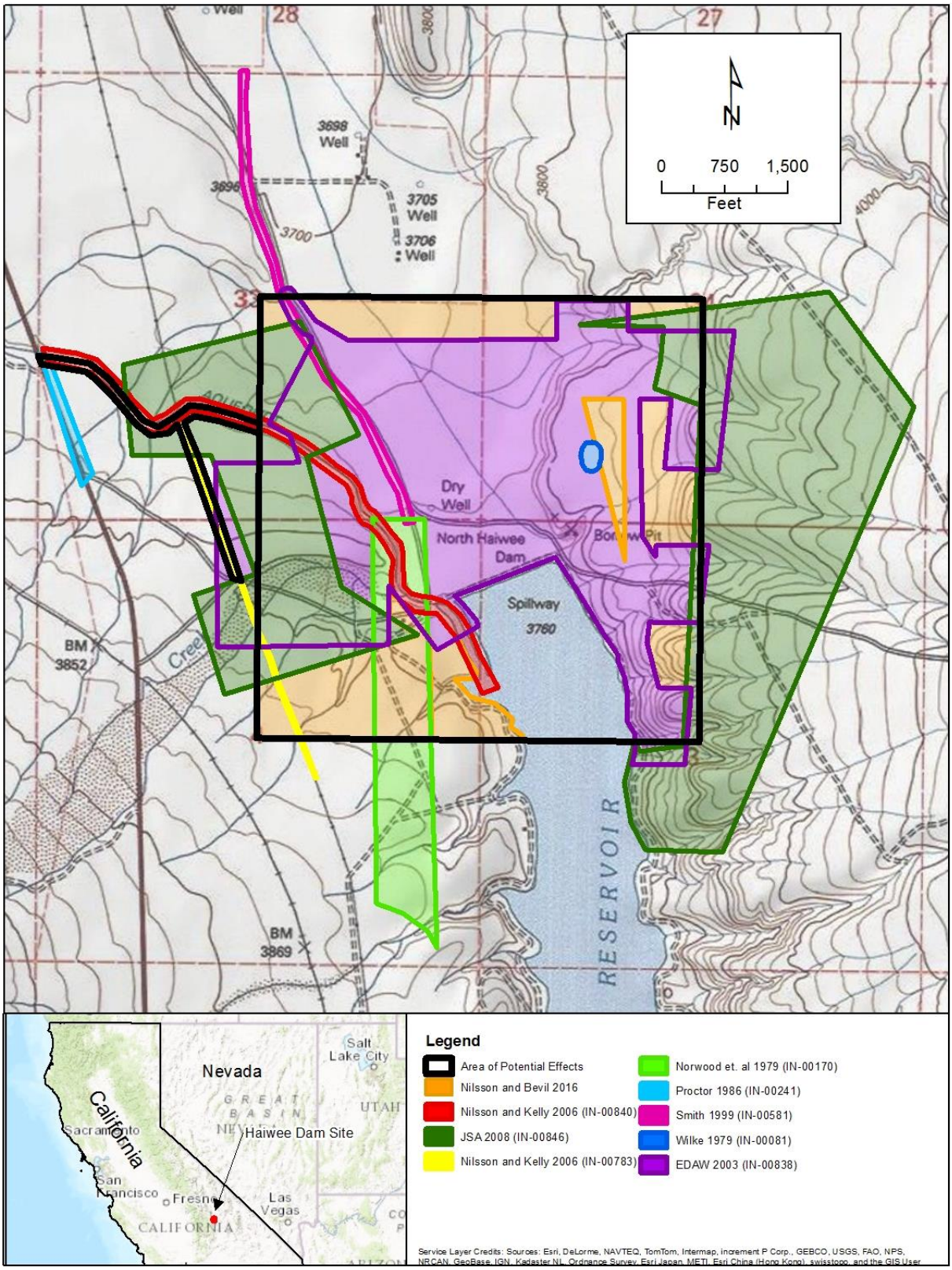


Figure 3-1. Cultural resources inventories conducted within the Project APE.

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Table 3-4. Summary of Project-related Inventories, Monitoring, and Limited Testing Studies Conducted within the Project APE.

Project Component	Firm/Year	Cultural Resources Task	Land Ownership	New Resources Identified	Previously Recorded Sites Updated	New Isolated Finds Identified	Report Reference
Geotechnical Investigations	EDAW 2002	425-acre survey	LADWP (332 acres); BLM (103 acres)	CA-INY-6574 CA-INY-6575H CA-INY-6576 CA-INY-6577 CA-INY-6578 CA-INY-6579 CA-INY-6580H CA-INY-6581 CA-INY-6582 CA-INY-6583H CA-INY-6584 CA-INY-6585 CA-INY-6586 CA-INY-6587	CA-INY-2243/5703 CA-INY-4591H	19	Shaver 2003
Geotechnical Investigations	URS 2006	Monitoring and limited shovel testing	LADWP and BLM	CA-INY-7615 CA-INY-7616	CA-INY-2243/5703	0	Nilsson 2007
Geotechnical Investigations	JSA 2007	419-acre survey	BLM (369 acres)	CA-INY-7665 CA-INY-7666H CA-INY-7667H CA-INY-7668 CA-INY-7669 CA-INY-7670 CA-INY-7671	CA-INY-6931 CA-INY-6932 CA-INY-6933	11	Shaver 2008
Geophysical Investigations	URS 2008 and 2009	Monitoring	LADWP	CA-INY-9342	CA-INY-2243/5703 CA-INY-6577 CA-INY-6931 CA-INY-7615	0	Nilsson 2010
Geotechnical Investigations	URS 2010	20-acre survey	LADWP	None	None	3	URS 2010

Table 3-4. Summary of Project-related Inventories, Monitoring, and Limited Testing Studies Conducted within the Project APE.

Project Component	Firm/Year	Cultural Resources Task	Land Ownership	New Resources Identified	Previously Recorded Sites Updated	New Isolated Finds Identified	Report Reference
Geophysical Investigations	URS 2011	Monitoring	LADWP	None	CA-INY-2243/5703 CA-INY-6574	4	Nilsson 2011
Geophysical and Geotechnical Investigations	URS 2012 URS 2013	Monitoring and limited testing	LADWP and BLM	CA-INY-9343 CA-INY-9344 CA-INY-9345 CA-INY-9346 CA-INY-9347	CA-INY-2243/5703 CA-INY-6574 CA-INY-6582 CA-INY-6578/6579 CA-INY-7615	8	Nilsson and Bevill 2015, 2016
Cultural Resources Inventory	AECOM 2016	Supplemental APE survey	LADWP and BLM	DD-01 DD-02 DD-03 DD-04 JA-1 JA-02 JM-01/RB-01 MK-01 RB-03 RB-04 RB-05	CA-INY-6581 CA-INY-6931 CA-INY-6933/7278 CA-INY-7279 CA-INY-7616 CA-INY-7816	13	This report
Geotechnical Investigations	AECOM 2016	Monitoring	LADWP				Nilsson 2016

BLM – Bureau of Land Management, EDAW – EDAW, Inc., JSA – Jones & Stokes Associates, LADWP – Los Angeles Department of Water and Power, URS – URS Corporation.

Five prehistoric sites were identified on BLM land, including a hearth feature (CA-INY-7665) and four lithic scatters (CA-INY-7668, CA-INY-7669, CA-INY-7670, and CA-INY-7671). The hearth site, while partially dispersed, was viewed as having the ability to contribute information regarding regional settlement and activity patterns of the aboriginal inhabitants. Although sparse, the four lithic scatter assemblages were considered to have the potential to yield additional information regarding prehistoric activity patterns. As such, these sites were recommended as qualifying for study under the State of California's Archaeological Resource Identification and Data Acquisition Program (CARIDAP) (Shaver 2008).

The two previously recorded multiple component sites (CA-INY-6931 and CA-INY-6933) exhibited broad-based assemblages for both historic-period and prehistoric artifacts. The historic-period assemblages appeared to be associated with LAA1 construction labor camps. Since construction efforts at Haiwee Reservoirs lasted for a longer timeframe than individual sections of the LAA1, such labor camps were considered to illustrate a unique resource. Furthermore, the prehistoric artifacts observed in these broad lithic scatters were seen as contributing additional information regarding regional prehistoric activity and discard patterns (Shaver 2008).

Recommendations were made for nine archaeological sites on or near BLM property that might be affected by the proposed geotechnical investigations. These recommendations included three options: (1) monitor to avoid; (2) move to avoid; and (3) avoid on BLM property. Sites CA-INY-6585, CA-INY-6932, CA-INY-6933, and CA-INY-7615 were recommended as move to avoid, indicating a high risk of impact, and that the Project would likely result in adverse effects to the property if the resource could not be moved. Sites CA-INY-6579 and CA-INY-7665 were recommended as monitor to avoid, indicating medium risk of Project effects. Two sites, CA-INY-2243/5703 and CA-INY-4591H, were recommended as avoid on BLM property, indicating a high risk for Project effect to these sites if avoidance was not possible. The study concluded with a recommendation that an archaeological monitor be present during the course of all geophysical and geotechnical investigations to ensure that identified sites on BLM or LADWP lands would not be inadvertently affected by Project activities (Shaver 2008).

URS Cultural Resources Monitoring (2008 and 2009)

In December 2008 and March 2009, LADWP undertook seismic reflection and refraction surveys of five lines (Line 1–5) within the Project Site. These lines traversed six previously recorded archaeological sites: CA-INY-2243/5703, CA-INY-4591H, CA-INY-6574, CA-INY-6575, CA-INY-6577, and CA-INY-6585. In keeping with the Project's MMRP, URS conducted several tasks to avoid or minimize damages these sites. These tasks included: (1) pedestrian inventory of each seismic line before laydown and reflection and refraction surveys; (2) flag for avoidance any artifact concentrations or features near the seismic lines and propose an alternate line path; and (3) on-site archaeological monitoring during seismic survey activities within the boundaries of the recorded sites.

Before initiating the seismic surveys, a pedestrian cultural resources inventory was conducted along the entire extent of each line following the proposed centerline of the geophone line to identify artifact concentrations that might be within the route of the seismic work. Additionally, all access roads leading to the geophone locations were inventoried. The inventory resulted in the identification and recordation of four new artifact concentrations within CA-INY-2243/5703 (Locus R, S, T, and U); expansion of boundaries for CA-INY-6578/6579; and the re-recordation of CA-INY-6577 based upon expanded site boundaries (Nilsson 2010).

Monitoring measures included flagging the full extent of the artifact concentration to ensure avoidance, relocating or offsetting geophone locations, and flagging of alternate access roads to minimize surface disturbance to noted resources. The geophysical seismic surveys resulted in minor disturbance to archaeological sites. Site integrity was maintained by conducting inventory of the seismic lines and travel routes before use to minimize effects and by avoidance of artifact concentrations. In general, disturbance was limited to the placement of geophones and wooden stakes, tire tracks (2 to 3 in. deep), and soil compression.

The report (Nilsson 2010) noted that the existing Dam was an engineering feature associated with the LAA1, a National Historic Civil Engineering Landmark. Although construction of the proposed NHD2 would not require removal of the historic NHD, aspects of its integrity would likely be affected, including its setting, feeling, and

association. To ensure that CEQA and NRHP requirements would be met, it was recommended that the existing Dam be evaluated for inclusion in the CRHR and NRHP and that a determination of effect be assessed.

URS Cultural Resources Inventory (2010)

In August 2010, URS conducted an archaeological inventory on LADWP land to support the preparation of an addendum to the Mitigated Negative Declaration for the Project's geotechnical investigations (URS 2010). The survey focused on investigation of three seismic lines (Line 6, Line 7 extension, and Line 8 extension) all located along the eastern edge of NHR. Additionally, four proposed trench locations were inventoried including Trench 4A, 4B, 4C, and 4E. These inventories discovered three new prehistoric isolated finds, including a lunate, crescent-shaped obsidian tool (HW-ISO-1); two obsidian flakes (HW-ISO-2); and three obsidian flakes (HW-ISO-3). It was recommended that an archaeological monitor be retained during conduct of the geotechnical investigations, which resulted in the implementation of the activities detailed in the following section, entitled *2011 URS Cultural Resources Monitoring***.**

URS Cultural Resources Monitoring (2011)

In February 2011, URS conducted an additional phase of archaeological inventory and monitoring of geophysical survey activities on LADWP land within the Project Site (Nilsson 2011). The geophysical work included the collection of high-resolution, seismic reflection and refraction data along three lines (Line 6, Line 7 extension, and Line 8 extension) inventoried by URS the previous year. Based on the results of previous cultural resources inventories (Norwood et al. 1979; Shaver 2003), two archaeological sites would be crossed by the 2011 activities. These sites included CA-INY-2243/5703, an extensive multiple component property (Line 8), and CA-INY-6574, a historic ore processing complex and borrow site associated with construction of NHD.

To minimize disturbances to these two sites, the cultural resources monitoring program focused on three principal tasks, including (1) pedestrian inventory of each seismic line before laydown and reflection and refraction surveys; (2) flag for avoidance any artifact concentrations or features near the seismic lines and propose an alternate line path; and (3) on-site archaeological monitoring during seismic survey activities within the boundaries of the recorded sites.

Before initiating the seismic surveys, a pedestrian archaeological inventory was conducted following the centerline of the proposed geophone lines. The inventory allowed for viewing of 15 m (45 ft.) on either side of centerline, for a total survey corridor measuring 30 m wide. Additionally, all-terrain vehicle (ATV) access roads leading to the geophone locations were inventoried.

While the entire Project Site had been previously surveyed (Shaver 2003, 2008), the 2011 URS inventory focused on identifying artifact concentrations that might be within the proposed route of the seismic lines. If these or other areas of potential concern were found, avoidance measures were developed and implemented to minimize impacts to noted resources. These measures included flagging the full extent of the artifact concentration to ensure avoidance, relocating or offsetting geophone locations, and flagging of alternate access roads to minimize surface disturbance to noted resources. On occasion, slight deviations in the seismic lines were also made, under the direction of the biological monitor, to avoid animal burrows.

The URS inventory resulted in the identification and recordation of two new artifact concentrations within CA-INY-2243/5703 (Locus V and W) and the addition of a prehistoric component (Locus D) to CA-INY-6574. Site boundaries were expanded for both sites based on these revisions. Additionally, four isolated finds were found outside the boundaries of either CA-INY-2243/5703 or CA-INY-6574, but within the larger Project area. These finds include three individual obsidian flakes (ISO-2011-1, ISO-2011-2, and ISO-2011-3) and a group of one standing and two collapsed wooden post claim markers (ISO-2011-4).

The 2011 seismic surveys resulted in minor impact to the two previously recorded archaeological sites. Site integrity was maintained by conducting inventory of the seismic lines and travel routes before use to minimize

effects and by avoidance of artifact concentrations. In general, disturbance was limited to the placement of geophones, wooden stakes, and tire tracks only within Locus O of CA-INY-2243/5703; all other site loci were avoided.

The URS monitoring report (Nilsson 2011) noted that cultural resources investigations for the Project area had focused on identification, recordation, and mitigation of effects to known archaeological sites because of geophysical investigations. It was recommended that if the Project required additional geophysical or geotechnical investigations, then archaeological inventory and monitoring of new activities should be conducted to comply with the Project MMRP. If the Project proceeded to include construction of NHD2 and realignment of the LAA1 channel, then additional cultural resources investigations would be required to meet CEQA and/or NHPA guidelines. It was recommended that such studies should include CRHP and/or NRHP Phase II evaluation of sites that would be affected by Project activities. Depending upon the results of the Phase II study, Phase III data recovery investigations were noted as possibly warranted for unavoidable historic properties.

The report also indicated that the existing Dam was an engineering feature associated with the LAA1, which was designated a National Historic Civil Engineering Landmark in 1971. Although construction of the proposed NHD2 would not require removal of the historic NHD, aspects of its integrity would likely be affected by the Project, including features such as setting, feeling, and association. To ensure that CEQA and NHPA requirements are met, it was recommended that the existing Dam be evaluated for inclusion in the CRHP and NRHP, and that a determination of effect to this engineering feature be assessed. Construction of the proposed NHD2 would require relocation of the LAA1 canal, which forms part of the larger National Historic Civil Engineering Landmark designation for this LAA1 system. Thus, it also was recommended that the LAA1 segment within the Project area be assessed for CRHP and NRHP eligibility and that appropriate mitigation measures be developed.

AECOM Comprehensive Cultural Resources Inventory and Monitoring Report

In 2015, URS prepared a comprehensive report summarizing the results of cultural resources studies conducted in support of the Project between 2002 and 2014 (Nilsson and Bevill 2015), including areas both within and outside the current Project APE. This report was updated in 2016 to provide a summary of cultural resources studies conducted only within the Project Site area (Nilsson and Bevill 2016a). Elements included within both reports included studies conducted before 2012 for which reports existed, as well as studies conducted after 2012 which were being newly reported. The latter studies are summarized below, as the former are reflected in the project-specific discussions provided above.

URS Geotechnical and Geophysical Investigations (2012 and 2013)

The LADWP's 2012 and 2013 field investigations involved the completion of various geophysical and geotechnical tasks focused on providing additional information to ensure that the proposed NHD2 is designed and constructed safely. Geophysical work included conduct of seismic reflection and refractions surveys for Lines 9, 10, and 11. In keeping with the Project's MRRP, URS conducted several tasks to avoid or minimize damages to archaeological sites through which work would directly proceed. Such tasks initially included: (1) pedestrian inventory of geophysical study area before work was conducted; (2) flag for avoidance any artifact concentrations or features near the work area, including identifying an alternate line path for the work; and (3) on-site archaeological monitoring during work activities conducted within the boundaries of the recorded sites. These tasks were subsequently expanded to include limited subsurface archaeological testing at three sites on BLM land (CA-INY-6578/6579, CA-INY-6582, and CA-INY-9347) and two sites on LADWP land (CA-INY-2243/5703 and CA-INY-7615) where geotechnical investigations would be conducted within site boundaries (Nilsson and Bevill 2015). Finally, during the trench monitoring at CA-INY-2243/5703, a deeply buried cultural deposit was exposed, which required the conduct of additional archaeological testing (Nilsson and Bevill 2015). The geophysical seismic reflection and refraction inventory for Lines 9, 10, and 11 identified three new archaeological sites (CA-INY-9343, -9345, and -9346) seven isolated obsidian or basalt flakes. A new locus (Locus E) was added to previously recorded site CA-INY-6574.

Geotechnical tasks consisted of work designed to complete (1) drilling of remaining bucket auger holes, mud rotary boreholes, and test pits on BLM land and LADWP property; and (2) fault investigation work focused on trench excavations on LADWP land. Overall, URS monitored 169 drilling locations and 15 fault investigation trenches that were excavated on both LADWP and BLM land. These activities were conducted within select areas of CA-INY-2243/5703, CA-INY-6574, and CA-INY-7615.

All proposed geotechnical work areas, including seismic recording lines, cone penetration test (CPT) lines, sonic drill boreholes, and trenches with associated access routes and spoils piles were surveyed in 1 to 2 m wide pedestrian transects. The seismic recording lines and CPT lines had corridors surveyed to a margin at least 15 m on each side of their respective centerlines. Artifacts noted during the survey were flagged with pinflags. Upon completion of the individual surveys, all prehistoric and historic artifacts observed within the surveyed area were documented.

During the course of the 2012 LADWP field investigations, URS monitored excavation of 15 fault investigation trenches in the basin area north of the existing Dam, or others bordering the eastern edge of NHR. Trench excavations were made in three areas referred to as the "NHD2 Axis Area," "Fault A Trench Area," and "Quarry". URS conducted a pre-excavation pedestrian survey of each trench corridor to include 15 m on both sides of centerline. Cumulatively, 3,029-linear-feet of trenches were inventoried. Following the survey, URS monitored all trench excavations, including most backfilling efforts.

In the NHD2 Axis Area, fault investigation trenching was performed across the width of the basin, within the young valley alluvium to depths of about 15 ft. bgs. This depth was approximately at the top of groundwater. Three trenches, Trench 12-5a, 12-5b, and 12-5c, were excavated, each along the corridor for the proposed NHD2. The trenches traversed southwest/northeast across the southern portion of CA-INY-2243/5703, specifically within Locus A/B (Trench 12-5a and 12-5b) and Locus D/W (Trench 12-5c). Before trench excavation, URS conducted a pedestrian surface survey of the various trench corridors. For the Trench 12-5 (a, b, and c) area, since CA-INY-2243/5703 is largely defined by a sparse obsidian lithic scatter, the survey sought to identify areas of surface lithic concentrations within the trench corridor for possible avoidance or re-route. Additionally, before deep trenching was initiated at Trench 12-5a and 12-5b, a shovel-testing program was designed in consultation with BLM archaeologist Donald Storm to examine the trench alignment area north of Cactus Flats Road for the presence of subsurface artifacts or features. Trenching exposed two prehistoric fire hearth features, which were examined further during controlled archaeological excavations. The results of pre-trenching archaeological testing and feature recovery program are presented in the Project's comprehensive inventory and monitoring report (Nilsson and Bevill 2015).

Cactus Flats Road Realignment Survey (2013)

In 2013, URS conducted a cultural resources inventory for the proposed Cactus Flats Road Realignment route, which traverses the east-central area of CA-INY-2243/5703. This inventory, which was carried out between January 15 and 17, 2013, consisted of a pedestrian survey of the road corridor to include 15 m on both sides of the centerline. Six mud rotary drilling locations (NHD-13-RW18 to NHD-13-RW23) were also planned along the road corridor, and these locations, as well as their access roads, were also inventoried and subsequently monitored during drilling activities.

The Cactus Flats Road Realignment survey area contained a widely dispersed, low-density obsidian lithic scatter, with no artifacts concentrations identified. Noted prehistoric artifacts included 39 obsidian flakes or pieces of shatter and 3 isolated tools. The tools consisted of three obsidian biface fragments (ISO-2013-1, ISO-2013-2, and ISO-2013-3). Also, found were three historic-era artifacts, consisting of a wooden post, a metal spike, and a modified 5-gallon kerosene fuel can.

LAA1 Segment Survey (2014)

At the request of LADWP, on September 24, 2014 URS archaeologists Russ Bevill and Jerry Doty conducted a survey of the LAA1 (CA-INY-4591H) segment within the project area located just north of NHD to relocate a reported retaining wall feature. This wall, constructed of dry-laid concrete rubble and rocks, was mapped, measured, and photographed, and an updated Primary Record was completed for CA-INY-4591H.

AECOM Phase II Investigations (2015)

In 2015, AECOM conducted Phase II archaeological investigations at 12 prehistoric and/or historic-period archaeological sites that, at that time, had the potential to be affected by Project-related activities. The study was conducted to provide information necessary to examine the significance and eligibility of the sites to the NRHP and CRHR.

The Phase II study sites included seven prehistoric and five multiple component (prehistoric and historic) resources (Nilsson and Bevill 2016b). The prehistoric sites consisted of sparse obsidian lithic scatters, including CA-INY-6576, -6587, -9343, -9345, -9347, 9785, and -9790. Four multiple component sites, CA-INY-6580, -9783, -9786, and -9797, contained sparse obsidian lithic scatters and diffuse historic artifact scatters. The final multiple component site, CA-INY-6574/H, exhibited a sparse obsidian lithic scatter, a historic borrow pit associated with construction of NHD, and an ore-processing complex. Phase II investigations largely focused on the prehistoric components of the multiple component sites with the exception of CA-INY-6574/H, where subsurface testing was conducted within the Locus B ore-processing complex. Site evaluation methods included fieldwork, laboratory analysis, and specialized studies. Field methods focused on surface reconnaissance, controlled surface collection units, shovel test units, and controlled excavation units. Overall, 17.96 cubic meters (m^3) of site matrix were excavated from among the study sites. In addition to the fieldwork at the 12 study sites, shovel testing was conducted along the LAA realignment corridor to confirm the absence of subsurface cultural deposits; this work identified no new archaeological sites.

Collectively, the recovered Phase II artifact assemblages included 110 prehistoric items and 829 historic-period objects. All project sites contained prehistoric artifacts, consisting predominately of obsidian debitage, but also incorporating a few flaked stone tools such as bifaces, a burin, edge-modified pieces, projectile points, and a scraper; also recovered was one bird bone fragment. Prehistoric deposits extended to a maximum subsurface depth of 60 centimeters (cm), with most being restricted to near-surface deposits. Collective temporal data for the prehistoric components indicated use of the study area over millennia, with the strongest evidence found for middle and late Holocene occupation, representing the Little Lake (5950–3150 years before present [B.P.]) and Newberry (3150–1350 B.P.) periods. A few artifacts correlated to earlier (pre-5950 B.P.) and later (post 1350 B.P.) use, but these were not sufficient to accurately assess site use during these times. The prehistoric components inferred use as short-term encampments by specialized task groups that made logistical forays to the high terrace areas above the former Haiwee Meadows to procure food resources or engage in other temporary activities.

Phase II investigations also included examination of the Locus B ore-processing complex at CA-INY-6574/H. Archival research was conducted to assist in identifying the site's past land use history, and subsurface testing was undertaken to assess depth and constituency. Testing revealed the presence of a burnt structure, as well as a robust artifact assemblage of over 800 items comprised of Activities, Domestic, Indefinite Use, Personal, and Structural related objects. Most items are unidentifiable with regard to function or age, being either fragmentary or lacking diagnostic features. Based on archival research and firebrick chronology, Locus B represents an ore-processing complex that operated during the 1920s and/or 1930s. A small assemblage of historic-period artifacts was also recovered during testing at CA-INY-6580, restricted to a variety glass and metal, as well as one piece of coal. These items point to site use during the early twentieth century, coinciding with the construction of the LAA1, NHD, and/or NHR. The site's proximity to a nearby LAA1 labor camp further underscores this association.

Four sites, including CA-INY-6580, -9345, -9347, and -9785 were recommended eligible to the NRHP under Criterion D due to the information potential of their prehistoric components. The remaining eight sites, CA-INY-6574/H, -6576, -

6587, -9343, -9783, -9786, -9790, and -9797, were recommended as not eligible, largely due to their lack of information potential associated with shallow cultural deposits. One exception was CA-INY-6574/H, where the historic component, although demonstrating depth and abundant artifacts, also had diminished contextual integrity.

Management recommendations advanced the four NRHP-eligible sites to Phase III data recovery (CA-INY-6580, -9785, -9345, and -9347), since these sites had the potential to be affected by Project activities. Because they were recommended as non-eligible properties, no further cultural resources studies or treatment measures were advanced for the remaining eight Phase II sites.

AECOM Supplementary APE, LAA Access Road, and SCE Haul Road Survey (2016)

To complete the cultural resources inventory for those portions of the Project APE, SCE Haul Road, and LAA Access Road not subject to previous investigation, in October and November 2016 AECOM conducted a supplementary pedestrian survey of the remaining non-inventoried parcels and roads. This inventory encompassed five parcels (Survey Areas 1-5) and the survey of 1,750 feet of road alignment. Figure 3-2 provides the location of the supplemental survey areas.

Survey Areas 1-5

Survey Area 1 covered three separate parcels bordering the northern end of the Project APE. Collectively, these parcels comprised 39.6 acres of LADWP land, including portions of the SE ¼ of Section 33 and the SW ¼ of Section 34, within Township 19 South, Range 37 East. Surface elevations within the parcel range from 3,720 to 3,825 ft. amsl. A flat topography of deep, sandy sediments interspersed with saltbush vegetation, characterizes this survey area. Newly identified resources included one prehistoric lithic scatter site (RB-04) and four isolated finds (ISO-DD-03, ISO-DD-04, ISO-DD -05, and ISO-DD-06).

Survey Area 2 included a triangular-shaped parcel of LADWP land located on a high, broad terrace located in the eastern half of the Project APE. This 10.5-acre parcel is situated within the SW ¼ of Section 34, in Township 19 South, Range 37 East, as well as the NW ¼ of Section 3, in Township 20 South, Range 37E. Surface elevations within the parcel range from 3,810 to 3,825 ft. amsl. A gentle topography of deep, sandy sediments interspersed with sagebrush vegetation characterizes the survey area. Identified resources included one previously recorded prehistoric lithic scatter (CA-INY-9345), as well as one new prehistoric lithic scatter site (RB-03) and one new isolated find (ISO-RB-05).

Survey Area 3 comprised a roughly L-shaped parcel of LADWP land located along the east-central boundary of the Project APE. This 21-acre parcel, located roughly 200 ft. east of Survey Area 2, is situated within the SW ¼ of Section 34, in Township 19 South, Range 37 East, as well as the NW ¼ of Section 3, in Township 20 South, Range 37E. Surface elevations within the parcel range from 3,830 to 3,940 ft. amsl. A gentle topography of deep, sandy sediments interspersed with saltbush vegetation and a few Joshua trees characterize the survey area. No archaeological sites were identified within Survey Area 3, but two new isolated finds (ISO-RB-03 and ISO-RB-04) were noted.

Survey Area 4 consisted of a roughly square-shaped parcel of LADWP land located along the eastern boundary of the Project APE, south of Cactus Flats Road and east of NHR. This 12.3-acre parcel is situated within the NW ¼ of Section 3, in Township 20 South, Range 37E. Surface elevations within the parcel range from 3,850 to 3,950 ft. amsl. The survey area encompassed mostly steep slopes covered by a light scatter of saltbush and creosote. No archaeological sites or isolated finds were identified within Survey Area 4.

Survey Area 5 included a 64.5-acre parcel located in the southwest portion of the Project APE, largely south of North Haiwee Road but also including a small area north of the road, near the LADWP caretaker's residence. The parcel is within the NE ¼ of Section 4, within Township 20 South, Range 37 East. Surface elevations within the parcel range from 3,760 to 3,840 ft. amsl. The survey area encompassed a relatively flat topography, characterized by scattered saltbush, cholla, yucca, and Joshua trees, and punctuated with ephemeral drainages. The parcel

included a mix of BLM and LADWP land, portions of which had been previously inventoried (Norwood et al. 1979; Nilsson and Kelly 2006). The inventory identified seven new archaeological sites, consisting of two prehistoric lithic scatters (DD-01 and JA-1), four multiple component sites (DD-02, DD-03, DD-04, and JA-02), and one historic-period artifact scatters (JM-01/RB-01). Also newly recorded was a built environment resource comprised of the LADWP caretaker's residence (RB-05). Seven new isolated finds were identified (ISO-DD-01, ISO-DD-02, ISO-JA-01, ISO-JM-01, ISO-JM-02, ISO-RB-01, ISO-RB-06). Five previously recorded sites were noted within Survey Area 5 (CA-INY-6580, -6933/7278, -7229, -7616, and -7816) and records were updated for all resources except CA-INY-6580.

LAA Access Road and SCE Haul Route Survey

AECOM conducted a cultural resources inventory of the non-inventoried portions of the LAA access road and the SCE haul route on November 7, 2016. Inventory of the LAA access road began at its intersection with State Highway 395 and extended southwest along the road for a distance of 1,150 ft., with a 10-foot-wide corridor on either side of the existing road prism examined. The inventory identified one new archaeological site, MK-01, a historic-period artifact scatter, as well as one new isolated prehistoric flake (ISO-MK-01). One previously recorded site, CA-INY-6931, was identified within the survey area and its record was updated.

Inventory of the non-surveyed portion of the SCE Haul Route included a roughly 600-foot-long segment located between transmission line towers 669 and 671. The survey of the SCE haul route focused on the west side of the existing road, where a 10-foot-wide area was inventoried; the east side of the road was not surveyed. No new cultural resources were identified. Previously recorded Isolate P-14-009330, a railroad spike and metal object, was noted outside the survey corridor. Previously recorded Isolate P-14-0099331, consisting of two obsidian flakes, was relocated and subsumed within the boundaries of Site CA-INY-6581.

AECOM Geotechnical Monitoring (2016)

AECOM conducted cultural resources monitoring in November 2016 by AECOM in support of LADWP's ongoing geotechnical sampling studies for the project (Nilsson 2016). The sampling study focused on 16 soil borings encompassed within the Project Site. Eleven boring locations were within the bounds of CA-INY-2243/5703, a previously recorded multiple component archaeological site, while the remaining five borings were outside the boundary of an archaeological site. Because CA-INY-2243/5703 is a NRHP-eligible resource, project activities required the presence of an archaeological monitor during drilling activities, in keeping with the MMRP established for the site. AECOM surveyed all access routes and the bore locations for cultural resources prior to excavation, and no significant cultural materials were identified. Bore location sediments were examined and no buried deposits were identified at any bore location.

AECOM Phase II Investigations (2016-2017)

Between November 2016 and January 2017, AECOM conducted Phase II fieldwork at six project-related archaeological sites: CA-INY-6577, -6578, -6581, -6582, -7616, and RB-03. Analyses and reporting for the Phase II study is currently underway.

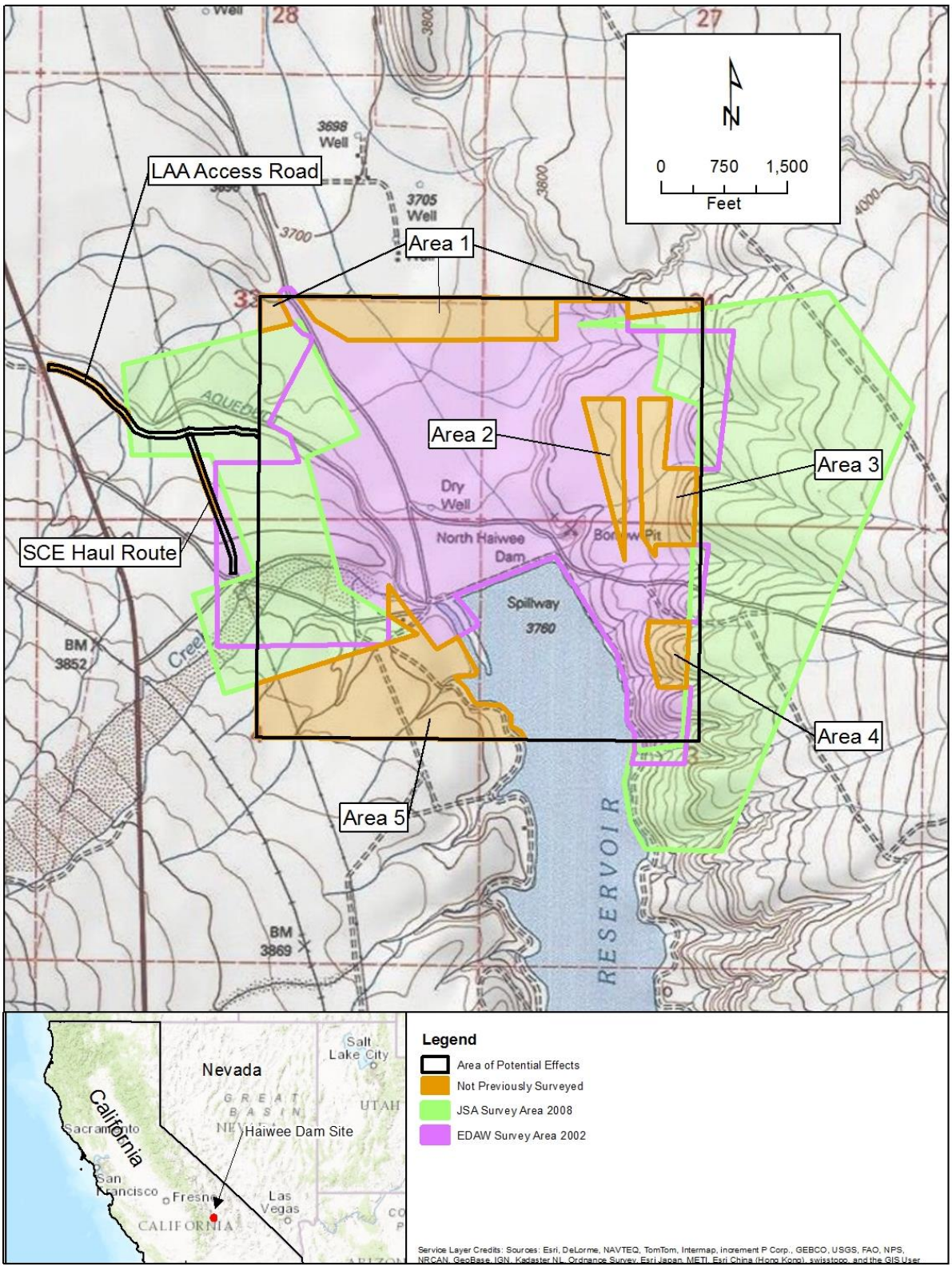

Figure 3-2. AECOM Supplementary APE, LAA access road, and SCE haul road survey areas.

CHAPTER 4 – SITE AND ISOLATE DESCRIPTIONS

INTRODUCTION

Cultural resources studies conducted within the Project APE have identified a broad array of prehistoric and historic-period archaeological sites, built environment resources, and isolated finds. Overall, 92 resources have been recorded, consisting of 34 archaeological sites, 3 built environment resources, and 55 isolated finds. These resources are widely distributed across the landscape, with most occurring in the western half of the Project APE. Archaeological sites and built environment resources demonstrate a resource density of 1:17 acres, while isolated finds indicate a resource density of 1:12.8 acres; overall, cultural resource density, incorporating all resource types, is 1:7 acres.

Archaeological sites consist of 12 prehistoric, 5 historic-period, and 17 multiple component resources (Table 4-1). Obsidian lithic scatters, consisting of flaked stone debitage and occasional formed tools, characterize most prehistoric site components. Two sites with prehistoric components also contain Owens Valley Brownware, one site includes incised steatite fragments, and one other resource exhibits bedrock milling features. Collectively, the prehistoric components document over 6,000 years of human land use. Two deeply buried prehistoric fire hearths identified at CA-INY-2243/5703, both associated with the middle Holocene (Little Lake period [5950–3150 B.P)], provide the earliest evidence of land use within the Project APE. Time-sensitive prehistoric artifacts noted among the prehistoric components indicate continued and expanded land use during the late Holocene, beginning as early as the Newberry period (3150–1350 B.P.) and extending into the Haiwee (1350 – 650 B.P.) and Marana (650 B.P.–Historic) periods.

Historic-period archaeological components represent a variety of resources, with most reflecting a common theme of early twentieth-century land use. These resources, which occur at either historic-period or multiple component archaeological sites, include several LAA1 labor camps, two former borrow sites associated with construction of the existing Dam (Borrow Site #1 and #2), a former homesite, an ore processing area, general artifact refuse scatters, and a segment of communication line. One site, comprised of the Los Angeles-Owens River stage road, was used as early as the 1860s, continuing into post-1910 contexts. Three built environment resources, which remain in active use, also occur within the Project APE: the LAA, NHD, and a LADWP caretaker's residence.

In addition to archaeological sites and built environment resources, 55 isolated finds have been identified with the Project APE, including 49 prehistoric and 6 historic-period locales (Table 4-1). Prehistoric isolates are largely defined by single obsidian or basalt flakes (35 locations), or single flaked stone tools (3 locations). Multiple obsidian flakes characterize nine isolated finds, including six finds with two obsidian flakes each, two finds with three obsidian flakes, and one find with four obsidian flakes. Finally, two isolated find locations contain a combination of one obsidian flake and one flaked stone tool. Historic-period isolates include small quantities of domestic debris, such as glass fragments, tin cans, and other metal, as well as a rock feature and wooden posts.

Table 4-1. Cultural Resources by Resource Type and Resource Class.

Resource Type	Resource Class			Total
	Prehistoric	Historic	Multiple Component	
Archaeological Sites	12	5	17	34
Built Environment Resources		3		3
Isolated Finds	49	6		55
Total	61	14	17	92

Table 4-2. Archaeological Sites and Built Environment Resources.

Primary Number	Trinomial	Other Site Designation	Resource Description	Ownership	Date Recorded/Updated (Report Reference)	Location within the APE
P-14-002242	CA-INY-2242*	DA-130	Prehistoric lithic scatter	LADWP	Recorded 1977 (Norwood et al. 1977)	Project Site
P-14-002243/ P-14-005703	CA-INY-2243/5703	DL-131; Olancha Pipeline Temp 1	Multiple component: prehistoric lithic scatter and historic homestead and artifact scatters	LADWP/ BLM	Recorded 1977 (Norwood et al. 1977) Updated 2002 (Shaver 2003) Updated 2009 (Nilsson 2010) Updated 2011 (Nilsson 2011) Updated 2012 (Nilsson and Bevill 2015)	Project Site
P-14-004591	CA-INY-4591H	AG-3	First Los Angeles Aqueduct	LADWP/ BLM	Recorded 1992 (Costello and Marvin 1992) Updated 1993 (Reno et al. 1993) Updated 2000 (Meyer and Newland 2000) Updated 2014 (Nilsson and Bevill 2015)	Project Site
P-14-007955/ P-14-007956/ P-14-008211	CA-INY-6574	HD-CS-1	Multiple component: prehistoric lithic scatter, NHD borrow site #2, and historic features and artifact scatter	LADWP	Recorded 2002 (Shaver 2003) Updated 2011 (Nilsson et al. 2011) Updated 2013 (Nilsson and Bevill 2015)	Project Site
P-14-008212	CA-INY-6575	HD-CS-002H	Historic artifact scatter and earthen berm	LADWP	Recorded 2002 (Shaver 2003)	Project Site
P-14-008213	CA-INY-6576	HD-RD-003	Prehistoric lithic scatter	BLM	Recorded 2002 (Shaver 2003)	Project Site
P-14-008214	CA-INY-6577	HD-RD-004	Multiple component: prehistoric lithic scatter with bedrock milling stations and historic LAA1 labor camp	BLM	Recorded 2002 (Shaver 2003) Updated 2008 (Nilsson 2010)	General Area
P-14-008215 P-14-008216	CA-INY-6578/6579	HD-RD-005 HD-RD-006	Multiple component: prehistoric lithic scatter and historic artifact scatter	BLM	Recorded 2002 (Shaver 2003) Updated and merged with CA-INY-6579 (Nilsson and Bevill 2015)	General Area
P-14-008217	CA-INY-6580	HD-RD-007H	Multiple component: prehistoric lithic scatter and historic subterranean structure and artifact scatter	LADWP	Recorded 2002 (Shaver 2003) Updated 2016 (Nilsson and Bevill 2016b)	General Area
P-14-008218	CA-INY-6581	HD-CS-008	Prehistoric lithic scatter	BLM	Recorded 2002 (Shaver 2003) Updated 2013 (Nilsson and Bevill 2015)	SCE Road

Table 4-2. Archaeological Sites and Built Environment Resources.

Primary Number	Trinomial	Other Site Designation	Resource Description	Ownership	Date Recorded/Updated (Report Reference)	Location within the APE
P-14-008219	CA-INY-6582	HD-CS-009	Multiple component: prehistoric lithic scatter and historic communication line	BLM	Recorded 2002 (Shaver 2003) Updated 2012 (Nilsson and Bevill 2015)	General Area
P-14-008220	CA-INY-6583	HD-CS-010	Multiple component: prehistoric flake and historic artifact scatter	LADWP	Recorded 2003 (Shaver 2003)	Project Site
P-14-008221	CA-INY-6584	HD-CS-011H	Historic rock alignment	LADWP	Recorded 2003 (Shaver 2003)	General Area
P-14-008223	CA-INY-6586	HD-CS-013	Multiple component: prehistoric flake and historic artifact scatter	LADWP	Recorded 2003 (Shaver 2003) Updated 2013 (Nilsson and Bevill 2015)	Project Site
P-14-008224	CA-INY-6587	HD-CS-014	Prehistoric lithic scatter	LADWP	Recorded 2003 (Shaver 2003)	Project Site
P-14-008819/ P-14-009329	CA-INY-6931/7276	HTL-2 SRI-101	Multiple component: prehistoric lithic scatter and historic LAA1 labor camp	BLM	Recorded 2006 (Nilsson and Kelly 2006) Recorded 2006 (Minor and Lerch 2007) Updated 2007 (Shaver 2008) Updated 2016 (This report)	SCE Road and LAA Access Road
P-14-008820 P-14-009332	CA-INY-6932/7277	HTL-3/13 SRI-102	Multiple component: prehistoric lithic scatter and historic LAA1 labor camp	BLM	Recorded 2006 (Nilsson and Kelly 2006) Recorded 2006 (Minor and Lerch 2007) Updated 2007 (Shaver 2008) Updated 2016 (This report)	General Area
P-14-008821/ P-14-009333	CA-INY-6933/ CA-INY-7278	HTL-4/5/12	Multiple component: prehistoric lithic scatter and historic artifact scatter	BLM	Recorded 2006 (Nilsson and Kelly 2006) Recorded 2006 (Minor and Lerch 2007) Updated 2007 (Shaver 2008) Updated 2016 (This report)	General Area
P-14-009334	CA-INY-7279	SRI-104	Multiple component: prehistoric lithic scatter and historic artifact scatter and rock ring feature	BLM	Recorded 2006 (Minor and Lerch 2007) Updated 2016 (This report)	General Area

Table 4-2. Archaeological Sites and Built Environment Resources.

Primary Number	Trinomial	Other Site Designation	Resource Description	Ownership	Date Recorded/Updated (Report Reference)	Location within the APE
P-14-010007	CA-INY-7615	EN-1	Prehistoric flaked stone, ground stone, and pottery scatter	LADWP	Recorded 2006 (Nilsson 2007) Updated 2008 (Nilsson 2010) Updated 2015 (Nilsson and Bevill 2015)	Project Site
P-14-010008	CA-INY-7616	MS-1	Multiple component: prehistoric lithic scatter and historic artifact scatter	LADWP	Recorded 2006 (Nilsson 2007)	General Area
P-14-010295	CA-INY-7816	PLI-90	Historic Los Angeles – Owens River Valley Road; Highway 23	BLM/LADWP	Recorded 2008 (Pacific Legacy 2009) Updated 2016 (This report)	General Area
P-14-012158	CA-INY-9343	JD-2	Prehistoric lithic scatter	LADWP	Recorded 2012 (Nilsson and Bevill 2015)	Project Site
P-14-012160	CA-INY-9345	JD-4	Prehistoric lithic scatter	LADWP	Recorded 2012 (Nilsson and Bevill 2015)	Project Site
P-14-012162	CA-INY-9347	JD-7	Prehistoric lithic scatter	BLM	Recorded 2012 (Nilsson and Bevill 2015) Updated 2016	Project Site
P-14-012178/ P-14-12887	North Haiwee Dam		Historic NHD and borrow site #1	LADWP	Recorded 2014 (Nilsson and Bevill 2015)	Project Site
P-14-	CA-INY-	DD-01	Prehistoric lithic scatter	BLM	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	DD-02	Multiple Component: prehistoric lithic scatter and historic dump and artifact scatters	BLM/LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	DD-03	Multiple component: prehistoric tool and historic artifact scatter	LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	DD-04	Multiple component: prehistoric lithic scatter and historic artifact scatter	LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	JA-01	Prehistoric lithic scatter	LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	JA-02	Multiple component: prehistoric flake and historic artifact scatter	BLM	Recorded 2016 (This report)	General Area

Table 4-2. Archaeological Sites and Built Environment Resources.

Primary Number	Trinomial	Other Site Designation	Resource Description	Ownership	Date Recorded/Updated (Report Reference)	Location within the APE
P-14-	CA-INY-	JM-01/RB-01	Historic artifact scatter	LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	MK-01	Historic artifact scatter	BLM	Recorded 2016 (This report)	LAA Access Road
P-14-	CA-INY-	RB-03	Prehistoric lithic scatter	LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	RB-04	Prehistoric lithic scatter	LADWP	Recorded 2016 (This report)	General Area
P-14-	CA-INY-	RB-05	NHD Caretaker's Residence	BLM/LADWP	Recorded 2016 (This report)	Project Site

* CA-INY-2242 was not relocated (Shaver 2003).

BLM – Bureau of Land Management, LAA1 – First Los Angeles Aqueduct, LADWP – Los Angeles Department of Water and Power, NHD – North Haiwee Dam.

Presented below is a description of each archaeological site and built environment resource that highlights its cultural constituents and recordation history, as well as a discussion of Project-related activities that have occurred within their boundaries. Also provided is a summary discussion of the isolated finds. Appendix A provides State of California DPR Archaeological Site Record forms, including updates. Appendix B contains State of California DPR Primary Records for the isolated finds (as available). Figure C-1 in Appendix C provides a map depicting the location of each archaeological site and built environment resource, while Figure D-1 in Appendix D provides the location of isolated finds.

Archaeological Sites

CA-INY-2242

This prehistoric site consists of an obsidian lithic scatter northwest of the existing Dam. BLM archaeologist N. Farrell recorded the site in 1977 as part of an inventory reported by Norwood and colleagues (1979). The site description indicated the presence of a dense obsidian scatter composed of about 150 unmodified flakes and 5 worked flakes in a 20 by 5 m area. The 2002 EDAW cultural resources survey attempted to relocate the site, but no physical evidence of it was found (Shaver 2003:22). Due to substantial disturbance in the area, EDAW noted that the site was likely heavily damaged by ongoing maintenance of the LAA1.

CA-INY-2243/5703

CA-INY-2243/5703 is an expansive, multiple component property that encompasses a 120-acre area. Twenty-two loci, or artifact concentrations, (Locus A/B to X) have been identified across the site (Table 4-3). As currently defined, the site encompasses an area measuring 700 m north-south by 525 m east-west.

The site's prehistoric component consists of a widespread obsidian lithic scatter and a concentration of Owens Valley Brownware pottery. Eleven prehistoric loci have been identified (Loci A/B, C, D/W, E, F, J, R, S, T, V, and X), while three other multiple component loci (Loci G, I, and O) also contain prehistoric artifacts. A low-density flake scatter of less than 1 flake per 10 square meters (m^2) links the various loci. Within the lithic concentrations, flakes occur in a maximum density of 5–10 per 10 m^2. Overall, the flakes consist of black translucent obsidian with occasional light and dark grey banding, which is typical of material from the neighboring Coso Volcanic Field (CVF). Surface artifacts include at least 500 obsidian flakes, 15 pieces of Owens Valley Brownware pottery (Locus J), 5 flake tools (Loci F, X, and W), 9 obsidian bifaces (Loci A/B, O, X, and non-locus), 1 Rose Spring projectile point (non-locus), 1 Cottonwood projectile point fragment (Locus A/B), 1 unmodified *Margaratifera* shell fragment (Locus D), and 1 millingstone (non-locus). Few of these artifacts are temporally diagnostic, with those present being restricted to the Cottonwood and Rose Spring projectile points as well as Owens Valley Brownware pottery. Collectively, the projectile points and pottery infer site use during the Marana period (650 B.P.–Contact). Radiocarbon dates obtained from two, deeply buried fire hearths exposed during geotechnical trench excavations in 2012, however, suggest greater antiquity within the Locus A/B area that extends back in time to the Little Lake period (5950–3150 B.P.).

The site's historic-period component includes a former homestead (Locus G), two wellheads (Locus K and N), two wooden posts (Locus L and M), and several artifact concentrations dispersed across the basin (Locus H, I, O, P, Q, and U). Artifacts associated with these loci include bottle glass (including amethyst [pre-1917] and aqua [pre-1920]), drinking vessel glass, porcelain, yellow ware ceramics, chicken wire, tin cans, twisted metal cable, galvanized corrugated sheet metal, Mason jar fragments, and window glass. Based on artifact typologies, the historic-period component reflects site use from ca. 1910 to the 1950s. Archival records indicate that the site area is within a land patent issued by the U.S. Government to Allan W. Ramsey on October 11, 1919, under the Homestead Entry Act (12 Statute 392).

Both natural and cultural factors have disturbed the site. Several dirt roads cross the site, and the existing Dam and the LAA1 have affected the prehistoric component. Additional disturbances include an area of fill deposit; recreational activities, including off-road vehicle use; and widespread rodent disturbance. Structures associated

with the Locus G homestead are non-extant. Geophysical and geotechnical investigations conducted between 2006 and 2016 have also affected the cultural deposit. These activities included installation of water monitoring wells, mechanical auguring and trenching, the use of Vibroseis machines, and mechanized equipment driven on the site.

Site Recordation History

CA-INY-2243/5703 was first recorded as two individual sites: CA-INY-2243 (Farrell 1977b) and CA-INY-5703 (Smith 1999). In 2002, the EDAW survey (Shaver 2003) combined these two sites, which are now referred to as CA-INY-2243/5703. Since then, URS prepared four site record updates (Doty 2009a; Nilsson and Bevill 2015; Nilsson and Doty 2011 and 2012) based upon monitoring activities conducted for the Project.

As initially recorded in 1977, CA-INY-2243 was described as a ca. 1900s era historic homestead with a well, cabin foundation, and associated debris (Farrell 1977b). The noted cabin foundation, made of fieldstone and cement, measured 8 by 4 ft. and had an average height of 1.5 ft. The well, situated 10 ft. from the cabin foundation, consisted of a 4-in. diameter vertical iron pipe with 4 by 8 in. timbers that once supported housing or a pump. Artifacts were strewn over a 100 by 200 ft. area, consisting of a variety of domestic, personal, structural, and indefinite type debris. Domestic items included a metal pan, white ironstone fragments, white crockery fragments, and a bed frame. Personal items were composed of tobacco tins, while structural items included plaster fragments. A diverse group of indefinite use item was noted, including amethyst and clear glass fragments, window screen mesh, metal pieces, pipefittings, castors, machinery pieces, metal bolts and spikes, assorted pieces of wire and wood, and a fence post with barbed-wire attached. In addition to the historic-period remains, also present was one obsidian flake. The site was noted as in fair condition, with effects related to artifact collecting and fire, the latter possibly associated with demolition of the non-extant structure.

As part of the Olancha Water Development Project survey conducted in 1999, Brian F. Smith Associates (Smith 1999) updated the CA-INY-2243 site record to include an ironstone fragment with a dateable hallmark identified as “Homer Laughlin, Hudson”, manufactured during the period of 1900–1920 (Pierson 1999a). This survey also identified CA-INY-5703 (Pierson 1999b), a widely dispersed obsidian lithic scatter, as being about 200 m northwest of CA-INY-2243. CA-INY-5703 was noted as encompassing an expansive area measuring 450 by 180 m.

Both CA-INY-2243 and CA-INY-5703 were revisited by EDAW archaeologists in 2002 during the first survey conducted for the Project (Shaver 2003). This re-examination identified more extensive prehistoric and historic-period components at CA-INY-2243 than originally reported (Shaver, Deis, Fitzsimons, Strauss, Dreibelbis, Gadreault, Toenjes, and Carrel 2002). Overall, six prehistoric lithic concentrations (Locus A through F) and a prehistoric pot drop (Locus J) were identified. Expansion of the CA-INY-2243 northern boundary encompassed the prehistoric lithic scatter previously recorded as CA-INY-5703 (Pierson 1999a), which was relabeled as Locus O. EDAW also identified six new loci of historic-period artifacts and features, including two well casings (Locus K and N), two wooden structural features (Locus L and M), and two artifact deposits (Locus H and I). The original historic homestead area of CA-INY-2243 (Farrell 1999a) was relabeled as Locus G. Based on these cumulative changes, site boundaries were expanded to encompass the newly defined loci, and the two sites were merged to create the CA-INY-2243/5703 designation.

The 2006 URS monitoring project (Nilsson 2007) identified two additional historic-period loci (Locus P and Q) within the recorded site boundaries. The subsequent 2008 and 2009 URS monitoring (Nilsson 2010) recognized four additional loci at the site: Locus R, S, T, and U. Site boundaries were expanded slightly to accommodate the extension of Locus A and B in the southeastern area (Doty 2009a). The 2011 URS monitoring work (Nilsson 2011) discovered two additional loci, designated Locus V and W. Locus V, situated at the northeastern edge of the site, required slight expansion of the overall site boundary (Nilsson and Doty 2011a). The boundaries of five previously recorded loci (Locus A/B, E, F, I, and O) were also expanded, and updated artifact lists were prepared. The 2012 and 2013 URS monitoring project catalogued the artifacts within Locus G, re-mapped the boundaries of Locus W based on new surface disturbance to include the Locus D area; added Locus X to the western site area; and documented subsurface test excavations along a geotechnical trench area.

Locus Descriptions

Locus A/B

As originally recorded by EDAW in 2002, Locus A and Locus B consisted of two adjacent obsidian flake concentrations. Each locus measured roughly 50 by 25 m, with few meters separating their deposits. Based on surface artifact distribution, URS joined the two loci into the combined Locus A/B designation in 2011, expanding locus boundaries to an area measuring 200 m north-south by 175 m east-west. In addition to obsidian flakes, three formed tools have been identified on the surface on this locus, including one Cottonwood Triangular projectile point base and two Type 4 biface fragments (Figure 4-1).

Table 4-3. CA-INY-2243/5703 Locus Information.

Locus	Description	Dimensions	Year Recorded/ Report Reference	Year Updated/ Report Reference
A/B	Obsidian lithic scatter	200 m N/S x 175 m E/W	2002 (Shaver 2003)	2011 (Nilsson 2011)
C	Obsidian lithic scatter	20 m N/S x 20 m E/W	2002 (Shaver 2003)	——
D/W	Obsidian lithic scatter	75 m N/S x 120 m E/W	2002 (Shaver 2003)	2009 (Nilsson 2010); merged with Locus W in 2013 (Nilsson and Bevill 2015, 2016a)
E	Obsidian lithic scatter	20 m N/S x 40 m E/W	2002 (Shaver 2003)	—
F	Obsidian lithic scatter	25 m N/S x 50 m E/W	2002 (Shaver 2003)	2009 (Nilsson 2010)
G	Historic homestead and obsidian lithic scatter	75 m N/S x 150 m E/W	1977 (Norwood et al. 1979)	1999 (Pierson 1999a) 2002 (Shaver 2003) 2013 (Nilsson and Bevill 2015, 2016a)
H	Historic refuse	10 m N/S x 10 m E/W	2002 (Shaver 2003)	
I	Obsidian lithic scatter and historic refuse	35 m N/S x 40 m E/W	2002 (Shaver 2003)	2011 (Nilsson 2011)
J	Owens Valley Brownware	20 m N/S x 20 m E/W	2002 (Shaver 2003)	
K	Pipe and well case	10 m N/S x 10 m E/W	2002 (Shaver 2003)	
L	Wooden posts	10 m N/S x 15 m E/W	2002 (Shaver 2003)	
M	Wooden posts	15 m N/S x 15 m E/W	2002 (Shaver 2003)	
N	Well case	3 m N/S x 3 m E/W	2002 (Shaver 2003)	
O	Obsidian lithic scatter and historic refuse	350 m NW/SE x 125 m NE/SW	1999 (Smith et al. 1999)	2002 (Shaver 2003) 2011 (Nilsson 2011)
P	Historic refuse	10 m N/S x 10 m E/W	2006 (Nilsson 2007)	
Q	Historic refuse	20 m N/S x 12 m E/W	2006 (Nilsson 2007)	
R	Obsidian lithic scatter	15 m N/S x 15 m E/W	2008 (Nilsson 2010)	
S	Obsidian lithic scatter	20 m N/S x 10 m E/W	2008 (Nilsson 2010)	
T	Obsidian lithic scatter	20 m N/S x 20 m E/W	2008 (Nilsson 2010)	
U	Historic refuse	12 m NW/SE x 25 m E/SW	2008 (Nilsson 2010)	
V	Obsidian lithic scatter	50 m N/S x 30 m E/W	2011 (Nilsson 2011)	
X	Obsidian lithic scatter	105 m N/S x 80 m E/W	2013 (Nilsson and Bevill 2015, 2016a)	

Project-related activities have included varied geophysical investigations, including the excavation of bucket auger (BA) holes, pump wells (PW/PWO), observation wells (OW), and trenches. In 2006, URS conducted limited shovel testing within the southern portion of Locus A/B, resulting in the excavation of ten, 50 by 50 centimeter (cm) units. These units identified a limited subsurface deposit restricted to the upper 20 cm of the site. In 2012, geotechnical drilling was conducted at 13 borehole locations within the locus. URS investigated this area with a series of 16 1-x-l-m excavation units (EU) dug to a depth of 60 centimeters below surface (cmbs). The greatest flake density was encountered in the western half of the proposed trench area. Subsequent geophysical investigations within the same trench area identified a deeply buried subsurface component at Locus A/B that included obsidian flakes and two cultural features, both found between 230 and 260 cmbs.

Locus C

Locus C is a small obsidian flake concentration. As originally recorded by EDAW in 2002, Locus C encompasses a small area measuring roughly 20 by 20 m. Project-related activities have included the drilling of one observation well (NHD-06-OW2). In 2006, URS dug one shovel test unit (STU) within the locus in advance of well drilling. The unit, excavated to a depth of 20 cmbs, revealed no cultural remains. In 2012, geotechnical activities included the excavation of trench through the locus deposit, as well as three RWs, three cone penetrating tests (CPTs), and one sonic bore (SB) location.

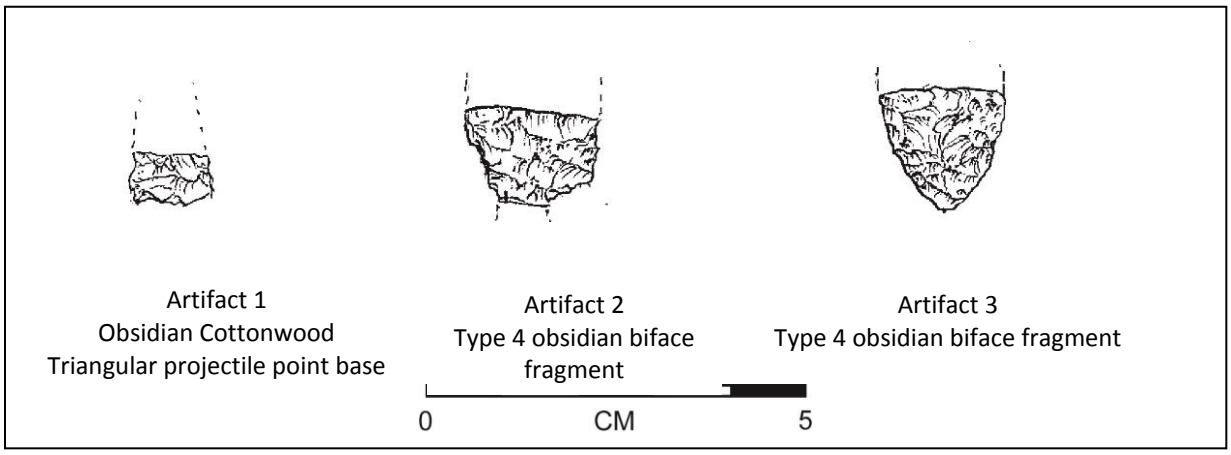

Figure 4-1. CA-INY-2243/5703 Locus A/B flaked stone tools.

Locus D/W

Locus D/W consists of an obsidian flake concentration. Locus D was identified by EDAW in 2002 as a small obsidian flake concentration. As part of URS's 2006 monitoring activities, one shovel test unit (STU) was dug near, but outside, the locus in advance of the excavation of a drill hole. The STU, excavated to a depth of 20 cmbs, revealed no cultural remains. During the 2009 URS monitoring project, a *Margaratifera* shell fragment was noted on the site surface, within a non-locus area very near Locus D.

As part of URS's 2011 monitoring activities, Locus W, a small scatter of obsidian flakes was identified during the survey of a seismic line. The flakes represented a broad range of reduction activities, including core, biface, and pressure technologies; also present was a single piece of angular shatter. The 2011 monitoring measures included flagging the full extent of the artifact concentrations to ensure avoidance, relocating or offsetting geophone locations, and flagging of alternate access roads to minimize surface disturbance to noted resources.

URS updated the locus description and sketch map in 2012, during which were identified two edge-modified pieces (EMPs) (Figure 4-2) and an *Anadonta* shell fragment. While determining potential impacts of rotary wash drilling in

the site area, it was noted that Locus W had been impacted by grading conducted during backfilling activities. The affected area included a swath measuring about 10 to 12 m wide and 100 m long.

Locus E

Locus E is an obsidian flake concentration near Locus D. Situated between two dirt roads, this locus measures 20 by 40 m. No Project-related activities have occurred within the locus boundary.

Locus F

Locus F is an obsidian flake concentration located between three dirt roads. The locus measures 25 by 50 m. In 2008, URS monitored the seismic survey activities associated with a seismic line that crossed the southern tip of Locus F. In 2009, URS identified an obsidian EMP within the locus (Figure 4-3).

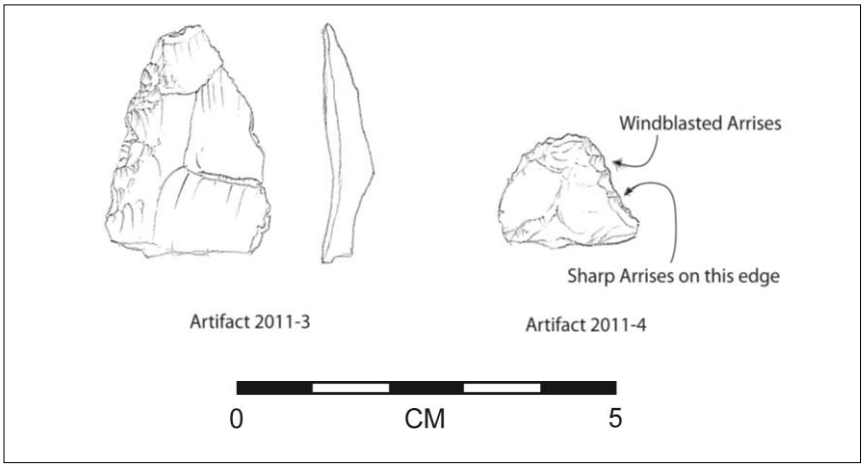

Figure 4-2. CA-INY-2243-5703 Locus D/W EMPs.

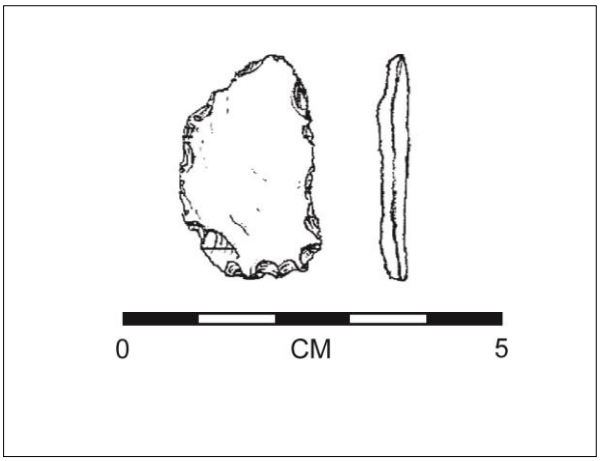

Figure 4-3. CA-INY-2243/5703 Locus F obsidian EMP.

Locus G

Locus G is an obsidian lithic scatter and a former homestead area. The locus, which encompasses an area measuring 75 by 150 m, was first recorded by N. Farrell in 1977 as CA-INY-2243, comprised of a well and cabin with associated refuse. In 1999, L. Pierson extended the site boundary, with the notation of additional domestic refuse. As part of EDAW's 2002 survey, the CA-INY-2243 area was categorized as Locus G, becoming part of a larger, multiple component site designated as CA-INY-2243/5703. The Locus G description included the well identified by N. Farrell in 1977, with the addition of a foundation, privy, and low rock wall, as well as an obsidian lithic concentration. In 2012, URS updated the historic-period artifact and feature descriptions for the locus.

The Locus G homestead area consists of a well, cement/cobble and boulder building foundation, two cobble-and-boulder linear foundations, and a possible privy surrounded by recent and historic-period debris. The well is a 29-in. tall structure with a protruding, 6½-in. diameter steel pipe (Shaver, Deis, Fitzsimons, Strauss, Dreibelbis, Gadreault, Toenjes, and Carrel 2002). The largest foundation is a low, mortared, cobble-and-boulder rock feature capped and smoothed with concrete. Aligned on a 350-degree axis, the foundation measures 15 ft. east/west by 30 ft. north/south. A second low, cobble-and-boulder wall, or foundation, is roughly 12 ft. north of the largest foundation. The second wall/foundation measures 30 ft. long by 1 ft. wide. A third L-shaped, low, rock wall/foundation is about 130 ft. east of the wellhead. This third feature, which is nearly flush with the ground, consists of unmortared, semi-flat cobbles and boulders. The north-south segment measures 21-feet-long, while the east-west segment measures 50 ft. long. The final feature is a possible privy depression about 60 ft. north of the largest foundation. The diameter of the depression measures about 8 ft.

Domestic artifacts include various domestic-related glass and ceramic fragments, tin cans, and cookware. Glass artifacts consist of colorless amethyst and aqua bottle fragments; colorless canning jar fragments; opaque white bowl fragments with a floral motif; a blue vase base; and a colorless decorative stopper. Ceramic items include earthenware crockery, white earthenware plate and saucer fragments, and porcelain bowl and teacup fragments. Tin cans are composed of evaporated milk (ca. 1917–1929), sanitary food cans, meat tins, church-key opened beer cans (pre-1960), and aluminum-top beer cans (post-1960s), as well as paint, solvent, and kerosene cans. Other artifacts include a variety of structural and indefinite use items such as nails, twisted wire, cable, iron pipe, copper mesh, sheet metal, and wire fencing, among others.

URS's 2006 monitoring efforts included excavation of one STU within Locus G. Excavated to a depth of 40 cmbs, this STU yielded one obsidian flake in the 0–10 cm level. No other project-related activities have occurred within the locus boundary.

Locus H

Locus H is a small cluster of historic-period cans and bottles encompassing a 10 by 10 m area. Its artifacts include six brown glass bottles, nine church-key opened beer cans, one paint can, and one friction-top can. No Project-related activities have occurred within the locus boundary.

Locus I

As originally recorded by Shaver and colleagues in 2002, Locus I consisted of a concentration of historic-period cans and bottles indicative of residential use. Artifacts included two portions of an early model vehicle, as well as beer cans, spice tins, meat tins, a light bulb base, condensed milk can, drinking glass, and whiskey bottle fragments. The 2011 URS monitoring program added a sparse obsidian lithic scatter to the locus and expanded its boundaries to encompass an area measuring 35 by 40 m. The lithic scatter consisted of 17 obsidian flakes representing early and late biface reduction activities, as well as a few pressure-reduced flakes.

URS's 2006 monitoring included the excavation of two STUs within the locus. Excavated to a depth of 40 cmbs, STU B-7 yielded no cultural remains. Excavation of STU B-7a, placed with a borehole access road, identified a subsurface artifacts consisting of two obsidian flakes in the 0–20 cm level and one obsidian EMP in the 20–40 cm

level. LADWP's 2011 geophysical investigations included examination of a seismic that crossed a 25 m extent of Locus I. Monitoring by URS resulted in the recommendation and implementation of no vehicular traffic through the locus. In 2013, geotechnical investigations within the locus included the excavation of two additional boreholes. Monitoring conducted by URS for these activities did not result in the identification of any additional resources.

Locus J

Locus J is a small (20 by 20 m) concentration of Owens Valley Brownware body sherds. The sherds, which number about 14 pieces, average 4 to 5 millimeters (mm) in thickness, and are about 3-x-3 millimeter (mm) in overall size. No Project-related activities have occurred within the locus boundary.

Locus K

Locus K is a single-seam steel pipe with a 4 in. outside diameter well case. The casing protrudes about 6-½ ft. above the ground. Its height, coupled with the lack of a pump mount, suggests its association with a former windmill. No Project-related activities have occurred within the locus boundary.

Locus L and M

Locus L and Locus M consist of wooden posts. Locus L is an alignment of four wooden posts (two upright, two down) connected by a piece of braided barbed wire for support. The posts measure 7.5-in. wide, 6-in. deep, and are over 6-ft. long. Locus M contains two standing wooden posts and two other collapsed posts that may have once stood as a square or rectangular feature. The posts are made of weathered railroad ties, with three joined by braided barbed wire. No Project-related activities have occurred within either locus.

Locus N

Locus N is a single-seam, single-riveted, well casing that protrudes about 5 in. aboveground. The well casing is made of 1-in. thick steel, or iron, that has been rolled into an oblong-shaped pipe or casing. It exhibits overlapping sides that were sealed with metal rivets. The well casing measures 14-in. long by 10.8-in. wide, and is 29-in. deep to the point where it has been filled by detritus. No Project-related activities have occurred within the locus boundary.

Locus O

Locus O consists of the original location of CA-INY-5703 as recorded by L. Pierson in 1999 (Pierson 1999a). The initial site record noted a large (450 by 180 m), dispersed obsidian flake scatter with tools on a broad floodplain. As part of EDAW's 2002 survey (Shaver 2003), the site was designated Locus O of CA-INY-2243/5703. In 2011, URS extended the Locus O boundary roughly 100 m south to include additional obsidian flakes and a small, 1920s era tin can scatter. Two obsidian biface fragments (Figure 4-4) have been recorded within the locus boundary, which measures 350 by 125 m.

In 2008, URS monitored geophysical studies conducted for two seismic lines that crosscut the locus. Monitoring measures included flagging the full extent of the artifact concentration to ensure avoidance, relocating or offsetting geophone locations, and flagging of alternate access roads to minimize surface disturbance to noted resources. No other Project-related activities have occurred within the locus boundary.

Locus P

Locus P is a historic-period artifact concentration. Artifacts include knife-opened, evaporated milk cans; two juice cans, clear bottle glass fragments; a brown bottle base; shoe leather; a friction lid can top; and fragments of a white earthenware plate.

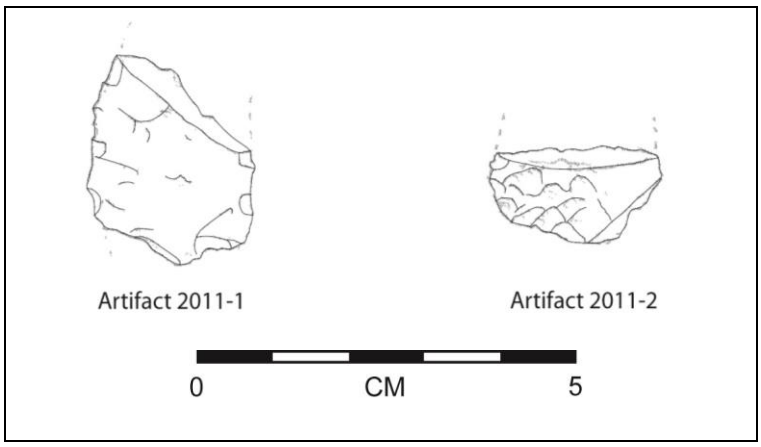

Figure 4-4. CA-INY-2243-5703 Locus O biface fragments.

Monitoring of geotechnical investigations conducted by URS in 2006 included the excavation of four STUs within the locus. STUs B-8, OW-14a, and OW-14e were dug to a depth of 40 cmbs, but none yielded cultural remains. The fourth STU, OW-14, produced two obsidian flakes in the 0–20 cm level.

Locus Q

Locus Q is a small concentration of historic-period artifacts. Artifacts include about 30 *Havoline* and *Penn State* motor oil cans, a 1-lb. *MJB* coffee can, one brake fluid can, colorless bottle glass, and window glass. No Project-related activities have occurred within the locus boundary.

Locus R, S, and T

These three loci consist of small, obsidian flake concentrations. Roughly 20 to 30 flakes characterize each concentration, which were first identified during the 2008 archaeological monitoring of seismic Line 2. Monitoring measures included flagging the full extent of the artifact concentrations to ensure avoidance, relocating or offsetting geophone locations, and flagging of alternate access roads to minimize surface disturbance to noted resources. No other Project-related activities have occurred within the loci.

Locus U

Locus U is a small concentration of historic-period artifacts. Noted items include about 25 cone-top beverage cans and crown caps that date from ca. 1935 to 1959. URS identified the locus in 2008 during archaeological monitoring. No Project-related activities have occurred within the locus boundary.

Locus V

Locus V consists of a small, dispersed scatter of nine obsidian biface thinning flakes. In addition to the flakes, one crushed evaporated milk can was also noted. URS identified the locus in 2011 during archaeological monitoring of a seismic line. Monitoring measures included flagging the full extent of the artifact concentrations to ensure avoidance, relocating or offsetting geophone locations, and flagging of alternate access roads to minimize surface disturbance to noted resources. No other Project-related activities have occurred within the locus boundary.

Locus X

Locus X is a multiple component artifact scatter that includes a prehistoric obsidian flake concentration and a historic-period artifact scatter. The prehistoric assemblage consists of about 50 flakes, while historic-period items include a few tin cans, an amber medicinal bottle, and white unimproved earthenware fragments.

Monitoring of geotechnical investigations conducted by URS in 2006 included the excavation of four STUs within the locus. STUs B-14, B-14a, B-14b, and B-14c were dug a depth of 20 or 40 cmbs, but none yielded cultural remains. In 2012, URS monitored the drilling of two boreholes within the central part of the locus.

Project-related Activities Conducted within the Site Boundary

Of the various archaeological sites found within the Project APE, CA-INY-2243/5703 has been the one most subject to Project-related activities. Several proposed project components occur within the site, and phased geophysical and geotechnical studies have examined this area since 2006. Presented below are summaries of the such studies conducted within the site boundary.

2006 Geotechnical Monitoring and Limited Shovel Testing

The 2006 geotechnical investigations were designed to examine multiple locations within the Project APE, including portions of CA-INY-2243/5703. Limited shovel testing was conducted at drill hole locations, as well as along proposed access roads situated within the site area. Testing was restricted to the southern half of the site, where geotechnical investigations were focused; the northern site area was not examined. The testing revealed the presence of a buried prehistoric cultural deposit that ranged from a depth of 10 to 60 cmbs (Nilsson 2007).

Sixty STUs were excavated within the south-central portion of the site, with 11 STUs producing obsidian flakes (Table 4-4). One temporally-diagnostic artifact, a Rose Spring series projectile point, a style characteristic of the Haiwee period (1350–650 B.P.), was found at a depth of 0 to 20 cmbs within STU Access B–9a.

Two trench locations within the site boundaries were also monitored during subsurface mechanical excavation. The trenches measured up to 300-feet-long, 10-feet-deep, and 20-feet-wide, including temporary storage of excavated materials. Before excavation, the location of each trench and its spoils areas was subjected to a 5 m spaced pedestrian survey. No cultural materials were found during the trench inventory. The entire trenching operation was subsequently monitored during excavation, and no cultural materials were found.

Table 4-4. STUs Excavated at CA-INY-2243/5703 in 2006.

STU Number	Locus	Depth of Excavation (cmbs)	Artifacts
B–1	Non–locus	40	None
B–2	Non–locus	20	None
B–3	Non–locus	20	None
B–4	Locus A/B	40	1 black translucent obsidian flake and 1 black opaque obsidian flake (0–20 cm)
B–5	Locus A/B	20	None
B–7	Locus I	40	None
B–8	Locus P	40	None
B–9	Non–locus	20	None
B–10	Non–locus	20	None
B–11	Non–locus	20	None
B–12	Non–locus	20	None
B–14	Locus X	40	None
B–15	Locus G	40	2 black translucent obsidian flakes (0–20 cm)
B–16	Locus A/B	40	1 black opaque obsidian flake (0–20 cm)
BA–11	Non–locus	40	None

Table 4-4. STUs Excavated at CA-INY-2243/5703 in 2006.

STU Number	Locus	Depth of Excavation (cmbs)	Artifacts
BA–17	Locus A/B	20	None
BA–18	Locus A/B	20	None
OW–2	Locus C	20	None
OW–3a	Non–locus	60	1 black, translucent, cloudy, obsidian flake (0–20 cm); 3 black, translucent, cloudy, obsidian flakes (20–40 cm)
OW–3b	Non–locus	40	1 black, translucent obsidian flake (0–20 cm)
OW–4	Locus A/B	20	None
OW–5	Non–locus	20	None
OW–8	Non–locus	40	None
OW–9	Non–locus	20	None
OW–11	Non–locus	40	None
OW–12a	Non–locus	20	2 black opaque obsidian Flakes (0–20 cm)
OW–12b	Non–locus	80	1 black opaque obsidian flake (0–20 cm); 1 black opaque obsidian flake (20–40 cm); 1 black opaque obsidian flake (40–60 cm)
OW–14a	Locus P	20	None
OW–14b	Locus P	40	2 black translucent obsidian flakes (0–20 cm)
OW–15	Locus A/B	20	None
PW–1	Non–locus	40	1 black translucent obsidian flake (0–20 cm)
PW–2	Locus A/B	20	None
Access B–2a	Non–locus	40	None
Access B–2b	Non–locus	40	None
Access B–2c	Non–locus	40	Bottle glass, plate glass (0–20 cm)
Access B–7a	Locus I	60	2 black, translucent, cloudy, obsidian flakes (0–20 cm); 1 opaque, obsidian, edge–modified flake (20–40 cm)
Access B–14a	Locus X	20	None
Access B–14b	Locus X	40	None
Access B–14c	Locus X	40	None
Access B–17a	Locus A/B	20	None
Access B–17b	Locus A/B	20	None
Access OW–14a	Non–locus	40	None
Access OW–14b	Non–locus	40	None
Access OW–14c	Non–locus	40	None
Access OW–14d	Non–locus	40	None
Access OW–14e	Locus P	40	None
Access B–9a	Non–locus	40	1 black opaque obsidian Rose Spring projectile point (0–20 cm)
Access B–9b	Non–locus	40	None
Access B–10a	Non–locus	40	None
Access B–10b	Non–locus	40	None
Access B–10c	Non–locus	40	None

Table 4-4. STUs Excavated at CA-INY-2243/5703 in 2006.

STU Number	Locus	Depth of Excavation (cmbs)	Artifacts
Access B–10d	Non–locus	40	None
Access OW–11a	Non–locus	40	None
Access OW–11b	Non–locus	40	None
Access OW–11c	Non–locus	40	None
Access OW–12a	Non–locus	40	None
Access OW–12b	Non–locus	40	None
Access OW–12c	Non–locus	40	None
Access OW–12d	Non–locus	40	None
Access OW–12e	Non–locus	40	None

2008 and 2009 Geophysical Monitoring

Archaeological inventory conducted in support of LADWP's 2008 and 2009 geophysical investigations recorded four new artifact concentrations within CA-INY-2243/5703 (Locus R, S, T, and U). Seismic survey activities were restricted to the southern part of the site, specifically the southern tip of Locus F, an obsidian lithic concentration. One seismic line averted newly identified Locus R, S, and T by circumventing obsidian artifact concentrations, as feasible. Another seismic line passed near Locus D of CA-INY-2243/5703. Few obsidian flakes were noted in the general path of this line, reflecting a low-density background scatter.

2011 Geophysical Monitoring

In 2011, seismic survey activities were conducted across the southern part of CA-INY-2243/5703 (Nilsson 2011). Beginning at the western end, one line crossed a 25 m extent of Locus I, which included a prehistoric lithic scatter and a historic-period artifact concentration. Monitoring resulted in the recommendation and implementation of no vehicular traffic through the locus, and the Polaris ATV being used for the study was guided by the archaeologist around the locus. This seismic line also crossed between Locus E and Locus P, but did not affect either of these artifact concentrations. The Polaris ATV was guided between these loci, in an area lacking surface artifacts. Additionally, no other vehicular traffic was allowed to cross the loci. Similar measures were undertaken for Locus W where Project activities avoided surface or subsurface disturbance within this area.

A second seismic line spanned the northern portion of the site. At its western end, the line traversed Locus O, an obsidian lithic scatter. No artifacts were observed on the surface of the seismic survey corridor, however, some were noted nearby. Obsidian flakes near the corridor were identified and pin-flagged and concentrations were cordoned off with flagging tape. These artifacts were avoided by project activities that occurred within the locus and the Polaris ATV was guided around the area of flake concentration. Foot traffic and blasting permitted within the locus area where no surface artifacts were identified.

2012 and 2013 Geotechnical and Geophysical Studies and Limited Shovel Testing

The 2012 and 2013 geotechnical and geophysical studies focused within CA-INY-2243/5703. Geophysical studies included examination of a seismic that crossed a non-locus area of the site. The URS inventory and monitoring of this line did not identify any cultural resources. Geotechnical work included excavation of a series of drill holes and fault investigation trenches (Table 4-5). Overall, 69 drill boreholes were dug within the site boundary, including 45 in non-locus contexts, 13 in Locus A/B, 7 in Locus C, 2 in Locus I, and 2 in Locus X.

Table 4-5. CA-INY-2243/5703 Geotechnical Drilling and Trench Locations Monitored in 2012 and 2013.

Year	Testing Type	Unit Number	Associated Site	Comment
2012	CPT	NHD-12-CPT7S	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT8	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT9	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT10	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT35	CA-INY-2243/5703, Locus A/B	
2012	CPT	NHD-12-CPT36	CA-INY-2243/5703, Locus A/B	
2012	CPT	NHD-12-CPT37	CA-INY-2243/5703, Locus A/B	
2012	CPT	NHD-12-CPT38	CA-INY-2243/5703, Locus A/B	
2012	CPT	NHD-12-CPT39	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT40	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT42	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT43	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT44	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT44A	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT45	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT46	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT46A	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT47	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT48	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT49	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT50	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT51	CA-INY-2243/5703, Non-locus	
2012	CPT	NHD-12-CPT52	CA-INY-2243/5703, Locus C	
2012	CPT	NHD-12-CPT53	CA-INY-2243/5703, Locus C	
2012	CPT	NHD-12-CPT54	CA-INY-2243/5703, Locus C	
2012	CPT	NHD-12-CPT55	CA-INY-2243/5703, Non-locus	
2012	PWO	NHD-12-PWO1R	CA-INY-2243/5703, Non-locus	
2012	SB	NHD-12-SB1	CA-INY-2243/5703, Non-locus	
2012	SB	NHD-12-SB2	CA-INY-2243/5703, Non-locus	
2012	SB	NHD-12-SB4	CA-INY-2243/5703, Locus A/B	
2012	SB	NHD-12-SB6	CA-INY-2243/5703, Non-locus	
2012	SB	NHD-12-SB7	CA-INY-2243/5703, Locus C	
2013	I	NHD-13-I18	CA-INY-2243/5703, Non-locus	
2013	I	NHD-13-I19	CA-INY-2243/5703, Non-locus	
2013	MW	NHD-13-I1	CA-INY-2243/5703, Non-locus	
2013	MW	NHD-13-I2	CA-INY-2243/5703, Locus A/B	
2013	PW	NHD-13-I3	CA-INY-2243/5703, Locus A/B	
2013	OW	NHD-13-OW5R	CA-INY-2243/5703, Non-locus	
2013	OW	NHD-13-OW15R	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW2	CA-INY-2243/5703, Locus C	
2013	RW	NHD-13-RW2A	CA-INY-2243/5703, Locus C	

Table 4-5. CA-INY-2243/5703 Geotechnical Drilling and Trench Locations Monitored in 2012 and 2013.

Year	Testing Type	Unit Number	Associated Site	Comment
2013	RW	NHD-13-RW2P	CA-INY-2243/5703, Locus C	
2013	RW	NHD-13-RW3	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW3P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW4	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW4P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW5	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW5A	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW5P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW6	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW6P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW7	CA-INY-2243/5703, Locus A/B	
2013	RW	NHD-13-RW7P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW8	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW8P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW9P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW12	CA-INY-2243/5703, Locus X	Exclusion flagging
2013	RW	NHD-13-RW12P	CA-INY-2243/5703, Locus X	Exclusion flagging; recommend drilling remain within previously disturbed area
2013	RW	NHD-13-RW13	CA-INY-2243/5703, Locus I	
2013	RW	NHD-13-RW13P	CA-INY-2243/5703, Locus I	
2013	RW	NHD-13-RW14	CA-INY-2243/5703, Locus A/B	Exclusion flagging
2013	RW	NHD-13-RW14P	CA-INY-2243/5703, Locus A/B	Exclusion flagging
2013	RW	NHD-13-RW15	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW15P	CA-INY-2243/5703, Non-locus	
2013	RW	NHD-13-RW25	CA-INY-2243/5703, Non-locus	
2013	SB	NHD-13-RW3	CA-INY-2243/5703, Locus A/B	
2012	Trench	NHD-13-RW12A	CA-INY-2243/5703, Locus A/B	Pre-trenching shovel testing
2012	Trench	NHD-13-RW12B	CA-INY-2243/5703, Locus A/B	Pre-trenching shovel testing
2012	Trench	NHD-13-RW12C	CA-INY-2243/5703, Non-locus	

CPT – Cone Penetration Testing, I – Hollow Stem Auger, MW – Monitoring Well, OW–Observation Well, PW and PWO – Pumping Well, RW – Mud Rotary Wash, SB – Sonic Boring.

Before deep trenching was initiated at two proposed trench areas, a shovel-testing program was designed, in consultation with BLM archaeologist Donald Storm, to examine the trench alignment area for the presence of subsurface artifacts or features. The program proposed by BLM consisted of the excavation of a series of 1 by 1 m wide, 50-cm deep units along the trench corridor. EUs 1–16 were laid out in a loose grid at approximately 20 m intervals in two roughly parallel lines on each side of the trench centerline, within Locus A/B. Subsurface testing resulted in the recovery of a sparse cultural assemblage from the excavation of 10.4 m^3 of sediment. The assemblage consisted of 131 obsidian flakes, 3 flaked stone tools, 32 faunal remains, and 1 piece of modern glass. Most artifacts were recovered from depths above 60 cm, with only 11 flakes and the 3 flaked stone tools found within the deeper trench units. Upon completion of unit testing, the trenches were mechanically excavated. During excavation of one trench, two discrete cultural features (Feature 1 and Feature 2) containing charcoal were uncovered and archaeologically excavated. Radiocarbon dating of the two fire hearth features provided near-identical conventional radiocarbon dates of 4120 +/-30 B.P. (Beta-337849) and 4100 +/-30 B.P. (Beta-337850).

Cumulative surface and subsurface temporal information indicate prehistoric site occupation initiated during the Little Lake period (5950-3150 B.P.), with additional use noted during the Marana period (650 B.P.–Historic). The full results of the pre-trenching archaeological testing, as well as the recovery of Features 1 and 2, are detailed in a report by Nilsson and Bevill (2015, 2016a).

CA-INY-6574

This multiple component site consists of a prehistoric lithic scatter; a material borrow pit (Borrow Site #2) used in 1912 for construction of NHD; and an ore-processing complex dating to the 1920s/1930s.The site occupies a broad, open, east-facing terrace, as well as steeper side slopes. Cultural remains occur within five loci (A–E) that include one prehistoric lithic concentration (Locus D), three historic-period areas (Locus A, B, and C), and one area (Locus E) with multiple component remains. The site is in fair condition. The wooden features in Locus A are deteriorating, and superstructures have been removed from the Locus B concrete foundations. Geotechnical drilling and trenching activities, as well installation of dirt roads and water monitoring wells, have also affected the surface of the site, as have disturbances related to off-road vehicle use and rodent burrowing.

Site Recordation History

CA-INY-6574 was originally recorded in 2002 by EDAW (Shaver, Fitzsimons, Strauss, and Carrel 2002) as a complex of concrete foundations, wooden structures, artifact deposits, and a borrow pit encompassed within three discrete loci (Locus A–C). URS updated the site record in 2011 (Nilsson and Doty 2011b), adding a newly identified prehistoric component, Locus D, a concentration of at least 15 obsidian flakes. Included in an updated site record prepared in 2012 was Locus E, a prehistoric lithic scatter and a collapsed rock cairn that is likely a mine claim marker. Site boundaries were adjusted to accommodate the Locus E finds, and currently encompass an area measuring 300 m north-south by 232 m east-west.

Phase II Testing

In 2015, AECOM conducted Phase II investigations at the site to assess its NHRP eligibility, as this resource lies within the NHD2 construction area and has the potential to be affected by project-related activities. Phase II investigations focused on prehistoric and historic components, targeting Locus B, D, and E. A summary of the Phase II study is provided below, while the full results are detailed in Nilsson and Bevill (2016b).

Investigations of the Locus D and E prehistoric component documented the presence of a thin, near-surface lithic scatter in both these locales. Together, the recovered, obsidian-based artifact assemblages included a sparse assemblage of nine flakes, one biface, and one EMP, all collected from a maximum depth of 40 cmbs. Temporal data for the prehistoric component, consisting exclusively of age-computed micron readings, indicate site use during the Marana, Newberry, and Little Lake periods. Given that the artifact assemblage reflected both low artifact density and diversity, the prehistoric component likely served as a temporary use area where limited lithic reduction tasks occurred.

Investigation of the Locus B historic-period component, comprised of an ore-processing complex, yielded an assemblage of over 800 artifacts recovered from subsurface contexts that extended to a maximum depth of 60 cmbs. One cultural feature was identified, consisting of a buried deposit of burnt structural remains and artifacts possibly associated with a former engine house. A large number of structural and indefinite use items were collected, largely from the Feature 1 area. Few artifacts were recovered related to activities, personal use, or domestic matters, suggesting that the tested portion of Locus B did not contain living quarters.

Archival research demonstrated that historic land use for the site area and its general environs is tied to events associated with early exploration; construction of the LAA, NHD, and NHR; and potential mineral and rock mining in the Coso Range. The earliest historical documentation references two trails associated with 1850s era exploration near the site, including Walker's Trail and an unnamed trail that became Cactus Flat Road (Site CA-INY-7816). Following this, the historical record is silent until the early twentieth century, when federal records from

1902 and 1909 provide information regarding land withdrawal (encompassing the site area) to facilitate construction of the LAA1 and its related facilities, including NHD and NHR. Although a homestead entry was filed in 1924 for a 120-acre area encompassing the site locale, it appears that the claim was not fulfilled and the entry was canceled in 1930. Following this, the site area remained an undeveloped parcel under BLM administration until it was transferred to the LADWP in 1992.

The results of archival research, coupled with the scant temporal data for the archaeological assemblage, suggest that the ore-processing complex operated sometime between 1913 and 1933, after construction of the LAA and NHD (1913) and before the 1933 Executive Order restricting settlement, location, sale, or entry. Review of State Mineralogist Reports for Mines and Mineral Resources specific to Inyo County (1917 to 1934) did not yield any information particular to the site area or any neighboring mines. Thus, the individual(s) responsible for the mining venture and the exact dates of operation remain unknown.

Given its limited data potential and inability to yield information important to prehistory and history (Criterion D of 36 CFR 60), the site was recommended as not eligible for listing in the NRHP or CRHR.

Locus Descriptions

Locus A

Locus A consists of two, partially intact wooden structures and associated artifacts in the northwest corner of the site, at the break in slope between an upper terrace and a lower valley bottom. The locus includes a wood-lined subterranean structure at the foot of the slope, possibly a well (Feature 1); a standing wooden ore chute/separator that appears to have been used to process quartz, pieces of which are still present inside (Feature 2); a dispersed pile of wood, likely the remains of a small building or structure (Feature 3); portions of a wood-framed touring car; and a dispersed refuse deposit of utilitarian and residential debris. Locus A was not included as part of the Phase II investigations.

Locus B

Locus B is an early twentieth-century, ore-processing complex built into the west-facing hillside slope. The locus, which encompasses an area measuring roughly 150 ft. north-south by 150 ft. east-west, contains five concrete foundations and associated debris.

Foundation #1 is a small, rectangular-shaped form that measures 68-¼ in. long, 39-½ in. wide, and 37 in. deep. The top of the foundation has three wooden beams, laid horizontal against each other. Twelve threaded iron bolts, in two rows of six, protrude from the top surface. The bolts may have once anchored machinery, which is non-extant.

Foundation #2, located about 15 m southwest of Foundation #1, is also rectangular-shaped, and measures 78-½ in. long by 35-¼ in. wide by 31-½ in. deep. Four 1-in. diameter threaded bolts protrude from the surface of this foundation. The bolts may have once anchored machinery, which is non-extant.

Foundation #3 is a 10-foot-square foundation with a 7-½-ft. diameter circular section that is filled with sand; a solid, 2-ft. tall, 4-in. diameter steel pole protrudes upward from the sand. The foundation extends into the hillside slope on the eastern elevation; the western elevation rises 4 ft. 10 in. above the slope.

Foundation #4 is a partially exposed concrete foundation at the top of slope, just below an earthen loading ramp. A wooden beam, measuring 178-¾ in. long, 9 in. wide, and 7-¼ in. tall, spans the foundation. Two concrete filled drums, each 2 ft. in diameter and set 12 ft. apart, border the western side of the foundation.

Foundation #5, situated between Foundation #2 and #3, is a concrete slab that measures 78-½ in. long, 12-7/8 in. wide, and 22-½ in. tall.

Several locations within the Locus B complex contain railroad ties, burned wooden planks, piles of firebricks, and portions of concrete sidewalks. Many firebricks are stamped with makers' marks, indicating their manufacture by seven different California-based companies (Table 4-6). Manufacturing dates for the specific brick types range from ca. 1901 to 1953. Three brick manufacturers were in operation during the LAA1, NHD, and NHR construction period (1907–1913), including the Pacific Sewer Pipe Company (1910–1921), LaClede Christy Clay Products Company (1889–1942), and the St. Louis Fire Brick and Clay Company (1901–1936). The date ranges for these manufacturer's, however, extend beyond the LAA1 and NHD construction period (after 1913), making the temporal association of the bricks with these events unclear. Three other brick types were made after 1913, including those of the Los Angeles Pressed Brick Company (1915–1926), Pacific Excelsior (1921–1953), and American Refractories Company (1927–1938). These latter bricks post-date the LAA1 and NHD construction period.

Table 4-6. CA-INY-6574 Brick Maker's Marks.

Locus	Identifying Mark	Manufacturer	Location	Date of Manufacture*
A	_JAN 2 GMB TR_	Gladding, McBean and Company	Lincoln, CA	1875–1942
B	AMERCO	American Refractories Company	Los Angeles, CA	1927–1938
B	PSP24 PSP 18 R PS A PSP ACOR_ _SP_ORN _P_RN 30 R	Pacific Sewer Pipe Company, Plant No. 3	Corona, Riverside County, CA	1910–1921
B	Pacific Excelsior PSP_CELS_	Pacific Excelsior	Corona, Riverside County, CA or Lincoln Heights, Los Angeles, CA	1921–1953
B	APB CO 84 _APB CO (Stars) LAPB CO 1 LAPB CO 2 LAPL CO (Star)	Los Angeles Pressed Brick Company	Los Angeles, CA (office); Plant No. 4 at Alberhill, Riverside County, CA	1916–1926
B	LACLEDE CROWN LACLED_CROWN	LaClede Christy Clay Products Company	St. Louis, MO	1889–1942
B	CAL_EX_	St. Louis Fire Brick and Clay Company	Los Angeles, CA	1901–1936
B	_LAY M. CO	Pacific Clay Manufacturing Company	Corona, Riverside County, CA	

* – Fire brick maker's mark sources are courtesy of Dan Mosier @ calbricks.netfirms.com

Locus C

Locus C consists of a large, earthen pit, known as Borrow Site 2, a feature associated with construction of the existing Dam. Today, the pit, which encompasses the southern part of the site, comprises an area measuring roughly 500 ft. northeast-southwest by 375 ft. northwest-southeast. Three borrow sites, identified as Borrow Site 1, 2, and Wagon Borrow (Figure 2-10), were used to construct the main body of NHD (Davis and Roux 2001). Borrow Sites 1 and 2 were used for placing the hydraulic fill portion of NHD.

Borrow Site 1 was used from April through October 1912 to position about 57,000 cubic yards of earth (Davis and Roux 2001). Borrow Site 1 material was placed in the lower portions of NHD, including the cutoff trench, the silt layer created at beginning of construction, and the lower portions of the shell and core (Davis and Roux 2001). The pit consisted of too much sand, however, a situation that cut the pumps and force mains (or discharge pipes), allowing only a relatively low percentage of material to remain in suspension during transport to the NHD site (City of Los Angeles 1916; Davis and Roux 2001). To ameliorate the situation, Borrow Pit 2 (the Locus C area of CA-INY-6474) was excavated. This pit was used from October through December 1912 to place about 84,235-cubic-yards of soil within the upper portions of the existing Dam's shell and core. The pit material was much finer and lighter and moved rapidly through the pumps.

To expedite dam construction and make up for time lost with the problems at Borrow Site 1, a portion of NHD's western embankment was constructed with dry wagon-placed material. Designated as the Wagon Borrow, some 26,137-cubic-yards of material were obtained from excavations for the LAA1 inlet canal. The dirt was hauled by wagons for a distance of 200 to 500 ft., where it was deposited (also by wagons) to form part of NHD (City of Los Angeles 1916; Davis and Roux 2001). All dam fill was completed by the end of December 1912 (Davis and Roux 2001).

Locus D

Locus D, added to the site record by URS in 2011, consists of a sparse obsidian lithic scatter along the eastern edge of the site. This small locus encompasses an area measuring 38 m north-south by 45 m east-west. Surface artifacts include at least 15 flakes, representing late-stage core reduction, late-stage biface reduction, and pressure reduction activities.

Locus E

Locus E, added to the site record by URS in 2013, consists of a prehistoric lithic scatter and a collapsed, historic-period rock cairn that likely served as a mining claim marker. The locus measures 85 m north-south by 38 m east-west. The lithic scatter contains 38 obsidian flakes, 1 quartzite flake, 1 obsidian EMP, and 2 obsidian biface fragments (Figure 4-5). The flakes consist of early and late-stage biface thinning detritus. The rock cairn feature measures 5.6 ft. north-south by 5.9 ft. east-west and stands one course high. It is constructed from more than 30 local cobbles and small boulders. Present within the cairn are broken fragments of a pocket tobacco tin that may have once held a paper mining claim notice. A dirt road leading to a monitoring well bisects the locus.

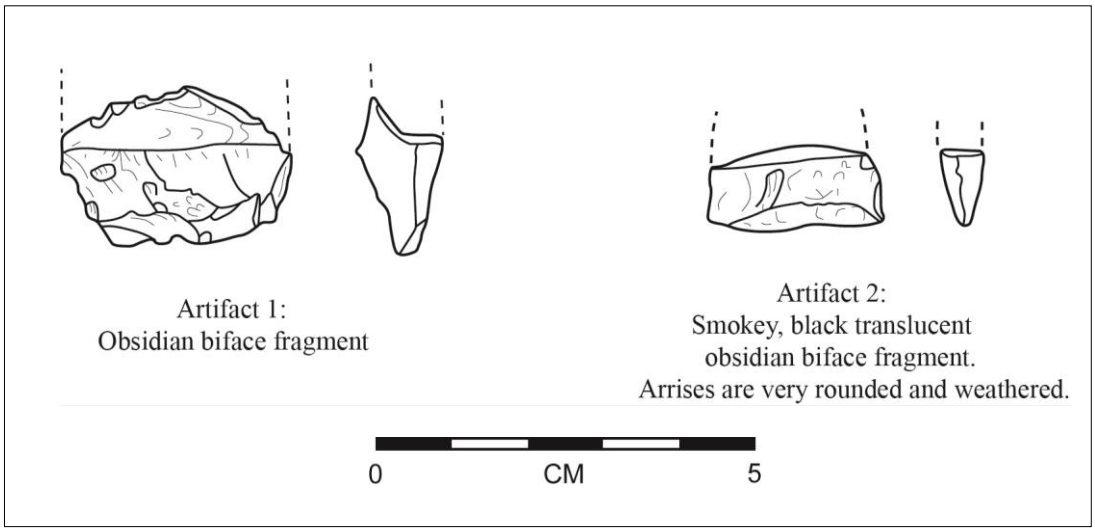

Figure 4-5. CA-INY-6574 Locus E biface fragments.

Project Related Activities Conducted within the Site Boundary

As part of LADWP's 2006 geophysical investigations, URS monitored the excavation of a trench and monitoring well, both located within the boundaries of CA-INY-6574 (Nilsson 2007). The trench was along the western edge of the site, in an area between Locus A and Locus B that was devoid of surface artifacts. URS excavated two STUs in the trench area, STU B-13a and STU B-13b, both outside the site's historic-period artifact scatter (Table 4-7). Dug to a depth of 20 and 40 cm, respectively, neither unit yielded cultural remains (Nilsson 2007). STU OW-7 was excavated at the location of the monitoring well. This unit, dug to 20 cmbs, also yielded no cultural remains.

As part of LADWP's 2008 and 2009 geophysical investigations, a seismic line crossed the southern end of CA-INY-6574, within the Locus C borrow pit area (Nilsson 2010). To minimize effects within the borrow area, the geophones, cables, and batteries needed for the seismic study were hand-carried. The Vibroseis machine was used only through the portion of Line 1 within the borrow pit and was not extended eastward on the line.

Table 4-7. CA-INY-6574 STU Information.

STU Number	Year Excavated	Excavation Depth (cmbs)	Artifacts
BA–13a	2006	20	None
BA–13b	2006	40	None
OW–7	2006	20	None

cmbs – centimeters below surface.

Geophysical investigations conducted in 2011 included examination of another seismic line that crossed the central portion of the site, between Locus A and Locus B where no cultural resources had been noted (Nilsson 2011). None of the structures, foundations, or artifact deposits associated with these loci was affected. The line also traversed the southern end of newly discovered Locus D in an area where three obsidian flakes had been noted on the surface. Seismic testing was conducted outside the Locus D boundary, and none of the flakes was within the impact area. Additionally, vehicular traffic did not cross the locus.

LADWP's 2012 and 2013 field investigations included geophysical and geotechnical work within the site boundary. One seismic line extended roughly 325 ft. northeast-southwest through the site, across the Locus E area. Nine drilling locations, including two RWs, four SBs, and three VWs, were drilled within the site, along the margins of a drainage separating Locus A and Locus C (Table 4-8). As needed, the URS monitor placed exclusion flagging around neighboring artifact locales to avoid disturbance during the drilling activities.

Table 4-8. CA-INY-6574 Geotechnical Drilling Locations Monitored in 2012 and 2013.

Year	Testing Type	Drill Hole Number	Associated Site	Comment
2012	SB	NHD-12-SB11	CA-INY-6574	
2013	RW	NHD-13-RW11	CA-INY-6574	Exclusion flagging
2013	RW	NHD-13-RW11P	CA-INY-6574	Exclusion flagging
2013	SB	NHD-13-SB1	CA-INY-6574	Exclusion flagging
2013	SB	NHD-13-SB2	CA-INY-6574	Exclusion flagging
2013	SB	NHD-13-SB4	CA-INY-6574	
2013	VW	NHD-13-VW1	CA-INY-6574	
2013	VW	NHD-13-VW2	CA-INY-6574	
2013	VW	NHD-13-VW3	CA-INY-6574	

RW – Mud Rotary Wash, SB – Sonic Boring, VW – Vadose Well

CA-INY-6575

This historic-period site consists of a domestic refuse deposit and an earthen berm. The site, which encompasses an area measuring 150 m north-south by 40 m east-west, is in fair condition. It was recorded by EDAW in 2002 (Shaver and Carrel 2002), and its record has not been updated. No Project-related activities have occurred within the site boundaries.

Most of the site's domestic debris occurs within one small artifact concentration composed of tin cans, glass, and ceramic artifacts. Items consist of brown glass, 1 piece of ceramic tableware, 18 church-key opened beer cans, 2 solder-top cans, 2 tobacco tins, 1 meat tin, and wire. Based on the presence of church-key opened beer cans, the site dates to post-1935. An earthen berm, which measures 500-foot-long, 3-foot-tall, and 8-foot-wide, is about 60 ft. east of the artifact concentration. The berm appears to coincide with the placement of fill material along the north edge of the existing Dam in 1972 (Shaver and Carrel 2002; see Figure 2-10). EDAW archaeologists postulated that the berm predated the fill material placed to localize ponding from high-water seepage at the face of NHD.

CA-INY-6576

This prehistoric site is a small cluster of three obsidian biface thinning flakes, near a large stand of Joshua trees. The site, which is in fair condition, encompasses an area measuring 2 m north-south by 2 m east-west. It was recorded by in 2002 by EDAW (Deis et al. 2002), and its site record has not been updated. No Project-related activities have occurred within the site boundaries.

Phase II Testing

AECOM conducted Phase II investigations at the site in November 2015 to assess its NHRP eligibility, as this resource has the potential to be affected by project-related activities. Phase II investigations documented the presence of a sparse, surface lithic scatter comprised of two obsidian flakes; no subsurface artifacts were found (Nilsson and Bevill 2016b). Temporal data, derived from obsidian hydration dating, equated site use to a single-

episode during the Newberry period. Given its limited data potential and inability to yield information important to prehistory (Criterion D of 36 CFR 60), the site was recommended as not eligible for listing in the NRHP or CRHR.

CA-INY-6577

This multiple component site consists of a prehistoric lithic scatter and several bedrock milling features, as well as the remains of a LAA1 period labor camp. It encompasses an area measuring 170 m north-south by 260 m east-west, 34,697 m². The prehistoric component includes a low-density obsidian lithic scatter, five granite/granodiorite boulders with bedrock milling slicks, and one handstone. The historic-period component includes three features and an artifact assemblage of over 100 artifacts, including domestic, personal, activities, and miscellaneous items. The site is in fair condition; several dirt roads have affected its periphery, and a wooden pole utility line and its two-track dirt road traverse roughly east-west across the site.

Site Recordation History

The site was originally recorded in 2002 by EDAW (Deis, Dreibelbis, and Gadreault 2002a) as a small cluster of historic-period features amidst a light surface scattering of six prehistoric interior obsidian flakes. Three historic-period features (Features 1–3), one tin can concentration, and one large bottle and glass concentration were identified. Feature 1 was described as a concentration of coal clinkers and stove coke measuring 10 m north-south by 20 m east-west. Feature 2 was recorded as a concentration of firebrick, coal, and slag encompassing a 9 m north-south by 20 m east-west area. Feature 3 was identified as a much larger concentration of brick, coal, and slag within a 45 m northeast-southwest by 15 m northwest-southeast area. Also noted were at least 100 historic-period artifacts, including stove parts, bottle glass, tableware, barrel hoops, coal clinkers and coke, firebrick, corrugated metal, and leather shoe fragments.

Figure 4-6. CA-INY-6577 Feature 5 bedrock milling station.
Milling slick is the polished area above the trowel.

URS updated the site record in 2008, expanding site boundaries to encompass a prehistoric bedrock milling complex, thereby enlarging the Feature 3 area and adding a previously unrecorded tin can concentration to the site inventory (Doty 2008a). Only two of the original six obsidian flakes noted in 2002 were relocated in 2008. As part of the newly identified bedrock milling complex, five granite bedrock milling stations (Features 4–8) and one metavolcanic unifacial handstone were recorded in the northwestern corner of the site. Feature 4 consists of a bedrock milling station with two milling slicks, while Features 5–8 are bedrock milling stations with a single milling slick each (Figure 4-6). The three historic-period features (Feature 1–3), tin can concentration, and bottle and glass concentration recorded by EDAW in 2002 were relocated. No new artifacts were added to those already identified by EDAW. Historic artifacts and features are indicative of the site's use as labor camp associated with construction of the LAA1 system (1907–1913). Features 1–3 are considered areas of coal ash disposal, while most historic-period artifacts are indicative of domestic activities focused on food preparation.

Phase II Testing

At the request of BLM, in November 2016, AECOM conducted Phase II investigations at the site to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Project-related Activities Conducted within the Site Boundary

As part of the 2008 and 2009 geophysical investigations, the western end of a seismic line that passed through the northern site area, specifically a tin can scatter; the LAA1 labor camp area and the prehistoric bedrock milling area were not crossed (Nilsson 2010). The geophones, cables, and batteries required for the seismic study were hand carried, and no vehicles were allowed to cross the site. The Vibroseis machine was stationed off-site, on a two-track road. The sole impacts to the site were foot traffic and the hand placement of stakes, cables, batteries, and geophone.

CA-INY-6578/6579

This site is a large, diffuse, prehistoric lithic scatter and historic-period artifact scatter. The cultural assemblage encompasses an area measuring 150 m north-south by 250 m east-west, and is defined by four distinct artifact concentrations (Locus A, B, C, and D). The site is in fair condition, with the periphery having been affected by dirt roads, utility lines, and a two-track road.

The prehistoric assemblage consists of a low-density obsidian flake scatter composed of at least 200 pieces of obsidian debitage, 1 basalt flake, 1 obsidian corner- or side-notched projectile point, 4 obsidian bifaces, 2 EMPs, and 1 piece of *Haliotis* shell. These artifacts occur across the entirety of the site, with a discrete locus of 84 flakes (Locus D) found on the eastern side of a berm. Debitage technology reflects early- and late-stage biface thinning flakes, as well as some pressure flakes. The large size of the obsidian corner- or side-notched point infers possible association with the Newberry period (3150–1350 B.P.).

Loci A, B, and C, situated in the western half of the site, consist of historic-period artifact concentrations that contain refuse from activities associated with construction of the LAA1, NHD, and/or NHR (1907–1913). Collectively, the historic-period component includes at least 200 tin cans and can fragments, bottle glass, barrel hoops, wire, strap metal, coke, burnt faunal bone, and a suspender clip, the latter dating to ca. 1892. These objects are primarily concentrated within the loci, although additional debris is scattered across the site. Locus A and B consist mainly of condensed milk cans and large hole-in-cap cans that date between 1908 and 1914, corresponding with the LAA1 construction period. Locus C is a small concentration of post-1935 cone-top beverage cans (Rock 1988) two condensed milk cans, and one sanitary can.

Site Recordation History

EDAW (Deis et al. 2002b) recorded CA-INY-6578 in 2002 as a small cluster of 20 obsidian flakes. The identified lithic assemblage consisted primarily of interior obsidian flakes and one possible EMP. It was noted that the fluvial character of an ephemeral creek that crosses the site had likely dispersed artifacts across the site area, which measured 14 m north-south by 33 m east-west.

EDAW (Deis et al. 2002c) recorded CA-INY-6579 in 2002 as a multiple component resource. The site encompassed an area measuring 100 m north-south by 120 m east-west. Two early twentieth-century artifact concentrations (Locus A and B) were identified amid a background scatter of similar historic-period items. A prehistoric component was also noted at Locus B, defined by eight obsidian flakes. Site-wide, historic-period artifacts included 90 vent-hole milk cans, 27 hole-in-top cans, 1 pocket tobacco tin, and 33 crushed can fragments. Also present at Locus A were two brown bottle glass fragments, charcoal, metal strapping, one graniteware cup, and two barrel hoops. Locus B contained two barrel hoops, one square brown bottle base, and leather pieces.

In 2012, URS updated the records for Sites CA-INY-6578 and CA-INY-6579 in advance of LADWP's geotechnical investigations. Re-recordation efforts revealed that the two sites were geographically linked by a continuous, low-density obsidian flake scatter, prompting their merger into one site, designated as CA-INY-6578/6579.

Phase II Testing

At the request of BLM, in November 2016, AECOM conducted Phase II investigations at the site to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Project-related Activities Conducted within the Site Boundary

LADWP's geotechnical investigations planned for 2012 included the excavation of a 15-foot-long test pit within the boundaries of CA-INY-6578/6579, as well as the drilling of two boreholes. To assess the nature and constituency of the site deposit within these three areas, BLM requested that limited archaeological investigations be conducted before the geotechnical work. The testing program outlined by BLM included examination of the test pit area ,with three 1-x-1-m EUs to be placed within the footprint of the proposed pit, while the two borehole locations were to be examined with a single 1-x-1-m EU each.

Limited subsurface investigations identified a sparse subsurface lithic scatter that ranged from 50 to 140 cmbs, depending upon unit location (Nilsson and Bevill 2015, 2016a). The EU3 area (NHD-12-RW3) yielded the greatest cultural depth, with cultural materials recovered to 130 cmbs. Depth in the test pit area ranged between 30 and 60 cmbs, while the one borehole area demonstrated a cultural deposit to the depth of 100 cmbs. A light-density obsidian and basalt flake scatter dominates the cultural deposit. Subsequent to archaeological testing, LADWP abandoned plans to conduct geotechnical investigations at the site. The areas examined, however, offered little information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. The limited testing did not constitute formal evaluation of the site's NRHP eligibility, but rather an assessment of the depth and nature of the cultural deposit within the proposed geotechnical investigation areas. The full results of the limited archaeological testing are detailed in Nilsson and Bevill (2015, 2016a).

CA-INY-6580

This multiple component site consists of a prehistoric lithic scatter and historic-period artifact scatter and water tank on a high terrace. Cultural remains are dispersed across a broad stretch of the terrace, encompassing an area measuring 110 m north-south by 80 m east-west. Site disturbances include LADWP dirt access roads bordering the western, eastern, and southern site boundaries, as well as a subterranean water tank and a utility line built in the northern site area. No Project-related activities have occurred within the site boundaries.

Site Recordation History

The site was recorded by EDAW in 2002 as a historic-period containing domestic-related items and a water tank feature. Several hundred glass fragments, including pieces of clear, brown, green, amethyst, and aquamarine material, dominated the artifact assemblage. Also noted were an enameled baking dish; flue pipe; barrel hoop strapping; light bulb base; at least 46 ceramic fragments, including pieces of blue, white, and yellow pottery; and 11 tin canisters, including sanitary, hole-in-cap, and a contemporary beer can. With the exception of the beer can, the historic artifacts appeared to date to pre-1914 and were considered associated with construction of the LAA1, NHD, and/or NHR. The water tank (Feature 1) is a modern, cylindrical structure with an overlapping wooden plank roof that sits atop a concrete platform.

AECOM revisited the site in 2015 as part of a Borrow Site haul route survey (Bevill and Nilsson 2015). Cursory review of the site area at that time noted the presence of a previously unrecorded prehistoric component, consisting of at least eight obsidian flakes, and the site was designated a multiple component property. Because the unevaluated prehistoric component had the potential to be affected by haul route construction/improvement, the site was added to the Phase II investigation program. The historic-period component had been previously assessed as not meeting NRHP eligibility criteria as a contributing element to the First Los Angeles Aqueduct Historic Archaeological District (FLAAHAD; Nilsson et al. 2006) under Criterion D, where artifact concentrations with little diversity or limited quantities are considered non-contributing elements to the district.

Phase II Testing

AECOM conducted Phase II investigations at the site in November 2015 to assess its NHRP eligibility, since a project access route crosses the site and has the potential to affect this resource. Phase II investigations focused exclusively on the prehistoric component and produced a total of 35 prehistoric artifacts and 27 historic artifacts recovered from subsurface contexts to a depth of 60 cmbs (Nilsson and Bevill 2016b). Most prehistoric artifacts occurred in units excavated within the northwest portion of site, while historic artifacts occurred in the northwest area and in areas to the south.

Temporal data, derived from the obsidian hydration analysis, infers prehistoric site use predominately during the Little Lake period, with two artifacts suggesting possible use during the Newberry period, two during the Lake Mohave period, and one during the Haiwee period. Since the recovered artifact assemblage reflected both low artifact density and diversity, the site likely served as a temporary use area where, minimally, lithic reduction tasks occurred. Given its data potential within the domain of cultural chronology and lithic technology, the prehistoric component demonstrated the ability to provide information important to prehistory and the site was recommended eligible for listing in the NRHP under Criterion D of 36 CFR 60.4.

A small assemblage of historic-period artifacts were recovered during site testing. These items point to site use during the early twentieth century related to the construction of the LAA1, NHD, and/or NHR. The site's proximity to a nearby LAA1 labor camp further underscored this association. The historic-period assemblage demonstrated little data potential and did meet eligibility criteria as a contributing element to the FLAAHAD (Nilsson et al. 2006) under Criterion D, where artifact concentrations with little diversity or limited quantities are considered non-contributing elements to the district. Based on its lack of information potential, the historic-period component was recommended as not eligible to the NRHP.

CA-INY-6581

This prehistoric site consists of a sparse obsidian lithic scatter on a broad, open flat that encompasses an area measuring 60 m by 70 m, or 3,297 m². Local vegetation incorporates mostly brush species such as saltbush and rabbitbrush, as well as a few Joshua trees. The site is in good condition, although it is bisected by a transmission line access road, and an electrical tower is positioned at the northern end of the site. No project-related activities have occurred within the site.

Site Recordation History

The site was initially recorded by EDAW in 2002 (Shaver et al. 2002a) as consisting of a small cluster of three obsidian biface thinning flakes encompassing a 10 by 45 m area. In 2013, URS updated the site record to include 15 obsidian flakes, two obsidian stemmed projectile points (Figure 4-7), as well as to enlarge site boundaries to encompass an area measuring 50 m north-south by 80 m east-west.

Phase II Testing

AECOM conducted Phase II investigations at the site in January 2017 to assess its NHRP eligibility, as widening of an access road has the potential to affect the site. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

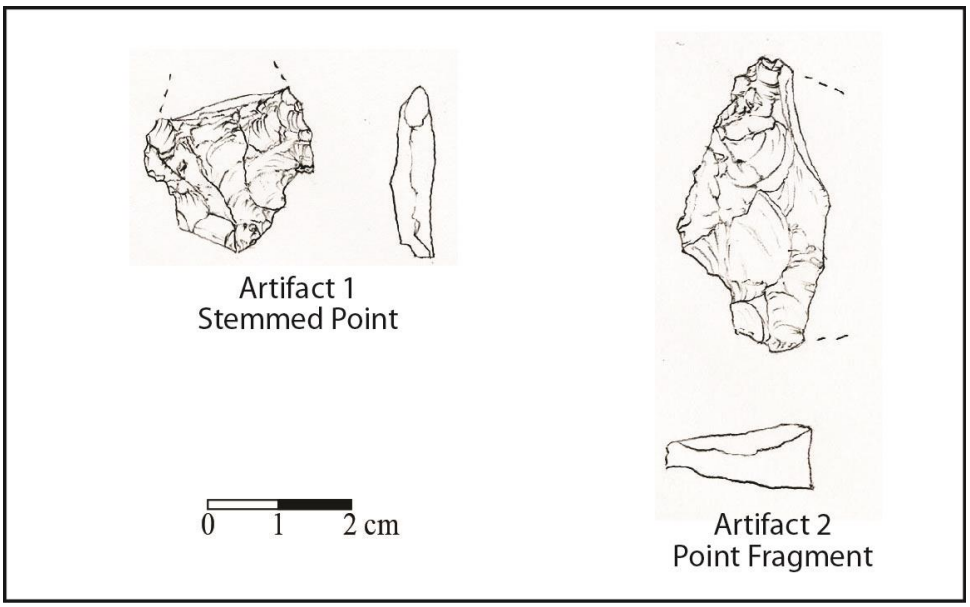

Figure 4-7. CA-INY-6581 stemmed projectile point fragments found in 2002.

CA-INY-6582

This multiple component site consists of a prehistoric obsidian lithic scatter that is bisected by a historic-period telephone or telegraph wire. Prehistoric surface artifacts include at least 70 obsidian flakes, 1 obsidian biface, 1 obsidian EMP, and 1 abraded quartzite rock. The sole historic-period artifact is a 650-foot-long segment of single-strand aluminum telephone wire, lying on the ground surface, which crosses the length of the site, extending northwest/southeast outside the site boundaries. Although bisected by a two-track dirt road, the site is in fair condition, with a few effects related to rodent disturbance and natural erosion.

Site Recordation History

EDAW originally recorded the site in December 2002 (Shaver et al. 2002b) as consisting of three small obsidian flaking stations (FS-1 to FS-3) connected by a sparse background lithic scatter. FS-1 included about 50 biface thinning flakes, shatter, and possible primary flakes. FS-2 included 13 biface thinning flakes, while FS-3 contained 9 biface thinning flakes. Noted at the site datum was a triangular-shaped projectile point.

In 2012, URS updated the site record in response to LADWP's investigation of a test pit, in the southwest corner of the site. The site update identified similar debitage counts; however, only one discrete flake concentration (FS-1)

was relocated. In addition to debitage, URS recorded one Type 4 obsidian biface, one possible abraded quartzite rock, and one obsidian EMP. The biface corresponds with the triangular projectile point recorded by EDAW in 2002. URS expanded site boundaries to encompass an area measuring 90 m east-west by 55 m north-south.

Phase II Testing

At the request of BLM, in November 2016, AECOM conducted Phase II investigations at the site to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Project-related Activities Conducted within the Site Boundary

Geotechnical investigations proposed by LADWP in 2012 included work within the boundaries of CA-INY-6582. Before investigations were implemented, URS undertook limited archaeological testing at the site. BLM requested that the test pit area be investigated by excavation of three 1-x-1-m EUs placed within the footprint of the proposed pit area. Subsurface excavations resulted in identification of no cultural remains. Subsequent to the limited archaeological testing, LADWP abandoned plans to conduct geotechnical investigations at the site.

Given the lack of cultural depth, the area examined offered no information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. Because testing focused in an area of the site that lacked surface artifacts, it did not constitute formal evaluation of the site's NRHP eligibility and research potential.

CA-INY-6583

This multiple component site consists of a single prehistoric obsidian flake and a historic-period artifact deposit of household debris. Historic artifacts occur within two concentrations: Locus A, at the north end of the site, and Locus B, at the south end. Locus A artifacts include fragmented Mason jars, and variously colored glass fragments, as well as a jadeite bowl fragment, Mission Beverages 7-Up® bottle, light bulb base, toothpaste tube, coat hanger, and aluminum pan. Also identified within Locus A was the single prehistoric flake. Locus B contains at least 40 pieces of fragmented clear glass, including spice, syrup, and mayonnaise bottle bases. The estimated date of the historic-period refuse is likely after A.D. 1945. Site condition is fair, and a dirt road borders the site to the north. The site was originally recorded in 2003 by EDAW (Shaver et al. 2003a). The site record has not been updated, and no Project-related activities have occurred within the site boundaries.

CA-INY-6584

This historic-period site, located on an east-facing bluff, consists of a low-stacked course of mortar-less cobbles. The site encompasses an area measuring 3 m east-west by 8 m north-south. The cobble feature closes off a natural erosional gap between an upper, low-velocity, well-sorted soil and a lower, high-velocity mud flow. The feature consists of 4 or 5 courses of stacked rock, with the larger rocks averaging 8-in. in diameter. A modern staircase is 5-ft. south of the feature, and nearby is a concrete bridge. The estimated date of the feature is post-1912, as workers on the LAA1, the Dam, and/or NHR may have built it (Shaver et al. 2003b). Site condition is fair, with effects related to natural erosion. The site was originally recorded in 2003 by EDAW (Shaver et al. 2003b). The site record has not been updated, and no project-related activities have occurred within the site boundaries.

CA-INY-6586

This multiple component site consists of a single obsidian flake and a small, post-1942 roadside artifact scatter on a broad terrace within a Joshua tree woodland. The site encompasses a 41 by 44 m area. Most historic-period artifacts occur in a concentration on the northern side of a sandy, two-track road that accesses a LADWP monitoring well, which is about 300 ft. southwest. Artifacts consists of 16 evaporated milk cans (post-1940s), fragments of 1 meat can, 3 tobacco tins, amber glass, *HYPRO* bleach bottle fragments, and 5 sanitary can

fragments with P-38 openings (post-1942). The site is in good condition, although natural erosion is affecting the artifacts. As discussed below, seismic recording activities have also affected the site. The site was originally recorded in 2003 by EDAW (Shaver et al. 2003d) and its record was updated by URS in 2012.

Project-related Activities Conducted within the Site Boundary

In June 2012, URS monitored geotechnical seismic recording activities along an 8 m (26 ft.) long extent of a seismic line that crossed the northern portion of the site. These activities, which involved the use of explosive charges, resulted in 8-in. diameter auger holes 3 ft. below the surface. The explosive charges were placed at 10-ft. intervals along the seismic line, with blast craters being 3–4 ft. in diameter. This resulted in two seismic test craters within the site boundary.

CA-INY-6587

This prehistoric site consists of an obsidian lithic scatter on a broad ridge. The site encompasses an area measuring 40 m north-south by 45 m east-west. Surface artifacts include a least 30 obsidian flakes, most of which are within Locus 1, a 10-m-diameter lithic concentration located in the central part of the site. All artifacts exhibit a high degree of aeolian weathering, and the site itself is in fair condition. An unimproved dirt road is situated about 20 ft. south of the site and several packrat nests occur in the site area. The site was originally recorded in 2003 by EDAW. The site record has not been updated, and no Project-related activities have occurred within the site boundaries.

Phase II Testing

AECOM conducted Phase II investigations at the site in November 2015 to assess its NHRP eligibility, since it is within a Project access road corridor and has the potential to be affected by road construction activities and associated laydown areas. Phase II investigations produced 14 obsidian flakes, documenting the presence of a low-density subsurface artifact deposit that extended to a maximum depth of 60 cmbs; most flakes, however, occurred within the upper 20 cm. The artifact assemblage indicates site activities focused on core and general percussion reduction of obsidian toolstone. Given that the artifact assemblage reflected both low density and low diversity, the site likely served as a temporary use area where limited lithic reduction tasks occurred. Due to heavy sandblasting, the lithic assemblage was not amenable for obsidian hydration studies. One artifact yielded information inferring site use during the Little Lake period. Given its limited data potential, the site lacked the ability to yield information important to prehistory (Criterion D of 36 CFR 60). Based on these findings, the site was recommended as not eligible for listing in the NRHP or CRHR.

CA-INY-6931/7276

This large, multiple component site consists of a prehistoric lithic scatter and the remains of a LAA1 construction labor camp. The site sits on a broad, alluvial fan dotted with sparse brush, including saltbush and rabbitbrush; a few yucca and Joshua trees are also present. The site encompasses an area measuring 140 m northeast-southwest by 80 m northwest-southeast. Disturbances include two electrical transmission lines that cross the site, as well as their associated access roads.

Site Recordation History

URS originally recorded the site in 2006 as a LAA1 labor camp (Bevill and Smith 2006a; Nilsson and Kelly 2006). Historic-period artifacts were noted within three primary concentrations (Locus 1–3), and included a variety of personal objects, domestic debris, tools and hardware, and other miscellaneous items. Personal objects consisted of shell buttons, scraps of shoe leather, shoe grommets, writing slate fragments, suitcase parts, a pocket watch, tobacco tins, buckles, and a fragment of metal and glass goggles. Abundant hole-in-cap and matchstick filler tin cans, broken bottles, cast iron stove parts, and light bulb and lantern globe glass represented the domestic debris. Wire-cut nails, pieces of wire, iron pipe segments, and metal items comprised the tools and hardware. Other items

included barrel hoops, strap metal, a *DuPont* blasting powder can, and a galvanized metal pail lid. Butchered animal bone and clay firebricks were also noted.

In April 2006, Statistical Research, Inc. recorded a light diffuse lithic scatter and low density, historic-period artifact scatter, corresponding with the location of CA-INY-6931. That site, which overlaps the southern end of CA-INY-6931, was assigned the trinomial of CA-INY-7276.

In 2007, URS conducted Phase II evaluations at the site as part of the Long Valley-Haiwee Transmission Line project (Nilsson et al. 2007). To examine the site deposit, five 50-x-50 cm STUs and two 5-x-5-foot EUs were dug. These units revealed a shallow subsurface artifact deposit that extended to no more than 6 in. below ground surface (bgs). The recovered assemblage consisted of 72 artifacts and 727 pieces of highly fragmented and burned faunal remains. Domestic artifacts included tin cans and amethyst and aqua bottle fragments, while personal items included metal footwear eyelets and a glass button. The largest artifact category was composed of structural and construction items, namely nails and screws. Additionally, several indeterminate use items were found, consisting of glazed porcelain fragments and a piece of rusted metal. The faunal remains, all from one unit, included generic domesticates composed of cow, goat/sheep, and pig bone. All faunal pieces exhibited the effects of intense heat exposure and a high degree of fragmentation. Based on these findings, site function was confirmed as representing a LAA1 (1907–1913) labor camp, and the site was evaluated as a contributing element to the First Los Angeles Aqueduct Historical Archaeological District (FLAAHAD) (Nilsson et al. 2007).

In 2007, JSA revisited the site as part of the Project, updating the site record to include expanding the site boundary to the northwest to incorporate additional artifacts (Eckhardt et al. 2007a). Newly identified historic-period resources included a concrete-lined holding pond, scattered labor camp materials, and additional refuse deposits. A prehistoric component was also noted, composed of more than 20 flakes and a biface fragment.

As part of the 2016 Project APE supplemental survey, AECOM revisited CA-INY-6931 to assess its proximity to CA-INY-7276 recorded by Statistical Research, Inc. in 2006. Reconnaissance of these two sites identified that a low-density artifact scatter links the properties, prompting the preparation of a single, updated site record (CA-INY-6931/7276) that encompasses both resources.

CA-INY-6932/7277

This multiple component site consists of a prehistoric lithic scatter and historic-period rock features likely associated with a LAA1 labor camp. The site is on a northeast-facing slope, on the western side of NHR. One historic-period feature consists of a large, rectangular-shaped rock alignment, while other smaller alignments appear to be tent pads. Historic artifacts include sanitary cans and aqua glass. Prehistoric items consist of four tools, including one biface fragment, two retouched flakes, and one projectile point fragment. Site disturbances include natural erosion and a transmission line access road that bisects the site. The site encompasses an area measuring 340 m north-south by 200 m east-west. No project-related activities have occurred within the site boundaries.

Site Recordation History

URS recorded the site in 2006, during the inventory of the Long Valley-Haiwee Transmission Line Project, as a sparse lithic scatter within and near a shallow wash (Bevill and Smith 2006b; Nilsson and Kelly 2006). At least 40 obsidian flakes and 2 reworked Type 4 obsidian bifaces were noted. The flakes included both core and biface reduction debris made from black, semi-translucent obsidian and cloudy, black, semi translucent obsidian, many of which appeared water-worn or sandblasted. Also noted were a few wind-blown tin cans.

In 2007, URS conducted Phase II evaluations at the site as part of the Long Valley-Haiwee Transmission Line Project (Nilsson et al. 2007). To examine the site deposit, four 50-x-50-cm STU's (STU1–STU4) were excavated at or near existing or proposed pole replacements. Only STU2 produced cultural remains, restricted to a single percussion-reduced obsidian flake recovered from the 0–20 cm level. Due to the paucity of subsurface artifacts, no EUs were

dug. Neither biface noted during site recordation was relocated during the testing program. Obsidian source analysis of the single obsidian flake from the site indicated that the artifact was made of tool stone from the Sugarloaf Mountain source, located within the CVF. Hydration analysis indicated a 3.8-micron value, correlating to ca. 510 years ago. Testing revealed that the site was a sparse, near surface, obsidian lithic scatter with little to no subsurface depth. Based on the paucity of artifacts and the lack of a subsurface deposit, the site was recommended as not eligible for inclusion on the NRHP (Nilsson et al. 2007).

Statistical Research, Inc. recorded a separate, but adjacent multiple component site (CA-INY-7277), in 2006 (Minor and Keur 2006a). Identified under a transmission line tower, this site consisted of a prehistoric lithic scatter with one obsidian projectile point fragment and three obsidian flakes, as well as a historic-period component that included one metal pulley wheel that may have been used to hoist insulators and/or tools up the tower.

In 2007, JSA revisited CA-INY-6932 as part of the Project and updated the site record to incorporate historic-period features and artifacts (Eckhardt et al. 2007b). One feature consisted of a rock-lined alignment, while other rock features appeared to be tent pads. Historic artifacts included at least 10 solder-top sanitary cans and aqua glass fragments. These artifacts and features inferred site use during the LAA1 construction period (1907–1913). JSA expanded the CA-INY-6932 boundaries to encompass an area measuring 340 m northeast-southwest by 200 m northwest-southeast. This expansion included the artifacts associated with CA-INY-7277, although the JSA site record did not mention that site.

As part of the 2016 Project APE supplemental survey, AECOM revisited CA-INY-6932 and CA-INY-7277. Reconnaissance of these two sites identified that a low-density artifact scatter links the properties, prompting the preparation of a single, updated site record (CA-INY-6932/7277) that encompasses both resources.

CA-INY-6933/7278

This multiple component site consists of a prehistoric lithic scatter and a small, historic-period artifact deposit on a gentle, rocky, northeast-facing slope, within an area of low-lying saltbush and rabbitbrush. Site integrity is good, with impacts restricted to the two transmission lines and their access roads, which bisect the site. As updated by AECOM in 2016, the cultural deposit encompasses an area measuring 200 m east-west by 100 m north-south. No project-related activities have occurred within the site boundaries.

Site Recordation History

URS recorded the site in April 2006 as a large, sparse, prehistoric lithic scatter and historic-period artifact scatter located within a shallow wash, south of Summit Creek. Site dimensions comprised an area of 116 by 80 m, or 7,284 m^2. Prehistoric artifacts included at least 50 obsidian flakes, 1 red CCS flake, 1 Type 2 obsidian biface fragment, 1 obsidian Rose Spring Corner-notched projectile point, 1 obsidian split-stem projectile point, and 1 ovate-shaped bifacial schist tool. The Rose Spring point inferred site use during the Haiwee period (1350–650 B.P.), while the split-stem point suggested earlier use during the Newberry period (3150–1350 B.P.).

The historic-period component was contained within a small refuse area in the central part of the site. Associated artifacts included glass insulators, a blasting powder can, numerous evaporated or condensed milk cans, several large food cans, and a cigarette tin. These artifacts were noted as likely associated with construction of the Long Valley-Haiwee transmission line in 1927.

A survey conducted by Statistical Research, Inc. in October 2006 identified a light diffuse lithic scatter and low-density historic-period artifact scatter beneath a transmission line tower, which is located east of CA-INY-6933, as recorded earlier that year by URS. The EIC assigned the trinomial of CA-INY-7278 to the Statistical Research, Inc., site.

In 2007, JSA revisited and re-recorded CA-INY-6933 as part of their survey of BLM lands associated with the Project. This re-recordation included the identification of additional prehistoric obsidian bifacial thinning flakes and

expansion of site boundaries to the northeast, into the CA-INY-7278 area, although no mention of that site was made in the updated record for CA-INY-6933. Also in 2007, URS conducted Phase II evaluations at CA-INY-6933 as part of the Long Valley-Haiwee Transmission Line Project (Nilsson et al. 2007). To examine the site deposit, three 50-x-50-cm STU's were excavated, all at existing or proposed transmission pole locations. No artifacts were recovered from the STUs. Based on the lack of a subsurface deposit, the site was recommended as not eligible for inclusion on the NRHP (Nilsson et al. 2007).

As part of the 2016 Project APE supplemental survey, AECOM revisited both CA-INY-6933 and CA-INY-7278. Reconnaissance of these two sites identified that a low-density artifact scatter links the properties, prompting the preparation of a single, updated site record (CA-INY-6933/7278) that encompasses both resources.

CA-INY-7279

This multiple component site consists of a prehistoric lithic scatter and a historic-period artifact scatter and rock ring on a high terrace, overlooking an ephemeral wash. The site encompasses an area measuring 160 by 100 m, or 12,560 m². Site vegetation includes sparse, low-lying saltbush, shadscale, and creosote bush. A transmission line bisects the central part of the site, with associated features including a two-track dirt access road and two wooden utility poles. Another transmission line, with associated on-site features that include a two-track dirt access road and a steel transmission line tower, crosses the eastern part of the site.

Statistical Research, Inc. (Minor and Keur 2006b) recorded the site as light, diffuse prehistoric lithic scatter and a low-density historic-period artifact scatter with a rock ring. Site dimensions were mapped as a 68 by 55 m area. Only two obsidian flakes comprised the prehistoric lithic scatter. Historic-period items consisted of a discrete artifact scatter of tin can fragments, miscellaneous metal, glass, and some ceramic items. Metal items included a segment of galvanized pipe and assorted tin can and other miscellaneous items. Glass artifacts encompassed a concentration of amethyst and aqua colored window glass shards and some olive green glass. A Chinese teacup fragment and green and tan/yellow ceramic pieces were also observed. Outside the discrete artifact scatter, isolated glass artifacts included a brown beer bottle, additional amethyst glass fragments, while metal items included a hole-in-cap meat can and an upright tobacco tin. The site's sole cultural feature consisted of a modern or historic-period rock ring possibly associated with tower construction.

During AECOM's 2016 supplemental APE survey effort, numerous prehistoric artifacts were observed west of an on-site tower, extending beyond the transmission line corridor. As many as 32 obsidian flakes were observed, as well as one obsidian Elko series corner-notched projectile point (Figure 4-8), one obsidian Type 4 biface midsection, and one possible quartz crystal flake. Site boundaries were extended 140 m west to encompass these additional prehistoric artifacts, resulting in a revised site area measuring 160 by 100 m. No changes were required for the site's historic-period artifact inventory, and it was noted that the rock ring feature remains intact.

Elko Corner-notched projectile point

Feature 1 – historic-period rock ring

Figure 4-8. CA-INY-7279 Elko Series projectile point and modern rock ring.

CA-INY-7615

This prehistoric site is an artifact scatter west of the existing Dam. Although sparsely represented, site artifacts are diverse and include 1 piece of obsidian debitage, 27 Owens Valley Brownware sherds, 1 handstone, and 1 piece of modified steatite. Site disturbances include construction and maintenance of a dirt road that bisects the site, as well as drilling activities associated with LADWP's geotechnical investigations conducted in 2012 and 2013. The site encompasses an area measuring 35 m north-south by 40 m east-west.

Site Recordation History

URS recorded the site in 2006 (Smith 2006) as a prehistoric resource containing four pieces of Owens Valley Brownware pottery and two pieces of incised steatite. The pottery fragments included three body sherds and one rim sherd. The steatite pieces, which conjoined, consisted of two vessel body fragments with striations or modifications.

In 2008, URS updated the site record (Doty 2008b) to note the presence of eight additional pieces of pottery (12 total) and two pieces of incised steatite. In 2012, URS updated the site record again upon completion of subsurface testing conducted in advance of LADWP's geotechnical investigations. Added to the site record were 15 additional pieces of Owens Valley Brownware pottery and 1 handstone fragment.

Project-related Activities Conducted within the Site Boundary

LADWP's geotechnical investigations planned for 2012 and 2013 included excavation of four boreholes within the site boundaries. Consequently, BLM requested that the site be archaeologically investigated before drilling proceeded. Toward this end, two 1-x-2-m and two 1-x-1-m excavation units were dug.

Based on the results of surface collection and subsurface testing, the site represents a shallow cultural deposit defined by Owens Valley Brownware ceramics, but also including one handstone, one piece of modified steatite,

and one obsidian flake. Given the lack of cultural depth, the site offered little information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. Excavation of the various boreholes was judged to have no impact to the site's cultural deposit (Nilsson 2012). The subsequent geotechnical investigations were monitored by URS to ensure that more substantial and significant cultural remains were not encountered, and none was found.

CA-INY-7616

This multiple component site consists of a prehistoric lithic scatter and scattered historic-period refuse on a high terrace. The site has undergone multiple impacts including road construction and use as well as bulldozer grading. It encompasses an area measuring 205 m north-south by 200 m east-west. URS recorded the site in 2006 (Smith 2006), and its record has not been updated. No project-related activities have occurred within the site boundaries.

The prehistoric component consists of at least 100 obsidian flakes representing secondary, tertiary, and biface reduction activities. Lacking diagnostic artifacts, this component is undated. The historic-period component is a refuse deposit that contains clear green, amber, and amethyst fragments of bottle glass; various gauges of galvanized wire; pocket tobacco tins; matchstick evaporated milk cans; sheets of galvanized metal; 1930s automobile parts; and axe cut juniper wood fragments. The historic-period materials date from the early twentieth-century to modern times.

Phase II Testing

At the request of BLM, in November 2016, AECOM conducted Phase II investigations at the site to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

CA-INY-7816

This historic-period site consists of remnants of old Highway 23 and its stage road precursor located within the western portion of the Project APE. Known as the old Los Angeles-Owens River/Valley Road, the route played a pivotal role in the historic development and settlement of Inyo County. The road served as the Eastern Sierra's principal north-south route from the mid-1860s (Figures 4-9 and 4-10) to the early 1930s, when it was superseded by, or incorporated into State Route 23, which was constructed through this area between 1929 and 1931 (Shapiro et al. 2008).

Pacific Legacy, Inc. initially recorded the site in 2009, documenting a 1.3-mile-long road segment (Segment A) that extended from near Grant, CA to the north end of NHR (Shapiro et al. 2008). The resource was described as an actively used dirt road, in fair condition, that averaged 10 feet wide. No features or artifacts were found in direct association with the road segment. Archival research indicated that the road comprises part of old Highway 23 and a former stage road.

At least 12 segments (B thru M) of historic road were identified within the Project APE. The segments appear to represent various manifestations of the historic travel route known by a number of names, including: Three Flags Trail; Indian's Big Trail; Bullion Road; Owens River Road; Darwin, Panamint and Owens River Road; Inyo-Los Angeles Road; Los Angeles-Owens River Road; Owens River Valley Road; Mojave-Bishop Road; El Camino Sierra; and Legislative Route Number 23 (LRN 23) (Chalfant 1933; Edwards 1964; Pracchia 1994; Serpico 2006; Shapiro et al. 2008; Warren and Roske 1981). Early on, this route connected to the San Joaquin Valley by way of Walker Pass, and after 1872 by way of Tehachapi Pass; Los Angeles could be reached by way of several passes near Antelope Valley, south of Mojave. Near the Project, the earliest route dating to the 1860s passed through Haiwee Meadows and later, during construction of Haiwee Reservoirs (ca. 1908-1913), the road was moved to the west near the present route of U.S. Route 395.

Segment A is the 1.3-mile stretch of road recorded by Pacific Legacy, Inc. in 2009. Within the Project APE, Segment B consists of a two-track road measuring 200 ft. long and 10 ft. wide. Segment C is a short segment of road cut on a fairly steep (30 degrees) hillside. Much of the cut has been washed out to form a deep rut. This segment measures approximately 10 ft. wide and 230 ft. long. The segment extends from the edge of a modern gravel road east to CA-INY-6580.

Segment D is an overgrown, faint, two-track road that appears south of CA-INY-6580. It is a continuation of Segment C, separated from it by a modern bladed access road. Where this road segment begins on the south edge of the bladed road, another faint two-track (Segment E) splits from it and runs parallel to Segment D. Measuring about 10 ft. wide, Segment D runs south-southeast for 1,900 ft., at which point the road appears to have turned east and followed a sloping ridge down to Haiwee Meadows. The segment passes through a historic-period site recorded as JM-01/RB-01.

Segment E is a very faint two-track that runs parallel to the west side of Segment D. It extends south of the modern bladed access road for at least 1,700 ft. before it fades. At a point midway along this route, on the south side of a drainage crossing, the road has been cleared of stones, forming distinct rock alignments along both edges of the route.

Segment F is a short stretch of abandoned dirt road that is just west of Segments D and E. This road also appears at the southern edge of a modern bladed access road and is likely an extension of Segment C. From the bladed access road to a point where the road is crossed by another modern two-track, Segment F measures 155 ft. in length and 10 ft. in width.

Segment G is a continuation of Segment F that is still in use, although it has been posted with a "TRESPASSING / LOITERING / FORBIDDEN BY LAW" sign at its north end. This two-track road appears to have been bladed, and it intersects two roads coming in from the west. At its south end, the road turned east and followed a drainage downslope to Haiwee Meadows. It has been backed at this turn by an earthen berm. This road segment measures 0.4 mi. (2,100 ft.) long and 10 to 12 ft. wide.

Road segments B through G are likely variants of the original Los Angeles-Owens River/Valley Road and Bullion Road, dating from the 1860s to roughly 1910. Segment G is the only stretch of road that is still in use, primarily for recreation. While the 1913 USGS Ballarat topographic map shows the road from Haiwee exiting the valley farther south, it would appear that these road segments largely follow the same route and once tied into that system.

Segment H is a visible, deep road cut that runs northwest-southeast between the SCE transmission line and US-395. This segment of intact road runs parallel to a modern, bladed access road that also extends to US-395. The southern end of Segment H passes into site CA-INY-6932. Segment H, comprised of a loose sandy track, measures roughly 15 ft. wide or more in places, and is 1 ft. deep or more. The recorded segment is 1,700 ft. long. Partially buried automobile parts are visible along the southwest edge of the road, including a transmission case, hood panel, a windshield frame, seat springs, and framework from a canopy. These parts appear to represent a 1920s automobile, likely a touring car. Pacific Legacy, Inc. (Shapiro et al. 2008) recorded Segment H in 2008. This segment likely represents LRN 23/Highway 23/El Camino Sierra that dates from roughly 1913 to ca. 1922. This road would have extended south along the SCE line to Loco Station.

Segment I is a faint stretch of abandoned roadbed that occurs between the SCE transmission line and the Long Valley-Haiwee transmission line, south of Segment H, and appears to be a continuation of the latter. This segment measures 390 ft. long and about 10 ft. wide. Several granite boulders at the south end of the segment appear to have been moved.

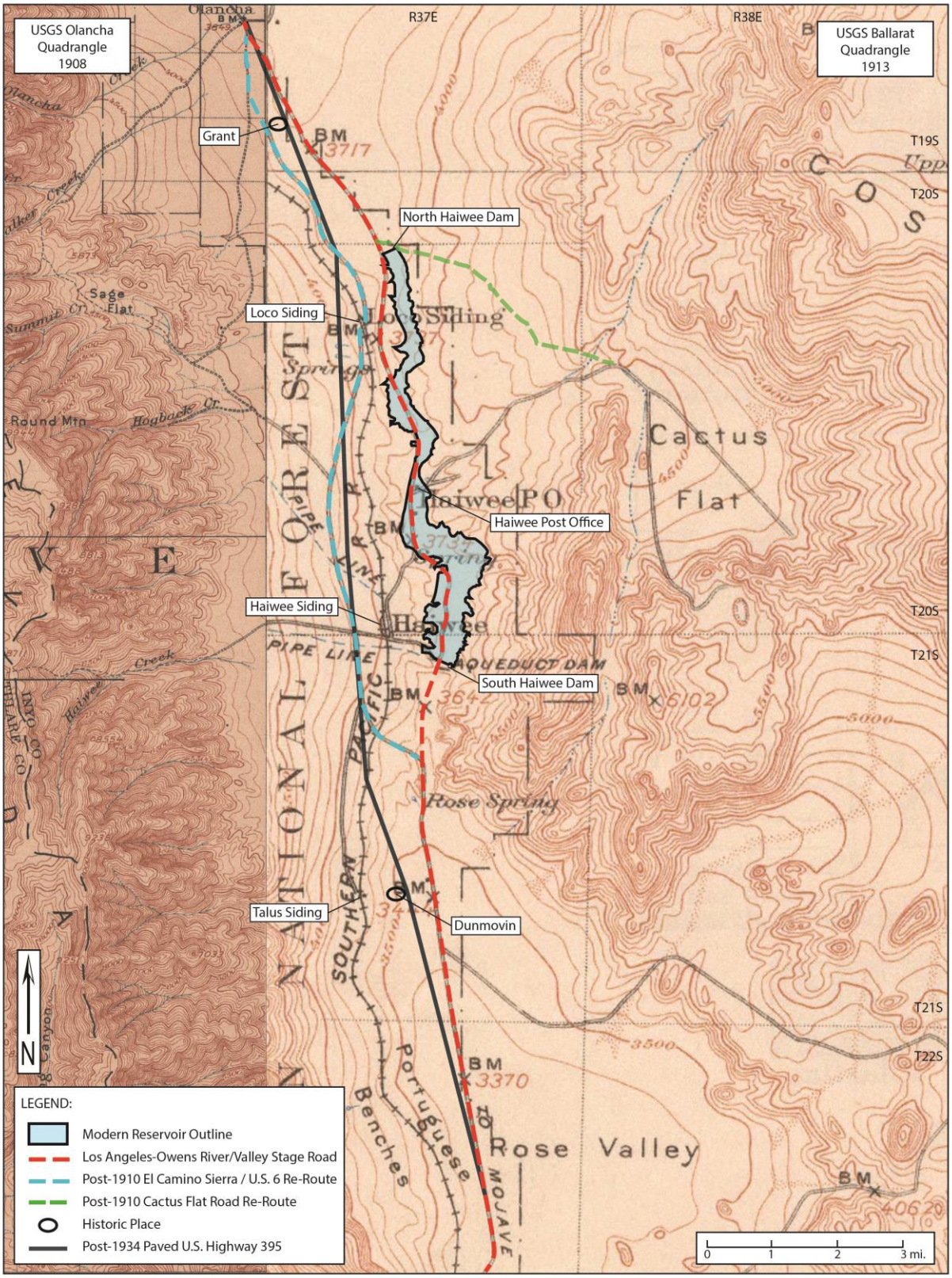

Figure 4-9. Historic roads near CA-INY-7816.
Source: USGS Olancha (1908) and Ballarat (1913) topographic maps.

Figure 4-10. Stage Trail and Wolfskill Wagon crossing Haiwee Meadows.
Undated, but before construction of Haiwee Reservoirs in 1912.
Source: Eastern California Museum (used by permission).

Segment J is a 200-ft-long stretch of bladed road that extends east of the south end of Segment I, connecting Segment I to Segment K.

Segment K is a two-track road loop that extends east of the SCE transmission line, with the south end of the loop ending near a tower. This loop road passes along an extensive historic-period dump recorded as Site DD-02. The dump contains domestic and structural materials that appear to post-date 1910, with some items likely dating to as late as the 1950s. This loop may represent the original route of the post-1913 highway or a siding off the highway.

Segment L is the route of Cactus Flats Road north of NHD. This route appears to correspond to the early stage route from Haiwee to Olancha depicted on the USGS 1913 Ballarat and 1908 Olancha topographic maps. At present, this feature consists of a wide, bladed, gravel and sand road that is extensively used as a haul route. The bladed road measures up to 25 ft. wide and runs 2,750 ft. north-south in the Project APE. This segment of road retains no historic-period integrity.

Segment M is a two-track dirt road that extends south from the modern Cactus Flats Road to the west end of NHD. This two-track access road passes through a wire gate. At present, it is used as a main access road to the existing Dam from Cactus Flats Road. This road also generally follows the stage road depicted on the USGS 1913 Ballarat topographic map. This road segment measures 1,125 ft. long and roughly 10 to 12 ft. wide.

Historical Overview

The earliest documented route associated with CA-INY-7816 located near the Project APE appears on the 1856 Government Land Office (GLO) map, following roughly the present route of Cactus Flats Road, with a branch of the trail heading southeast identified as "Walkers Trail." Joseph R. Walker traversed what is now known as Walker Pass in 1834 and made his way north through Owens Valley to rejoin his exploration party on the Humboldt River. Walker later led the Chiles emigrant party over this trail in 1843.

During the 1870s, countless freight wagons led by mule teams passed along the Bullion Road in Inyo County, carrying ore from the Inyo and Coso Mines to Indian Wells Valley and beyond. By 1908, freight wagons were moving towards Owens Valley from the west, carrying supplies from the town of Mojave that were needed to construct the LAA1. That same year, Southern Pacific began construction of the standard gauge Jawbone Railroad from Mojave to Owenyo, and the line was completed in 1910 (Serpico 2006). Traffic might have slowed on the old wagon road once the railroad was complete; however, by this time the use of automobiles was becoming commonplace and the old Bullion Road was discovered to be a scenic route for motorists.

The good roads movement reached Inyo County by August 1909, with hopes to form a roads district that would include the larger towns. That same year, the California State Legislature approved $18 million for construction of a State Highway System and this route became known as LRN 23. In September 1910, at the request of the Inyo Good Roads Club, Governor James N. Gillette travelled to Bishop to attend the unveiling of a monument marking the beginning point of what the club called the *El Camino Sierra*, a 200-mile-long "highway" along the eastern Sierra Nevada. By January 1911, the Inyo Good Roads Club was working to get a share of the $18 million state highway bond for the improvement of El Camino Sierra in Inyo and Mono counties. Their hope was to improve the highway between Bridgeport and Mojave so that it would become a regular tourist destination for motorists (San Francisco Chronicle 1911). By December 1911, the Inyo Good Roads Club was promoting the idea of creating a 1,500-mile scenic highway system to be known as the Pasear. This system would include El Camino Sierra, El Camino Real, and El Camino Capital, extending through Oakland, San Francisco, Sacramento, Folsom, Placerville, Lake Tahoe, Markleville, Bridgeport, Mono Lake, Bishop, Big Pine, Independence, Lone Pine, Mojave, Los Angeles, Ventura, Santa Barbara, San Luis Obispo, Monterey, Santa Cruz, and San Jose. The Pasear would be a feature of the upcoming 1915 Panama-Pacific Exposition. The Inyo Good Roads Club, a federation of smaller clubs in Bishop, Big Pine, Independence, and Lone Pine, pointed out the need for improvement and reconstruction of neglected places along El Camino Sierra to make the Pasear a reality (Riverside Daily Press 1911).

By December 1911, the Southern Sierra Power Company had begun construction of a new power plant at Bishop Creek and a transmission line running from Bishop Creek south to Indian Wells Valley, Randsburg, and San Bernardino. An earlier power facility at Bishop Creek, established in 1905, provided energy to the mines at Tonopah and Goldfield, Nevada. When work at those mines declined in 1909, the power company sought out a new market in southern California and plans were made to run power from Bishop Creek to Los Angeles. This 238-mile-long "Tower Line" was completed by the end of 1912 and was in operation by January 1913, later becoming the SCE transmission line. Much of the supply and patrol road built alongside the transmission line was reconstructed into highway, becoming part of US-395 (Myers 1986:77-80).

The route of Midland Trail, also known as Roosevelt Highway, was laid out in early 1912, and it would later become U.S. Route 6. A May 1917 description of Midland Trail indicates that it still largely followed the old Bullion Road (*San Diego Union* 1917). It was reported that traffic had increased on this road, with motorists following it from San Diego through Los Angeles, passing through Saugus and Bouquet Canyon to Elizabeth Lake, Willow Springs, and Mojave. From there, it passed by the old stagecoach stations, including Cinco, Dove Springs, Freeman (Coyote Holes), Indian Wells, Little Lake, Cowan Springs, and Olancha. It was in 1917 that the Southern California Auto Club posted signs along Midland Trail from Los Angeles to Salt Lake City (*San Luis Obispo Daily Telegram* 1917).

By late 1918, the name El Camino Sierra was applied to the highway system extending from Mojave north along the eastern Sierra Nevada and Cascade Range, as far north as Oroville, Washington near the Canadian border (*The Daily Telegram* 1918). In July 1921, the state highway commission issued a $750,000 contract to improve the

highway from Lancaster to Mojave to open up Antelope Valley for development. This route was to become a first-class boulevard and a link in the "contemplated highway from Los Angeles into the Owens river valley" (*Riverside Daily Press* 1921). In 1921 and 1922, the Automobile Club of Southern California replaced older wooden signs on the Midland Trail with enameled metal signs (*Evening Tribune* 1921). In October 1922, it was noted that these signs were placed from Bishop to Keeler and from there on the alternate route to Panamint Valley and Ballarat, then to Trona and Randsburg. Later, additional signs were to be located along what was called the Tehachapi route (*Riverside Daily Press* 1922).

It was not until 1926, however, that the American Association of State Highways and the federal Bureau of Public Roads established a Federal Highway System. At that time, U.S. Highway 395 was established, extending only from Spokane, Washington north to the Canadian border. It was not until 1934 that U.S. Highway 395 was extended south to San Diego, taking in much of LRN 23.

By the end of August 1927, the state highway department awarded a contract to P.O. Payton of Norwalk to grade 21.25 miles of highway between Coso Junction and Olancha, at a cost of $23,952 (*Evening Tribune* 1927). The state contract for this stretch of highway specified that the roadbed would measure 24 to 30 ft. wide (*San Diego Union* 1927). Grading of the road between Coso Junction and Olancha was completed by April 1928, at which time sandy portions of the road were being surfaced with rock. Additional stretches of road between Indian Wells and Lone Pine had also been scraped to eliminate rough spots (*San Francisco Chronicle* 1928).

On October 30, 1929, a state contract was opened for the grading and oil treating of 21.3 miles between Coso Junction and Olancha (*San Francisco Chronicle* 1929). By November 6, 2016, it was reported that the cost of the contract would amount to $239,792.50 (*Evening Tribune* 1929). The state contract was awarded in February 1930 for the grading and paving of 21.3 miles of highway between Coso Junction and Olancha. The work was to include the flattening of the undulating grades and the placement of oil-treated crushed gravel or stone. The new road cut was to measure 36 ft. wide with a 20 ft. wide oiled surface (*Hemet News* 1930; *San Diego Union* 1930). This distance of realigned highway would have extended from Olancha south to the point where US-6/US-395 diverged from the old El Camino Sierra/LRN 23 at Red Hill. Around 1936 and 1937, the road from Bishop to Inyokern was signed as US-6. Signage for US-395 was also beginning to appear, although the route was not fully signed to San Diego until 1939.

CA-INY-9343

This prehistoric site is a diffuse, low-density lithic scatter near the western rim of a broad, sandy terrace in Joshua tree woodland. The site encompasses an area measuring 70 m northwest-southeast by 40 m northeast-southwest. Surface artifacts include 12 obsidian flakes, 1 weathered Type 3 obsidian biface fragment, and 1 complete obsidian stemmed projectile point that likely dates to the Newberry period (3150–1350 B.P.). Effects to the site include a two-track road that crosses the site's southeastern end and geotechnical seismic recording activities. In 2012, URS recorded the site (Doty 2012a), and its record has not been updated.

Phase II Testing

AECOM conducted Phase II investigations at the site in November 2015 to assess its NHRP eligibility, as this resource is within the Project's construction area and has the potential to be affected by project activities. Phase II investigations produced a total of five artifacts, including three flakes, one biface fragment, and one end scraper, all collected from the site surface (Nilsson and Bevill 2016b). The stemmed projectile point was noted during site recordation in 2012 was not relocated during the Phase II study. Reconnaissance conducted in the area between CA-INY-9343 and neighboring site CA-INY-6574/H indicates that a low-density lithic scatter links these two properties, with only 10 m separating the two sites. Therefore, CA-INY-9343 may be considered an extension of Locus E at CA-INY-6574/H instead of a separate site.

Evaluated singularly or collectively as part of CA-INY-6574/H, the recovered assemblage documented the presence of a low-density, surface artifact deposit composed entirely of flaked stone artifacts; no artifacts were found in

subsurface contexts. The sparse debitage assemblage indicated site activities included percussion-based reduction of CVF obsidian. Due to heavy sandblasting, the recovered assemblage, particularly the flaked stone tools, was not amenable for obsidian hydration studies, as only two of the five artifacts submitted for analysis returned micron readings, the remainder exhibiting either variable bands or diffuse hydration. Temporal data infers site use during the Little Lake period, while the stemmed series point suggests association with the Little Lake or Newberry period. Given that the artifact assemblage reflects both low density and low diversity, the site likely served as a temporary use area where limited lithic reduction tasks occurred. Given its limited data potential, the site lacked the ability to yield information important to prehistory (Criterion D of 36 CFR 60). Based on these findings, it was recommended as not eligible for listing in the NRHP or CRHR.

Project-related Activities Conducted within the Site Boundary

In June 2012, URS monitored geotechnical seismic recording activities along a 32 m (105 ft.) long extent of a seismic line that crossed the northern portion of the site. These activities, which involved the use of explosive charges, resulted in 8-in. diameter auger holes dug to 3 ft. below the surface. The explosive charges were placed at 10-ft. intervals along the seismic line, with blast craters being 3 to 4 ft. in diameter. This resulted in 10 seismic test craters within the site boundary.

CA-INY-9345

This prehistoric site is a small, diffuse, obsidian and basalt lithic scatter below the western tow of a north/south trending ridge. The site, which is on a gentle, western-sloping, sandy terrace, encompasses an area measuring 90 m northeast-southwest by 35 m northwest-southeast. Surface artifacts consist of two obsidian EMPs and at least 15 obsidian and basalt flakes. Although no artifact concentrations were identified, most flakes occur within the northeastern part of the site, while the two EMPS are along the southern boundary, east of a dirt road. The site is in good condition, although a north/south trending road bisects it, and another dirt road traverses its southern end. Geotechnical seismic recording activities have also affected the site. The site was recorded by URS in 2012 (Doty 2012c), and its record has not been updated.

Phase II Testing

AECOM conducted Phase II investigations at the site in November 2015 to assess its NHRP eligibility, as this resource is within a proposed access road corridor and has the potential to be affected by road construction activities and associated laydown areas. Surface reconnaissance noted the presence of a least six flakes which were found diffusely scattered across the site, as well as one previously documented obsidian EMP. The Phase II investigation produced 10 obsidian artifacts, comprised of 9 obsidian flakes and the EMP (Nilsson and Bevill 2016b). With the exception of two flakes, all artifacts were recovered from surface contexts. The recovered assemblage documents the presence of a low-density, near-surface artifact deposit composed entirely of flaked stone artifacts. The sparse debitage assemblage indicates site activities included percussion-based reduction of WSL obsidian. Temporal data, drawn from obsidian hydration analysis, place site occupation within the Newberry period (both early and late Newberry). The site likely served as a temporary use area where limited lithic reduction tasks occurred.

Despite the recovery of few artifacts, the site has demonstrated its ability to contribute information necessary to address topics of significance identified within the Project Research Design (Nilsson 2015). Given its data potential within the domain of cultural chronology, this single component, Newberry period site demonstrated the ability to provide information important to prehistory and was recommended eligible for listing in the NRHP under Criterion D of 36 CFR 60.4. Site integrity was also demonstrated by an intact surface and subsurface deposit that has witnessed few effects, with impacts related only to construction of a dirt road that bisects the site.

Project-related Activities Conducted within the Site Boundary

In June 2012, URS monitored geotechnical seismic recording activities along a 12 m (39 ft.) long extent of a seismic line that crossed the northwest corner of the site. These activities, which involved the use of explosive charges, resulted in 8-in. diameter auger holes extending 3 ft. bgs. The explosive charges were placed at 10-foot intervals along the seismic line, with blast craters being 3 to 4 ft. in diameter. Seismic testing resulted in four test craters within the site boundary.

CA-INY-9347

This prehistoric site is an obsidian lithic scatter on the northeast-facing terrace slope. The site encompasses an area measuring 81 m northeast-southwest by 17 m northwest-southeast. The surface artifact assemblage is composed of 21 obsidian flakes, 2 obsidian biface fragments that retrofit, and 1 obsidian EMP. Flake types include 1 early core and 3 late core reduction, as well as 11 early biface and 6 late biface reduction pieces. Artifacts are dispersed in an east/northeasterly direction, down a 4 to 5 degree slope, and below a clump of Joshua trees. The site is in good condition with minimal disturbance attributed to natural erosion. It was recorded by URS in 2012 (Doty 2012d), and its record was updated in 2016 following Phase II testing.

Phase II Testing

AECOM conducted Phase II investigations at the site in November 2015 to assess its NHRP eligibility, as this resource is within the Project's construction area and has the potential to be affected by project-related activities. Phase II investigations identified 21 obsidian flakes, 2 obsidian biface fragments that retrofit, 1 obsidian burin, and 1 obsidian EMP (Nilsson and Bevill 2016b). Site investigations documented the presence of a low-density subsurface artifact deposit that extended to a maximum depth of 60 cmbs; however, most flakes occurred within the upper 40 cm. The obsidian hydration profile inferred site use predominately during the Newberry period, with a few artifacts associated with the Little Lake period. The site likely served as a temporary use area where limited lithic reduction tasks occurred.

Given its data potential within the domain of cultural chronology, the site demonstrated the ability to provide information important to prehistory and, therefore, was recommended eligible for listing in the NRHP under Criterion D of 36 CFR 60.4. Site integrity was also demonstrated by an intact surface and subsurface deposit that has witnessed few effects other than natural erosion.

Project-related Activities Conducted within the Site Boundary

LADWP's 2012 geotechnical investigations included excavation of a borehole, which was just outside southwest corner of the site. In keeping with the testing protocol developed by BLM, one excavation unit (EU4) was dug at the borehole location. The unit was 1-x-1 m in size and was excavated in 10 cm levels to a depth of 40 cmbs. One artifact was recovered, consisting of a single CCS flake found in the 0–10 cm level. The unit was terminated after the excavation of an additional three sterile 10 cm levels. Given the lack of cultural depth, the area examined offered no information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. Excavation of the borehole was judged to have no impact to the site's cultural deposit (Nilsson 2012). The subsequent geotechnical investigations were monitored by URS to ensure that more substantial and significant cultural remains were not encountered, and none was found. Because testing focused in an area of the site that lacked surface artifacts, it did not constitute formal evaluation of the site's NRHP eligibility and research potential. The results of the limited testing program are detailed in Nilsson and Bevill (2015, 2016a).

Site DD-01

This prehistoric site consists of a light density obsidian lithic scatter dispersed across a broad, flat, northeast-facing alluvial fan. The resource encompasses an area measuring 35 by 22 m, or 604 m^2. Sparse vegetation, consisting of

scattered saltbush and a few Joshua trees, characterizes the site area. Although the site lies on flat ground, steeper slopes associated with ephemeral drainages surround it to the north, east, and west; the confluence of these ephemeral streams are about 150 feet north of the site.

The cultural assemblage includes at least 33 obsidian flakes and 2 obsidian biface fragments (Figure 4-11). The obsidian flakes reflect a near equal mix of early and late stage core and biface reduction pieces, about one-third of which have retained some cortex. Both bifaces consist of Type 3 specimens, including one tip fragment (A1) and one end fragment (A2). Artifact A1 is a triangular-shaped piece that measures 3.2 cm long, 2.7 cm wide, and 0.8 cm thick. Artifact A2 is an ovate-shaped end piece that measures 4.9 cm long, 3.8 cm wide, and 1.1 cm thick. All obsidian consists of black, semi-translucent material that likely derived from the CVF.

Artifact A1 – Type 3 biface fragment

Artifact A2 – Type 3 biface fragment

Figure 4-11. Site DD-01 biface fragments.

Site DD-02

This large, multiple component site consists of a sparse prehistoric lithic scatter and 13 discrete loci of historic-period artifacts that date from the 1910s to the 1950s. The site sits atop two broad terraces and encompasses an area measuring 950 ft. by 600 ft., or 447,450 ft². It is within a Joshua tree/Desert Scrub community with sagebrush, rabbitbrush, yucca, and saltbush species present. Surface disturbances include a network of two-track roads that crisscross the resource, natural erosion, and evidence of unauthorized artifact collection in the form of small, excavated pits and redistributed artifacts.

The prehistoric lithic scatter (Locus 7) comprises a small area (25 by 11 m) of at least 10 obsidian flakes noted in the western portion of the site. The flakes include biface-reduction and general percussion-reduced pieces made from black opaque toolstone likely derived from the CVF.

Thirteen loci encompass the historic-period component. Locus 1 includes an extensive, concentrated dump with thousands of items, while the other 12 loci (Locus 2-6 and 8-13) comprise smaller artifact concentrations. Locus 1 consists of a 140 m (NE/SW) by 70 m (NW/SE) area between the ephemeral drainage and a transmission line access road. Artifacts include thousands of evaporated milk, sanitary, and beer cans, as well as meat and fish tins. Additional items consist of kerosene containers, mineral spirits and paint cans, blasting powder cans, sewer pipe, concrete footings, dimensional lumber, coffee cans, tobacco tins, clear, amethyst, amber, green and blue bottle

glass, shoe leather, Fiestaware®, transferware, mayonnaise jars, box spring seat cushions, an enamelware basin, barbed wire, porcelain cup fragments, aluminum foil, cone-top beer cans, fuel tanks, oil cans, nails, barrel hoops, stovepipe, wire mesh, electric light bulbs, a Sears "Hobart" water heater, salt and pepper cans, a 50-gallon drum, wood crate sections, galvanized buckets and auto engine parts. Temporally diagnostic artifacts suggest items were deposited over decades, extending from the 1910s through the 1950s.

Locus 2 includes the remains of a small burn dump of domestic and hardware items, measuring 12 by 15 ft. All artifacts and other materials have been burned. Noted items include melted clear, amethyst, green and brown bottle glass; window glass; glass canning jar fragments; cone-top beer can; corrugated tin; wire-cut nails; nuts and bolts, paint cans; milled lumber; and metal strapping with nails. Also present are abundant charcoal fragments and ash. The amethyst glass suggests temporal association with the early 1910s, while the cone-top beer can infers 1935 to 1959, during the manufacturing period for this artifact type.

Locus 3 encompasses a small, discrete artifact concentration associated with early twentieth century construction of the LAA, NHD, and/or NHR. The concentration, which encompasses an 18 by 10 ft. area, occurs on a slope midway between the high terrace and the bottom of the ephemeral drainage. Additional artifacts are scatter another 50 ft. or more to the south, east, and northeast. Artifacts consist of at least 75 food cans of various types; 2 pocket tobacco tins; 12 ceramic fragments; 10 or more fragments of brown, cobalt, and green bottle glass; burned can fragments; iron bolt; barrel hoops; and miscellaneous other debris. A cobalt medicinal bottle fragment, exhibits an embossment that reads "TAKE NEXT DOSE AT" at the neck base. One brown bottle fragment has "120" marked on its base. Also present within the concentration are pieces of unidentifiable, burnt bone.

Locus 3 ceramic items include at least three dinner plates, one bowl, five saucers, and one cup. One white earthenware dinner plate is embossed with the "HOMER LAUGHLIN/HOTEL/2 21 L" backstamp, indicating it was manufactured at the Company's Plant L in February 1921. Another white earthenware dinner plate backstamp displays a green "HOMER LAUGHLIN HOTEL CHINA/12 7 L" mark, indicating its manufacture at Plant L in December 1907 (Figure 4-12). The mark of "ROYAL IRONSTONE CHINA/ J. & G. MEAKIN/ EASTWOOD, HANLEY" occurs on the base of a tea or coffee cup (Figure 4-13). The J. and G. Meakin Company was founded in 1851 at Hanley, Stoke-on-Trent, North Staffordshire, England. The company's Eastwood Works operated from 1888-1959, producing over 20,000 pottery designs (http://www.thepotteries.org/allpotters/725.htm). After 1890, the Meakin pottery backstamp contained the words "ENGLAND", but the current specimen does not, suggesting its manufacture before this date (http://www.thepotteries.org/mark/m/meakin_jg.html). The metal lid of a Standard Oil Company 25-lb. bucket displays "MICA AXLE GREASE" and the image of a wagon wheel (Figure 4-13) that appear to date to at least the mid-1910s (Barrett-Jackson 2016).

Figure 4-12. Homer Laughlin dinnerware backstamps.

Figure 4-13. J & G Meakin Royal Ironstone China (left) and Standard Oil Company Mica Axle Grease bucket lid (right).

Locus 4 consists of a single feature, comprised of an undated concentration of concrete and terra cotta fragments located on the east bank of the drainage, between it and the large pile of discarded vegetation. Materials appear to be the remnants of a concrete slab that incorporated terracotta pipe, native cobbles, and chicken wire. Some surfaces are coated with a layer of black and gray asphalt and sand, used to create a non-slip surface. No artifacts are present.

Locus 5 consists of a small concentration of tin cans located near Locus 4. About 40 cans are present, the majority of which are cone-top beer cans; also present is a crown cap. The cans are concentrated in a crescent-shaped scatter that measures 10 by 4 ft. wide and exhibit remnants of green and yellow printed labels, none of which is legible.

Locus 6 comprises a second concentration of 18 identical cone-top beer cans located roughly 75 ft. northeast of Locus 5, just west of the northern end of the discarded vegetation pile. The locus covers an area measuring 12 by 5 ft.

Locus 8 occurs about 75 ft. southwest of Locus 5 and consists of a pile of concrete rubble placed atop natural bedrock. This features measures 25 ft. (N/S) by 15 ft. (E/W), and is about 2 ft. tall.

Locus 9 is a small pile of decayed, milled wood found in the west side of an old, faint, two-track road. This locus, at the west edge of the site, measures roughly 20 ft. (E/W) by 15 ft. (N/S).

Locus 10 is a small dump of iron water pipes and other metal hardware on the west-facing slope above the drainage that bisects the site. This dump occurs below a large, mechanically graded area recorded as Locus 12.

Locus 11 is a scatter of corrugated sheet metal and metal stovepipe segments on the same west-facing slope as Locus 10. Locus 11 is 50 ft. north of Locus 12 and 50 ft. west of Locus 12. The artifacts at Locus 10 appear to be from a dismantled structure.

Locus 12 is a large, mechanically graded flat on the west side of a bladed access road. Visible within the graded area are numerous metal and ceramic items, including structural materials and domestic tableware. Also noted was a 1945 wheat penny. A borrow pit occurs just north of Locus 12.

Locus 13 is a large, light density scatter of tin cans, sheet metal, and other metal artifacts. The locus occurs on a flat east of a bladed access road, between the road and a small, ephemeral drainage. Some of the artifacts in Locus 13 were likely deposited by wind. Included in the locus are several log cabin syrup tins and numerous sanitary cans.

Locus 14 is a small concentration of 24 cone-top beer cans on the eastern edge of Locus 13, adjacent to a small, ephemeral drainage. The cans are rusted and do not retain any lithography. This concentration measures 10 by 10 ft.

Site DD-03

This multiple component site consists of a prehistoric biface fragment and a small, historic-period artifact scatter within an ephemeral drainage. The site encompasses a 115 by 80 ft. area, or 7,222 ft². Scattered saltbush dominates site vegetation, and a single golden cholla occurs in the center of the site. A few widely distributed Joshua trees occur outside the site boundary. The site is in good condition, with effects related to natural erosion and artifact decomposition.

The single prehistoric artifact consists of a Type 4 obsidian biface midsection. The historic-period assemblage comprises a variety of domestic and indefinite use artifacts. Domestic items include two glazed brownware fragments, two enamelware washbasins, two bed mattress springs, one chair frame, burned stovepipe, an embossed glass bottle fragment, and an evaporated milk can. The bottle's base is embossed with "P C Co/6", indicating its manufacture between 1925 and 1930 by the Pacific Coast Glass Company of San Francisco, California (Toulouse 1972). Indefinite use items comprises an array of miscellaneous artifacts, including corrugated sheet metal, galvanized metal wire, window screen, threaded metal pipe, riveted pipe, barrel hoops, battery core, miscellaneous milled wood, a bag of cement, two repurposed metal cans with adapted wire handles, and miscellaneous hardware.

Site DD-04

This multiple component site consists of a sparse prehistoric lithic scatter and a few pieces of historic-period refuse dispersed across a broad, northeast-facing alluvial fan. The resource encompasses an area measuring 40 by 20 m, or 628 m². Sparse vegetation, consisting of scattered saltbush and a few Joshua trees, characterizes the area. The site lies between two maintained dirt roads that have not directly affected the resource, but a smaller two-track road bisects it.

The prehistoric component contains 23 obsidian flakes and 1 Type 3 biface end fragment. Flake technology largely reflects biface-thinning technology and a few core reduction pieces are present. About half of the flakes retain some cortex, the attributes of which suggest their association with the CVF. The biface end fragment, made from black semi-translucent obsidian, measures 2.5 cm long, 1.8 cm wide, and 0.7 cm thick. The historic-period component includes one metal can, unidentifiable metal fragments, and one amethyst colored glass jar fragment.

Site JA-01

This prehistoric site consists of a moderate-density lithic scatter dispersed across a broad, flat, northeast-facing alluvial fan. The site encompasses an area measuring 36 by 26 m, or 734 m². Sparse vegetation, consisting of scattered saltbush and a few Joshua trees, characterizes the site area. This resource lies 5 m north of an ATV trail and shallow drainage, and 75 m southeast of a deeper ephemeral drainage. The site is in good condition, with minor effects related to natural erosion.

The cultural assemblage contains only lithic debitage, comprised of 101 obsidian flakes. The flakes reflect both early and late stage core and biface reduction activities; several pieces of angular shatter are also present. Black, cloudy, semi-translucent material, likely derived from the CVF, characterizes the obsidian toolstone, and half of the flakes exhibit primary or secondary cortex.

Site JA-02

This multiple component site consists of a single prehistoric obsidian flake and a historic-period artifact and feature deposit. The site encompasses an area measuring 510 by 330 ft., or 132,115 ft². Site vegetation consists of scatter saltbush and a few Joshua trees. A two-track road borders the western edge of the site and a turnout occurs within the site boundary. The site is in poor condition, with effects related to natural exposure.

The single prehistoric artifact consists of a late-stage biface-reduction flake noted near the center of the site. The flake is fashioned from black opaque toolstone, likely derived from the CVF source.

Three features and scattered artifacts and ecofacts define the historic-period component. Feature 1 is a 5-foot-diameter concentration of over 200 small, fragmented pieces of burnt animal bone (likely cattle), a baling wire round, and loose baling wire pieces. Feature 2 encompasses a 6 by 5 ft. concentration of at least 30 pieces of 1-inch-square ceramic tile. Feature 3 consists of a 10-foot-diameter concentration of piled tree limbs and two wooden lath. The non-feature areas of the site contain lengths of metal rods, an aluminum belt buckle, sanitary can, and over 100 pieces of scattered, desiccated cattle bone. Also present are three tubeless automobile tires, including a "GOODYEAR 8.15-15 POWER CUSHION" tire (ca. 1966), an "ARISTOCRAT 4 PLY NYLON LOW PROFILE" tire, and a "B.F. GOODRICH SILVERTOWN EXTRA.MILE.R-WR" tire. Although the Goodyear Tire Company patented the first tubeless tire in 1903, it wasn't until 1952 that a patent was granted, prompting the Packard Motor Car Company to be the first to use a Goodrich tubeless tire as an option on their 1954 Clipper range (Car History 4 U 2016). Overall, the historic-period artifacts appear to date to the mid-1950s and/or 1960s.

Site JM-01/RB-01

This historic-period site consists of two artifact concentrations (Locus 1 and Locus 2) located on a broad, open terrace. The site encompasses an area measuring 280 by 120 ft. Site vegetation includes predominately saltbush, but also present are a few scattered yucca and Joshua trees. With the exception of natural erosion and artifact deterioration, no effects have occurred to the site.

Locus 1, situated in the southern part of the site, consists of a concentration of wooden window frames and other assorted debris, including glass fragments, barrel hoops, riveted metal pipe, and cast iron water pipe. The window frames generally measure 3 ft. square, and the milled lumber pieces forming the frames are held together with wooden dowels.

Locus 2, located in the northern part of the site, consists of a mechanically excavated pit that contains domestic, personal, activities, and indefinite use debris. Domestic items include "KAVA" and "MAXIM" clear glass coffee jars, condiment jars, a "CLAUSSEN" clear glass pickle jar, a "Ball" canning jar lid, and a portable sink. Activities-related items include three electrical connection boxes and 1-quart paint can. Personal items comprise two metal bicycle seats, a child's toy frame with ABC letters, and a plastic thermos. Indefinite use items encompass metal frames, milled wood, chicken wire, two 5-gallon gas cans, a 5-gallon metal bucket, cast iron plumbing, and metal door hinges. A low-density artifact scatter that includes galvanized wire, a "Valvoline" motor oil can, and baling wire links the two loci. Artifact typologies suggest that the site dates to the 1950s or later.

Site MK-01

This historic-period site consists of a sparse, 1930s to 1940s era artifact scatter located on a broad, northeast-trending alluvial fan. The resource encompasses an area measuring 300 by 350 ft., or 82,425 ft². Sparse vegetation occurs across the site area, consisting mainly of saltbush, rabbitbrush, cholla, and intermittent Joshua trees. The site is in fair condition, with effects related to natural erosion and artifact deterioration.

The cultural assemblage comprises a scatter of domestic, activities, and indefinite use items. Domestic refuse includes roughly 50 sanitary, evaporated milk, and church-key opened beverage cans. Activities-related items consist of motor oil cans, while indefinite use artifacts include kerosene cans, corrugated metal, stovepipe, window

screen fragments, and sheet metal fragments. Also present are modern aluminum beverage cans (post-1970s), representing roadside debris.

Site RB-03

This prehistoric site consists of a sparse, obsidian lithic scatter on a gently sloping hillside bench. The resource encompasses an area measuring 22 by 13 m, or 225 m². Site vegetation includes saltbush, bursage, creosotebush, and Joshua trees. Site condition is good, with minor effects related to wind-blown sand.

The cultural assemblage consists entirely of obsidian debitage, comprised of 11 flakes. All but one flake is a biface reduction piece, the exception being a late-stage, core-reduction flake. All artifacts consist of black, cloudy, semi-translucent toolstone that appears visually similar to CVF obsidian.

Phase II Testing

AECOM conducted Phase II investigations at the site in January 2017 to assess its NHRP eligibility, as the site is within a proposed access corridor and has the potential to be affected by road construction activities and associated laydown areas. Analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility are currently in progress.

Site RB-04

This prehistoric site consists of a sparse, obsidian lithic scatter within a shallow wash on the west edge of a broad, flat valley. The resource encompasses an area measuring 115 by 50 m, or 4,513 m². Tall rabbitbrush, saltbush, shadscale, and bursage plants characterize site vegetation. A low, mechanically excavated earthen levee, constructed for flood control and water channelization, bisects the site. A barbed wire fence crosses the northern end of the site, and evidence of cattle grazing occurs across the area.

The cultural assemblage includes at least 36 obsidian flakes made from black, cloudy, semi-translucent material likely derived from the CVF. The flakes represent late-stage core-reduction and early to late stage biface-reduction activities. The widely scattered flakes were likely dispersed across the site area by floodwaters and levee construction.

Built Environment Resources

CA-INY-4591H

The trinomial CA-INY-4591H designates the water conveyance system and related features of the LAA1 (1907–1913) located within Inyo County. The roughly 0.5-mile-long segment of the LAA1 that traverses the Project area is the terminal section of the 40-mile-long open, concrete-lined canal that extends south from the Alabama Hills (near Lone Pine) to NHR (Figure 4-14). The first 23 miles of aqueduct, from the intake near Blackrock Springs to the Alabama Hills (outside the Project APE), were built as an unlined concrete channel dug with floating, suction dredges (Dredge No. 1 and Dredge No. 2). The next 40 mi., extending south from the Alabama Hills to Haiwee Reservoirs (including that part within the Project APE), were concrete-lined, but not covered, owing to the porous nature of the ground through which the ditch was built.

Figure 4-14. LAA1 as a concrete-lined, open canal on western side of the Project Site.

Two types of open, concrete-lined channels were used in the LAA1's Alabama Hills to Haiwee Reservoirs segment. The concrete-lined channel between Cottonwood Creek and Haiwee Reservoirs was excavated with a steam powered floating dipper dredge. Using this process, earth was removed from the ditch with a bucket, creating a concave bottom, with the dirt discharged away from the channel (National Park Service 2001). The second type of concrete-lined channel was built like the first, except that it had a flat bottom (National Park Service 2001). Using this system, the ditch was excavated using electric or Model 60 Marion steam shovels. In both cases, concreting was undertaken immediately behind the shovels using tufa cement from the Haiwee tufa plant. All concrete lined portions of the LAA1 were plastered to facilitate water flow in the conduit (City of Los Angeles 1916:191). At SHR, the LAA1 became a covered, box-shaped, concrete conduit, which continued across the desert for 135.26 miles to Fairmont Reservoir, eventually leading to its terminus at the Cascades, in San Fernando Valley.

Resource Recordation History

The Inyo County segment of the LAA1 (CA-INY-4591H) was originally recorded in 1992 (Costello and Marvin 1992), and three updates have been prepared (Meyer and Newland 2000; Nilsson and Bevill 2015, 2016a; Reno et al. 1993). The 1992 record chronicles a one-mile-long segment that extends south from the Alabama Gates. This section, which lies outside the Project APE, includes three aqueduct features: Feature 1, the Alabama Gates and Spillway; Feature 2, the dynamited location and wash-out channel from the May 12, 1926 aqueduct bombing; and Feature 3, the concrete-lined open canal (Costello and Marvin 1992).

Feature 1 is composed of the Alabama Hills water gates and operating mechanisms, the housing that covers the gates, and the spillway that carries water back to the Owens River. There are five valves built into the gate housing, and when closed, contain water within the LAA1, and when opened, allow water to flow down the spillway. Feature 2 is a segment of the LAA1 that was dynamited on May 16, 1926 at the Alabama Gates. The repair of this section is noticeable today as a distinctive soil discoloration. The resulting washout from the bombing remains as an eroded channel that is crossed by a dirt road. Rocks on the eastern side of the road may have been placed as a retaining wall during the repair job. The channel is currently eroded along its sides. Feature 3 is a concrete-lined, open section of the LAA1 that begins at the northern end of the Alabama Hills and extends one mile south. The

channel is U-shaped, with concrete sides measuring 34-ft. wide and 18-ft. deep. The uphill side of the LAA1 has been cut into the rock of the Alabama Hills, while the downhill side is supported by large earthen berms. Concrete bridges allowed for the passage of runoff from seasonal drainages.

The first record update (Reno et al. 1993) provides supplementary information for that portion of the LAA1 within the Caltrans Manzanar 4 Lane Project area, corresponding with a 920-ft.-long segment that crosses US-395 about 7.4 mi. south of Independence, California. The second site record update (Meyer and Newland 2000) provides information for Well 92, an associated feature of the LAA1 system.

In 2014, URS added an unmortared rock retaining wall feature to the CA-INY-4591H record. Situated within the Project APE, the wall occupies an area between a 45-degree hillslope of loose sand and gravel and a barbed-wire fence. In this location, the aqueduct is concrete-lined and measures about 15 ft. deep. The rock wall is made of thin, tabular concrete chunks, exhibits 9 to 11 courses, and stands 16 to 18 in. in height. While the exact age of the rock wall is unknown, its construction features and the absence of lichen growth suggest it is not associated with the aqueduct construction period (1907–1913). It was likely built later (possibly within the last 50 years) to provide stability to the steep hillslope, deterring its loose, sandy soil from entering the aqueduct channel.

Project-related Activities Conducted within the Resource Boundary

To date, no Project-related activities have affected the LAA1. Future construction activities associated with project, however, will require realignment of the LAA1 channel to include demolition of an existing section; earthwork such as excavation, grading, and compaction; and hauling and concrete work. The *CA-INY-4591H Management Recommendations* section presented below in Chapter 5 discusses this topic.

NHD and Historic Borrow Site No. 1

This resource consists of NHD (P-14-012173), a 100-year old structure that impounds the waters of NHR, one of four basins created between 1907 and 1913 to store the waters of the LAA1. Also included is the NHD's historic borrow site, termed Borrow Site 1. The existing Dam is at the north end of NHR (Figure 4-15), where it serves to keep water from flowing north toward Owens Lake. The reservoir itself functions to regulate the flow of the LAA1, and it has an unassisted maximum elevation of 3,760 ft. and assisted maximum elevation of 3,764 ft. (Davis and Roux 2001:1). The existing Dam has a maximum height of 34 ft. above the original streambed and is about 1,500 ft. long. Chapter 3 above, details the construction history of NHD.

Figure 4-15. NHD overview, facing east.

Project-related Activities Conducted within the Resource Boundary

To date, no Project-related activities have affected NHD. Future construction activities associated with project, however, would involve notching of the existing Dam and installation of impermeable membrane over the north face. The *NHD Management Recommendations* section presented below in Chapter 5 discusses this topic.

RB-05

This resource consists of a LADWP caretaker's residence located along the northern side of North Haiwee Road (Figure 4-16). This one story, 1930s era Minimal Traditional and English Cottage style dwelling features an L-shaped massing. The building consists of a central gable roofed block that is encircled by a hipped roof skirt that extends to a short enclosed eave. A one-story ell extends north of the main block and attaches to a one-story gable roofed addition. The property also includes a three-car garage that appears to date from the 1980s. The immediate setting also includes a circular corral (modern), a rectangular rock lined garden with several panels, and a one story, masonry building with a shed roof.

Figure 4-16. Site RB-05 overview, LADWP caretaker's residence, facing northwest.

Isolated Finds

The cultural resources inventory and monitoring studies conducted within the Project APE have identified 55 isolated find locations, consisting of 49 prehistoric and 6 historic-period locales. Table 4-9 presents a listing of the isolated finds, while Figure D-1 in Appendix D depicts their locations.

Prehistoric isolates include locations defined largely by single obsidian or basalt flakes (35 locations), or single flaked stone tools (3 locations). Multiple obsidian flakes characterize nine isolated finds, including six finds with two obsidian flakes each, two finds with three obsidian flakes, and one find with four obsidian flakes. Finally, prehistoric two isolated finds contain a combination of one obsidian flake and one flaked stone tool.

Historic-period isolated finds include six locales. One locale consists of a segment of well pipe (P-14-008243), while two others contain a wooden post feature that likely represents a former mine claim markers (P-14-010091 and ISO-RB-4). One other isolated find, consisting of two glass bottles, occurs within the updated boundaries of Site CA-INY-6577. Isolated find P-14-009330 includes a railroad spike and metal bracket. One find, P-14-008237, consists of motor vehicle parts located within the boundary of Site CA-INY-7616.

Table 4-9. Isolated Finds.

Primary Number	Isolate Number	Temporal Component	Description	Land Ownership	Location within APE	Comments
P-14-008225	HD-CS-001i	Prehistoric	1 obsidian flake	LADWP	Project Site	Located within the updated boundary for CA-INY-2243/5703
P-14-008226	HD-CS-002i	Prehistoric	1 obsidian flake	LADWP	Project Site	Located within the updated boundary for CA-INY-2243/5703
P-14-008227	HD-CS-003i	Prehistoric	1 obsidian flake	LADWP	Project Site and Borrow Site 10	
P-14-008231	HD-CS-007i	Prehistoric	1 obsidian flake and 1 projectile point fragment	BLM	Project Site and Borrow Site 10	Located within the updated boundary for CA-INY-6577
P-14-008233	HD-RD-011i	Prehistoric	1 obsidian flake	BLM	General Area	Located within the updated boundary for CA-INY-6577
P-14-008234	HD-RD-012Hi	Historic	2 bottles	BLM	General Area	Located within the updated boundary for CA-INY-6577
P-14-008235	HD-RD-013i	Prehistoric	1 obsidian flake	BLM	General Area	Located within the updated boundary for CA-INY-6577
P-14-008236	HD-RD-014i	Prehistoric	1 obsidian flake	BLM	General Area	Located within the updated boundary for CA-INY-6577
P-14-008237	HD-CS-015Hi	Historic	Motor vehicle body parts	LADWP	General Area	Located within the updated boundary for CA-INY-7616
P-14-008238	HD-CS-016i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-008239	HD-CS-017i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-008240	HD-CS-019i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-008241	HD-CS-020i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-008242	HD-CS-021i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-008243	HD-CS-022Hi	Historic	Well pipe segment	BLM	Project Site	

Table 4-9. Isolated Finds.

Primary Number	Isolate Number	Temporal Component	Description	Land Ownership	Location within APE	Comments
P-14-009330	SRI-1001	Historic	Railroad spike and metal object	BLM	SCE Road	
P-14-009331	SRI-1002	Prehistoric	2 obsidian flakes	BLM	SCE Road	Located within the updated boundary for CA-INY-6581
P-14-010091	JSA-CS-21H	Historic	Wooden post	LADWP	Project Site	
P-14-010092	JSA-WE-1i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-010093	JSA-WE-2i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-010097	JSA-WE-6i	Prehistoric	2 obsidian flakes	BLM	Project Site	
P-14-010102	JSA-WE-11i	Prehistoric	1 obsidian flake	BLM	Project Site	
P-14-010103	JSA-CS-12i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-010104	JSA-CS-13i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-010105	JSA-CS-14i	Prehistoric	2 obsidian flakes	LADWP	Project Site	
P-14-010106	JSA-CS-15i	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012163/ P-14-012934	ISO-2012-1	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012164/ P-14-012935	ISO-2012-2	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012165/ P-14-012936	ISO-2012-3	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012166/ P-14-012937	ISO-2012-4	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012167/ P-14-012938	ISO-2012-5	Prehistoric	1 basalt flake	LADWP	Project Site	

Table 4-9. Isolated Finds.

Primary Number	Isolate Number	Temporal Component	Description	Land Ownership	Location within APE	Comments
P-14-012168/ P-14-012939	ISO-2012-7	Prehistoric	1 basalt flake	LADWP	General Area	
P-14-012169 P-14-012940	ISO-2013-1	Prehistoric	1 obsidian biface fragment	LADWP	Project Site	Located within the updated boundary for CA-INY-6578/6579
P-14-012927	HW-ISO-1	Prehistoric	1 obsidian crescent tool	LADWP	Project Site	
P-14-012928	HW-ISO-2	Prehistoric	2 obsidian flakes	LADWP	Project Site	
P-14-012929	HW-ISO-3	Prehistoric	3 obsidian flakes	LADWP	Project Site	
P-14-012271/ P-14-012930	ISO-2011-1	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012931	ISO-2011-2	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012273/ P-14-012932	ISO-2011-3	Prehistoric	1 obsidian flake	LADWP	Project Site	
P-14-012933	ISO-2011-4	Prehistoric	1 obsidian flake	LADWP	General Area	
P-14-	ISO-DD-1	Prehistoric	1 obsidian flake	BLM	General Area	
P-14-	ISO-DD-2	Prehistoric	2 obsidian flakes	LADWP	General Area	
P-14-	ISO-JA-1	Prehistoric	Type 2 obsidian biface fragments	LADWP	General Area	
P-14-	ISO-JM-1	Prehistoric	1 obsidian flake	LADWP	General Area	
P-14-	ISO-JM-2	Prehistoric	1 obsidian edge-modified piece and 1 obsidian flake	LADWP	General Area	
P-14-	ISO-RB-1	Prehistoric	1 obsidian flake	BLM	General Area	

Table 4-9. Isolated Finds.

Primary Number	Isolate Number	Temporal Component	Description	Land Ownership	Location within APE	Comments
P-14-	ISO-RB-3	Prehistoric	3 obsidian flakes	LADWP	General Area	
P-14-	ISO-RB-4	Historic	Wooden post claim marker	LADWP	General Area	
P-14-	ISO-RB-5	Prehistoric	1 obsidian flake	LADWP	General Area	
P-14	IS0-RB-6	Prehistoric	2 obsidian flakes	LADWP	General Area	
P-14-	ISO-DD-3	Prehistoric	1 obsidian flake	LADWP	General Area	
P-14-	ISO-DD-4	Prehistoric	1 obsidian flake	LADWP	General Area	
P-14-	ISO-DD-5	Prehistoric	1 obsidian flake	LADWP	General Area	
P-14-	ISO-DD-6	Prehistoric	4 obsidian flakes	LADWP	General Area	
P-14-	ISO-MK-01	Prehistoric	1 obsidian flake	BLM	LAA Access Road	

BLM – Bureau of Land Management, LADWP – Los Angeles Department of Water and Power.

CHAPTER 5 – NRHP AND MANAGEMENT RECOMMENDATIONS

As the Project APE encompass portions of municipal (LADWP) and federally-managed (BLM) lands, the cultural resources studies that have been conducted have been consistent with requirements set forth in both the NHPA (federal land) and CEQA (municipal land), as amended. Because the Project invokes compliance with Section 106 of the NHPA due to federal permitting from the BLM, discussions of site significance presented below follow NRHP criteria (36 CFR § 60.4) and terminology which, notwithstanding, provide little distinction from those used for assessing resource eligibility under the CRHR.

Section 106 of the NHPA, procedures of the ACHP (36 CFR § 800), and BLM policy (8100 Manual) require inventory and evaluation of cultural resources within potential impact areas. The NRHP is the official federal list of historic properties, including districts, sites, buildings, structures, and objects, which are significant in American history, architecture, archaeology, engineering, and culture. A historic property may be of national, state, or local significance, and is defined as the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of those remains.

The significance of a property is best judged and explained when it is evaluated within its historic context; those patterns or trends by which a specific occurrence, property, or site is understood, and its meaning and significance within history or prehistory is made clear (National Park Service 1998:7). It serves as the framework within which NRHP criteria are applied to specific properties. A key principle of historic contexts is that resources, properties, or events do not occur in isolation, but rather are part of larger developments, associations, or patterns.

After identifying the relevant historic context with which a property is associated, four criteria of evaluation are considered to assess significance. These criteria serve as the standards by which every property nominated to the NRHP is judged. The criteria are broadly written to recognize the Nation's wide variety of historic properties, and to identify the range of resources and kinds of significance that qualify properties for NRHP listing. The criteria recognize associative, design, and information values, as listed in the *Code of Federal Regulations* (CFR), Title 36, Part 60:

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

Criterion A. That are associated with events that have made significant contributions to the broad pattern of our history; or

Criterion B. That are associated with the lives of persons significant in our past; or

Criterion C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D. That have yielded, or may be likely to yield, information important in prehistory or history.

To be listed in the NRHP, a property must not only be shown to be significant under one or more criteria, but it also must have *integrity*. Within the concept of integrity, the NRHP recognizes seven aspects or qualities that, in various combinations, define integrity (National Park Service 1998:44). The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association. It is recognized that all properties change over time, and it is not necessary for one to retain all historic physical characteristics or features. It must, however, retain essential physical features that enable it to convey its historic identity that define why it is significant and when it was significant (National Park Service 1998:46).

If a resource is determined NRHP-eligible, then Section 106 of the NHPA (80 Stat. 915; 16 USC §§ 470) and its implementing regulations (36 CFR § 800) require that effects of a proposed project to that resource be determined. If such properties are identified and would be adversely affected by the project implementation, then prudent and feasible measures to avoid or reduce adverse impacts must be taken. In addition, the ACHP and the SHPO must be provided an opportunity to review and comment on these measures. The ACHP has adopted regulations (36 CFR § 800) that implement this commenting authority.

A critical factor in evaluating a particular resource is a determination of what information that property may contain that is "important" to an understanding of prehistory or history. It is a truism that any site may contain information that some archeologist may consider important (ACHP 1980:10), yet this does not imply that the public interest would be well served to attempt to preserve all sites. By establishing guidelines, the agencies have clearly set the precedent that not all information is important; hence, not all sites are important (cf. ACHP 1980:9-10). Federal guidelines encourage the use of a set of research questions that generally are recognized as important research goals to evaluate significance. If a site contains information that is demonstrably useful in answering such questions, such as those presented above, then it can be considered an important site.

Determination of site significance is most often based on the integrity of resources, as well as the demonstrated contribution of site information to research domains and/or potential to provide additional data in such categories. For the current investigation, NRHP recommendations are derived through examination of archaeological materials identified at sites, presence or absence of subsurface deposits, degree of impacts (integrity), and discussions of research potential. Significance of prehistoric archaeological sites may be evaluated in terms of site distribution patterns, assemblage composition and integrity, cultural chronology, subsistence orientations, and economic patterns. Historical sites may be evaluated in terms of their type, age, on-site behaviors, and their relationship to recognized settlement patterns and subsistence activities.

NRHP AND MANAGEMENT RECOMMENDATIONS

Presented below are NRHP and management recommendations for the 37 archaeological sites and built environment resources identified within the Project APE. Several factors were used to develop the recommendations, including surface observations, assessment of resource function, the presence/absence of multiple artifact classes and feature types, indications of apparent and demonstrated subsurface deposits, Phase II testing results, and resource integrity. Table 5-1 summarizes NRHP eligibility recommendations, while Table 5-2 provides resource-specific information regarding NRHP eligibility, Project effects, and management recommendations. Figure E-1 in Appendix E provides the location of the Project's archaeological sites and built environment resources with respect to planned project components.

Table 5-1. NRHP Eligibility Recommendations by Resource Class.

Resource Class	NRHP Recommendation				Total
	Eligible	Not Eligible	Unevaluated	Evaluation in Progress	
Prehistoric	2	5	3	2	12
Multiple Component	3	5			8
Historic	3	6	4	4	17
Total	8	16	7	6	37

NRHP – National Register of Historic Places.

Table 5-2. NRHP Eligibility Recommendations, Project Effects, and Management Recommendations.

Resource No.	Resource Description	Ownership	Project Site					Borrow Site	Roadway Improve-ments	NRHP/CRHR Eligibility	Management Recommendations
			LAA Channel Realignment	Cactus Flats Road Realignment	Basin	NHD2/LAA1 Construction	NHD2 & LAA1 Parking and Staging				
CA-INY-2242	Prehistoric lithic scatter	LADWP								Not eligible	None
CA-INY-2243/5703	Multiple component: prehistoric lithic scatter and historic artifact scatter	BLM/LADWP		●	●	●	●			Eligible	Phase III data recovery
CA-INY-4591H	LAA1	BLM/LADWP	●			●		●		Eligible	HAER recordation
CA-INY-6574	Multiple component: prehistoric lithic scatter and historic feature and artifact scatter	LADWP				●				Not eligible	None
CA-INY-6575	Historic artifact scatter and earthen berm	LADWP			●	●				Not eligible	None
CA-INY-6576	Prehistoric lithic scatter	BLM	●			●		●		Not eligible	None

Table 5-2. NRHP Eligibility Recommendations, Project Effects, and Management Recommendations.

Resource No.	Resource Description	Ownership	Project Site					Borrow Site	Roadway Improve-ments	NRHP/CRHR Eligibility	Management Recommendations
			LAA Channel Realignment	Cactus Flats Road Realignment	Basin	NHD2/LAA1 Construction	NHD2 & LAA1 Parking and Staging				
CA-INY-6577	Multiple component: prehistoric lithic scatter with bedrock milling features and historic LAA1 labor camp	BLM								Evaluation in progress	Pending
CA-INY-6578/6579	Multiple component: prehistoric lithic scatter and historic artifact scatter	BLM								Evaluation in progress	Pending
CA-INY-6580	Multiple component: prehistoric lithic scatter and historic artifact scatter	LADWP						●[1]		Eligible	Phase III data recovery
CA-INY-6581	Prehistoric lithic scatter	BLM							●	Evaluation in progress	Pending
CA-INY-6582	Multiple component: prehistoric lithic scatter and historic communication line	BLM				●				Evaluation in progress	Pending

Table 5-2. NRHP Eligibility Recommendations, Project Effects, and Management Recommendations.

Resource No.	Resource Description	Ownership	Project Site					Borrow Site	Roadway Improve-ments	NRHP/CRHR Eligibility	Management Recommendations
			LAA Channel Realignment	Cactus Flats Road Realignment	Basin	NHD2/LAA1 Construction	NHD2 & LAA1 Parking and Staging				
CA-INY-6583	Multiple component: prehistoric flake and historic artifact scatter	LADWP								Not eligible	None
CA-INY-6584	Historic rock alignment	LADWP								Not eligible	None
CA-INY-6586	Multiple component: prehistoric flake and historic artifact scatter	LADWP		●						Not eligible	None
CA-INY-6587	Prehistoric lithic scatter	LADWP		●						Not eligible	None
CA-INY-6931/7276	Multiple component: prehistoric lithic scatter and historic LAA1 labor camp	BLM							●	Eligible	None; road widening will not adversely affect those portions of the site that contribute to its NRHP eligibility
CA-INY-6932/7277	Multiple component: prehistoric lithic scatter and historic LAA1 labor camp	BLM								Unevaluated	None

Table 5-2. NRHP Eligibility Recommendations, Project Effects, and Management Recommendations.

Resource No.	Resource Description	Ownership	Project Site					Borrow Site	Roadway Improve-ments	NRHP/CRHR Eligibility	Management Recommendations
			LAA Channel Realignment	Cactus Flats Road Realignment	Basin	NHD2/LAA1 Construction	NHD2 & LAA1 Parking and Staging				
CA-INY-6933/7278	Multiple component: prehistoric lithic scatter and historic artifact scatter	BLM								Not eligible	None
CA-INY-7279	Multiple component: prehistoric lithic scatter and historic artifact scatter and rock ring feature	BLM								Unevaluated	None
CA-INY-7615	Prehistoric flaked stone, ground stone, and pottery scatter	LADWP	●			●		●		Not eligible	None
CA-INY-7616	Multiple component: prehistoric lithic scatter and historic artifact scatter	LADWP								Evaluation in progress	Pending
CA-INY-7816	Los Angeles-Owens River Valley Road; Highway 23	BLM/LADWP		●						Eligible	None; existing Cactus Flats Road segment to be used as a project road does not retain integrity
CA-INY-9343	Prehistoric lithic scatter	LADWP		●						Not eligible	None

Table 5-2. NRHP Eligibility Recommendations, Project Effects, and Management Recommendations.

Resource No.	Resource Description	Ownership	Project Site					Borrow Site	Roadway Improve-ments	NRHP/CRHR Eligibility	Management Recommendations
			LAA Channel Realignment	Cactus Flats Road Realignment	Basin	NHD2/LAA1 Construction	NHD2 & LAA1 Parking and Staging				
CA-INY-9345	Prehistoric lithic scatter	LADWP		●						Eligible	Flag and avoid
CA-INY-9347	Prehistoric lithic scatter	BLM	●			●		●		Eligible	Phase III data recovery
P14-012178	NHD and historic Borrow Site #1	LADWP			●	●		●		Eligible	HAER recordation
DD-01	Prehistoric lithic scatter	BLM								Unevaluated	None
DD-02	Multiple component: prehistoric lithic scatter and historic scatter and features	BLM/LADWP								Unevaluated	None
DD-03	Multiple component: prehistoric tool and historic artifact scatter	LADWP								Not eligible	None
DD-04	Multiple component: prehistoric lithic scatter and historic artifact scatter	LADWP								Unevaluated	None
JA-01	Prehistoric lithic scatter	LADWP								Unevaluated	None

Table 5-2. NRHP Eligibility Recommendations, Project Effects, and Management Recommendations.

Resource No.	Resource Description	Ownership	Project Site					Borrow Site	Roadway Improve-ments	NRHP/CRHR Eligibility	Management Recommendations
			LAA Channel Realignment	Cactus Flats Road Realignment	Basin	NHD2/LAA1 Construction	NHD2 & LAA1 Parking and Staging				
JA-02	Multiple component: prehistoric flake and historic artifact scatter	BLM								Not eligible	None
JM-01/RB-01	Historic artifact scatter	LADWP								Not eligible	None
MK-01	Historic artifact scatter	BLM							●	Not eligible	None
RB-03	Prehistoric lithic scatter	LADWP		●						Evaluation in progress	Pending
RB-04	Prehistoric lithic scatter	LADWP								Unevaluated	None
RB-05	LADWP caretaker's residence	BLM/LADWP								Not eligible	None

[1] – Site is located on the haul route for Borrow Site 10 but not within the borrow site footprint.

Seven archaeological sites, comprised of three prehistoric and four multiple component resources, are unevaluated resources that, based on their information potential and fair to good integrity, may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4. The prospective eligibility of these sites is based largely upon three factors: (1) the potential for buried deposits; (2) fair to good integrity; and (3) the absence of subsurface data to accurately assess the nature and depth of the cultural deposits. The unevaluated prehistoric sites consist of sparse three lithic scatters (DD-01, JA-01, and RB-04) that have the potential to contribute important information for the understanding of local and regional prehistory. The unevaluated multiple component sites contain prehistoric lithic scatters and historic artifact scatters, some with cultural features. The prehistoric components at three of these sites (CA-INY-7279, DD-02, and DD-04) retain research potential, while some historic-period artifact scatters lack that potential. Because of its probable association with the LAA1 construction period, the historic-period component at site (CA-INY-6932/7277) also offer research potential and is considered an unevaluated resource.

Table 5-3. NRHP Eligibility Recommendations by Resource Class.

Resource Class	NRHP Recommendation			
	Eligible	Not Eligible	Unevaluated	Evaluation in Progress
Prehistoric	CA-INY-9345 CA-INY-9347	CA-INY-2242 CA-INY-6576 CA-INY-6587 CA-INY-7615 CA-INY-9343	DD-01 JA-01 RB-04	CA-INY-6581 RB-03
Historic	CA-INY-4591H P-14-012178 (NHD) CA-INY-7816	CA-INY-6575 CA-INY-6584 JM-01/RB-01 MK-01 RB-05		
Multiple	CA-INY-2243/5703 CA-INY-6580 CA-INY-6931/7276	CA-INY-6574 CA-INY-6583 CA-INY-6586 CA-INY-6933/7278 DD-03 JA-02	CA-INY-6932/7277 CA-INY-7279 DD-02 DD-04	CA-INY-6577 CA-INY-6578/6579 CA-INY-6582 CA-INY-7616
Total	8	16	7	6

NHD – North Haiwee Dam.

The 16 resources recommended as not eligible consist of 15 archaeological sites (five prehistoric, four historic-period, and six multiple component) and 1 built environment resource. One prehistoric site (CA-INY-2242) is an obsidian lithic scatter that was not relocated due to substantial disturbance in the site area. The remaining four prehistoric sites (CA-INY-6576, -6587, -7615, and -9343) were previously recommended not eligible based on subsurface testing (Nilsson and Bevill 2015, 2016a, 2016b). The four historic-period archaeological sites (CA-INY-6575, -6584, JM-01/RB-01, and MK-01) include three artifact scatters and one rock alignment with no additional research potential. Also recommended not eligible is a built environment resource (RB-05) comprised of a LADWP caretaker's residence. The six multiple component archaeological sites recommended as not eligible include four properties (CA-INY-6583, -6586, DD-03, and JA-02) that contain single prehistoric artifacts and historic-period artifact scatters that represent single-episode activities without clear association to any known historic site type (e.g., homestead, ranch, etc.) or specific activity (e.g., construction of NHD and NHR). Two multiple component sites, CA-INY-6574 and CA-INY-6933/7278, were previously evaluated as not eligible (Nilsson and Bevill 2016b; Nilsson et al. 2007).

Six resources have been previously determined NRHP-eligible, including CA-INY-2243/5703, the LAA1 (CA-INY-4591H), CA-INY-6580, -6931/7276, -9345, and -9347. CA-INY-2243/5703 consists of an extensive prehistoric lithic scatter and historic homestead with multiple refuse scatters. The LAA1 (CA-INY-4591H) also has been designated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers, demonstrating its significance as a prominent engineering feat of local and national importance. CA-INY-6931/7276 consists of a prehistoric lithic scatter and LAA1 labor camp that was previously evaluated as a contributing element to the First Los Angeles Aqueduct Historical Archaeological District (FLAAHAD) (Nilsson et al. 2007). Prehistoric resources associated with CA-INY-6580, -9345, and -9347 were evaluated as National Register eligible based on Phase II testing (Nilsson and Bevill 2016b).

Site CA-INY-7816 consists of remnants of old Highway 23 and its stage road precursor. The road served as the Eastern Sierra's principal north-south route from the mid-1860s (stage road) to the early 1930s, when it was superseded by, or incorporated into State Route 23, which was constructed through the area between 1929 and 1931. This site is recommended NRHP-eligible for its contribution to the development and growth of Inyo County via a series of road developments that provided economic, social, and political developments to the region.

Finally, NHD (P-14-012178) is recommended NRHP-eligible due to its historical significance and association with the LAA1 system.

CA-INY-2242

This prehistoric site was recorded as an obsidian lithic scatter of roughly 150 unmodified flakes and 5 flake tools. The cultural resources survey conducted by EDAW in 2002 attempted to relocate the site, but no physical evidence was found (Shaver 2003:22). Due to substantial disturbance in the area, it was noted that the site was likely heavily damaged by ongoing maintenance of the LAA1. As currently assessed, the site appears to have been destroyed. Based on this disturbance, coupled with the absence of artifacts in its originally recorded location, the site is recommended as not eligible for the NRHP.

CA-INY-2243/5703

CA-INY-2243/5703 is an expansive, multiple component archaeological site that encompasses a 120-acre area. Twenty-two loci, or artifact concentrations, (Locus A/B to X) have been identified across the site. The prehistoric component consists of a widespread obsidian lithic scatter and a concentration of Owens Valley Brownware pottery. Surface artifacts include at least 500 obsidian flakes, 15 pieces of Owens Valley Brownware pottery, and flaked stone and ground stone tools. The presence of Rose Spring and Cottonwood series projectile points and the pottery infer site use during the Marana period (650 B.P.–Historic). Two radiocarbon dates obtained from two fire hearths exposed during geotechnical trench excavations indicate greater antiquity that extends back in time to the Little Lake period (5950–3150 B.P.). The site's historic component includes a former homestead, two wellheads, two wooden posts, and several artifact concentrations. Based on artifact typologies, the historic component reflects site use from ca. 1910 to the 1950s.

Both natural and cultural factors have disturbed the site, with varying levels of intensity dependent upon the locus. Two-track roads created to support the Project's geotechnical investigations crisscross the site in multiple areas, and a graded dirt road bisects the site. Construction of the existing Dam and the LAA1 has affected the prehistoric component. Additional disturbances include an area of fill deposit on the northeasterly side of the dam; recreational activities, including off-road vehicle use; and widespread rodent disturbance. Structures associated with the former homestead are non-extant, and the area is often used for vehicle parking. Geophysical and geotechnical investigations conducted between 2006 and 2016 have also affected the cultural deposit. These activities included installation of water monitoring wells, mechanical auguring and trenching, and the use of Vibroseis machines and other mechanized equipment driven across the site.

Shovel testing conducted by URS in 2006 documented the presence of a 60 cm deep prehistoric component, which included time-sensitive artifacts such as obsidian artifacts and time-sensitive projectile points. Based on these

factors, and its good integrity, the site was recommended eligible for listing in the CRHR under Criterion 4 and the NRHP under Criterion D (Nilsson 2007). Before deep trenching was initiated at two trench locations during LADWP's 2012 geotechnical investigations, an archaeological shovel testing program was completed, resulting in the recovery of a sparse cultural assemblage from the excavation of 10.4 m^3 of sediment. The assemblage consisted of 131 obsidian flakes, 3 flaked stone tools, 32 faunal remains, and 1 piece of modern glass. Most artifacts were recovered from depths above 60 cm, with only 11 flakes and the 3 flaked stone tools found within the deeper trench units. Dating of the two, deeply buried fire hearth features provided near-identical conventional radiocarbon dates of 4120 +/-30 B.P. (Beta-337849) and 4100 +/-30 B.P. (Beta-337850), attributing these features to the middle Holocene (Little Lake period [5950–3150 B.P.].

NRHP Recommendation

The 2012 testing results confirm the site's designation as a NRHP-eligible property under Criterion D (36 CFR § 60.4) for its ability to yield information important in prehistory. The prehistoric component has established its ability to address questions within multiple research domains, including cultural chronology, settlement and land use, and resource procurement and use. Within the domain of cultural chronology, the site has demonstrated a multiple component deposit associated with the Late and Middle Holocene; time-diagnostic artifacts, inclusive of projectile points and ground stone artifacts; obsidian artifacts suitable for obsidian hydration studies; and stratigraphy that exhibits a fair level of cultural integrity and/or identifiable patterns in formation. The site has also shown the ability to address research issues related to prehistoric settlement and land use studies. Two discrete cultural features were discovered, dating to the Middle Holocene and Little Lake period. The presence of these deeply buried features suggests that the potential remains for additional features to exist within the site's multifaceted cultural deposit. Within the realm of prehistoric resource procurement and use, the site has yielded sufficient samples of obsidian debitage useful for study of reduction strategies; temporally and functionally diagnostic tools; and obsidian tool stone to assist in the identification of local and regional trade and interaction. Based on visual sourcing attributes of the recovered assemblage, the site can contribute to the developing picture of obsidian-hydration conversion rates for CVF obsidian. The recovery of diverse flaked stone artifacts, coupled with additional surface finds such as pottery and ground stone, has provided information documenting site function, and the potential remains for additional implements to offer further refinements to local and regional cultural patterns.

The site's historic component is composed of a former homestead, (Locus G), two well heads (Locus N), two wooden posts (Loci L and M), and several artifact concentrations (Loci H, I, O, P, Q, and U). Several concrete foundations and a diffuse artifact scatter define the former homestead area. While this area of the site has received little archaeological investigation, it may retain evidence of subsurface cultural deposits that could contribute to the site's NRHP eligibility. The historic artifact concentrations, as well as the wellheads and wooden posts, lack detectable layering or stratification, suggesting they are surface or near-surface features. These areas lack association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. They represent variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. The data potential of the artifact concentrations is limited to study of subsistence-related items and a few time-sensitive artifacts, namely tin food canisters. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of their research potential. Consequently, with the exception of the former homestead area, the site's historic component does not meet NRHP eligibility criteria by being associated with specific events important in history (Criterion A, respectively), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, several Project Site components would directly affect the site, including construction of NHD2; realignment of Cactus Flats Road; establishment and use of temporary roads and parking, stockpile, and staging areas; and development of several Basin components. Therefore, Phase III data recovery investigations are recommended as a treatment measure for the site.

CA-INY-4591H

This trinomial designation encompasses the water conveyance system and related features of the LAA1 (1907–1913) within Inyo County, California. The roughly 0.5-mile-long segment of the LAA1 that traverses the Project Site is the terminal section of the 40-mile-long open, concrete-lined canal that extends south from the Alabama Hills (near Lone Pine) to NHR. The LAA1 channel segment within the Project area is in good condition.

NRHP Recommendation

The LAA1 was designated a National Historic Civil Engineering Landmark in 1971 by the American Society of Civil Engineers, demonstrating its significance as a prominent engineering feat of local and national importance. In 2007, the LAA1 was listed in the California Office of Historic Preservation (OHP)'s Archaeological Determinations of Eligibility as a contributor to a district determined eligible for the NRHP, and it was listed in the CRHR. A segment of the LAA1 at the Alabama Gates has been recommended NRHP-eligible (Costello and Marvin 1992; Mikesell 1990) under Criterion A (event) and Criterion C (design/construction).

The historic record and context statement developed above in Chapter 2 support the view that the LAA1 represents a significant part of the history and engineering of water and hydroelectric power development, production, and conveyance in the early twentieth-century in southern California and the west. The LAA1 demonstrates local and national significance under Criterion A (Event) for its contribution to the development and growth of Los Angeles, the second largest city in the United States, behind New York. Construction of the LAA1, and the water and power it delivered to the City, was a pivotal event that forever changed the economic, political, and social development of southern California. Without the abundant water channeled to the City from the Owens River Valley, Los Angeles could not have grown into the principal residential, commercial, and industrial West Coast center that it is today. Construction of the LAA1 was a much heralded and significant accomplishment, often compared to the efforts required to build the Panama Canal, Erie Canal, and Catskill Aqueduct. Similarly, development of its related power resources was viewed by the growing City as a corollary to the development of municipal water. The early and overwhelming success of the LAA1 demonstrated the efficacy of public water development and inspired construction of larger delivery systems across the State, establishing a tradition separate from other areas of the arid west (Kahrl 1982:437).

The engineering technique of the LAA1 system constitutes a method of construction that shaped its historic identity and that of the larger southern California region. The LAA1 has local and national significance under Criterion C (Design/Construction) for its engineering feat that involved hundreds of miles of engineering features. Such features included tunnels, reservoirs, dams, canals, conduits, and pipes, not to mention the constructed infrastructure to support construction activities, including roads, transmission lines, railway, telephone lines, and camps for the approximate 4,000 individuals needed at the peak of construction. The system embodies a distinctive characteristic of a type, period, and method of construction. The LAA1 was designated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers in 1971, demonstrating its significance as a prominent engineering feat of local and national importance. Without the vision of its design, and the realization of its construction in the early twentieth-century, the widespread growth and prolific development that subsequently occurred within the City, and across southern California and the greater west, would not have been possible. In 2002, the U.S. Department of the Interior, National Park Service, placed the LAA1 system on the Historic American Building Survey/Historic American Engineering Record (HABS/HAER) as Survey Number HAER CA-298.

Development and construction of the LAA1 system is inexorably tied to the lives of persons of local significance. The most renowned of these is William Mulholland, a civil servant, whose dramatic rise from simple beginnings as a ditch tender with the Los Angeles Water Company, to Chief Engineer of the first municipally owned water and power system in California, mirrored the dramatic growth of the City itself. Mulholland's foresight and vision brought about the realization of the LAA1, which transformed Los Angeles from a small pueblo into a burgeoning metropolis within less than a decade. In 1904, Mulholland recognized that the growing City could not develop

further without an abundant and external water supply, and he soon began a search for new source. Aided by Fred Eaton, former mayor and city engineer, and J.B. Lippincott, a supervising engineer for California in the newly formed U.S. Reclamation Service, Mulholland's interest turned to the Owens River as a direct route for supplying water to the City. He soon began to plot an alignment, devising an aqueduct and reservoir system to transport the water entirely by gravity flow. For seven years (1907–1913), Mulholland and Assistant Engineer J.B. Lippincott personally supervised construction of the LAA1 and the elaborate infrastructure essential to support the multitude of activities needed to build the system. After the LAA1 was completed in November 1913, Mulholland turned his attention to improving and refining the City's water system (Mulholland 2000:259), including a then fledgling proposal for expansion by bringing Colorado River water to the City (which evolved into the Hoover Dam), as well as several other local reservoir projects to increase the LAA1's storage capacity. By 1925, Mulholland was involved with the development and construction of the ill-fated St. Francis Dam, the catastrophic failure of which in 1928 would mark his demise and eventual retirement in 1929. As a tribute to the iconic Chief Engineer, upon his death in 1935, his body lay in state in the rotunda of Los Angeles City Hall, all work on the Colorado River Aqueduct ceased for a minute of silence, and waters at the Haiwee Reservoirs were also stopped in their flow to the City (Mulholland 2000:331).

As part of a comprehensive inventory of the LAA1 and LAA2 corridors and their associated access roads in Inyo and Kern counties, 102 historic-period archaeological sites associated with the aqueduct system were evaluated for their NRHP eligibility (Nilsson et al. 2006). Based on their historical linkage of function, theme, and physical development, representing a unified entity related to the single event of aqueduct construction, the resources were recommended and evaluated as contributing or non-contributing elements of the First Los Angeles Aqueduct Historical Archaeological District (FLAAHAD). As accepted by the California State Office of Historic Preservation, this district then encompassed 58 contributing sites and 44 non-contributing sites (Nilsson et al. 2006).

Archaeological sites recommended as contributing elements to the FLAAHAD are important under Criterion D (information potential) of the NRHP (36 CFR § 60). These elements are significant if they have yielded, or may be likely to yield, information important in the history of the LAA1. Application of this criterion includes identifying data sets or categories of information present within the sites in question; identifying the appropriate historical and archaeological contexts, in this case, construction of the LAA1; documentation of why the information is important; and assessing the integrity of the sites. In general, the more features present at a site, and/or the higher the diversity of artifacts, the more data sets or information categories suitable for addressing research issues. Consequently, labor camps with multiple features and diverse artifact scatters, and construction camps with foundations and artifact scatters, have been identified as contributing elements. These sites clearly provide the potential to address research issues, such as camp layout, sanitation, ethnicity, gender, social status, subsistence, and alcohol and tobacco use. Likewise, all division headquarters are contributing, given the quantity of features and artifacts present. Scatters of artifacts demonstrating high diversity, but no features, have also been recommended as eligible, given that these too can contribute information to such research domains as ethnicity, gender, social status, subsistence, and alcohol and tobacco use.

Sites recommended as non-contributing elements include concentrations of artifacts with little diversity or limited quantity and simple foundations without associated artifacts. Some aqueduct and railroad related trash scatters, construction camps, and labor camps fall into this category, given that they contain little or no information beyond that recovered during site recordation.

Management Recommendations

To date, no Project-related activities have affected the LAA1 segment that crosses the Project APE. Construction activities associated with the proposed NHD2, however, will require realignment of the LAA1 channel. This realignment would include demolition of the 0.5-mile-long segment in the Project APE; earthwork such as excavation, grading, and compaction; and hauling and concrete work. Additionally, the LAA1 segment is within the proposed location of Borrow Site 10. The proposed LAA Realignment will require constructing a portion of new channel west of the existing aqueduct channel. Roughly 1,900 ft. of new trapezoidal channel, matching the existing LAA1 channel dimensions, will be constructed on BLM and LADWP land. Channel width will vary from 32 to 35 ft.,

while channel depth will be 12 to 15 ft. The channel will be paved using welded-wire mesh and 6-in. thick shotcrete. The excavated material will be used as part of the proposed NHD2 construction. The existing section of the LAA1 channel that will be bypassed by the realignment will be demolished, and the area will be filled in (LADWP 2012:3). Temporary staging and construction areas will be located near the construction site, on both BLM and LADWP property.

The 0.5-mile-long LAA1 channel within the Project APE remains largely as the original structure built by the City 100 years ago. Other than ongoing maintenance efforts, which have included placement of new concrete within the canal, the LAA1 retains its original aspects of historic integrity, including location, design, setting, materials, workmanship, feeling, and association. The aqueduct's setting has not been altered, and the structure exists in its original location. Although some maintenance activities have occurred, these have not affected the design, form, plan, or space of the structure. With the exception of maintenance efforts, the physical elements of the aqueduct's construction materials are intact, and are largely those laid down over 100 years ago. The aqueduct has also retained integrity of workmanship, providing information regarding the technology of the aqueduct-building craft and illustrating the engineering principles of its historic period. The aqueduct's physical characteristics maintain its feeling through its continued use as an integral part of the LAA1 system. Finally, the aqueduct's construction history and modern-day use as a water conveyance component of the LADWP water delivery system continues to convey its integrity of association.

While Proposed Project activities would result in the removal of a 0.5-mile-long segment of the LAA1, the historic facility would be replaced with a new LAA1 alignment that would be of a similar size, dimension, and appearance. The segment to be removed retains a high level of integrity, but is part of the larger LAA system that includes 233 miles of water conveyance features, and the aqueduct at this location does not contain important aspects of engineering or construction that are reflective of LAA's historic significance under NRHP Criteria A and C. Due to the comparatively small length of aqueduct that would be removed, the lack of important engineering features at this location, and the visual compatibility of the new replacement facility, the Proposed Project would not have an adverse effect upon the LAA1 pursuant to 36 CFR § 800.5(b). The characteristics that make the LAA1 eligible for the NRHP would not be appreciably diminished, as the LAA1 would continue to serve its historic function. Treatment measures are nonetheless recommended to reach a less than significant level of impact, pursuant to Section 21084.1 of the California Public Resources Code. While the HAER documentation supplied by the National Park Service in 2002 (HAER CA-298) provides a general overview of the LAA1 system, it does not offer specific information regarding the current Project segment that will be subject to demolition. Due to the historical significance and associations of the LAA1, a HAER Level II recordation level is recommended for the segment within the Project APE. HAER recordation of the segment may include both formal documentation (drawings, photographs, histories) and informal documentation (field records, and other significant materials not meeting HAER standards and guidelines). BLM has also recommended consideration of completion of a NRHP nomination to list the LAA1 on the National Register.

CA-INY-6574

This multiple component site consists of a prehistoric lithic scatter, the remains of an ore-processing complex, and Borrow Site 2, the latter associated with the construction of the existing Dam and NHR. Cultural remains occur within five loci (A–E) that include one prehistoric lithic concentration (Locus D), three historic areas (Locus A, B, and C), and one area (Locus E) with multiple component remains. Based on the results of Phase II testing, prehistoric site use occurred during the Marana, Newberry, and Little Lake periods. Artifacts and features associated with the historic component suggest that the ore-processing complex operated sometime between 1913 and 1933, after construction of the LAA and NHD (1913) and before a 1933 Executive Order restricting settlement, location, sale, or entry. The site has been affected by geotechnical drilling and trenching activities, as well installation of dirt roads and water monitoring wells. Other effects include off-road vehicle use and evidence of rodent burrowing.

NRHP Recommendation

As revealed through Phase II testing, the site's prehistoric component demonstrated little ability to contribute information necessary to address research domains and questions identified in the Project Research Design. The subsurface deposit contained few artifacts and no discrete features, precluding the identification of site components. Absent are time-diagnostic artifacts and sufficient quantities of obsidian suitable for hydration study and chronological reconstructions. Similarly lacking are data sets necessary for addressing research issues related to settlement patterns, subsistence orientations, and material conveyance strategies such as sufficient samples of obsidian for source studies; samples of debitage useful for study of technological reduction strategies, recycling practices, and reuse; faunal and floral remains representative of dietary practices; and items of exotic materials useful for identifying conveyance networks and interaction spheres. Given its limited data potential, the prehistoric component lacks the ability to yield information important to prehistory (Criterion D of 36 CFR 60). Based on these findings, the prehistoric component is recommended as not eligible for listing in the NRHP or CRHR.

The site's historic component comprises the remains Borrow Site #2, a 1912-era feature associated with construction of NHD/NHR, as well as an ore-processing complex dating to the 1920s and/or 1930s. While the LAA system demonstrates local and national significance under Criterion A (Event) for its contribution to the development and growth of Los Angeles, the NHD borrow site itself is not considered a contributing element to this significance. The historic component is not associated with persons significant in the past (Criterion B), nor does it contain elements that embody distinctive characteristics of a type, period, or method of construction (Criterion C). Although a robust artifact assemblage was recovered, largely from the Feature 1 area, the chronological association of most items is unknown due to their fragmentary and deteriorated condition, as well as their lack of temporally diagnostic attributes. Additionally, over 95 percent of all recovered artifacts consist of indefinite use items and structural remains whose purpose cannot be accurately determined beyond a general level because of their fragmented nature and limited functional attributes. Investigations have shown that while a structure was once present in this area, it has been destroyed by fire, rendering it, like its associated artifact assemblage, of little information potential. Further investigation of the Locus B area is unlikely to provide new information relating to historic site function due to the fragmentary and non-diagnostic nature of the artifact assemblage. Concrete foundations, a firebrick concentration, and an earthen loading ramp characterize other unexamined areas within Locus B, none of which is amenable for further archaeological investigation. Although the Locus C borrow pit is associated with the LAA1 construction period, this feature does not meet eligibility criteria as a contributing element to the FLAAHAD (Nilsson et al. 2006) under Criterion D. Based on these cumulative factors, the site (prehistoric and historic-period components) is recommended as not eligible to the NRHP or CRHR.

Management Recommendations

CA-INY-6574 lies within the NHD2 and LAA1 construction area and has the potential to be affected by project-related activities. Because the site was recommended as a non-eligible property, no additional measures are required before Project construction proceeds.

CA-INY-6575

This historic-period archaeological site is a domestic artifact deposit and an earthen berm. Most of the site's domestic debris occurs within one small artifact concentration composed of tin cans, glass, and ceramic artifacts that date to after A.D. 1935. The site is in fair condition, with effects related to two-track roads that cross the site.

NRHP Recommendation

As revealed through Phase II testing, the site's domestic artifact deposit lacks detectable layering or stratification, suggesting that it is a near-surface roadside refuse scatter. Both the artifacts and the earthen berm lack association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. The artifact assemblage demonstrates little data potential, limited to

study of subsistence-related items and a few time-sensitive artifacts, namely tin food canisters. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. Consequently, the site does not meet NRHP eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D). Based on these findings, the site is recommended as not eligible for listing in the NRHP or CRHR.

Management Recommendations

CA-INY-6575 lies within the Project's basin component and construction earthwork area and has the potential to be affected by project-related activities. Because the site is recommended as a non-eligible property, no additional measures are required before Project construction proceeds.

CA-INY-6576

This prehistoric site is a small cluster of three obsidian biface thinning flakes. Phase II testing document the presence of a sparse, surface lithic scatter comprised of obsidian flakes; no subsurface artifacts were found. Obsidian source analysis for the two artifacts indicates their manufacture from WSL material. Both artifacts returned identical hydration values, equating them to the Newberry period. The flakes represent a single-episode of site use. Site condition is fair, with effects related to minor rodent disturbance and natural erosion.

NRHP Recommendation

Based on the results of Phase II testing, the site has demonstrated little ability to contribute information necessary to address prehistoric research domains and questions identified in the Project Research Design. The subsurface deposit contained no artifacts and no discrete features, precluding the identification of site components. Absent are time-diagnostic artifacts and sufficient quantities of obsidian suitable for hydration study and chronological reconstructions. Similarly lacking are data sets necessary for addressing research issues related to settlement patterns, subsistence orientations, and material conveyance strategies such as sufficient samples of obsidian for source studies; samples of debitage useful for study of technological reduction strategies, recycling practices, and reuse; faunal and floral remains representative of dietary practices; and items of exotic materials useful for identifying conveyance networks and interaction spheres. Given its limited data potential, the site lacks the ability to yield information important to prehistory (Criterion D of 36 CFR 60). Based on these findings, CA-INY-6576 is recommended as not eligible for listing in the NRHP or CRHR.

Management Recommendations

CA-INY-6576 would be directly affected by Project activities. Because the site is recommended as a non-eligible property, no additional measures are required before Project construction proceeds.

CA-INY-6577

This multiple component site consists of a prehistoric lithic scatter with bedrock milling features, as well as the remains of a LAA1 period (1907–1913) labor camp. The prehistoric component, which is undated, includes a low-density obsidian lithic scatter, five granite/granodiorite boulders with bedrock milling slicks, and one handstone. The historic component is composed of a LAA1 construction labor camp, including three features and an artifact scatter. The site is in fair condition; several dirt roads have affected its periphery, and a utility line and its two-track dirt road traverse roughly east-west across the site.

NRHP Recommendation

AECOM conducted Phase II investigations at the site in November 2016 to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Management Recommendations

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-6578/6579

This site is a large, diffuse, prehistoric lithic scatter, and historic-period artifact scatter. The cultural assemblage is defined by four distinct artifact concentrations (Locus A, B, C, and D). The surface prehistoric assemblage consists of a low-density obsidian flake scatter composed of several hundred obsidian flakes; seven obsidian tools, including an obsidian corner- or side-notched projectile point that is likely associated with the Newberry period (3150–1350 B.P.); and a piece of *Haliotis* shell. Prehistoric artifacts are spread across the entire site area, with a discrete concentration comprising Locus D. Locus A, B, and C consist of historic-period artifact concentrations that contain domestic, personal, and miscellaneous debris from activities associated with construction of the LAA1, the existing Dam, and/or NHR (1907–1913). The site is in fair condition, with its periphery having been affected by dirt roads, utility lines, and a two-track road.

Limited subsurface investigations were conducted at the site by URS in 2012 within three areas planned for geotechnical investigation, all located within non-locus areas. Testing identified a sparse subsurface lithic scatter that ranged from 50 to 140 cmbs. A light-density scatter of obsidian and basalt flakes defined the subsurface prehistoric deposit.

Based on the results of limited testing, the geotechnical areas examined within the larger site area offered little information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. While clearance was given to conduct geotechnical investigations at these three locales, it was also noted that the limited testing did not constitute formal evaluation of the site's NRHP eligibility, but rather an assessment of the depth and nature of the cultural deposit within the proposed geotechnical investigation areas only (Nilsson 2012).

NRHP Recommendation

AECOM conducted Phase II investigations at the site in November 2016 to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Management Recommendations

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-6580

This multiple component site consists of a prehistoric lithic scatter and historic-period artifact scatter and water tank. The site was recorded by EDAW in 2002 (Shaver 2003). Artifacts appeared date to pre-1914 and were considered associated with construction of the LAA1, NHD, and/or NHR. URS assessed the site as not meeting NRHP eligibility criteria as a contributing element to the FLAAHAD (Nilsson et al. 2006) under Criterion D, where artifact concentrations with little diversity or limited quantities are considered non-contributing elements to the

district. AECOM's cursory review of the site area in August 2015 noted the presence of a previously unrecorded prehistoric component, consisting of at least eight obsidian flakes.

AECOM conducted Phase II investigations at the site in November 2015, focused exclusively on the prehistoric component (Nilsson and Bevill 2015). The recovered cultural assemblage consisted of 35 prehistoric artifacts and 27 historic artifacts from subsurface contexts to a depth of 60 cmbs. Most prehistoric artifacts occurred in units excavated within the northwest portion of site, while historic artifacts occurred in the northwest area and in areas to the south.

Obsidian debitage dominates the prehistoric artifact assemblage, which also includes one leaf-shaped projectile point collected from the site surface. This debitage assemblage indicates site activities focused on percussion-based core- and biface-reduction technologies that employed large flakes as a source of parent material. Obsidian source data specify the use of three CVF sources for tool manufacture, including WSL, SLM, and WCP. Although sandblasting has affected the obsidian artifact assemblage, about two-thirds of the items submitted for hydration analysis returned micron readings useful for chronological reconstructions. The obsidian hydration profile infers site use predominately during the Little Lake period, with two artifacts suggesting possible use during the Newberry period, two during the Lake Mohave period, and one during the Haiwee period. Three SLM flakes from EU-1 exhibit multiple hydration bands, suggesting the transport and subsequent use of older pieces of obsidian (Little Lake and Lake Mohave) during later periods of site occupation (Haiwee and Newberry). Also possible is that more recent site occupants (Haiwee and Newberry) scavenged and reused older obsidian flakes deposited on-site by earlier groups. Given that the artifact assemblage reflects both low artifact density and diversity, the site likely served as a temporary use area where, minimally, lithic reduction tasks occurred.

The recovered historic artifact assemblage represents a variety of activities, domestic, personal, structural, and indefinite use items. These items point to historic-period site use during the early twentieth century related to the construction of the LAA1, NHD, and/or NHR. The site's proximity to a nearby LAA1 labor camp further underscores this association.

NRHP Recommendation

Based on the results of Phase II testing, the site's prehistoric component demonstrated its ability to contribute information necessary to address topics of significance identified within the Project Research Design. Given its data potential within the domain of cultural chronology and lithic technology, the prehistoric component established the ability to provide information important to prehistory and was recommended eligible for listing in the NRHP under Criterion D of 36 CFR 60.4 (Nilsson and Bevill 2016b). Although site integrity has been compromised to some extent by historic-period disturbances associated with a nearby LAA1 labor camp, as well as other modern effects related to the subterranean water tank and several access roads, the site retained sufficient integrity to support its eligibility recommendation.

The site's historic component was previously recommended as not eligible to the NRHP (Nilsson and Bevill 2015, 2016a), and the findings of the Phase II study corroborated this evaluation. This component is most closely associated with construction of the LAA1, the existing Dam, and/or NHR. While the LAA1 system demonstrates local and national significance under Criterion A (Event) for its contribution to the development and growth of Los Angeles, the site itself is not considered a contributing element to this significance. The historic component is not associated with persons significant in the past (Criterion B), nor does it contain elements that embody distinctive characteristics of a type, period, or method of construction (Criterion C). Despite its probable association with these events, the assemblage lacks evidence to support the presence of camp-related features, such as tent pads, privies, and foundations. Instead, the site appears to be a refuse scatter without detectable layering or stratification. Thus, the historic assemblage demonstrates little data potential. Although likely associated with the LAA1, NHD, and/or NHR construction period, the historic component does not meet eligibility criteria as a contributing element to the FLAAHAD (Nilsson et al. 2006) under Criterion D, where artifact concentrations with little diversity or limited quantities are considered non-contributing elements to the district. Based on its lack of information potential, the historic component was recommended as not eligible to the NRHP.

Management Recommendation

As currently designed, an access route would bisect the site, including the prehistoric component. If the road cannot be redesigned to avoid this NHRP-eligible site, then Phase III data recovery investigations are recommended for the prehistoric component to reduce adverse effects and mitigate the loss of significant archaeological deposits before Project construction proceeds.

CA-INY-6581

This prehistoric site consists of a sparse obsidian lithic scatter on a broad, open flat. The artifact assemblage includes at least 15 obsidian biface thinning flakes, 1 obsidian biface fragment, and 2 obsidian stemmed point fragments, the latter likely associated with the Newberry period (3150–1350 B.P.). The site is in good condition, although a transmission line access road bisects the site and an electrical tower is positioned at its northern end.

NRHP Recommendation

AECOM conducted Phase II investigations at the site in January 2017 to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Management Recommendation

As currently designed, widening of an access road would affect the site. If the site is determined NRHP-eligible, then additional treatment measures may be required before Project construction proceeds.

CA-INY-6582

This multiple component site is a prehistoric obsidian lithic scatter that also contains a historic-era telephone or telegraph wire. Prehistoric surface artifacts include at least 70 obsidian flakes, 2 formed tools, and 1 abraded quartzite rock. The sole historic-period artifact is a 650-foot-long segment of single-strand aluminum telephone wire, lying on the ground surface that crosses the length of the site, extending northwest/southeast outside the site boundaries. Although bisected by a two-track dirt road, the site is in fair condition, with a few effects related to rodent disturbance and natural erosion.

Limited subsurface investigations were conducted at the site by URS in 2012 within one area planned for geotechnical investigation, but no cultural remains were found. Based on the results of limited testing, the examined area of the site offered little information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. While clearance was given to conduct geotechnical investigation at the test pit location, it was also noted that the limited testing did not constitute formal evaluation of the site's NRHP eligibility, but rather an assessment of the depth and nature of the cultural deposit within the proposed geotechnical investigation areas (Nilsson 2012).

NRHP Recommendation

AECOM conducted Phase II investigations at the site in November 2016 to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Management Recommendation

As currently designed, Project activities will occur outside the site boundary, although NHD2/LAA1 construction earthwork activities will occur near the northeast corner of the site. If the site is determined NRHP-eligible, and

such activities cannot be redesigned to avoid the site, then additional treatment measures may be required before Project construction proceeds.

CA-INY-6583

This multiple component site consists of a single prehistoric obsidian flake and a historic-period refuse deposit of household debris located at the base of a northwest trending ridge. The historic-period refuse occurs within two concentrations, composed of post-1945 domestic and personal-related items. Site condition is fair, and a dirt road borders the site to the north.

NRHP Recommendation

The site's prehistoric component is limited to a single obsidian flake. Represented by this isolated artifact, the prehistoric component is recommended as not eligible to the NRHP due to its lack of data potential.

The historic-period artifact assemblage demonstrates little data potential, limited to study of household debris. Data contributions from the artifact assemblage have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. The artifacts lack association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. As an isolated historic-period refuse deposit that lacks integrity and association, the historic-period component is recommended not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, project-related activities would avoid this site. Based on the recommendation of non-eligibility, no additional measures are recommended for the site.

CA-INY-6584

This historic-period site consists of a low-stacked course of mortar-less cobbles. The estimated date of the feature is post-1912, as it may have workers on the LAA1, NHD, and/or NHR may have built it (Shaver et al. 2003b). Site condition is fair, with effects related to natural erosion.

NRHP Recommendation

The site's historic-period feature demonstrates no data potential beyond what has already been recorded. Data contributions from the feature have been detailed in the archaeological site record form, thereby recovering the site's research potential. The site lacks association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. As an isolated feature that lacks clear associations, the site is recommended not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-6586

This multiple component site consists of a single prehistoric obsidian flake and a concentration of historic-period refuse on a broad flat northeast of the existing Dam. The historic-period artifact assemblage contains domestic- and personal-related items, including clear and brown glass fragments, condensed milk cans, pocket tobacco tins, and sanitary cans, which date to post-1945. The site is in fair condition, with some effects related to a two-track road that crosses its southern end.

NRHP Recommendation

The site's prehistoric component is limited to a single obsidian flake. Represented by this isolated artifact, the prehistoric component is recommended as not eligible to the NRHP due to its lack of data potential.

The historic-period artifact assemblage demonstrates little data potential, limited to study of household and personal debris, namely tin food canisters, tobacco tins, and glass fragments. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. The site's historic-period component lacks association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. As an isolated refuse deposit that lacks integrity and association, the historic-period component is recommended as not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

CA-INY-6586 lies within an access road corridor and has the potential to be affected by road construction activities and associated laydown areas. Based on the recommendation of non-eligibility, however, no additional measures are recommended for the site.

CA-INY-6587

This prehistoric site consists of an obsidian lithic scatter on a broad ridge northeast of NHR. The surface artifact assemblage includes at least 30 flakes and 1 possible biface fragment. The flakes are mostly concentrated within a 10-m-diameter area in the central part of the site, but are also less densely distributed elsewhere. All artifacts exhibit a high degree of aeolian weathering, and the site itself is in fair condition.

Phase II investigations conducted at the site in November 2015 produced 14 obsidian flakes, documented the presence of a low-density subsurface artifact deposit that extended to a maximum depth of 60 cmbs; most flakes, however, occurred within the upper 20 cm. The artifact assemblage indicated site activities focused on core and general percussion reduction of CVF obsidian, including material from the WCL and WSL source areas. Given that the artifact assemblage reflects both low density and low diversity, it was concluded that the site likely served as a temporary use area where limited lithic reduction tasks occurred. Due to heavy sandblasting, the lithic assemblage was not amenable for obsidian hydration studies, as only one of eight pieces submitted for analysis returned a micron reading. This one artifact represents the only temporal data for the site, inferring site use during the Little Lake period.

NRHP Recommendation

Based on the results of Phase II testing, the site demonstrated little ability to contribute information necessary to address prehistoric research domains and questions for the Owens Valley area identified in the Project Research Design. The subsurface deposit contained few artifacts and no discrete features, precluding the identification of site components. Given its limited data potential, the site lacked the ability to yield information important to

prehistory (Criterion D of 36 CFR 60). Based on these findings, the site was recommended as not eligible for listing in the NRHP or CRHR.

Management Recommendation

CA-INY-6587 is within an access road corridor and has the potential to be affected by road construction activities and associated laydown areas. Because the site was recommended as a non-eligible property, no additional measures are required before Project construction proceeds.

CA-INY-6931/7276

This large, multiple component site consists of a prehistoric lithic scatter and the remains of a LAA1 labor camp. Artifacts occur within three primary concentrations and include a variety of personal objects, domestic debris, tools and hardware, other miscellaneous items. Butchered animal bone and clay firebricks were also noted. The site is in fair condition, with disturbances including two electric transmission lines and associated access roads that cross the site.

NRHP Recommendation

In 2007, URS conducted Phase II evaluations at the site as part of the Long Valley-Haiwee Transmission Line project (Nilsson et al. 2007). The recovered historic-period artifact assemblage included a variety of domestic, personal, structural-related artifacts, as well as faunal remains, consistent with site use as an LAA1 construction labor camp. Based on these results, the site was evaluated as a contributing element to the FLAAHAD under Criterion D of 36 CFR § 60.4 (Nilsson et al. 2006; Nilsson et al. 2007).

Management Recommendation

As currently designed, widening of existing access roads would directly affect the site. These widening activities, however, would occur within areas of the site where sparse historic-period artifacts occur on the surface, and where no prehistoric artifacts are present. The Phase II evaluations conducted previously at the site documented that its NRHP values exist within an area of the site that would not be affected by road widening activities. Thus, the proposed road widening would not adversely affect those portions of the site that contribute to its NRHP eligibility, precluding the need for Phase III data recovery. It is recommended, however, that road widening activities be monitored by a professional archaeologist to ensure that inadvertent discoveries do not change the recommendation of no adverse effect.

CA-INY-6932/7277

This multiple component site consists of a prehistoric lithic scatter and historic-period rock features, the latter associated with a LAA1 labor camp. The site is on a northeast-facing slope, on the western side of NHR. One feature consists of a large rectangular rock alignment, while other alignments appear to be tent pads. Historic artifacts include sanitary cans and aqua glass. Prehistoric items consist of four tools, including one biface fragment, two retouched flakes, and one projectile point fragment. Site disturbances include natural erosion and a transmission line access road that bisects the site.

NRHP Recommendation

In 2007, URS conducted Phase II evaluations of the prehistoric component as part of the Long Valley-Haiwee Transmission Line project (Nilsson et al. 2007). Testing revealed that the site was a sparse, near-surface, obsidian lithic scatter with little to no subsurface depth. Based on the paucity of artifacts and the lack of a subsurface deposit, the site (then only a prehistoric component) was recommended as not eligible for inclusion on the NRHP (Nilsson et al. 2007).

The historic-period component, which was identified after the URS site testing program, remains unevaluated. Based on its possible association as an LAA1 labor camp, this component may be eligible for the FLAAHAD as a contributing element under Criterion D of 36 CFR § 60.4 (Nilsson et al. 2006; Nilsson et al. 2007).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-6933/7278

This multiple component site consists of a large, prehistoric lithic scatter and a small, historic-period refuse deposit associated with the 1927 installation of the Long Valley-Haiwee transmission line. It occupies a gentle, rocky, northeast-facing slope on the western side of NHR. Prehistoric artifacts include at least 50 obsidian flakes, 1 CCS flake, 1 Type 2 obsidian biface fragment, 1 obsidian Rose Spring Corner-notched projectile point, 1 obsidian split-stem projectile point, and 1 ovate-shaped bifacial schist tool. The Rose Spring point infers site use during the Haiwee period (1350–650 B.P.), while the split-stem point suggests use during the earlier Newberry period (3150–1350 B.P.). The historic-period component occurs within a small refuse disposal area defined by domestic, personal, and activities-related debris. Site integrity is good, with impacts restricted to the Long Valley-Haiwee transmission line and its access road, which bisect the site.

NRHP Recommendation

In 2007, URS conducted Phase II evaluation of the prehistoric component as part of the Long Valley-Haiwee Transmission Line Project (Nilsson et al. 2007). Testing revealed no prehistoric artifacts in subsurface contexts. Based on the lack of a subsurface deposit, the site was recommended as not eligible for inclusion on the NRHP (Nilsson et al. 2007).

The historic-period artifact assemblage demonstrates little data potential, limited to study of few domestic, personal, and activities-related debris. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. The site's historic-period component lacks association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. As an isolated historic-period refuse deposit that lacks integrity, the historic-period component is recommended as not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-7279

This multiple component site consists of a prehistoric lithic scatter and a historic-period refuse scatter and rock ring on a high terrace above and west of NHR. The prehistoric component includes some 30 obsidian flakes, 1 obsidian Elko series corner-notched projectile point, 1 obsidian Type 4 biface midsection, and 1 possible quartz crystal flake. The historic-period component consists of a discrete artifact scatter of tin can fragments, miscellaneous metal, glass, and some ceramic items. Metal items included a segment of galvanized pipe and assorted tin can and other items. The site's sole cultural feature consisted of a modern or historic-period rock ring

possibly associated with tower construction. The resource is in fair condition and is bisected by two transmission line access roads.

NRHP Recommendation

The site's prehistoric component has the potential to contribute important information for the understanding of local and regional prehistory. The presence of obsidian flaked stone artifacts denotes the site's ability to contribute to issues relating to lithic procurement and reduction technologies; mechanisms of trade and exchange, through obsidian source studies; and to cultural chronology, through obsidian hydration analysis. Although not demonstrated on the surface, the site may contain subsurface archaeological materials, such as additional time sensitive and stylistic artifacts, to provide data regarding cultural chronology and site occupation and function. Based on its information potential and fair integrity, the prehistoric component may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4, but surface evidence alone is insufficient to make such a determination. Therefore, the prehistoric component is considered unevaluated for the NRHP.

The historic-period component lacks detectable layering or stratification, suggesting that it represents a near-surface roadside refuse scatter. Both the artifacts and the rock feature lack association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. The historic-period artifact assemblage demonstrates little data potential, limited to study of subsistence-related items and a few time-sensitive artifacts, namely tin food canisters. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the component's research potential. Consequently, the historic-period component does not meet NRHP eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-7615

This prehistoric site comprises a diffuse artifact scatter comprised of 1 piece of obsidian debitage, 27 Owens Valley Brownware sherds, 1 handstone, and 1 piece of modified steatite. Site disturbances include construction and maintenance of a dirt road that bisects the site, as well as drilling activities associated with geotechnical investigations conducted in 2012. The site represents a temporary use area occupied during the Marana period (650 B.P.–Historic).

NRHP Recommendation

In 2012, URS conducted subsurface testing at the site within four areas planned for geotechnical investigation. Testing revealed a sparse assemblage of Owens Valley Brownware pottery contained within a near-surface deposit. No cultural remains were found below a depth of 5 cmbs.

Given the absence of a subsurface cultural deposit, the site offers little information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. With the exception of the single obsidian flake, all surface artifacts were collected from this shallow site, further reinforcing its limited information potential. The site lacks the potential to contribute additional information important for the understanding of local and regional prehistory. Therefore, it is recommended as not eligible for NRHP listing under Criterion D of 36 CFR § 60.4.

Management Recommendation

CA-INY-7615 would be directly affected by Project activities. Based on the NRHP recommendation of non-eligible, no further measures are recommended for this site.

CA-INY-7616

This multiple component site consists of a prehistoric lithic scatter and scattered historic-period refuse. The prehistoric component includes at least 100 obsidian flakes. The historic-period component is a refuse deposit of domestic and personal-related debris, as well as automobile parts. The historic-period materials date from the early twentieth-century to recent times, with the beginning date derived from the presence of amethyst bottle glass.

NRHP Recommendation

AECOM conducted Phase II investigations at the site in November 2016 to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

CA-INY-7816

This historic-period site consists of remnants of old Highway 23 and its stage road precursor located within the western portion of the Project APE. The road served as the Eastern Sierra's principal north-south route from the mid-1860s (stage road) to the early 1930s, when it was superseded by, or incorporated into State Route 23 in 1931. Two segments of the feature that cross the Project Site coincide with a branch of "Walkers Trail, a 1840s era route traversed by mountain man Joseph R. Walker.

The updated site record prepared by AECOM identified at least 12 discontinuous segments of the historic-period road within the Project APE. These abandoned and active road segments appear to represent various manifestations of the historic travel route known by a number of names, including the Walker's Trail, Three Flags Trail, Indian's Big Trail, Bullion Road, Owens River Road, Los Angeles-Owens River/Valley Road, El Camino Sierra, and Legislative Route Number 23 (Chalfant 1933; Pracchia 1994; Shapiro et al. 2008; Warren and Roske 1981).

NRHP Recommendation

The historic context statement developed for CA-INY-7816, presented above in Chapter 4, supports the view that this transportation route played a pivotal role in the historic development and settlement of Inyo County and adjacent regions. The road served as the Eastern Sierra's principal north-south route from the mid-1860s (stage road) to the early 1930s, when it was superseded by, or incorporated into – State Route 23, which was constructed through this area between 1929 and 1931 (Shapiro et al. 2008). Before the 1860s, this linear feature also served as a trail that brought the earliest European American explorers to Owens Valley.

The site demonstrates local significance under Criterion A (Event) for its contribution to the development and growth of Inyo County via a series of road developments that provided economic, social, and political developments to the region. Although several individuals of local and state prominence facilitated the on-going development of the road system, the site is not illustrative of their life and therefore not directly linked to their importance in history (Criterion B). The road system does not demonstrate a particular engineering technique or constitute a method of construction that shaped its historic identity and that of the larger Inyo County or eastern

California region (Criterion C). Finally, the site lacks the ability to yield information important in history (Criterion D). Based on these factors, the site is recommended eligible for the NRHP under Criterion A for its association with events that have made significant contributions to the broad pattern of our history.

Management Recommendation

As currently designed, Project activities will largely occur outside the 12 road segments that comprise the recorded area of Site CA-INY-7816. Two segments, Segment K and Segment L, form part of the existing Cactus Flats Road, a well-maintained, graded dirt road that crosses the Project Site. Segment K is the route of Cactus Flats Road north of NHD. This route appears to correspond to the early stage route from Haiwee to Olancha depicted on the USGS 1913 Ballarat and 1908 Olancha topographic maps. At present, this consists of a wide, bladed, gravel and sand road that is extensively used as a modern-day travel and haul route. This road segment retains no historic integrity. Segment L is a two-track dirt road that extends south from the modern Cactus Flats Road to the west end of NHD. This two-track access road passes through a wire gate. Presently, it is used as a main access road to the existing Dam from Cactus Flats Road. This road also generally follows the stage road depicted on the USGS 1913 Ballarat topographic map. This road segment also lacks historic integrity. Although Cactus Flats Road will be realigned as part of the Project, activities associated with road realignment will not include the Segment K and Segment L areas, both of which will remain intact in their current location. No treatment measures are recommended for these two road segments, as both features lack integrity, particularly aspects of design, workmanship, feeling, and materials.

CA-INY-9343

This prehistoric site is a diffuse, low-density lithic scatter on a sandy terrace. Surface artifacts consist of 12 obsidian flakes, 1 weathered Type 3 obsidian biface fragment, and 1 obsidian stemmed projectile point that likely dates to the Newberry period (3150–1350 B.P.). Reconnaissance conducted in the area between CA-INY-9343 and neighboring site CA-INY-6574/H indicates that a low-density lithic scatter links these two properties, with only 10 m separating the two sites. Therefore, CA-INY-9343 may be considered an extension of Locus E at CA-INY-6574/H instead of a separate site. Effects to CA-INY-9343 include a two-track road that crosses the southeastern end of the site.

AECOM conducted Phase II investigations at the site in November 2015 (Nilsson and Bevill 2016b). The recovered assemblage documented the presence of a low-density, surface artifact deposit composed entirely of flaked stone artifacts; no subsurface cultural remains were found. Obsidian hydration dating inferred site use during the Little Lake period, while the stemmed series point suggested association with the Little Lake or Newberry period. Given that the artifact assemblage reflects both low density and low diversity, the site likely served as a temporary use area where limited lithic reduction tasks occurred.

NRHP Recommendation

The Phase II study demonstrated that the site had little ability to contribute information necessary to address prehistoric research domains and questions for the Owens Valley area identified in the Project Research Design. The subsurface deposit contained no artifacts and no discrete features, precluding the identification of site components. Given its limited data potential, the site lacked the ability to yield information important to prehistory (Criterion D of 36 CFR 60). Based on these findings, the site was recommended as not eligible for listing in the NRHP or CRHR.

Management Recommendation

As currently designed, the site is within the Project's construction area and has the potential to be directly affected by Project activities. Because the site was recommended as a non-eligible property, no additional measures are required before Project construction proceeds.

CA-INY-9345

This prehistoric site is a small, diffuse, lithic scatter on a terrace northeast of the existing Dam. Artifacts include two obsidian EMPs, one obsidian late core reduction flake, two obsidian early biface thinning flakes, two obsidian late biface thinning flakes, and one basalt early core reduction flake. The site is in good condition, although a north/south trending road bisects it.

AECOM conducted Phase II testing of the site in November 2015 (Nilsson and Bevill 2016b). Investigations produced 10 obsidian artifacts, comprised of 9 obsidian flakes and the EMP. With the exception of two flakes, all artifacts were recovered from surface contexts. The recovered assemblage documented the presence of a low-density, near-surface artifact deposit composed entirely of flaked stone artifacts. The sparse debitage assemblage indicates site activities included percussion-based reduction of WSL obsidian. Unlike the other Phase II sites situated on a similar landform (i.e., CA-INY-6587, CA-INY-9343), the CA-INY-9345 artifact assemblage returned viable obsidian hydration readings that placed site occupation exclusively within Newberry period (both early and late Newberry). The site likely served as a temporary use area where limited lithic reduction tasks occurred.

NRHP Recommendation

Based on the results of the Phase II testing, the site demonstrated its ability to contribute information necessary to address topics of significance identified within the Project Research Design. Of note in this regard is the site's contribution within the cultural chronology research domain, which reflected the presence of a rare, single component Newberry period site tied to a single obsidian source (WSL). Further work at the site, focused on broad-scale, near-surface investigations, has the potential to provide a more robust artifact assemblage necessary to address chronological issues for early and late Newberry period components that would benefit from further investigation. The site provided little corresponding data within the realm of subsistence orientations and settlement patterns.

Given its data potential within the domain of cultural chronology, this single component, Newberry period site has demonstrated the ability to provide information important to prehistory and, therefore, was recommended eligible for listing in the NRHP under Criterion D of 36 CFR 60.4. Site integrity was demonstrated by an intact surface and subsurface deposit that has witnessed few effects, with impacts related only to construction of a dirt road that bisects the site.

Management Recommendation

CA-INY-9345 is within a proposed access road corridor and has the potential to be affected by road construction activities and associated laydown areas. Flag and avoidance procedures are currently planned for this site to eliminate adverse effects. Thus, no treatment measures are recommended for the site.

CA-INY-9347

This prehistoric site is an obsidian lithic scatter on a high bench northwest of the existing Dam. The artifact assemblage is composed of 21 obsidian flakes, 2 obsidian biface fragments that retrofit, and 1 obsidian EMP. The site is in good condition with minimal disturbance attributed to natural erosion.

Limited subsurface investigations were conducted at the site by URS in 2012 within one area planned for geotechnical investigation, but only one flake was found. Based on the results of limited testing, the examined area offered little information potential to address local and regional research questions in the absence of greater artifact density, assemblage diversity, and cultural features. While clearance was given to conduct geotechnical investigation at the drill hole location, it was also noted that the limited testing did not constitute formal evaluation of the site's NRHP eligibility, but rather an assessment of the depth and nature of the cultural deposit within the proposed geotechnical investigation areas (Nilsson 2012).

AECOM conducted Phase II testing of the site in November 2015 (Nilsson and Bevill 2016b). The investigations identified 21 obsidian flakes, 2 obsidian biface fragments that retrofit, 1 obsidian burin, and 1 obsidian EMP. While flakes were recovered from both surface and subsurface contexts, all three flaked stone tools were collected from the site surface. Debitage analysis indicated that the flakes were produced through both core-- and biface-reduction technologies. An interesting aspect of the flake technology was evidence for use of hard hammer percussion, which resulted in specific flake characteristics not noted elsewhere among the Project's other Phase II sites. Overall, site investigations document the presence of a low-density subsurface artifact deposit that extends to a maximum depth of 60 cmbs. Most flakes, however, occurred within the upper 40 cm of the deposit. Obsidian source data, both XRF and visual, indicate exclusive use of WSL obsidian. Although sandblasting has affected the obsidian artifact assemblage, about two-thirds of the items submitted for hydration analysis returned micron readings useful for chronological reconstructions. The obsidian hydration profile infers site use predominately during the Newberry period, with a few artifacts associated with the Little Lake period. The site likely served as a temporary use area where limited lithic reduction tasks occurred.

NRHP Recommendation

Based on the results of the Phase II testing, the site demonstrated its ability to contribute information necessary to address topics of significance identified within the Project Research Design. Of note in this regard was the site's contribution within the cultural chronology research domain. While the subsurface deposit contained few artifacts and no discrete features, obsidian hydration results indicate the presence of a strong, late Newberry period component site, along with minor evidence for Little Lake period associations, both of these tied to the use of a single obsidian source (WSL). This near single component aspect to the site elevates its potential to address research questions and data gaps associated specifically with Newberry period occupations, as outlined in the Project Research Design. The hint of a Little Lake component signals the site's potential to address research questions regarding this period for which robust data are lacking from sites in the southern Owens Valley. In addition, the site provides an opportunity to refine the obsidian hydration conversion formula for WSL toolstone, particularly as it relates to the late Newberry period and possibly the Little Lake period. Further work at the site has the ability to provide a more robust artifact assemblage needed to address chronological issues identified for early Newberry period and Little Lake components that would benefit from further investigation. In contrast, the deposit provided little corresponding data within the realm of subsistence orientations and settlement patterns.

Given its data potential within the domain of cultural chronology, the site demonstrated the ability to provide information important to prehistory and was recommended eligible for listing in the NRHP under Criterion D of 36 CFR 60.4. Site integrity was also demonstrated by an intact surface and subsurface deposit that has witnessed few effects other than natural erosion.

Management Recommendation

As currently designed, the site is within the Project's construction area and has the potential to be affected by Project-related activities. If such activities cannot be redesigned to avoid this NRHP-eligible site, then Phase III data recovery investigations are recommended to reduce adverse effects and mitigate the loss of significant archaeological deposits before Project construction proceeds.

NHD and Historic Borrow Site No. 1

This resource consists of NHD, a 100-year old feature that impounds the waters of NHR, one of four basins created between 1907 and 1913 to store the waters of the LAA1. It also includes historic Borrow Site No. 1, located just northwest of the dam.

NRHP Recommendation

NHD is an engineering feature associated with the LAA1 system, which has been designated as a National Historic Civil Engineering Landmark and a NRHP-eligible site. The historic record and context statement developed above in

Chapter 2 support the view that the LAA1 an NHD represent a significant part of the history and engineering of water and hydroelectric power development, production, and conveyance in the early twentieth-century in southern California and the west.

Given its association with the LAA1, the existing Dam demonstrates local and national significance under Criterion A (Event) for its contribution to the development and growth of Los Angeles, the second largest city in the United States, behind New York. The LAA1 and NHD also demonstrate local and national significance under Criterion C (Design/Construction) for the engineering feat that involved hundreds of miles of system-related features. Such features included tunnels, reservoirs, dams (including NHD), canals, conduits, and pipes, not to mention the constructed infrastructure to support construction activities, including roads, transmission lines, railway, telephone lines, and camps for the approximate 4,000 individuals needed at the peak of construction. The system embodies a distinctive characteristic of a type, period, and method of construction.

NHD remains as the original unaltered structure built by the City of Los Angeles 100 years ago. In 1951, a 4-in. thick concrete overlay was placed on the upstream slope of the existing Dam to help stabilize deterioration of the original facing. In 1972, surface ponding of water that seeped from Haiwee Reservoirs during high water periods necessitated the placement of fill material (blanket fill area), with a maximum thickness of 7 ft. at the northeast corner of the existing Dam (Davis and Roux 2001). Other than these two stabilizing efforts, NHD retains its original aspects of historic integrity, including location, design, setting, materials, workmanship, feeling, and association. The existing Dam's setting has not been altered and the structure exists in its original location. Although some stabilization efforts have occurred, these have not affected the design, form, plan, or space of the structure. With the exception of the minor stabilization efforts, the physical elements of the existing Dam's construction materials are intact, and are largely those laid down over 100 years ago. NHD has also retained integrity of workmanship, providing information regarding the technology of the dam-building craft and illustrating the aesthetic principles of its historic period. The existing Dam's physical characteristics maintain its feeling through its continued use as an integral part of the LAA1 system. Finally, NHD's direct link with the LAA1 system and its construction history and modern-day use convey its integrity of association.

Based on these factors, NHD is recommended eligible to the NRHP under Criterion A for its association with events that have made significant contributions to the broad pattern of our history, and under Criterion C for its engineering and construction features that represent distinctive characteristics of a type, period, or method of construction.

Management Recommendation

Although construction of the proposed NHD2 would not require removal of the historic NHD, aspects of the latter's integrity will be affected by the Project, including its setting, feeling, and association. The Project would involve the notching of the NHD that would affect approximately 10% of the total width of the dam. The Project would also install impermeable membrane over that portion of the north face of NHD that would only be installed within the confines of a storage basin that would border the north side of the NHD. The modifications to the structural materials and design of the dam would diminish the integrity of the resource's significant historic features by (1) creating a concrete-lined notch that would impact approximately 10% of the dam's overall width and would diminish the dam's concrete slope on the south side by removal of existing concrete panels; (2) changing the dam's relatively uniform elevation and profile at the notching location; (3) removing a section of the dam's earthen construction; and (4) partially covering the dam's north slope with an impermeable membrane material within the confines of the basin that would alter the dam's soil-covered appearance.

These modifications would directly affect the integrity of NHD, including the resource's historic materials (removal of material within the notch, installation of membrane), and design (notch, concrete lining). These effects would be considered adverse pursuant to 36 CFR § 800.5(b) and result in a substantial adverse change pursuant to California PRC Section 21084.1, the threshold for which includes "demolition, destruction, relocation, or alteration activities that would impair the significance of the historic resource." These alterations to the physical

characteristics that make the dam eligible for the NRHP and CRHR under Criteria A/1 and C/3 would constitute a substantial adverse change that would impair the significance of the historical resource.

Due to the historical significance of the existing Dam and its association with the LAA1 system, a HAER Level II recordation level is recommended to record the pre-Project setting. Materials to be added to the HAER documentation should include scanned original construction drawings to vellum, large format photography of historic photographs of the existing Dam, existing condition large format photographs, and additional construction details, as well as written information that includes a history and description of the facility.

Implementation of the HAER recordation would not reduce the level of impact to NHD to a less-than-significant level under CEQA. CEQA Guidelines Section 15126.4(b)(2) states that, "In some circumstances, documentation of a historical resource, by way of historic narrative, photographs, or architectural drawings as mitigation for the effects of demolition of the resources will not mitigate the effects to a point where clearly no significant effect on the environment would occur." The proposed measures would reduce, but not fully avoid, the impact of the Proposed Project to a less than significant level, because the existing Dam would remain materially impaired after implementation of the historical documentation and public interpretation has been completed. Therefore, the Project impact would have a significant and unavoidable impact under CEQA.

Site DD-01

This prehistoric site consists of a light density obsidian lithic scatter dispersed across a broad, flat, northeast-facing alluvial fan located on the west side of NHR. The site is undisturbed and in good condition. The cultural assemblage includes at least 33 obsidian flakes and 2 obsidian biface fragments.

NRHP Recommendation

The site's artifact assemblage has the potential to contribute important information for the understanding of local and regional prehistory. The presence of obsidian flaked stone artifacts denotes the site's ability to contribute to issues relating to lithic procurement and reduction technologies; mechanisms of trade and exchange, through obsidian source studies; and to cultural chronology, through obsidian hydration analysis. The site may contain subsurface archaeological materials, such as time sensitive and stylistic artifacts, to provide data regarding cultural chronology and site occupation and function. Based on its information potential and fair integrity, the site may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4, but surface evidence alone is insufficient to make such a determination. Therefore, the site is considered an unevaluated property.

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site DD-02

This large, multiple component site consists of a sparse prehistoric lithic scatter and multiple historic-period loci that date from the 1910s to the 1950s. The prehistoric lithic scatter comprises a small area of at least 10 obsidian flakes. Thirteen loci encompass the historic-period component. One locus includes an extensive, concentrated dump with thousands of items, while the other 12 loci comprise smaller artifact concentrations. Surface disturbances include a network of two-track roads that crisscross the resource, natural erosion, and evidence of unauthorized artifact collection in the form of small, excavated pits and redistributed artifacts.

NRHP Recommendation

The site's prehistoric assemblage has the potential to contribute important information for the understanding of local and regional prehistory. The presence of obsidian flaked stone artifacts denotes the site's ability to contribute

to issues relating to lithic procurement and reduction technologies; mechanisms of trade and exchange, through obsidian source studies; and to cultural chronology, through obsidian hydration analysis. Although not demonstrated on the surface, the site may contain subsurface archaeological materials, such as time sensitive and stylistic artifacts, to provide data regarding cultural chronology and site occupation and function. Although the site is unevaluated, based on its information potential and fair integrity, the prehistoric component may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4, but surface evidence alone is insufficient to make such a determination. Therefore, the prehistoric component is considered an unevaluated resource.

The historic-period component demonstrates little data potential beyond what has been detailed in the archaeological site record form, thereby recovering much of the site's research potential. With the exception of Locus 3, which dates to the LAA1 construction period, the site's historic-period loci lack association with nearby eligible properties for which historic contexts are or can be established. The non-LAA1 deposits represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, they cannot contribute to property significance. Based on these considerations, the non-LAA1 period loci are recommended not eligible to the NRHP, as they do not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

The LAA1 period locus consists of a small, near-surface deposit whose data values have been collected through site recordation. Although associated with the LAA1 construction period, this deposit does not meet eligibility criteria as a contributing element to the FLAAHAD (Nilsson et al. 2006) under Criterion D, where artifact concentrations with little diversity or limited quantities are considered non-contributing elements to the district. Based on its lack of information potential, Locus 3 is also recommended as not eligible to the NRHP.

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site DD-03

This multiple component site consists of a prehistoric biface fragment and a small, historic-period refuse scatter within an ephemeral drainage. The site is in good condition, with effects related only to natural erosion and artifact decomposition.

NRHP Recommendation

The site's prehistoric component is limited to a single obsidian tool. Represented by this isolated artifact, the prehistoric component is recommended as not eligible to the NRHP due to its lack of data potential.

The historic-period component demonstrates little data potential beyond what has been detailed in the archaeological site record form, thereby recovering much of the site's research potential. The site's historic-period component lacks association with nearby eligible properties for which historic contexts are or can be established. These historic component represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. Based on these considerations, historic-period component is recommended not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site DD-04

This multiple component site consists of a sparse prehistoric lithic scatter and a few pieces of historic-period refuse dispersed across a broad, flat, northeast-facing alluvial fan. The site lies between two maintained dirt roads that have not directly affected the site, but a smaller two-track road bisects the resource. The prehistoric component contains 23 obsidian flakes and 1 Type 3 biface end fragment. The historic-period era component includes one metal can, unidentifiable metal fragments, and one amethyst colored glass jar lid.

NRHP Recommendation

The site's prehistoric assemblage has the potential to contribute important information for the understanding of local and regional prehistory. The presence of obsidian flaked stone artifacts denotes the site's ability to contribute to issues relating to lithic procurement and reduction technologies; mechanisms of trade and exchange, through obsidian source studies; and to cultural chronology, through obsidian hydration analysis. The site may contain subsurface archaeological materials, such as time sensitive and stylistic artifacts, to provide data regarding cultural chronology and site occupation and function. Based on its information potential and fair integrity, the prehistoric component may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4, but surface evidence alone is insufficient to make such a determination. Therefore, the prehistoric component is considered an unevaluated property.

The historic-period artifact assemblage demonstrates little data potential, limited to study of few domestic, personal, and activities-related debris. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. The site's historic-period component lacks association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. As an isolated historic-period refuse deposit that lacks integrity, the historic-period component is recommended as not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site JA-01

This prehistoric site consists of a moderate-density lithic scatter dispersed across a broad, flat, northeast-facing alluvial fan. The site is in good condition, with minor effects related to natural erosion. The cultural assemblage contains only lithic debitage, comprised of 101 obsidian flakes. Subsurface depth is suspected based on artifact density and soil development.

NRHP Recommendation

The site's artifact assemblage has the potential to contribute important information for the understanding of local and regional prehistory. The presence of obsidian flaked stone artifacts denotes the site's ability to contribute to issues relating to lithic procurement and reduction technologies; mechanisms of trade and exchange, through obsidian source studies; and to cultural chronology, through obsidian hydration analysis. The site may contain subsurface archaeological materials, such as time sensitive and stylistic artifacts, to provide data regarding cultural chronology and site occupation and function. Based on its information potential and fair integrity, the site may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4, but surface evidence alone is insufficient to make such a determination. Therefore, the site is considered an unevaluated property.

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site JA-02

This multiple component site consists of a single prehistoric obsidian flake and a historic-period artifact scatter with butchered cow bone and three features dispersed across a broad terrace. A two-track road borders the western edge of the site and a turnout occurs within the site boundary. The site is in poor condition, with effects related to natural exposure.

NRHP Recommendation

The site's prehistoric component is limited to a single obsidian flake. Represented by this isolated artifact, the prehistoric component is recommended as not eligible to the NRHP due to its lack of data potential.

The site's historic-period refuse scatter lacks detectable layering or stratification, suggesting that it is a near-surface roadside refuse scatter. The historic-period component lacks association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. As an isolated refuse deposit that lacks integrity and association, the historic-period component is recommended as not eligible to the NRHP, as it does not meet eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended.

Site JM-01/RB-01

This historic-period site consists of two refuse concentrations (Locus 1 and Locus 2) located on a broad, open terrace. Artifacts include domestic, personal, activities, and indefinite use items. Temporally sensitive artifacts suggest the site dates to after the 1950s.

NRHP Recommendation

The site's historic-period refuse deposit lacks detectable layering or stratification, suggesting that it is a near-surface roadside refuse scatter. Both refuse concentrations lack association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. The deposits represent variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, they cannot contribute to property significance. The assemblages demonstrate little data potential, limited to study of subsistence-related items and a few time-sensitive artifacts, namely tin food canisters. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. Consequently, the site does not meet NRHP eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site MK-01

This historic-period site consists of a sparse, 1930s to 1940s era refuse scatter located on a broad, northeast-trending alluvial fan. The cultural assemblage comprises a range of domestic, activities, and indefinite use items, including tin cans, corrugated metal, stovepipe, window screen fragments, and sheet metal fragments. Also present are modern aluminum beverage cans (post-1970s), representing roadside debris. The site is in fair condition, with effects related to natural erosion and artifact deterioration.

NRHP Recommendation

The site's refuse deposit lacks detectable layering or stratification, suggesting that it is a near-surface roadside refuse scatter. The noted assemblage lacks association with nearby eligible properties (such as the LAA1) for which historic contexts are or can be established. Since the cultural deposit represents variable and idiosyncratic behavior by unknown persons or groups, and without a historic context, it cannot contribute to property significance. The site demonstrates little data potential, limited to study of domestic-related items and a few time-sensitive artifacts, namely tin food canisters. Data contributions from these sources have been detailed in the archaeological site record form, thereby recovering much of the site's research potential. Consequently, the site does not meet NRHP eligibility criteria by being associated with specific events important in history (Criterion A), association with persons important in history (Criterion B), design/construction (Criterion C), or ability to yield information important in history (Criterion D).

Management Recommendation

As currently designed, the widening of an access road would directly affect the site. Given the recommendation of non-eligibility, no further measures are recommended for the site.

Site RB-03

This prehistoric site consists of a sparse obsidian lithic scatter on a gently sloping hillside bench. The resource is in good condition, with minor effects related to wind-blown sand. The cultural assemblage consists entirely of obsidian debitage, comprised of 11 flakes.

NRHP Recommendation

AECOM conducted Phase II investigations at the site in January 2017 to assess its NHRP eligibility. Currently in progress are the analysis and reporting for the Phase II study, as well as the assessment of the site's NRHP eligibility.

Management Recommendation

The site is within a proposed access corridor and has the potential to be affected by road construction activities and associated laydown areas. If the site is determined NRHP-eligible, then additional treatment measures may be required before Project construction proceeds.

Site RB-04

This prehistoric site consists of a sparse obsidian lithic scatter within a shallow wash on the west edge of a broad, flat valley. The site is in fair condition. A barbed wire fence marking the LADWP/private property boundary crosses

the northern end of the site, and evidence of cattle grazing occurs across the site. The cultural assemblage includes at least 36 obsidian flakes that were likely dispersed across the site area by floodwaters and levee construction.

NRHP Recommendation

The site's artifact assemblage has the potential to contribute important information for the understanding of local and regional prehistory. The presence of obsidian flaked stone artifacts denotes the site's ability to contribute to issues relating to lithic procurement and reduction technologies; mechanisms of trade and exchange, through obsidian source studies; and to cultural chronology, through obsidian hydration analysis. The site may contain subsurface archaeological materials, such as time sensitive and stylistic artifacts, to provide data regarding cultural chronology and site occupation and function. Based on its information potential and fair integrity, the site may be eligible for listing on the NRHP under Criterion D of 36 CFR § 60.4, but surface evidence alone is insufficient to make such a determination. Therefore, the site is considered an unevaluated property.

Management Recommendation

As currently designed, Project activities will occur outside the site boundary. Therefore, no additional measures are recommended for the site.

Site RB-05

This built environment resource consists of a LADWP caretaker's residence located on North Haiwee Road. The property includes a 1930s one story, three bay house; a 1980s three car garage; a modern corral; and a rock lined garden.

NRHP Recommendation

The house has been modified over time; most notably, the house's doors and windows appear to have all been replaced thus diminishing its integrity of materials, design, and workmanship. The house appears to retain its integrity of association, location, association, and feeling. The dwelling exhibits a short eave and smaller windows a central block that features a gable roof that is surrounded by a hipped skirt. This detailing is indicative of the Minimal Traditional style but also reflects English cottage inspirations through its central corbelled chimney, irregularly placed fenestration, and complex roofing. The house was likely constructed well after the finalization of construction of NHD in 1913. It has served as the Caretaker's residence since its initial construction that likely occurred in the 1930s. It is unclear whether the additions to the rear of the house occurred later in time. The LADWP constructed residential units elsewhere along the LAA corridor and a few still survive (including this example). Due to the minimal architectural detailing and diminished integrity from the window replacements, the house does not appear to retain sufficient historical integrity to convey its significance. While associated with the NRHP-eligible LAA (also a National Historic Civil Engineering Landmark), it does not appear to have been built at the same time of the NHR and LAA, and so only served in a facility management capacity (as opposed to being associated with the LAA's original construction). It therefore does not retain significant associations with broad patterns or events (Criterion A), is not associated with a significant person or group of people (Criterion B) and is not of a particular type, period, or method of construction that is significant to residential architecture (Criterion C).

Management Recommendation

As currently designed, Project activities will not affect the resource. Therefore, no additional measures are recommended.

GENERAL PROJECT RECOMMENDATIONS

The Project's cultural resources investigations have focused principally on identification, recordation, and limited testing of effects to recorded archaeological sites identified with the APE. If the Project requires further geotechnical and/or geophysical investigations, then it is recommended that archaeological inventory and monitoring of new activities be conducted to comply with the Project's MMRP. If the Project moves forward to construction, then additional cultural resources studies will be required to meet CEQA and/or NEPA guidelines.

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VOLUME II – APPENDICES

APPENDIX A – STATE OF CALIFORNIA ARCHAEOLOGICAL SITE RECORD FORMS
APPENDIX B – STATE OF CALIFORNIA PRIMARY RECORDS FOR ISOLATE FINDS
APPENDIX C – ARCHAEOLOGICAL SITES AND BUILT ENVIRONMENT RESOURCES LOCATION MAP
APPENDIX D – ISOLATED FINDS LOCATION MAP
APPENDIX E – PROJECT COMPONENT MAP DEPICTING ARCHAEOLOGICAL SITES AND BUILT ENVIRONMENT RESOURCES

Due to sensitivity regarding specifics and locations of cultural resources sites, this report is confidential, and may be obtained by qualified personnel upon request from LADWP.

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Appendix F2

Potential Fossil Yield Classification Report

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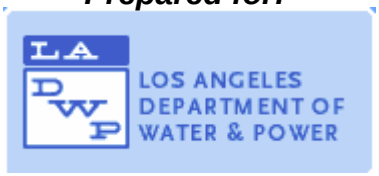
POTENTIAL FOSSIL YIELD CLASSIFICATION ANALYSIS OF THE GEOLOGIC UNITS MAPPED WITHIN THE NORTH HAIWEE DAM NO. 2 PROJECT INYO COUNTY, CALIFORNIA

Prepared for:



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1 INTRODUCTION

Geologic mapping of the Owens Lake and Haiwee Reservoirs area is spotty. Complete coverage at the 1:24,000 scale and the 1:62,500 scale is not available. This analysis is based on the 1:62,500 geologic mapping of three 15' quadrangles: the Keeler quadrangle (Stinson, 1977b), the Haiwee Reservoir quadrangle (Stinson, 1977a), and the Olancha quadrangle (DuBray and Moore, 1985). These were supplemented by the 1:250,000 geologic mapping of Matthews and Burnett (1965) and Streitz and Stinson (1974). This information is further enhanced with an investigation of pertinent geologic and paleontological literature relevant to the North Haiwee Dam No. 2 Project.

Two paleontological records searches were requested: one from the Natural History Museum of Los Angeles County (LACM) and one from the University of Michigan Museum of Paleontology. Neither cites specific geologic mapping.

2 PROJECT DESCRIPTION

The Los Angeles Department of Water and Power (LADWP), proposes to improve the seismic reliability of the North Haiwee Reservoir (NHR) located in the Owens Valley, California, approximately 150 miles north of Los Angeles. LADWP has prepared this draft joint Environmental Impact Report/Environmental Assessment (EIR/EA) in cooperation with the Bureau of Land Management (BLM). The purpose of the North Haiwee Dam No. 2 Project (Proposed Project) is to construct North Haiwee Dam No. 2 (NHD2 or new Dam) to the north of North Haiwee Dam (NHD or existing Dam), which impounds NHR. Seismic studies have found that NHD would have potential to fail during a Maximum Credible Earthquake event, the largest possible earthquake which could happen. NHD2 would serve to improve the seismic reliability of NHR in the event that the existing Dam is damaged or breached by an earthquake event, thereby ensuring public health and safety and securing the City of Los Angeles' water source. The Proposed Project would provide sufficient seismic reliability for NHR, maintain the function of an essential water conveyance infrastructure component for the City of Los Angeles, and protect local populations from a hazardous flooding event. The Proposed Project would also create a basin between NHD2 and NHD, allowing LADWP to divert water from the LAA, through the basin, and through a notch in NHD into NHR.

This technical report includes the evaluation of the No Project Alternative as well as two Build Alternatives: the Cement Deep Soil Mixing (CDSM) Alternative and the Excavate and Recompact Alternative. The Proposed Project consists of the following components, which are common to both Build Alternatives:

- Construction of the NHD2 components: NHD2, the east and west berms, and grading of the basin area between NHD and NHD2;
- Realignment of Cactus Flats Road;
- Realignment of the Los Angeles Aqueduct (LAA) and construction of the diversion structure and temporary bridge;
- Construction of the diversion channel and NHD modifications;
- Excavation of materials from Borrow Site 10[1]; and
- Purchase and hauling of materials from Borrow Site 15.

[1] Borrow Site 10 refers to the LAA Excavation Area and Borrow Site 15 refers to the existing mine in Keeler in the Draft EIR/EA.

The differentiating component between the two Build Alternatives is the method of construction of the foundation of NHD2, which affects the timeline and construction efforts of the NHD2 components and use of Borrow Sites 10 and 15. Construction of the remaining Proposed Project components is the same between the two Build Alternatives, except for the timeline of the diversion channel and NHD modifications.

Refer to Chapter 1.0, Introduction and Chapter 2.0, Project Description and Alternatives of the Draft EIR/EA for the full description of the Proposed Project, including purpose and need, objectives, regulatory requirements, alternatives, construction, and operations. Borrow Site 10 refers to the LAA Excavation Area and Borrow Site 15 refers to the existing mine in Keeler in the Draft EIR/EA

3 METHODOLOGY

This review is based upon a records search, a literature search, and geologic mapping. No fieldwork was done to verify the geologic mapping or to locate vertebrate fossils. Only mapped geologic units are considered. California Pleistocene desert fossil soils (paleosols) frequently contain vertebrate fossils, mantle the pre-existing topography, and do not appear on geologic maps (Stewart et *al*., 2012; Stewart and Hakel, 2016). Therefore, the presence of Pleistocene paleosols and fossils preserved in them can only be detected by field surveys.

As described in Section 2, Project Description above, the Proposed Project is located in the Owens Valley. The Project vicinity is shown in Figure 1. The NHD2 components (the new Dam, berms, and basin grading), Cactus Flats Road Realignment, LAA Realignment components (including the diversion structure and bridge), diversion channel and NHD modifications, and Borrow Site 10 (including its haul route) are considered in this analysis. Borrow Site 15 is not considered in this analysis as it is an existing mine from which materials would be purchased, and its haul route would not require the construction of any new roads or expansion of any existing roads. The NHD2 components, Cactus Flats Road Realignment, and LAA Realignment components, and diversion channel and NHD modifications are depicted in Figure 2. Borrow Site 10 and its haul route are shown in Figure 3. The geologic mapping of the Proposed Project components is also shown on these figures. Figure 4 explains the geologic units used in mapping.

4 GEOLOGIC UNITS

The Proposed Project was overlaid on geologic unit maps in order to determine which geologic units occur within one mile of the Proposed Project, including its haul routes. The geologic units in the Project vicinity are:

Qf – Fan deposits (Holocene)

The mapping of Stinson (1977a and 1977b) describes this unit as slightly dissected, poorly sorted accumulations of boulders, cobbles, and gravel in sandy and silty matrix; upper five to ten feet locally cemented by caliche; material derived from Sierra Nevada or Haiwee Ridge; grades downslope into alluvium.

If the age assignment of this unit is correct, the potential of this unit to produce significant paleontological resources would be restricted to horizons of 5,000 years or older. However, the mention of caliche cementation raises the possibility of some antiquity of cemented portions. Because of their recent age, the surficial playa deposits should be rated **Class 2 – low**. Deeper deposits, cemented portions and horizons below cemented portions should be rated **Class 3a – moderate.**

Qal – Alluvium (Holocene)

The mapping of Stinson (1977a and 1977b) describes this unit as poorly consolidated silt and sand on valley floors; unsorted cobbles, pebbles, and coarse sand on slopes surrounding valley floors; thin windblown sand and silt accumulations on west slope of Haiwee Ridge.

The LACM has localities producing vertebrate fossils in Quaternary alluvium near Olancha and Swansea. The specimens from those localities are considered to be of late Pleistocene and Holocene age (McLeod, 2016). A Columbian mammoth collected in Qal sediments has to be of Pleistocene age. Stinson (1977a, 1977b) assigns a Holocene age to these sediments. Given that the LACM has specimens in hand that they believe to be of Pleistocene age, it must be concluded that this unit produces significant paleontological resources. These deposits should be rated **Class 4 – high.**

Qoa – Older alluvium (Pleistocene)

The mapping of Stinson (1977a) does not show either the existing Dam or the new Dam as impacting Older alluvium, but more detailed mapping by Black and Veatch Corporation does (LADWP, 2015). Likewise, the mapping of Stinson does not show the rerouted Cactus Flats Road as crossing Older alluvium, but the mapping by Black and Veatch Corporation does. The age assignment in the mapping of Stinson (1977a) is early Pleistocene. Because of fossils known from this unit in other areas, it should be rated **Class 4 – high.**

Tcp – Coso Formation sedimentary rocks (Pliocene)

Stinson (1977a) describes this unit as undifferentiated sedimentary rocks; including fanglomerate consisting of massive indurated arkosic sandstone and conglomerate and limy sandstone, often ferruginous (**Tclss**). McLeod (2016) indicates that the LACM has extensive collections from the Coso Formation, although all of them are on the northern flank of the Coso Mountains east to east-northeast of Dirty Socks Springs and southeast of Highway 190. These include fossil fish, birds, and mammals. Borrow Site 24 is situated in this sedimentary unit. Because of these records, sediments of the Coso Formation should be rated **Class 4 – high.**

Tclss – Coso Formation limy sandstone (Pliocene)

Stinson (1977a) describes this unit as a limy sandstone facies of the Coso Formation. It is a subset of the Coso Formation sediments discussed above. AECOM archaeologists have witnessed fish fossils near Borrow Site 24[2] (Elena Nilsson, pers. com., 2015). The locality lies within sediments mapped as **Tclss**. Therefore, this facies must be rated at least **Class 4 – high.**

Table 1 summarizes the geologic units which occur within each Proposed Project component. Sensitivity ratings for each of the geologic units are also provided.

Table 1
Geologic Unit Sensitivity for Proposed Project Footprint[a]

Proposed Project Components	Unit Abbreviation	Unit Description	Potential Fossil Yield Classification
NHD2, Berms, and Basin Grading	Qal	Quaternary alluvium	4 (high)
Diversion Channel and NHD Modifications	Qal	Quaternary alluvium	4 (high)

[2] Borrow Site 24 was a borrow site previously under consideration but now withdrawn from consideration due to insufficient material quality for construction of NHD2. This location was surveyed for archaeological resources in 2014, and is located just west of South Haiwee Reservoir, approximately 3.3 miles south of the Project Site.

Table 1
Geologic Unit Sensitivity for Proposed Project Footprint[a]

Proposed Project Components	Unit Abbreviation	Unit Description	Potential Fossil Yield Classification
Cactus Flats Road Realignment	Qal	Quaternary alluvium	4 (high)
	Qoa	Quaternary older alluvium	4 (high)
LAA Realignment and Diversion Structure[b]	Qal	Quaternary alluvium	4 (high)
Construction Staging and Stockpile Area	Qal	Quaternary alluvium	4 (high)
Borrow Site 10[c]	Qal	Quaternary alluvium	4 (high)

Note: [a] Geologic units shown are those which occur within Proposed Project component footprints and where haul routes would be widened or constructed.

[b] The LAA Realignment includes the access road which would be widened and extended to provide access from US-395 to the LAA Realignment during operations.

[c] Borrow Site 10 includes areas where new road segments would be constructed for haul routes (as depicted in Figure 3). As described above, Borrow Site 15 is excluded from analysis as described above, and the haul route for Borrow Site 15 would require no expansion or new construction. Figures 2 and 3 show the geologic mapping within a one-mile radius of the Proposed Project components and haul routes.
Source: AECOM, 2016

5 SPECIFIC LOCALITY INFORMATION

The paleontological records search results provided by the LACM (McLeod, 2016) can be found in Appendix A.[3] The LACM has many vertebrate fossil localities which are situated on the northern flank of the Coso Mountains east to east-northeast of Dirty Socks Springs and southeast of Highway 190 (McLeod, 2016). He also stated that the LACM has localities producing Pleistocene and Holocene fossils west to south-southwest of Swansea. Fossils from those sites include fish, birds, rabbits, rodents, and even-toed ungulates (artiodactyls). A Columbian mammoth was collected southeast of Olancha. This specimen is clearly of Pleistocene age, and must have come from sediments mapped as Qal.

Dr. Adam Rountrey of the University of Michigan Museum of Paleontology sent two communications in January of 2016. Their collection has fossils of a minnow (*Siphateles*) and a sucker (*Catostomus*) at two localities. One of these is on the eastern side of Owens Lake. The other is near Dirty Socks Spring.

A borehole was made in the lakebed of Owens Lake in 1991 and 1992. The fossils recovered from that borehole included a minnow of the genus *Gila*, a sucker (Catostomidae) and a trout or whitefish (Salmonidae) (Smith, 1993). The fossils came from depths of 184 to 315 meters. Radiocarbon dates of 30,670 to 32,320 years before present were obtained at 31.3 meters (Bischoff and Rubin, 1993). The Bishop Ash (783 thousand years before present) was encountered at 303 to 320 meters (Sarna-Wojeicki *et al*., 1993). Thus, the age of the fish fossils must range from several hundred thousand years to over 783 thousand years. No attempt was made to assign formational names to any parts of the column. Smith *et al* (2009) described many fish fossils from the bed of Owens Lake. They described the sediments that produced the fossils as Owens Lake Sands and Owens Lake Clays. Both sediment types produced a species of *Catostomus* and *Siphateles bicolor*. The Owens Lake Sand specimens tentatively were assigned a middle Pleistocene age. The Owens Lake Clays specimens are thought to be somewhat younger (Smith *et al*., 2009).

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[3] The Appendix A Records Search includes a search of the previously proposed Borrow Sites 9 and 24, which have been removed from consideration. Borrow Sites 10 and 15 have been finalized as the borrow sites for the Proposed Project.

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APPENDIX A

RECORDS SEARCH FOR THE PROPOSED NORTH HAIWEE DAM NO. 2 PROJECT

NEAR OWENS LAKE, INYO COUNTY PROJECT AREA

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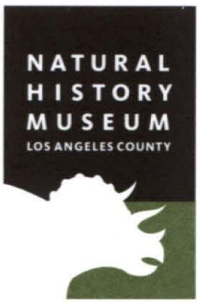
Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org



Vertebrate Paleontology Section
Telephone: (213) 763-3325
Fax: (213) 746-7431
e-mail: smcleod@nhm.org

14 January 2016

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101

Attn: J.D. Stewart, Ph.D., Paleontologist

re: Paleontological resources for the proposed North Haiwee Dam Project, AECOM Project # 60436391, near Owens Lake, Inyo County, project area

Dear J.D.:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed North Haiwee Dam Project, AECOM Project # 60436391, near Owens Lake, Inyo County, project areas as outlined on the portions of the Dolomite, Owens Lake, Keeler, Vermillion Canyon, Olancha, and Haiwee Reservoirs USGS topographic quadrangle maps that you sent to me via e-mail on 29 December 2015. We have one vertebrate fossil locality that may lie within or adjacent to the proposed project area, and we have other localities nearby from the same sedimentary deposits that occur in the proposed project area.

In the northern-most portion of the proposed project area, in the hills just east and southeast of Swansea around the proposed borrow site 15, there are exposures of marine Paleozoic dolomitic limestones. We do not have any vertebrate fossil localities from these rock units, but elsewhere in the southern Sierra Nevada Mountains they have produced fossil fish specimens.

In the southern portion of the proposed project area, in the cliffs on the western side of the North Haiwee Reservoir encompassing the proposed borrow sites 9 and 24, there are exposures of the Pliocene Coso Formation. These deposits may possibly occur at depth in the proposed haul route areas associated with the proposed borrow sites 9 and 24. We have a number of vertebrate fossil localities in the Coso Formation, LACM (CIT) 131, 284-285, LACM 1106, 1182, 3515, 4102, and

4591-4600, all east of the proposed haul route 15 east to east-northeast of Dirty Socks hot spring on the northern flank of the Coso Mountains southeast of Highway 190. Our Coso Formation localities produced a suite of fossil birds and mammals (see appendix for faunal list) and some of these taxa were published in the scientific literature (see appendix for scientific articles citing our Coso Formation specimens), including the holotypes (the single name-bearing specimens for species new to science) of the mastodon *Pliomastodon cosoensis*, the field mouse *Cosomys primus* (now known as *Mimomys primus*), and the bone-crushing dog *Hyaenognathus solus* (now know as *Borophagus diversidens*),

Surface deposits in the most of the rest of the proposed project area consist of alluvial fan deposits from the elevated terrain draining towards Owens Lake. The coarser grained deposits closer to the elevated terrain typically do not contain significant vertebrate fossils in the uppermost layers. In the less elevated terrain though, the surface deposits generally consist of younger Quaternary Alluvium in some combination of aeolian, fan, fluvial, and lacustrine sediments of late Pleistocene and Holocene age that may contain a typical Late Pleistocene to Recent faunal assemblage. From these deposits just west of the northern portion of the proposed project area around the proposed borrow site and haul route 15, west to south-southwest of Swansea, we have the fossil vertebrate localities LACM 7716-7719. These localities produced fossil specimens of bony fish, Teleostei, bird, Aves, jack rabbit, *Lepus*, pocket gopher, *Thomomys*, and even-toed ungulate, Artiodactyla. Our next closest vertebrate fossil locality from these deposits is LACM 4691, northwest of the proposed project area south of the Owens River just south of where State Highway 136 crosses the Owens River, that produced probosicdean remains and a fossil specimen of mountain lion, *Felis concolor*.

In the southern portion of the proposed project area, possibly occurring within the boundaries of the proposed borrow site 10 or the proposed haul routes 9, 10, or 24, we have the vertebrate fossil locality LACM 4538 from older Quaternary deposits near the current dam for the North Haiwee Reservoir, southeast of Olancha, that produced a specimen of the Columbian mammoth, *Mammuthus columbi*, collected by William Mulholland during construction of the Los Angeles aqueduct.

Shallow excavations in the coarser-grained Quaternary alluvial fan deposits exposed closer to the surrounding elevated terrain throughout the proposed project area may not uncover significant fossil vertebrate remains. Deeper excavations in those areas extend down into older and finer-grained sedimentary deposits, however, as well as any excavations in the Paleozoic dolomitic limestones exposed in the very northern portion of the proposed project area, the Coso Formation exposures in the southern portion of the proposed project area, and even shallow excavations in the finer-grained Quaternary alluvial or lacustrine deposits exposed in most of the proposed project area, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally recover any fossil remains while not impeding development. Also, sediment samples from the proposed project area should also be collected and processed to determine the small fossil potential of the site. Any fossils collected should be placed in an accredited scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosures: appendices, invoice

Taxa from Coso Formation localities
based on specimens in the LACM collections

Osteichthyes			
Cypriniformes			
Cyprinidae			
Gila		- chub	
Aves			
Accipitriformes			
Accipitridae			
Aquilinae		- eagle	
Gaviiformes			
Gaviidae			
Gavia		- loon	
Pelecaniformes			
Pelecanidae			
Pelecanus		- pelican	
Pelecaniformes			
Phalacrocoracidae			
Phalacrocorax		- cormorant	
Mammalia			
Artiodactyla			
Camelidae		- camels	
Camelops			
Hemiauchenia			
Tanupolama			Figured
Tayassuidae			
Platygonus		- peccary	Figured
Carnivora			
Canidae		- dogs	
Borophagus	*diversidens*		HOLOTYPE
Borophagus	*solus*		Published
Epicyon	*saevus*		Published
Lagomorpha			
Leporidae		- rabbits	
Hypolagus	*limnetus*		Published
Pewelagus	*dawsonae*		Figured
Perissodactyla			
Equidae			
Plesippus	*francescana*	- horse	Figured
Proboscidea			
Elephantidae			
Mammuthus	*meridionalis*	- mammoth	
Mammutidae			
Pliomastodon	*cosoensis*	- mastodon	HOLOTYPE
Rodentia			
Cricetidae		- deer mice & wood rats	
Cosomys	*primus*		HOLOTYPE
Paraneotoma	*taylori*		
Paraneotoma	*vaughani*		

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APPENDIX B

FIGURES

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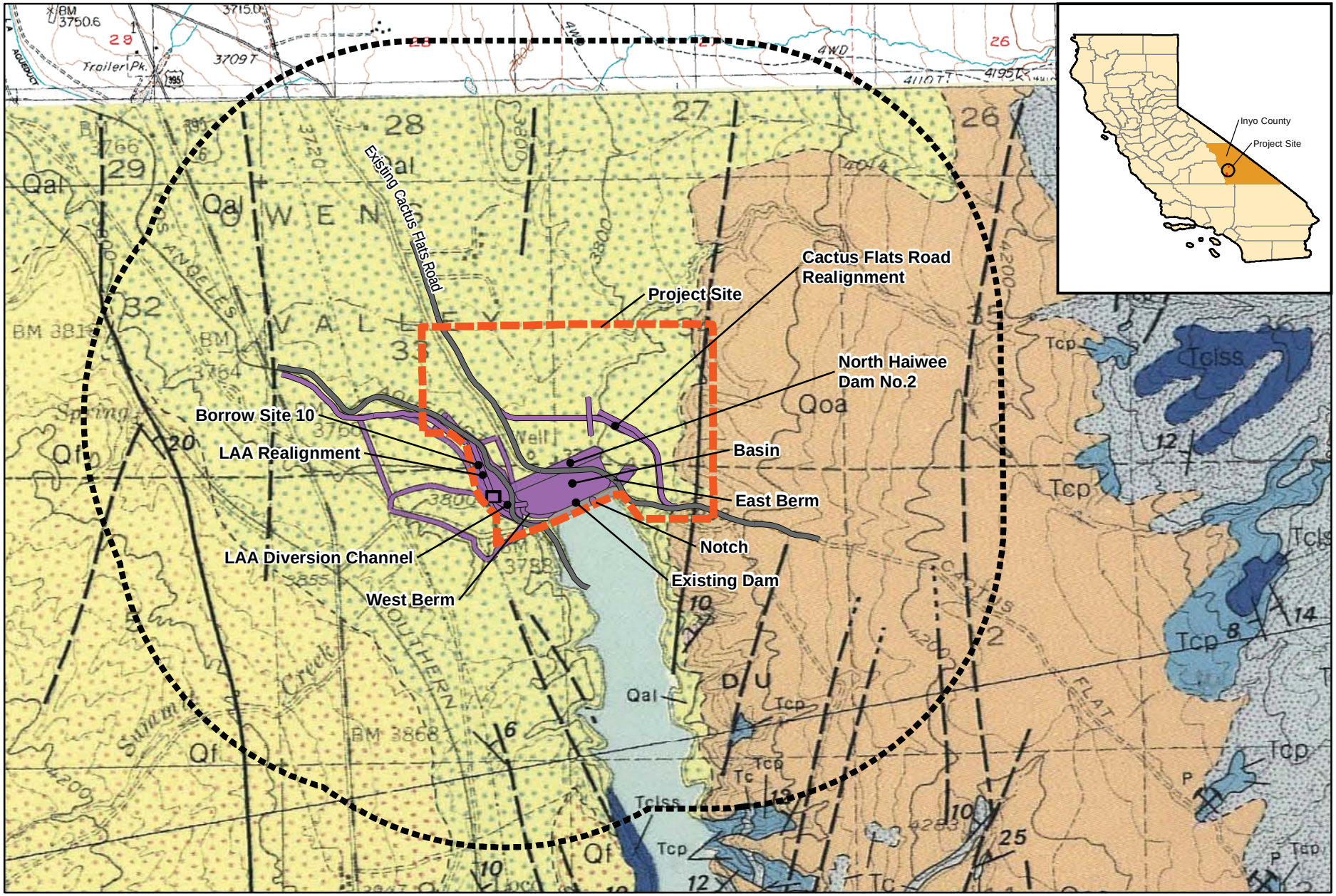
Source: Esri Maps & Data, 2015; Prepared By: AECOM, 2016.

0 3 6 Miles

Figure 1

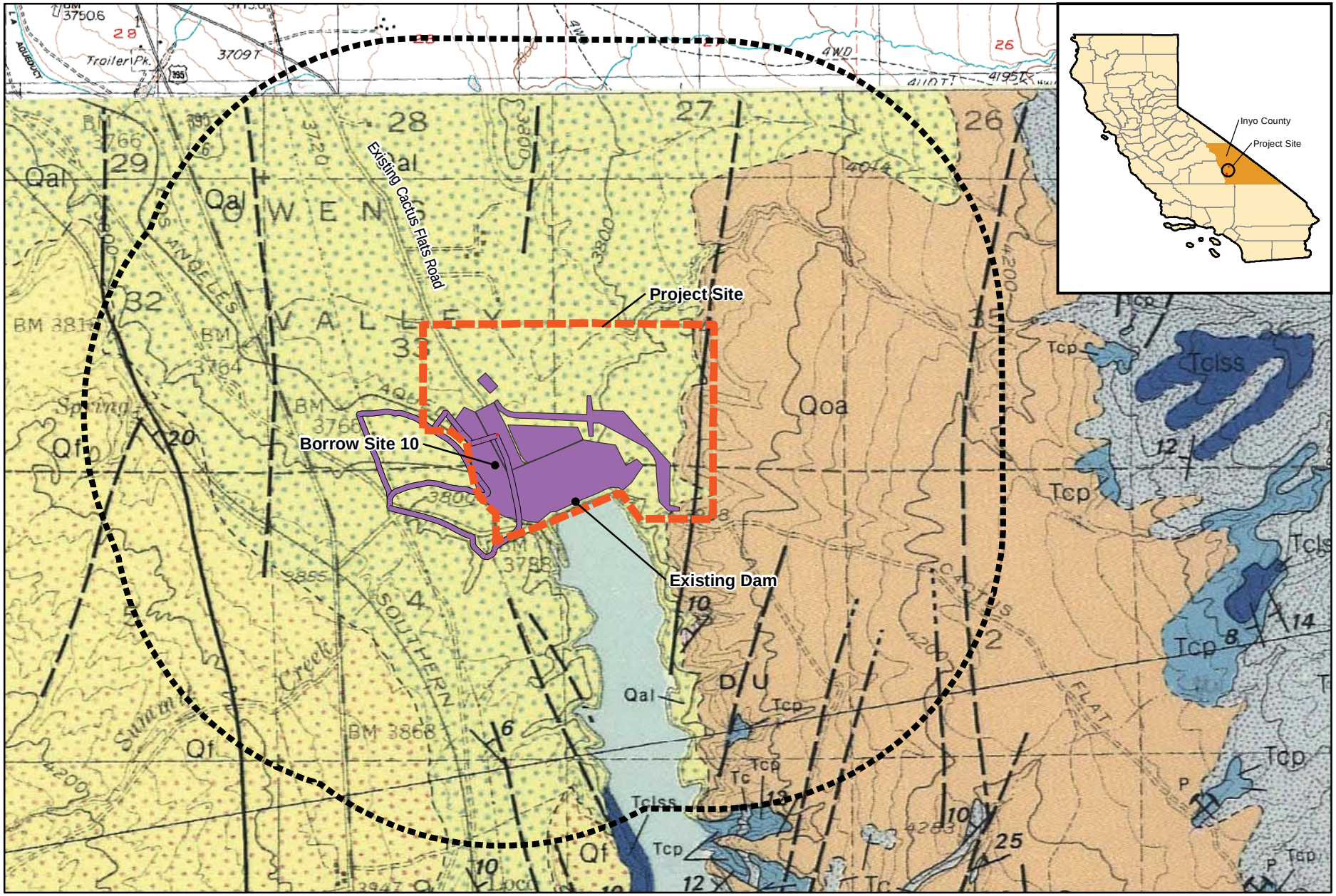
Project Vicinity



Source: Esri Maps & Data, 2017; Prepared By: AECOM, 2017.

Figure 2

Geology of Project Site



Source: Esri Maps & Data, 2017; Prepared By: AECOM, 2017.

0 0.3 0.6 Miles

Proposed Project Elements

Study Area (1-Mile Buffer)

Figure 3

Geology of Haul Routes for Site 10

Unit	General Lithology
Qal	Quaternary alluvium and stream wash
Qf	Quaternary Fan deposits
Qoa	Quaternary older alluvium
Tc	Coso Formation (Pliocene)
Tclss	Coso Formation, limy sandstone, subset of Tcp (Pliocene)
Tcp	Coso Formation, undifferentiated rhyolitic pyroclastic rocks including red tuff and interbedded lake bed deposits (Pliocene)

Figure 4

Explanation of Geologic Units Used in Mapping