

**APPENDIX G10**

# **CULTURAL RESOURCES**

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## Acronyms/Abbreviations

APE	Area of Potential Effects
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
NHPA	National Historic Preservation Act

This appendix describes the regulatory context, the major cultural areas that could be affected by project construction and operation, and the potential environmental consequences of the action alternatives.

## **G10.1 REGULATORY ENVIRONMENT**

A number of State and Federal laws and regulations pertain to cultural resources. The National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA) are the primary laws applicable to the project. It should be noted that compliance with the NHPA is comprehensive enough to satisfy CEQA requirements.

Federal cultural resources regulations for the implementation of Section 106 of the NHPA (36 Code of Federal Regulations [CFR 800]) requires Federal agencies to take into account the effects of their undertakings on historic properties and allow the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The goal of the Section 106 process is to offer a measure of protection to sites that have been determined eligible for listing on the National Register of Historic Places. The criteria for determining National Register eligibility are found in 36 CFR Part 60. These criteria state that eligible resources (historic properties) consist of:

. . . [D]istricts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or (d) that have yielded or may be likely to yield information important to history or prehistory.

Amendments to the NHPA (1986 and 1992) and subsequent revisions to the implementing regulations (1999, 2000) have expanded the provisions for public participation and, in particular, Native American involvement and consultation throughout the Section 106 process.

State historic preservation regulations affecting this project include statutes and guidelines contained in CEQA (Public Resources Code Sections 21083.2 and 21084.1 and Section 15064.5 of the CEQA Guidelines). In addition, California law, like Federal law, protects Native American burials, skeletal remains, and associated grave goods and provides for the sensitive treatment and disposition of those remains. Section 7070.5(b) of the California Health and Safety Code specifies the protocol that must be followed in the event that human remains are discovered either by archeological investigation or by project activities on State and private lands.

Further cultural resource guidance is provided in the Reclamation Manual (Policy LND P01, Cultural Resource Management policy; Directives and Standards LND 02-01, Cultural Resources Management directions; Directives and Standards LND 07-01, Inadvertent Discovery of Human Remains of Reclamation Lands).

Pursuant to 36 CFR 800 efforts must be made to solicit input from both interested members of the public and local Native American tribes regarding potential effects to cultural resources within the Area of Potential Effects (APE). Federal agencies are required to contact tribes to

determine if any sites of religious or cultural significance that may be eligible for the National Register of Historic Places are within the APE. At least five different tribes and Native American groups are present within the greater study area. Potential interested members of the public include historic preservation interest groups, historical societies, and museums that are local to the project vicinity.

## **G10.2      AFFECTED ENVIRONMENT**

The following paragraphs describe the major cultural areas that are likely to be affected by project construction and operation. Except where noted, the cultural areas follow those described by Baumhoff (1978). These cultural areas are San Joaquin Valley, Sacramento-San Joaquin River Delta, the South Coast Ranges, and the northern part of the Southern Coast. For the prehistoric period each area shares some characteristics but was occupied by distinct populations.

### **G10.2.1      San Joaquin Valley**

#### **G10.2.1.1      *Prehistory***

San Joaquin Valley has a long and complex cultural history with distinct regional patterns that extends back more than 11,000 years. The first generally agreed-upon evidence for the presence of prehistoric peoples in San Joaquin Valley is represented by the distinctive fluted spear points termed Clovis Points found on the margins of extinct lakes. The Clovis points are found on the same surface with the bones of extinct animals such as mammoths, sloths, and camels. Based on evidence from elsewhere, the ancient hunters who used these spear points existed during a narrow time range of 10,900 to 11,200 BP.

The next cultural period represented, the Western Pluvial Lakes Tradition, thought by most to be subsequent to the Clovis period, is another widespread complex that is characterized by stemmed spear points. This poorly defined early cultural tradition is regionally known from a small number of sites in the Central Coast Range, San Joaquin Valley lake margins, and Sierra Nevada foothills. The cultural tradition is dated to between 8,000 and 10,000 years ago and its practitioners may be the precursors to the subsequent cultural pattern.

About 8,000 years ago many California cultures shifted the main focus of their subsistence strategies from hunting to seed gathering as evidenced by the increase in food-grinding implements found in archeological sites dating to this period. This cultural pattern is best known for southern coastal California, where it has been termed the Milling Stone Horizon (Wallace 1954, 1978), but recent studies suggest that the horizon may be more widespread than originally described and is found throughout much of cismontane California. Radiocarbon dates associated with this period vary between 8,000 and 2,000 BP, although most dates cluster in the 6,000 to 4,000 BP range (Basgall and True 1985).

Cultural patterns as reflected in the archeological record, particularly specialized subsistence practices, became codified within the last 3,000 years. The archeological record becomes more complex, as specialized adaptations to locally available resources were developed and populations expanded. Many sites dated to this time period contain mortars and pestles and/or are associated with bedrock mortars implying the intense exploitation of the acorn. The range of subsistence resources utilized and exchange systems expanded significantly from the previous

period. Along the coast and in the Central Valley archeological evidence of social stratification and craft specialization is indicated by well-made artifacts such as charmstones and beads, often found as mortuary items. Ethnographic lifeways serve as good analogs for this period.

### **G10.2.1.2 History**

Long-term Euro-American incursions began with the Spanish missionaries and soldiers who entered California from the south in 1769. This period is characterized by the establishment of coastal missions and military presidios, the development of large tracts of land owned by the missions, and subjugation of the local native population for labor. With Mexico's independence from Spain in 1822, the mission period in California began to end. After 1836, large tracts of land were divided by government grants into large ranchos, often tens of thousands of acres or more. These large tracts often maintained large herds of cattle and horses, with agricultural development limited to small garden plots and vegetable-growing operations. In addition to the Spanish explorers and settlers, American explorers made forays into the region.

San Joaquin Valley was sparsely populated by Euro-Americans during the Mexican Period but large herds of semiwild horses and cattle were common. Mexican expeditions were mostly military ones sent to control Native Americans and get revenge for their raids on Mexican resources.

The Gold Rush changed the region significantly. The need for meat led to the establishment of cattle ranches and market hunting of tule elk and waterfowl. The region became a major stock raising area serving the mining towns of the Sierras and cities of Stockton, Sacramento, and San Francisco. Hogs were taken to the tulares to root in the summertime and driven into the foothills in the fall to fatten up on oak acorns. The latter had a direct negative impact on one of the Yokuts main food resources. As the Gold Rush faded, the miners shifted to new pursuits and agriculture expanded significantly. Miller and Lux consolidated their holdings in the region and owned a major portion of bottom lands along the San Joaquin River.

Modern patterns of land use for the region were established between 1857–1871 (Preston 1981). During this time emphasis shifted from livestock to growing crops facilitated by drainage and irrigation. However, dry farming of grain was the major crop on the alluvial lands. Droughts and floods during the period hastened this change. Thousands of cattle either starved or were drowned by floodwaters. Some of the first efforts at major crops of cotton took place in the 1870s but it did not become important until the 1920s (Turner 1981). Also, the rise of agribusiness began about this time, with small farms declining and corporate farms increasing. The Great Depression of the 1930s also brought in waves of Dust Bowl migrants and many of the present residents can trace their ancestry to these people.

Dry-farming practices predominated during the early years until the 1880s when large-scale diversions of water from the San Joaquin River and its tributaries began. By the turn of the century, more than 350,000 acres were being irrigated across San Joaquin Valley. New pump technology in the 1920s allowed more groundwater to be used. Valuable crops, such as vegetables, fruits, and nuts, were grown. New farming techniques allowed for leveling for irrigation on a scale never before possible. These practices had devastating results to the region's prehistoric sites and very few remain undisturbed. It is these conditions that characterize portions of the study area today.

The construction of the Central Valley Project in the mid-1900s drastically changed the hydrology of the San Joaquin River by diverting most of the river's flows at Friant Dam. The construction of the west-side canals to offset the Friant diversions led to the further development of irrigated agriculture and subsequent drainage issues.

As settlements grew, agricultural enterprises became more common. These communities may contain sites and structures of historical significance. Potential historic resources in the region are largely related to agriculture, including farmsteads, labor camps, yards for distributing agricultural produce, feedlots, canneries, pumping stations, siphons, canals, drains, unpaved roads, bridges, and ferry crossings. Labor camps generally consist of at least one wooden bunkhouse or boarding house, a dining hall, a cookhouse, a washroom, and associated buildings.

## **G10.2.2 Sacramento-San Joaquin River Delta**

The Delta has been separated out of the San Joaquin Valley cultural history since its history is distinct from the that of the other areas because of its unique biophysical environment.

### **G10.2.2.1 Prehistory**

The prehistory of the Delta is based on archeological investigations that occurred primarily in the first half of the 20th century. Approximately 80 percent of the known prehistoric sites were recorded prior to 1960. The Central California Culture Sequence is based on the differences of funeral patterns, artifact types, and induration (Lillard, Heizer, and Fenenga 1939). Three periods, or horizons, are recognized: the Early Period (now dated approximately 2500 to 500 BC), the Middle Period (500 BC to 300 AD), and the Late Period (300 to 1840 AD). This archeological construct has evolved into a new classification (Fredrickson 1974) that defines three major patterns: Windmill, Berkeley, and Augustine. Isolated artifacts thought to be early Holocene to late Pleistocene in age and, thus, predating the Windmill Pattern have been found on the surface at localities on the margin of the study area (Beck 1971; Heizer 1938).

The Windmill Pattern is known only from the eastern Delta, middle reaches of the Mokelumne River area, and adjacent areas of the lower valley from the middle Cosumnes River to Stockton. This pattern, equivalent to the Early Period in this area, has distinctive burial patterns, diagnostic shell ornaments, and stone tool forms. Considerable debate has focused on the subsistence base of these people (Dorn 1980; Gerow 1974; Heizer 1974; Schulz 1970, 1981).

The Berkeley Pattern is equivalent to the Middle Period in the lower Sacramento Valley, although earlier phases may be coeval with the Early Period in the Bay Area. The Berkeley Pattern is characterized by flexed burial positions, diagnostic ornaments, and, in the valley, by bone fish spears or leister points and stone pestles. The diet emphasized fish and acorns.

The Augustine Pattern corresponds to the Late Period in the lower Sacramento Valley. It is marked by the appearance of small projectile points and changes in funerary patterns and ornament styles. These cultures, in general, appear to be ancestral to the ethnographic groups of the same area (Bennyhoff 1961) and practiced a similar settlement-subsistence pattern.

The Meganos Complex (Fredrickson 1974) deserves mention. This complex, assigned to the Middle and Late Periods, is characterized by extended burials and by distinct cemeteries disassociated with midden areas. Such cemeteries are known particularly from the sand mounds

of the western Delta (Cook and Elsasser 1956). This complex shares the same dietary emphasis of the Berkeley Pattern.

### **G10.2.2.2      *Characteristics of Prehistoric Delta Sites***

Prior to leveling for agriculture many of the prehistoric sites in the Delta were low gentle sloping mounds, ranging in height from 6 inches to over 7 feet above the surrounding land surface (Schenck and Dawson 1929). The mounds are generally assumed to be natural rises that were enlarged by the gradual accumulation of midden, although some historical evidence suggests that they may have been intentionally modified by the inhabitants (Belcher 1843:130). Some of the mounds extend below the current ground level and some are buried entirely with no surface evidence (Heizer 1949). The composition of the cultural deposits varies greatly from black loam to yellow silty clay. Intermediate deposits contain varying amounts of fine sand, generally yellow or tan in color, and may be representative of sublevels of mound deposits. Hardpans are common in sites in the higher elevation depositional units and in some sand mounds, likely the result of long-term weathering.

### **G10.2.2.3      *Native Peoples***

The native peoples of the Delta area were divided among five linguistic groups, all belonging to the Penutian language stock. The far northeastern part of the Delta region was occupied by the Valley Nisenan, the eastern part and far western part by Plains and Bay Miwok speakers, the southern part by the Northern Valley Yokuts, and the northern shore of the Suisun Bay area by the Patwin. Despite sharing the same environment, distinct material cultural differences existed among the five groups (Bennyhoff 1977:47).

The Plains and Bay Miwok are members of the Utian family of the Penutian stock languages (Shiple 1978). The boundaries and divisions of the Miwok are based largely on linguistic evidence (Bennyhoff 1977; Kroeber 1925; Levy 1978; Schenck 1926). The Miwok were intensive collectors; they occupied large, fixed, multilineage villages (tribelets) located on high ground generally adjacent to watercourses. Most villages were occupied permanently except during short periods of harvesting. Camps for fishing and hunting were also part of the settlement system.

The Northern Valley Yokuts were semisedentary, with principle settlements on low mounds or levees on or near the banks of major watercourses. Loosely centralized tribes headed by a chief (the position of which was inherited) were tied to one or more principle villages. Secondary settlements consisted of small camps or villages of several households. Next to settlements were fishing stations, hunting camps, and lithic-tool-manufacturing sites. The early disruption of Yokut-speaking people resulted in little ethnographic information (Bennyhoff 1977; Schenck 1926; Schulz 1981; Kroeber 1925.)

The term Patwin refers to several tribelets of people who occupied the western side of Sacramento Valley extending from Suisun Bay north to just above the town of Princeton on the Sacramento River (Johnson 1978). Patwin tribelets generally occupied one primary and several satellite villages, some containing as many as 1,000 or more persons (Powers 1976). Each triblet had a sense of territoriality and autonomy (Johnson 1978). Subsistence, like that of their neighbors, was based on hunting, gathering, and fishing. Details on the Patwin lifeway are little

known because they were among the earliest groups in the region to be affected by missionization and introduced diseases. By 1871–1872, when Stephen Powers surveyed the State while gathering ethnographic information, the Patwin culture no longer existed.

The destruction of native Delta cultures was the result of several factors. Even before explorers and settlers made extensive contact, the missions drew Native Americans away from their villages. An 1833 epidemic, possibly malaria, killed thousands and numerous villages were abandoned. The secularization of the missions in 1834 caused Native Americans of various cultural affinities to retreat into areas of previous cultural homogeneity (Wallace 1978). The collapse of the Delta cultures began before the Gold Rush, and ended when later waves of settlers converted native territory into agriculture fields. Village mounds of the native peoples were abandoned, reoccupied by farmhouses, buried under levees, or leveled for agriculture.

#### **G10.2.2.4    *History***

Prior to 1850, before significant human modification, the Delta consisted mainly of intertidal wetlands laced with about 100 square kilometers of subtidal waterways. The Delta became an Indian refuge during the Mexican Period. Under pressure from the coastal missions with their associated military garrisons, tribal domains within the Delta broke down rapidly. In hope of creating stability in the interior and to build a buffer zone for the coastal areas, Mexican governors awarded land grants in the Delta region. Within the study area Paso del Pesadero was granted in 1843 to Antonio M. Pico. While he never occupied the area, he and one of the pioneer reclaimers in the Delta, Henry M. Naglee, were claimants of the 35,546-acre tract when Mexico ceded the land to the United States.

With the discovery of gold in the mid-1800s and the ensuing Gold Rush, development and improvement of a transportation system became a necessity in the region. Between 1850 and 1880, California saw the development of hundreds of primary wagon routes, the evolution of steamboat travel along major rivers, and the completion of numerous railroads. Many of these early transportation routes traversed the Delta waterways.

Human activities since 1850 have greatly altered the Delta. Artificial levees, erected for flood control and agricultural reclamation, now surround 98 percent of the historic wetland. Waterways have been shoaled by sediment from upstream hydraulic gold mines, deepened by dredging of construction material for levees, and interconnected by dredged-cut channels. Historic Delta cultural resources consist of early farms, agricultural labor camps, food processing facilities, docks, dolphins, levees, abandoned settlements, bridges, and sunken ships.

#### **G10.2.3        *South Coast Ranges***

##### **G10.2.3.1    *Prehistory***

The prehistory of the South Coast Ranges is not as well known as adjoining areas but the archeology appears to share many of the material cultural elements of both regions. Initial occupation probably extends back to the early Holocene. Such early sites contain abundant milling tools that suggest a heavy reliance upon seeds. Many of the late period sites appear to have been seasonally occupied by small groups of hunter-gatherers. Contact with the coast is evident by the common occurrence of marine shell in the cultural deposits.



### **G10.2.3.2**     *History*

The Southern Coast Ranges were divided up early between mission lands and individual land grants. During the Spanish and Mexican periods the lands were used primarily for the livestock grazing and little development took place. Dry land farming of grain continues today, but grape growing is becoming more important. Historic resources include early ranchos, mission lands, agricultural infrastructure, and early trails and roads.

## **G10.2.4**     **Southern/Central Coast**

### **G10.2.4.1**     *Prehistory*

The prehistory of the Southern/Central Coast area of California is one of the most intensively studied areas in the world. It has been occupied for at least 9000 years and possibly even earlier. Subsequent habitations can be divided into four cultural periods: 6500–3500 BC, 3500–1000 BC, 1000 BC–1200 AD, and 1200 AD–contact (Jones 1992). Following initial settlement, the number of occupied sites increases dramatically between 6500 and 3500 BC. Site locations become more diversified but the range of artifacts is narrow, primarily milling tools for the grinding of seeds. Projectile points are relatively rare. By 3500 BC the mortar and pestle become the more prominent seed processing tool. Marine mammals become a more important part of the diet for many coastal and island groups. After 1000 BC populations increase and site diversity is even greater with craft specialization beginning to take hold. The Late Period (post 1200 AD) shows a still greater profusion of sites and the use of all types of marine habitats. Elaborate shell and bone fish hooks and harpoon points indicate intensive exploitation of marine resources. Trade and exchange with inland groups led to elaborate exchange systems being formulated with standardized values for shell beads and other items.

When Europeans first explored the California coast during the 1500s and 1600s they encountered some of the most populous, prosperous, and complex hunter-gatherer societies on earth (Erlandson 1997). However, within a short period these groups were decimated by genocide and introduced diseases. Their population levels collapsed to a point where they could no longer sustain their cultural systems and only a small percentage of the descendants survived.

### **G10.2.4.2**     *History*

Like the Southern Coast Ranges, during the Spanish and Mexican Periods the lands were granted to the missions and individuals who used the lands for livestock grazing. Settlements occurred near the missions and government-related facilities and population numbers were low. Dry farming of various grains was initiated early on, supplementing the production of livestock, which was primarily for their hides. With the Gold Rush, the hide production switched to meat for the miners. Small-scale agriculture, primarily growing vegetables, expanded to fill an increased demand as California's population grew rapidly, but the area remained relatively isolated because of the terrain and the lack of a good harbor or roads. Historic resources include early ranchos, mission lands, agricultural infrastructure, early trails and roads, and coastal landings and fish camps.

### **G10.3 ENVIRONMENTAL CONSEQUENCES**

The impact assessment presented in this report does not focus on effects to individual cultural resources. Instead, generalized cultural resource types are described and impacts to the generalized cultural resources types are assessed. The assumption here is that all significant cultural resources within the project's APE will be adversely affected and that mitigation measures will be required. However, the need for mitigation can be reduced by avoidance during the project planning stages. For this to occur coordination will need to be close between the cultural resource personnel and those planning, preparing, and implementing the project. If avoidance of some cultural resources is possible in an economically and environmentally feasible way, provisions for their continued avoidance and periodic review would be written into the Programmatic Agreement and the Historic Property Management Plan, both of which are described below.

#### **G10.3.1 Assessment Methods**

Information about the project area's cultural history and resources was developed from reviews of the relevant archeological and historical databases, literature, including an extensive collection of earlier project-related documentation, maps, and reports. Also examined were the National Register of Historic Places, California Historic Landmarks, and California Inventory of Historic Resources.

#### **G10.3.2 Significance Criteria**

The Significance Criteria for cultural resources are based on National Register of Historic Places regulations (36 CFR Part 63), NHPA and its regulations (36 CFR 800), and CEQA.

A number of cultural resources within the APE of each alternative have been identified; however, none have been formally evaluated for their National Register significance. The legal and regulatory framework for carrying out such work can be approached in a number of different ways, but all will require inventory and evaluation studies. The preferred approach is to coordinate and integrate NHPA compliance with the National Environmental Policy Act process. Furthermore, because of the compressed schedule for the National Environmental Policy Act process and the amount of time it will take to complete the cultural resources studies, it will be necessary to develop a Programmatic Agreement to comply with Section 106 of the NHPA. The Programmatic Agreement will require the development of specific Historic Property Treatment Plans to mitigate the adverse effects of the project on historic properties.

It is expected that most Section 106 compliance obligations will be met prior to project implementation by mitigation or avoidance. However, it should be noted, depending on the alternative selected, that a long-term plan for managing cultural resources within project lands may be required. That is, the protection of known historic properties must be maintained for the project life and all inadvertent finds will need to be treated appropriately upon discovery. The preparation of a Historic Property Management Plan will provide the necessary specific guidance for the consideration and treatment of historic properties that may be accidentally affected during the course of the drainage program.

### **G10.3.2.1     *Impacts of No Action***

The No Action Alternative would have negative and positive impacts to cultural resources over the 50-year project life.

Changes in cropping patterns would affect cultural resources in a number of different ways. Deep ripping and leveling could further degrade archeological deposits. New irrigation techniques and drainage may further disturb cultural resources. The construction or removal of agriculture-related structures may also have a direct impact on historic properties.

An increase in land retirement, abandonment, or temporary fallowing may both reduce and increase affects to historic properties. Since many operators would be forced to fallow a portion of their fields in multiyear rotations, impacts to archeological resources from plowing, leveling, and other agriculture-related activities may be reduced. Abandonment of historic structures may lead to their destruction and loss. Impacts to cultural resources by conversions to nonagricultural land use would vary depending upon the change.

No new collection facilities would be constructed through 2050. The likelihood of disturbing buried archeological resources would be reduced. On-farm source control measures could increase the likelihood of disturbing cultural resources.

### **G10.3.2.2     *Impacts of Ocean Disposal***

Implementation of the Ocean Disposal Alternative could result in adverse effects on cultural resources. These effects could result from construction of the aqueduct, tunnel portals, and pumping plants. Reuse facilities (common to all alternatives) would be developed; this development could have adverse effects on historic properties. An unspecified amount of land would also be disturbed for temporary access/haul roads, staging areas, and disposal of excavated materials from tunnel boring and pipeline construction. All of these activities could have an adverse effect on historic properties. Construction of the extensive network of canals, pipelines, and drains to collect and convey drainwater to reuse facilities could also have direct adverse effects on cultural resources.

No specific cultural resource studies have been completed for this alternative. Surveys have been completed for the segment of the alignment that crosses Sunflower Valley and along the coast at Point Estero. Both areas have archeological sites that may be eligible for listing on the National Register of Historic Places.

Prehistoric archeological sites are common along southern Coast Range drainages and coastal areas. Sites include villages, camps, lithic scatters, and food processing areas. Cemeteries were generally associated with villages. Early historic sites, mainly related to ranching, also are present. Construction activities are likely to have an adverse effect on cultural resources. Completion of the Class I Records search is pending.

### **G10.3.2.3     *Impacts of Delta Disposal***

Implementation of either of the Delta Disposal Alternatives could result in adverse effects on cultural resources. These effects could result from construction of the aqueduct (whether fully or partially piped) and pumping plants. An unspecified amount of land would also be disturbed for use as temporary access/haul roads and construction staging areas. A biological treatment facility

would be constructed and four reuse facilities with their associated collection systems (common to all action alternatives) would be developed. All these actions have the potential to have adverse effects on historic properties.

A substantial amount of previous cultural resource inventory work has been conducted within the study limits of alternatives that dispose of drainwater into the Delta. The previous cultural resources studies, conducted between 1980 and 1983, were completed either by contractors for the Bureau of Reclamation or done in-house. The work was conducted in accordance with the requirements of Section 106 of the NHPA and its implementing regulations (CFR 800) at that time. Since that time the NHPA and its regulations have been amended and revised (see Appendix G10).

Cultural resource investigations conducted to date for the Delta Disposal Alternatives covered the area from the northern margins of Tulare Lake to the Chipps Island outlet. The study alignment of these past investigations is similar to, though not identical with, the currently proposed alignment. No specific studies have been completed for the alignment and drainage outfalls west of the Chipps Island outlet (Carquinez Strait outlet). In the previous investigations, a literature and records search was conducted and the data tabulated and mapped. Emphasis was placed on the identification of prehistoric and Native American historic age archeological sites, although databases and records for historic properties were also examined. From these data an attempt was made to find relationships between environmental variables (soils, vegetation, or water courses) and prehistoric and Native American historic site locations to determine areas that would be most likely to contain such sites.

Based on past investigations no previously recorded archeological sites, except those at Kesterson National Wildlife Refuge, fell within currently proposed the alignment. Prehistoric sites primarily occur on just a few soil types along drainages. These sites consist of village sites, camps, and artifact scatters. A number of the village sites are known to contain burials.

Most of the currently proposed alignment and reuse areas have been greatly altered by agricultural activities and few of the natural contours or drainages remain. Only isolated artifacts and artifact scatters were found to fall within the lands examined for the reservoirs. No historic properties were found along the Chipps Island conveyance route. A number of historic properties are known to be present near the Carquinez Strait alignment. A records search for this alignment is pending.

#### **G10.3.2.4      *Impacts of In-Valley Disposal***

Implementation of the In-Valley Disposal Alternative could result in adverse impacts to historic properties. Construction of four reuse facilities and associated collection/conveyance systems, pumping facilities, reverse osmosis and biological treatment facilities, two evaporation basins, and two alternative wetland habitat mitigation complexes all have the potential to affect historic properties.

No specific cultural resource studies have been completed for this alternative. Virtually all the lands that would be affected by this alternative have been modified by agricultural practices: leveling, plowing, farm roads, irrigation, and drainage. Most of the conveyance alignments follow existing roads. Scatters of artifacts have been noted for the area. Such scatters are

probably the remains of prehistoric archeological sites that have been obliterated by agricultural activities.

While completion of the Class I records search is pending, no known historic properties will be affected by this alternative.

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