3.7 Cultural Resources

3.7.1 Introduction

This section addresses the settings and impacts for the Proposed Project Alternatives. This section describes the setting for paleontological, archaeological, and historical resources at or in the vicinity of the proposed components and evaluates the potential impacts that could result from implementing each of the components, the Proposed Project Alternatives, and the No Project Alternative. Mitigation to reduce impacts is provided where applicable.

3.7.2 Environmental Setting

3.7.2.1 Paleontological Resources Setting

The presence of paleontological resources is associated directly with specific geologic formations, strata, or rock units known to contain the fossilized remains of fauna and flora. Fossil-bearing formations, in which organic materials were buried and solidified over geologic time, are uniformly sedimentary in origin but variable in age, composition, geographic location, and types of fossils they contain.

Paleontological resources are not included in the *National Register* or *California Register* definitions; therefore, they are not considered historic resources for the purposes of Section 106 or CEQA. Although paleontological resources are not considered cultural resources, they are included herein because under CEQA, the broad category of Cultural Resources encompasses fossils in addition to archaeological sites and the built-environment (CEQA Guidelines Appendix G, §§ V[c]). Vertebrate fossils in particular are afforded protection under CEQA as nonrenewable resources that can provide important scientific information about ancient life and the evolution of landforms (Scott and Springer, 2003). They are discussed in this EIR only in relation to potential construction impacts.

The principal types of vertebrate fossils typically yielded by formations in the Los Angeles area are marine and terrestrial vertebrate fossils and marine invertebrate fossils.

Geologic mapping of the Los Angeles region has identified the geological units present within the HSA (Jennings, 1962; Jennings and Strand, 1969). A full description of each geologic unit present in the HSA is provided in Section 3.9, Geology. The geologic units and their paleontological sensitivity level (potential to bear fossils) are presented in Table 3.7-1 and described below. The paleontology sensitivity across the HSA is shown in Figure 3.7-1.

Table 3.7-1. Geologic and Paleontological Summary Relative to Study Area *Integrated Resources Plan EIR*				
Years Before Present	**Period**	**Epoch**	**Formations**	**Paleontological Sensitivity Level**
Present to 11,000	Quaternary	Holocene	Younger alluvium and dune sand	Low
11,000 to 1.8 million		Pleistocene	Older alluvium and terrace deposits – marine or terrestrial	High
1.8 to 5 million	Tertiary	Pliocene	Fernando – marine	High
5 to 23 million		Miocene	Puente – marine	High
			Monterey – marine	High
			Topanga – marine	High
23 to 39 million		late Eocene – early Miocene	Sespe – terrestrial	High

Quaternary Geologic Units

Quaternary Period deposits generally consist of two components: an upper younger layer from the Holocene (present to about 11,000 years before present [B.P.]) and an underlying older layer from the Pleistocene (about 11,000 years B.P. to 1.8 million years before present [Ma]).

The surface of the coastal plain between the downtown area and Terminal Island is characterized primarily by Quaternary alluvium in most inland areas and Quaternary nonmarine terrace deposits in near-coastal areas. Along the coastline, the terrace deposits are capped with Quaternary dune sand. In general, most of the surface of the San Fernando Valley consists of Qal.

Because of the much shorter period in which it accumulated, overlying Holocene alluvium is characteristically shallow (often less than 10 feet below the surface) and thinner than underlying Pleistocene sediments that were deposited over 1.8 million years. Relatively recent in geological age, the thin upper layer of Holocene alluvium, therefore, lacks the potential to contain fossils. These units are assigned a low paleontological resource sensitivity rating with high potential for containing fossil material.

Pleistocene alluvium, however, represents age and depositional processes necessary for the fossilization of organic materials and, therefore, has a high potential to contain fossil resources (Woodford et al., 1954). Quaternary nonmarine terrace deposits are entirely late Pleistocene in age and, therefore, also have the potential to contain fossil materials. In the Los Angeles region, Pleistocene sediments were deposited during marine conditions or as a result of terrestrial processes and, therefore, could contain fossils from the general categories previously described. These units are assigned a high paleontological resource sensitivity rating with high potential for containing fossil material.

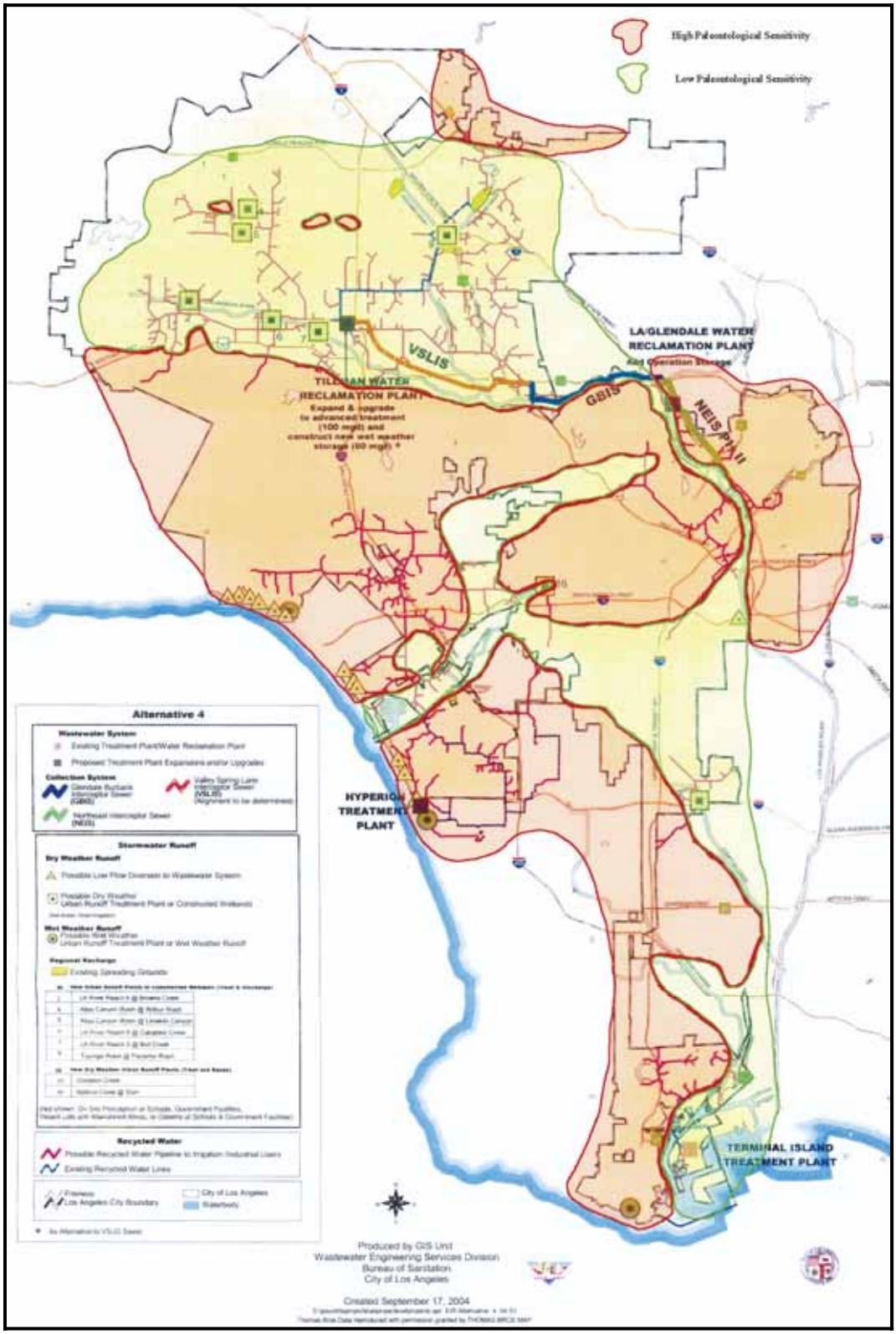

Figure 3.7-1
Paleontologic Sensitivities in the IRP Service Area

CH:CDM

Source: GIS Unit
Wastewater Engineering Services Division
Bureau of Sanitation

Tertiary Geologic Units

The Pliocene (1.8 to 5 Ma), Miocene (5 to 23 Ma), and Oligocene (23 to 33 Ma) also contain significant fossils (Reed, 1933; Conrey, 1967). In the Los Angeles region, Pliocene, Miocene, and older sediments were deposited during marine conditions or as a result of terrestrial processes and, therefore, might contain fossils from the general categories previously described.

In the Los Angeles Basin, for example, Pliocene marine strata often are represented by the Fernando Formation. Miocene marine strata in much of coastal Southern California are correlated with the Puente, Monterey, or Topanga Formations. Nonmarine strata from the Oligocene and Eocene can be correlated with the Sespe Formation. The paleontological resources associated with each of these formations and the sensitivity of the geologic units are briefly described below.

Fernando Formation

The Fernando Formation (Pu) (also known as the Pico Formation) was deposited during the Pliocene (about 1.8 to 5 Ma) in a marine environment. It is composed of shale, sandstone, and conglomerate. These deposits are usually marked by turbidities, alternating beds of sand and mud left by underwater slides of material on the continental shelf that are preserved as horizontal layers of sandstone and shale. Fossils typically found in the Fernando Formation range from microorganisms to larger creatures such as sharks, rays, and bony fish. The Fernando Formation has been identified in subsurface contexts in the central Los Angeles downtown area as well as in the Santa Monica-Pacific Palisades area. This unit is assigned a high paleontological resource sensitivity rating with high potential for containing fossil material.

Puente Formation

The marine Puente Formation (Mu) is Late Miocene in age (7 to 12 Ma) and is composed of interbedded siltstone, sandstone, and conglomerate. Exposure of this formation has been recorded in many parts of the central and eastern Los Angeles region. The Puente Formation has produced an extensive collection of marine invertebrates and vertebrates and is assigned a high paleontological resource sensitivity level.

Monterey Formation

The Monterey Formation (Mm) is a widespread unit deposited in a marine environment during the Middle to Late Miocene (5 to 17 Ma). The shale, sandstone, and mudstone deposits of the Monterey Formation are highly siliceous, a result of organic deposition (microorganisms such as diatoms) and inorganic deposition (volcanic ash). Virtually all types of marine fossils occur in the Monterey Formation, which is exposed throughout most of the IRP service area. Due to the extensive collection of marine vertebrates found in the Monterey Formation, this unit is assigned a high paleontological resource sensitivity level.

Topanga Formation
The Topanga Formation (Mi) primarily is a marine unit from the Early to Middle Miocene (11 to 23 Ma). The general lithology of the Topanga Formation consists of up to 690 meters of white to tan arkosic fossiliferous sandstone, with interbeds of gray to brown siltstone and conglomerate. A wide range of marine fossils are typically found in the Topanga Formation, including invertebrates such as foraminifera and bivalves and vertebrates such as pinnipeds, whales, dolphins, sharks, bony fish, and turtles. Exposures of the Topanga Formation have been identified in the Santa Monica-Pacific Palisades area. This formation has produced many significant marine invertebrates, vertebrates and plants, and is assigned a high paleontological resource sensitivity level.

Sespe Formation
The Sespe Formation (Øc) is nonmarine in origin, and is Late Eocene to Early Miocene in age (approximately 40 to 23 Ma). The Sespe Formation was deposited as a result of fluvial action that eroded ancient mountains, which have since vanished from the landscape. The Sespe Formation consists of distinctively reddish earthy sandstone, siltstone, and conglomerate and has been reported to contain terrestrial fossils (e.g. extinct carnivores, insectivores, rodents, and primates). Relative to the IRP service area, the Sespe Formation is generally exposed near the base of the Santa Monica Mountains in the western San Fernando Valley and in the Santa Monica-Pacific Palisades area. This unit is assigned a high paleontological resource sensitivity level throughout Southern California.

3.7.2.2 Archaeological Resources Setting

This section provides an overview of the cultural history of the Los Angeles Plain to provide a context for understanding the types, nature, and significance of prehistoric or ethnohistoric sites that might be encountered in the HSA. The prehistoric discussion presented here is largely derived from *The People of Y'aanga*, prepared for the Metropolitan Water District of Southern California Headquarters Project at Union Station (Goldberg et al., 1999). The ethnohistoric setting provides a general overview of the cultural practices of the Gabrieleno Tongva cultural group who occupied the Los Angeles region at the time of historic contact; a detailed presentation of these data is provided by William McCawley (1996) in his book, *The First Angelinos*. A broad overview of the historic development of the Los Angeles area is then presented.

Prehistoric Setting

Two regional chronologies are widely cited in the archaeological literature for the prehistory of Southern California: Wallace (1955, 1978) and Warren (1968, 1984). These chronologies are generalized temporal schemes based on the presence or absence of certain artifact types; both chronologies span the known prehistoric occupation of Southern California.

12,000–7500 B.P. Interval (Terminal Pleistocene/Early Holocene Period)
Warren's (1968, 1980) earliest interval of Southern California prehistory is the "San Dieguito Tradition," beginning about 10,000 B.P. and best defined in the

coastal San Diego area (True, 1958). Wallace (1978) calls this interval "Period I: Hunting" and considers it to begin about 12,000 B.P. Farther to the east, the San Dieguito Tradition is relatively coeval to the "Lake Mojave Period," an expression of the so-called "Western Pluvial Lakes Tradition" presumed to begin somewhat earlier than 9500 B.P. and lasting to perhaps 7000 B.P. in the southwestern Great Basin (Basgall and Hall, 1993; Warren, 1980 and 1984).

This interval is characterized by a long period of human adaptation to environmental changes brought about by the transition from the late Pleistocene to the early Holocene. As climatic conditions became warmer and more arid, Pleistocene megafauna gradually disappeared between 13,000 and 10,000 B.P. Human populations responded to these changing environmental conditions by focusing their subsistence efforts on the procurement of a wider variety of faunal and floral resources. Sites dating from this interval generally are found around early Holocene marshes, lakes, and streams, which dominated much of the landscape.

These early occupants of Southern California are believed to have been nomadic large-game hunters whose tool assemblage included percussion-flaked scrapers and knives; large, well-made stemmed, fluted, or leaf-shaped projectile points (e.g., Lake Mojave, Silver Lake); crescentics; heavy core/cobble tools; hammerstones; bifacial cores; and choppers and scraper-planes.

Perhaps the earliest evidence of human occupation in the Los Angeles region was recovered from the tar pits of Rancho La Brea. In 1914, the partial skeleton of a young woman was discovered in association with a mano (Merriam, 1914). During the early 1970s, complex chemical methods were used to decontaminate the human bone of intrusive carbon, and a treated collagen sample was dated at 9000 ± 80 B.P. (Berger et al., 1971). Apart from the "Brea Maid," as Merriam called the skeleton, no other human remains have been found at the tar pits.

Projectile points similar to the Lake Mojave and San Dieguito types as well as crescentics have been recovered at the Del Rey Bluffs immediately south of Ballona Lagoon, adjacent to a former mouth of the Los Angeles River (Lambert, 1983). The presence of these point types along the coast of the region suggests connections with the cultures of the southeastern California desert regions.

7500 to 5000 B.P. Interval (Middle Holocene Period)

In coastal Southern California, the early traditions changed by about 8000–7000 B.P. to what Warren refers to as the "Encinitas Tradition" and what Wallace terms "Period II: Food Collecting." Paleoclimatic data for this period indicate a trend toward increasingly warm and desiccating conditions. This interval has been described frequently as the "Milling Stone Horizon" because of the preponderance of milling tools in the archaeological assemblages of sites dated to this era (Basgall and True, 1985; Kowta, 1969; Wallace, 1955).

In the coastal and inland regions of Southern California, this period of cultural development is marked by the technological advancements of seed grinding for flour and the first use of marine resources, such as shellfish and marine mammals. Overall, the general settlement-subsistence patterns of the Middle Holocene were exemplified by a greater emphasis on seed gathering. Adaptation to various ecological niches, further population growth, and an increase in sedentism typify the subsequent periods of cultural history in Southern California. This subsistence orientation, characterized by a heavy dependence on both hunting and plant gathering, continued into the historic period.

The artifact assemblage of this period is similar to that of the previous period and includes crude hammerstones, scraper planes, choppers, large drills, crescents, and large flake tools. This assemblage also includes large leaf-shaped points and knives; manos and milling stones used for grinding hard seeds; and nonutilitarian artifacts, such as beads, pendants, charmstones, discoidals, and cogged stones (Kowta, 1969; True, 1958; Warren et al., 1961).

Based on the distribution of sites assigned to this period, aboriginal groups likely followed a modified, centrally based wandering pattern with an inferred shift toward enhanced logistical settlement organization (Binford, 1980; Warren, 1968). In this semisedentary pattern, larger groups occupied a base camp during a portion of the year, while smaller groups of people used satellite camps to exploit seasonally available floral resources such as grass seeds, berries, tubers, and nuts. King (1967) suggests that the coastal sites probably represent more permanent occupations than are found in the interior, because coastal inhabitants were sustained by more reliable and abundant food resources. Coastal occupants gathered fish and plant resources, and hunting was generally less important (projectile points are rare). The inland occupants primarily collected hard seeds and hunted small mammals (projectile points are more common).

The Topanga Complex is perhaps the best known component of the so-called Milling Stone Horizon in the vicinity of the Project region (Figure 3.7-2). During the 1940s and 1950s, Treganza and Bierman (1958) identified two phases of the Topanga Complex during excavations at CA-LAN-1 (the Tank Site) and CA-LAN-2, both located in Topanga Canyon. Phase I is characterized by scraper-planes, scrapers, choppers, core/cobble tools, an extensive ground stone tool assemblage, few projectile points, and secondary burials. In addition to an extensive ground stone tool inventory, Phase II is distinguished by small projectile points, incised and cogged stones, and fewer core/cobble tools; reburial continues along with the introduction of extended burials. A third phase of the Topanga Complex was identified at CA-LAN-2 in 1957 (Johnson, 1966). The hallmarks of Phase III are large rock-lined ovens, mortars and pestles, pressure-flaked points, core tools, and plentiful milling stones.

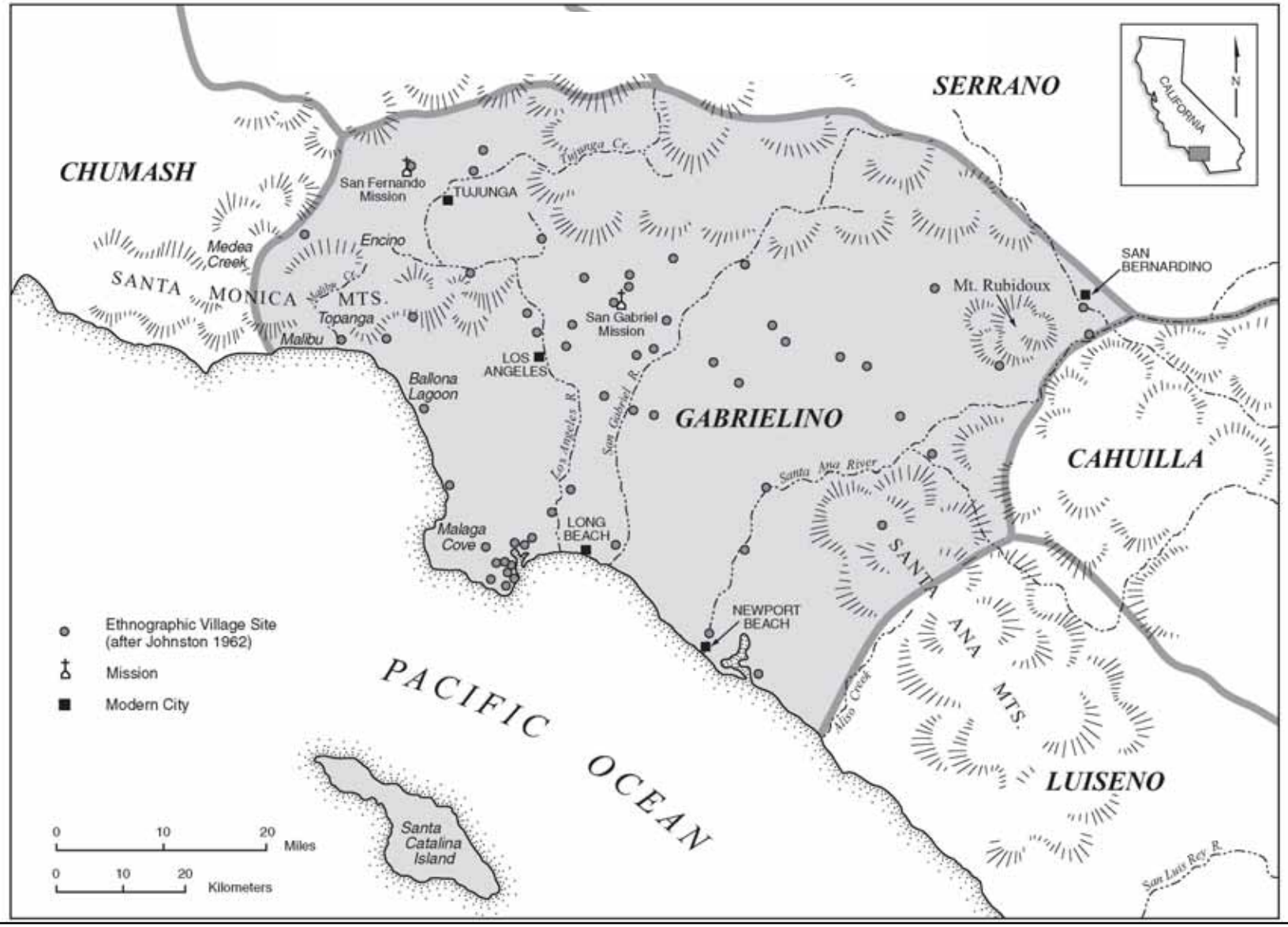

Figure 3.7-2
Ethnographic Villages within Gabrielino Territory

CH:CDM

Integrated Resources Plan
Environmental Impact Report

Source:
Goldberg et al. 1999

5000–1500 B.P. Interval (Middle to Late Holocene)

For the period after about 5000 B.P., Warren (1968) and Wallace (1978) diverge in their chronological sequences for the coastal regions of Southern California. Warren's Encinitas Tradition includes all areas outside the Chumash territory of the Santa Barbara coastal zone and continues until approximately 1300 B.P. Wallace, on the other hand, identifies a transition beginning approximately 5000 B.P., marking the onset of "Period III: Diversified Subsistence." In his original 1955 sequence, Wallace said this period, generally referred to as the "Intermediate Horizon," was based largely on changes in the archaeological assemblages of sites from the Santa Barbara coastal region.

In general, cultural patterns remained similar in character to those of the preceding horizon. However, the material culture at many coastal sites became more elaborate, reflecting an increase in sociopolitical complexity and increased efficiency in subsistence strategies (e.g., the introduction of the bow and arrow for hunting). The settlement-subsistence patterns and cultural development during this period are not well understood because of a lack of data, although some researchers have proposed that sedentism increased through the exploitation of storable food resources such as acorns.

The limited data suggest that the duration and intensity of occupation at base camps increased, especially toward the latter part of this period.

The subsistence base during this period broadened. The technological advancement of the mortar and pestle indicate the use of acorns, an important storable subsistence resource. Hunting also presumably gained in importance. An abundance of broad, leaf-shaped blades and heavy, often stemmed or notched projectile points have been found in association with large numbers of terrestrial and aquatic mammal bones. Other characteristic features of this period include the appearance of bone and antler implements and the occasional use of asphaltum and steatite. Most chronological sequences for Southern California recognize the introduction of the bow and arrow by 1500 B.P., marked by the appearance of small arrow points and arrow shaft straighteners.

Within the Los Angeles Basin, few sites have been identified that can be placed within this interval of prehistory. As discussed previously, the Phase-II and Phase-III components at CA-LAN-2 in Topanga Canyon are dated to this period. In addition, several sites south of Ballona Lagoon on the Del Rey bluffs confirm a rather well-developed Intermediate Horizon presence (Van Horn 1987; Van Horn and Murray, 1985). Projectile points from the Ballona Bluffs sites are, in some cases, similar to those found at sites in the southeastern California deserts, specifically in the Pinto Basin and at Gypsum Cave. This suggests that the coastal occupants of this period were in close contact with cultures occupying the eastern deserts. This is supported by the presence of Haliotis and Olivella shell beads in desert sites across Southern California.

Post 1500 B.P. Interval (Late Holocene)

Reliance on the bow and arrow for hunting along with the use of bedrock mortars and milling slicks mark the beginning of the tradition denoted as the "Late Prehistoric Horizon" by Wallace (1955) and the "Shoshonean Tradition" by Warren (1968), dating from about 1500 B.P. (anno Domini [A.D.] 500) to the time of Spanish contact (approximately A.D. 1769). Late prehistoric coastal sites are numerous. Diagnostic artifacts include small triangular projectile points, mortars and pestles, steatite ornaments and containers, perforated stones, circular shell fishhooks, and numerous and varied bone tools, as well as bone and shell ornamentation. Elaborate mortuary customs along with generous use of asphaltum and the development of extensive trade networks are also characteristic of this period.

The Late Horizon appears to represent increases in population size, economic complexity, social complexity, and the appearance of social ranking. King (1990) posits that the mortuary practices of the Intermediate and Late Horizons throughout Chumash territories evince social ranking, with beads used to confer status. Similarly, craft specialization on the northern Channel Islands has been linked to expanding economic capacities and emerging social ranking during the Late Period (Arnold, 1987). Although the motivating forces for such trends have yet to be identified with certainty, some researchers have suggested that economies controlled by social elites spurred increasing economic productivity and resultant population growth (Clewlow et al. 1978; King, 1990).

During the latter half of the late prehistoric occupation of the Southern California coastal region, pottery, ceramic pipes, cremation urns, rock paintings, and some European trade goods were added to the previous cultural assemblage (Meighan, 1954). Increased hunting efficiency (through use of the bow and arrow) and widespread exploitation of acorns and holly-leaf cherry (indicated by the abundance of mortars and pestles) provided reliable and storable food resources, which, in turn, promoted greater sedentism. Related to this increase in resource utilization and sedentism are sites with deeper middens, suggesting centrally based wandering or permanent habitation. These habitations would have been the villages, or rancherias, noted by the early European explorers (True, 1966 and 1970). By 500 B.P. (A.D. 1500), strong ethnic patterns developed among native populations in Southern California. The ethnic patterns could reflect accelerated cultural change brought about by increased efficiency in cultural adaptation and diffusion of technology from the central coastal region of California and the southern Great Basin (Douglas et al., 1981).

Coastal Los Angeles County is within the area of the Late Prehistoric Canaliño culture (Rogers, 1929), but later is marked by the Gabrieleno Tongva and Chumash. Because the Gabrieleno Tongva and Chumash material cultures were so similar, distinctions between these two groups are hard to detect archaeologically. One Canaliño site that has been investigated is CA-LAN-52, the Arroyo Sequit Site (Curtis, 1959 and 1963). Late Prehistoric/Canaliño

occupation of this site is believed to have first occurred approximately 2,000 years ago and persisted until the Mission Period (approximately A.D. 1800–1830). Probably one of the richest sites in coastal Southern California, the Malibu Site (CA-LAN-264) at the mouth of Malibu Creek also was occupied during this period (see Figure 3.7-2). At Malaga Cove near Santa Monica Bay, the upper two levels of a stratified midden deposit represent late prehistoric Canaliño occupation in Los Angeles. Level 3 deposits contained large mortars and long pestles, Haliotis shell fishhooks, tarring pebbles, and steatite vessels (Walker 1951). This Canaliño assemblage occurs also in the uppermost Level 4, but with the addition of arrow points, basket-hopper mortars, painted pebbles, glass beads, and burials attributable to the Gabrieleno Tongva.

Ethnohistory

During the protohistoric period, the Los Angeles region was inhabited by the Gabrieleno Tongva people. The Gabrieleno Tongva are characterized as one of the most complex societies in native Southern California, second perhaps only to the Chumash, their coastal neighbors to the northwest, in overall economic, ritual, and social organizational complexity (Bean and Smith, 1978; Kroeber 1925). The Gabrieleno Tongva, a Uto-Aztecan (or Shoshonean) group, might have entered the Los Angeles Basin as recently as 1500 B.P. from the southern Great Basin or interior California deserts. It is also possible that the Gabrieleno Tongva people migrated into the Los Angeles region in successive waves over a lengthy period of time beginning as early as 4000 B.P.

The Gabrieleno Tongva occupied a large territory, including the entire Los Angeles Basin, the coast from Malibu Creek to Aliso Creek, parts of the Santa Monica Mountains, the San Fernando Valley, the San Gabriel Valley, the San Bernardino Valley, the northern part of the Santa Ana Mountains, and much of the middle and lower Santa Ana River reaches. In addition, the Gabrieleno Tongva inhabited the islands of Santa Catalina, San Clemente, and San Nicolas (see Figure 3.7-2).

Within this large territory were more than 50 residential communities with populations that ranged from 50 to 150 individuals. Each community consisted of one or more lineages that maintained a permanent geographic territory including a permanent settlement, a variety of hunting and gathering areas, and ritual sites. A typical Gabrieleno Tongva settlement contained a variety of structures used for religious, residential, and recreational purposes. In the larger communities, a sacred enclosure generally was located near the center of the settlement, surrounded by the houses of the chief and other elite members of the community. Surrounding these structures were the smaller homes occupied by the rest of the community. Residences were of a characteristic Southern California style: domed, circular, thatched, and generally communal (two to four families per structure). Small, earth-covered sweathouses, ceremonial enclosures (with willow-stake fences), and menstrual huts generally were found in every village. Other features common at residential sites were level clearings used as playing fields, dance grounds, or cemeteries (McCawley, 1996).

Subsistence items described in ethnohistoric sources include large numbers of native grass seeds, six or more types of acorns, pinyon pine nuts, seeds and berries from various shrubs, fresh greens and shoots, mule deer, pronghorn, mountain sheep, rabbits and rodents, quail and waterfowl, snakes, lizards, insects, and freshwater fish, plus a wide variety of marine fish, shellfish, and sea mammals in coastal zones. Specific exploitation techniques described in ethnohistoric sources include rabbit drives in conjunction with seasonal controlled burning of chaparral, and the use of throwing sticks or nets in the capture of waterfowl in the low-lying marshlands found in places such as the Prado Basin. Reed rafts might have been used for marshland hunting (Priestley, 1937). This diverse inventory of subsistence resources was supplemented by additional supplies of deer skins, seeds, and acorns from interior groups such as the Serrano (Kroeber, 1925). Clothing was minimal and consisted, in colder seasons, principally of deerskin, rabbit fur, or birdskin capes, skirts, or blankets (Bean and Smith, 1978).

The material culture of the Gabrieleno Tongva is elaborate and in many ways comparable to that of the Chumash. Shell ornaments and beads, baskets, bone tools, flint weapons and drills, fishhooks, mortars and pestles, wooden bowls and paddles, shell spoons, wooden war clubs, and a variety of steatite items (cooking vessels, comals, and ornaments) are among the many types of artifacts common in descriptions of Gabrieleno Tongva culture (Blackburn, 1963). Highly developed artisanship is particularly evident in the many technomic implements inlaid with shell (using asphaltum) and in steatite items from production centers on Catalina Island.

As seen above, the Gabrieleno Tongva territory offered a rich and diverse resource base, which resulted in a society that was among one of the most materially wealthy and culturally sophisticated cultural groups in California (McCawley, 1996). The management of food resources by the chief was at the heart of the Gabrieleno Tongva economy. A portion of the daily hunting, fishing, or gathering activities was given to the chief who managed the community food reserves. Each family also kept a food supply for use in lean times. Additionally, the Gabrieleno Tongva territory lay at the center of an extensive trade network that extended east to the Colorado River and as far west as San Nicolas Island, which allowed the Gabrieleno Tongva to maintain trade relations with the Cahuilla, Serrano, Luiseño, Chumash, and Mojave cultural groups.

In general, the Gabrieleno Tongva cultivated alliances with other groups (such as the Chumash-Salinan-Gabrieleno Tongva alliance, for one [Bean, 1976]) and also maintained cult or ritual centers (such as the village Povongna) where trade fairs, mourning ceremonies, and other sorts of social and economic interactions linked villages of many zones into exchange and social partnerships. Strong (1929) indicates a loose ceremonial union was maintained among the Cahuilla, Luiseño, Serrano, and Gabrieleno Tongva, which was manifested in gifts of shell money sent by all to leaders of clans in which a death had occurred.

Trade was an important element of the Gabrieleno Tongva economy. While the principal commodity produced by the Gabrieleno Tongva, steatite vessels from centers on Catalina Island, originated well outside the defined study region, trade in

steatite items was conducted throughout the local territory and involved external relations with desert, southwestern, mountain, and coastal groups beyond Gabrieleno Tongva borders. Kroeber (1925) notes that the distribution of steatite and ceramic vessels is nearly mutually exclusive in Southern California. While the Gabrieleno Tongva and the Chumash used steatite (and baskets) for most container/storage needs, the Serrano, Luiseño, Cahuilla, Juaneño, Mojave, and others made ceramic pots and rarely used steatite. Conversely, Macko et al. (1983) suggest that steatite from distribution points at Redondo and San Pedro on the mainland shore reached the Serrano and Cahuilla, although exchange intensity to these groups is not specified. Olivella shell callus beads, manufactured on the northern Channel Islands by the Chumash and their predecessors, reportedly were used quite frequently as a currency by the Gabrieleno Tongva and other Southern California groups, particularly in situations when bartering methods were inappropriate or ineffective.

The first contact between the Europeans and the Gabrieleno Tongva is thought to have occurred in 1542 when the small Cabrillo fleet arrived at Santa Catalina Island. In 1602, the Sebastian Vizcaino expedition visited San Clemente and Santa Catalina islands and the mainland near San Pedro (McCawley, 1996). In 1769, the Gaspar de Portola expedition crossed the Gabrieleno Tongva homeland twice, and Mission San Gabriel was founded on September 8, 1771, at a location near the Whittier Narrows. Because of conflict, recruitment and conversion of the Native Americans remained slow for the first few years of the existence of the mission. Sometime around 1774, Mission San Gabriel was moved to its present location to obtain more suitable land for agriculture. A second mission, San Fernando, was established within Gabrieleno Tongva territory in 1797.

Mission life was highly regimented and contrasted sharply with the traditional Gabrieleno Tongva way of life. As a result, colonization had a dramatic and negative effect on Gabrieleno Tongva society, including fugitivism. The traditional Indian communities were depopulated and epidemics caused by the introduction of European diseases further reduced the population of Native Americans. Between 1832 and 1834, the government of Mexico implemented a series of secularization acts that theoretically were designed to turn over the mission lands to the native populations; however, most of this land was taken over by Mexican civilians. Thus, the primary result of secularization was increased fugitivism among the Gabrieleno Tongva (McCawley, 1996). The later American takeover of California brought further hardships to the Gabrieleno Tongva who eventually settled at small Native American and Mexican settlements in the Eagle Rock and Highland Park areas of Los Angeles as well as in Pauma, Pala, Temecula, Pechanga, and San Jacinto.

The ethnographic evidence suggests that several Gabrieleno Tongva settlements were located on the Los Angeles plain. Within the HSA, the expedition of Portola passed through a large Gabrieleno Tongva settlement on the west bank of the Los Angeles River known as Yaanga (alternatively spelled Yangna) on August 2, 1769. The precise location of Yaanga is uncertain because the original community was abandoned sometime prior to 1836 (Robinson, 1952). Covered today by downtown Los Angeles, no trace of this settlement likely has been visible for more than 130 years (Dillon, 1994). Dillon believes that Yaanga likely was located slightly to the south of the old

Spanish Plaza of Pueblo de Los Angeles, near where Bella Union Hotel was later built (Dillon, 1994) on Main Street above Commercial (Newmark and Newmark, 1930).

3.7.2.3 Historic Archaeological Setting

This summary of the history of Los Angeles offers a framework within which to identify and evaluate historic property types and land-use patterns as represented in local material culture.

Initial descriptions of the Los Angeles area come from Fray Juan Crespi, who traveled with the first Spanish incursion into the region, the Portola expedition, in 1769. He noted the area to be good land for planting all kinds of grain and seeds and the most suitable for a mission for it has all the requisites for a large village (Dillon, 1994). Mission San Diego de Alaca (San Diego) was established in 1769 and an additional 20 missions were established as Europeans attempted to colonize the remote western coast of the New World. These missions include San Fernando Rey de Espana (Mission Hills), established in 1797, and San Gabriel Archangel (San Gabriel), established in 1771, both in Los Angeles County. To reduce the military dependence on western missions, the Spanish government promoted several civilian-based agricultural colonies. These pueblos were required to supply agricultural surplus to the presidios. Los Angeles was known for its cultivation of wheat and corn (Hackel, 1997). To foster greater production, the pueblos were allowed to sell agricultural products not required by the military to Spanish supply ships.

The Pueblo of Los Angeles was established as a civilian settlement at the behest of the Spanish royal governor of California. Eleven families, a total of 44 people, recruited as colonists from Sinaloa, Mexico, founded the village of Nuestra Señora de la Reina de Los Angeles de Porciuncula on September 4, 1781. The first structures built in the fall of this year were described as "a dozen or so adobe structures surrounded by wooden palisades" (Dillon, 1994). This village provided housing for the newly arrived settlers and a military guard of four soldiers. By 1800, the village consisted of 30 adobe structures surrounding a central plaza and included a town hall, barracks, bodega (storehouse), and a calabozo (jail). All were enclosed in an adobe wall (Dillon, 1994). At the time of the establishment of El Pueblo de Los Angeles, the Spanish government provided strict rules governing the founding of a pueblo. Colonists to Alta California were required to construct an irrigation and public water conveyance system before all else. This resulted in the construction of the Zanja Madre, a major aqueduct with a series of ancillary ditches extending to nearby fields.

The settlement of Los Angeles, founded as a secular pueblo by the Spanish colonial government, survived the Spanish, Mexican, and American periods of control to emerge as the industrial metropolis it is today. Colonial effort culminated with the withdrawal of Spain from the New World in 1821.

Although Mexico declared independence from Spain, the new regime was unable to capitalize on colonial interest in Alta, California. In an attempt to strengthen control of the colonies and to reduce the influence of missions, the Colonization Act of 1824 was passed. It allowed for private and foreign land grants. The Secularization Act of 1833 went further and opened mission lands to Mexican loyalists seeking grants. With the abandonment of the mission system, land use around Los Angeles continued much as

it did before, focusing on agricultural and livestock production. Generally, an increase in ranching at the expense of dry farming, and extensive cattle ranches emerged to dominate the landscape. These operations were linked closely to the British tallow and hide trade that began during the Mission era. Anglo influence in the region increased, and between 1827 and 1833, 40 foreigners, most of whom were Anglo, settled in the Los Angeles area (Costello et al., 1996).

The Mexican-American War of 1846-1848 ended the tenuous hold that Mexico had on Alta, California. Migration of American settlers and traders to the region had already begun and increased in decades to follow. Discovery of gold in California drew many to the west coast. In Los Angeles, this meant a blending of Anglo American and Hispanic cultures. Population increased around existing Spanish settlements such as the pueblo and church. Communities developed along trails and traces that had been established between the once prosperous Spanish missions. Land reorganization and drought years, which devastated the cattle ranching, saw the expansion of Mission-era irrigation systems. As Beauchamp (1949) observed "the beginning of irrigation systems gave way to an engineered pattern of conduits and laterals."

In Los Angeles, the Zanja Madre (or Mother Ditch) was started in 1781 and flowed west of Alameda Street. It originally was composed of open ditches. Starting in the 1850s and continuing through the 1860s, branch channels were constructed to convey water to the vineyards and fruit orchards of the countryside. By 1888, the 52 miles of canal varied in construction from open ditches to wooden flumes, brick tunnels, cement channels, and finally iron pipes (SAIC, 1997).

The 1870s saw the connection of Southern California to the national railroad network and began a period of intensive urbanization (SAIC, 1997). The Los Angeles area experienced unprecedented regional growth in industry, residential development, and commerce. Population figures speak to the development of the period. In 1790, following the mapping of the pueblo, the population was 139. In 1800, it had increased to 310, and by 1830 the area had sustained a modest growth reaching 1,000. Following the first rail connection to the City in 1876, population increased twelvefold, reaching 12,000 people. In 1890, the City had grown to 50,100. In the following decades the population increased incrementally—102,500 in 1900; 319,000 in 1910; and 577,000 in 1920 (Swope, 1997).

During this period, the Southern Pacific Railroad arrived in Los Angeles (1876). In approximately 10 years, the Santa Fe Railway also reached the City (1885). Rail competition precipitated a California real estate boom from which Los Angeles and its environs benefited until 1888 (SAIC, 1997). The effects of the real estate boom years on the landscape were clear:

> *When the dust cleared, Los Angeles was a city of large buildings and paved streets, new colleges and churches, electric railroads and street lights. . . . The boom had, in fact, revolutionized Southern California—it swept away the vestiges of the Spanish origin and left it thoroughly Americanized in appearance and spirit (Nadeau, 1960; abstracted from Swope, 1997).*

Local transit lines, such as the Pacific Electric Railway and the Los Angeles Transit Line, provided intracity passenger transportation; residential communities began to

develop along its lines, spawning early suburbanization. Commercial and service-oriented businesses began to appear along these lines, and small ethnic enclaves or neighborhoods arose.

This period is characterized by the establishment of a well-defined regional image in economic, social, and cultural terms. The successful importation of water from Owens Valley in 1913 was at once a bold and ingenious engineering feat and an indication of Southern California's leaders [sic] resolve and a clear signal of the limitless potential of the land (SAIC, 1997).

The period population figures generally support this assessment. Between 1910 and 1920, population escalated from 319,000 to 577,000, due, in part, to the annexation of surrounding cities and townships as a mechanism to promote the controversial Los Angeles Aqueduct project (Swope, 1997). The land and water issues involved in this initiative speak to the growing political strength of the City boosters and engineers. Between 1930 and 1950, the local population continued to climb. In 1931, the population had reached 1,255,820; in 1940, the population was 1,504,277; and, by 1950, Los Angeles claimed just under 2,000,000.

Project-Specific Historic and Archaeological Data

An initial archaeological assessment was conducted of Hyperion, Tillman, LAG, NEIS II, and GBIS Alignments in September 2004. NEIS II and GBIS alignments and certain shaft sites also were identified during the tour.

Project-specific archaeological records and literature search were conducted on February 17, 2005, at the regional Information Center at California State University, Fullerton. The search included a review of all recorded archaeological sites within a 0.5-mile radius of those project components requiring site-specific clearance, including the Hyperion, Tillman, and LAG Treatment Plants, NEIS II, and GBIS. Limited archival research was performed to define prior land use within the site-specific areas of the four Project Alternatives and to evaluate the potential for preservation of archaeological deposits. In particular, historical bird's-eye view lithographs, Sanborn fire insurance maps, and other relevant documents and literature were reviewed for regional facilities where the Project parameters are generally defined.

A pedestrian and vehicular survey was conducted of all known shafts sites, drop sites, diversion structure sites, air treatment facility sites, and alternative alignments for the NEIS II and GBIS in March 2005.

Interested Native American individuals and tribes identified by the Native American Heritage Commission (NAHC) were contacted to gather information on issues of traditional cultural concerns in March 2005. Information gathered during the record search, limited archival research, site inspections, and Native American consultation are summarized for proposed facility improvements and the four Proposed Project Alternatives.

Archaeological Sensitivity

The results of the literature search and review of early historic records provided the basis for the general conclusions regarding site-specific archaeological sensitivity of

the Alternatives and components. Field inspections provided the opportunity to evaluate integrity and the likelihood that archaeological deposits have survived later period development.

Prehistoric Period

The Proposed Project is situated in the general region that was inhabited by the Gabrielino (see Section 4.7.2.1). The prehistoric sites identified by the records and literature search are 19-002345, 19-001110, and 19-000691. Site 19-002345 is located approximately 0.5-mile north of Hyperion, within the southwest corner of LAX, and consists of hundreds of stone tools, bone and shell fragments, and thermally affected stones (Bissel, 1995). Site 19-000691 is also on LAX property and consists of a shell scatter approximately 350 feet north of Imperial Highway at Virginia Street. The third prehistoric site (19-0001110) is located on Troost Street in Studio City. A cellar excavation in 1981 exposed more than 1,000 human bone fragments, ground stone tools, flaked stone tools, and shell (Singer and Schupp-Wessel, 1981). Numerous other sites have been discovered throughout areas covered by the program-level components of the Project. These sites include, but are not limited to, habitation sites, lithic scatters, bedrock milling slicks, and burials (see Walker, 1951; Warren, 1968, 1980, and 1984; True, 1958, 1966, and 1970, and others). Burial sites have been identified in locations including downtown Los Angeles and the Ballona Creek vicinity. Additionally, more than 2,800 sites have been documented in the Los Angeles Basin (Gabrielino-Tongva Tribe, 2004).

Within the existing treatment plants, ground disturbances are likely to have occurred during original construction. However, isolated pockets of intact native soils containing prehistoric deposits might have survived. Because of this previous disturbance, the prehistoric sensitivity for Hyperion, Tillman, and LAG generally is considered low. The area proposed for the storage tanks at LAG might be relatively undisturbed, and prehistoric sensitivity is considered high to moderate.

The proximity to large, permanent water sources such as the Los Angeles River, Ballona Creek, Compton Creek, and Tujunga Wash would have provided an attractive area for Native American populations and would have resulted in the establishment of habitation and resource procurement sites. Because much of the current project is adjacent to these water sources, the prehistoric sensitivity for the NEIS II and GBIS components (such as shaft sites and drop structures) is considered high to moderate.

The program-level components also have the potential to result in belowground disturbance. These disturbances include trenching for the recycled water pipeline and excavations that might be associated with dry and/or wet weather treatment plants.

Historic Period

Extensive research of early historical documents has not been undertaken at this stage of evaluation. Sanborn Fire Insurance Maps and bird's-eye-view maps, however, have been studied for evidence of early structures in the areas

of site-specific development. Hyperion and a number of commercial structures in the vicinity of LAG are depicted on the twentieth-century Sanborn maps. No structures are depicted on the nineteenth-century, bird's-eye-view maps for these areas.

The historic archaeological sites identified by the records and literature search include refuse deposits in Toluca Lake and Glendale, a World War II bunker on LAX property, and a mid-1800s limekiln situated adjacent to Crystal Springs Drive in Griffith Park. The records and literature search also identified the Feliz Adobe, listed in the City of Los Angeles Cultural Monuments. The adobe, possibly built in 1853 and remodeled in the 1920s, is located at 4730 Crystal Springs Drive, Griffith Park. Historic archaeological deposits could be associated with this property.

The historic archaeological property types likely to be present within the four Proposed Alternatives and program-level components are numerous and include structural remains, artifact-filled features such as wells, cisterns, privies, and agricultural components such as irrigation ditches.

Sensitivity within the existing treatment plants is similar to that outlined for the prehistoric sensitivity. Ground disturbance is likely to have occurred during original construction. However, isolated pockets of intact native soils containing important historic resources might have survived. Based on the current information available, the historic sensitivity for Hyperion, Tillman, and LAG is considered low. However, the possibility of occurrence of significant archaeological remains cannot be dismissed.

Detailed lot histories have not been produced for the shaft sites or other NEIS II and GBIS components, and the program-level components cannot be fully assessed at this time. Until a detailed work plan is developed that identifies or eliminates specific components and development sites, the historic sensitivity for these components must be assumed to be high to moderate.

Traditional Cultural Properties

The NAHC was notified prior to issuance of the NOP. The NAHC provided a Native American Contact List. All individuals and tribes listed by NAHC were contacted in writing in March of 2005.

All individuals and tribes were contacted by phone after April 7, 2005. Among the telephone responses received, the Los Angeles City/County Native American Indian Commission and the Gabrielino Tongva Indians of California Tribal Council expressed no concerns. The Tongva Ancestral Territorial Tribal Nation representative indicated he would review the letter of notification and call with any concerns.

On March 28, 2005, a representative from the Gabrielino Tongva relayed that all four Project Alternatives crossed their tribal territory. The tribal representative requested further notification of project design and

implementation schedules. Messages were left with the remaining organizations on the list provided by NAHC.

No traditional cultural properties were identified by Native American individuals or tribes contacted.

Potential for Discovery of Human Remains

A review of the Sacred Lands File maintained by the NAHC identified one archaeological site (CA-LAN-1575/H) of concern. While this site lies beyond the areas of potential effects (APEs) of the four Project Alternatives, the discovery of burials makes it relevant to the discussion of human remains. Construction of the Metropolitan Water District headquarters in 1996 resulted in the discovery of a Native American cemetery. In all, 14 primary burials and 5 secondarily deposited cremations were uncovered. Radiocarbon dates suggest that the primary interments date to the late prehistoric and protohistoric periods, while the cremations were deposited during the historic era. The location of the cemetery, osteological data, and mortuary practices strongly suggest that these interments represent Gabrielino (Tongva) tribal members. Based on these and other discoveries, the potential to encounter human remains along any of the four Project Alternatives or program-level components exists.

3.7.2.4 Historic and Architectural Resources Setting

Lists from various national, state, and local agencies were consulted for identification of resources of known architectural or historical significance within the HSA. These lists included the *National Register of Historic Places*, California Historic Landmarks, California Points of Historic Interest, State Office of Historic Preservation Historic Resources Inventory, and the City of Los Angeles List of Historic-Cultural Monuments. Additional information was obtained as a result of the records search performed by the South Central Coastal Information Center at the University of California Los Angeles, and a review of *Los Angeles: An Architectural Guide* (Gebhard and Winter, 2003). In addition, previous architectural/historic resource surveys that encompassed the vast majority of the HSA were consulted, including the Northeast Los Angeles District Plan completed for the Planning Department of the City of Los Angeles in 1990, the Wastewater Facilities Plan Update completed for the City of Los Angeles Department of Public Works in 1989, the North Outfall Sewer-East Central Interceptor Sewer project in 2001, and the Northeast Interceptor Sewer Project in 2002.

A field survey to identify historic and architectural resources that might be affected by the Proposed Project was undertaken by an architectural historian meeting the Secretary of the Interior Professional Qualifications Standards (48 FR 44738-9). The survey was undertaken only at Proposed Project locations that have the potential to affect aboveground buildings, structures, or objects, such as shaft sites and other surface construction areas. The survey did not include deep-tunnel configurations, because at that depth, the construction and operation would have no potential to damage or otherwise affect a building, structure, or object at surface level. The survey also did not include program-level elements of the Project, because their precise

locations or alignments are not yet known, and the study area for the survey cannot yet be determined. The survey applied National and *California Register* criteria to previously documented historic and architectural resources and to all newly identified buildings over 50 years of age within the HSA.

3.7.2.5 Project-Level Components

Hyperion

Paleontological Resources

Hyperion is located along the coastline where recently deposited beach and dune sand are underlain by Pleistocene nonmarine terrace deposits. Recent dune sand has little to no potential to contain fossils. Pleistocene San Pedro Sand and Palos Verde Sand also are exposed at the surface. Among these, the Pleistocene terrace deposits, San Pedro Sand, and Palos Verde Sand are assigned a high paleontological sensitivity level in Los Angeles County.

Between Ballona Creek and LAX, the Los Angeles County Museum of Natural History (LACM) reported that fossil localities LACM 1180, 3264, 3789, 4942, and 7332 yielded remains of mammoth (*Mammuthu*s), rabbit (*Lepus*), horse (*Equus*), bison (*Bison*), rodents (*Rodentia*), flounder (*Citharichthys stigmaeus*), and marine mammals such as fur seals and sea lions from Pleistocene deposits at depths as shallow as 13 feet. Locality LACM 1024 produced holotype specimens (name-bearing specimens new to science) of two bivalve clams (*Rochefortia reyana* and *Bornia cooki*) and a sea bird (*Moris reyana*) from uplifted cliffs at a depth of only 2 to 4 feet.

Archaeological Resources

The 1929 Sanborn Map of El Segundo depicts the Los Angeles City Sewage Treatment Plant. Two large, solid removal houses surrounded by 10 small structures, including offices, a blacksmith shop, and pump houses, are located east of Vista Del Mar. The map also notes that the plant, which began operations in 1925, is in Los Angeles City. The World War II bunker (19-002386) is the only historic archaeological resource recorded in the vicinity of Hyperion. Prehistoric site 19-002345 is located approximately 0.5-mile north of Hyperion in the southwest corner of LAX property, and consists of hundreds of stone tools, bones, shell fragments, and thermally affected stones (Bissel, 1995). Site 19-000691 is also on LAX property and consists of a shell scatter approximately 350 feet north of Imperial Highway at Virginia Street.

No previously recorded archaeological resources were identified within the APE. Further, no sites were identified during field reconnaissance. Hyperion is wholly developed, and no archaeological resources are visible at the surface. No traditional cultural properties have been identified within the APE.

Historic and Architectural Resources

Hyperion, located on Vista Del Mar in Los Angeles, was within Section 106 APE of the Wastewater Facilities Plan Update, and was evaluated as a result of the Section 106 compliance process in 1989. The 1989 APE did not extend beyond the Hyperion property boundaries. At the time of the 1989 survey,

none of the buildings, structures, or objects in the Hyperion APE was determined to be eligible for the *National Register*.

Consultation with SHPO would be undertaken to determine if properties within the Hyperion APE need to be re-evaluated because of their increased age or changes in evaluation methods or criteria that could have occurred since 1989.

Hyperion is recommended as not eligible for listing in the National Register of Historic Places (NRHP). Hyperion also is recommended as not eligible for listing in the California Register of Historic Resources (CRHR).

Tillman

Paleontological Resources

Tillman is located in the southern San Fernando Valley, the surface of which is mainly composed of Quaternary younger alluvium (11,000 years B.P. and younger) with little or no potential to contain fossil resources. Pleistocene Older Alluvium with high paleontological resource sensitivity underlies the Younger Alluvium. This area, therefore, has a potential to contain fossil resources when Pleistocene Alluvium and older sediments are excavated.

The LACM reported four fossil localities in the vicinity (LACM 1146, 3263, 3822, and 6208). LACM 1146 yielded mastodon (*Mammut americanum*), horse (*Equus occidentalis*), and camel (*Camelidae*) from a gravel pit at depths of 160 to 170 feet. LACM 3263, 3822, and 6208 yielded horse (*Equus*) at 14 feet; bison at 20 feet; and extinct peccary (*Platygonus*), camel (*Camelops*), and bison (*Bison*) remains at 75 to 100 feet below the surface.

Archaeological Resources

Tillman is not depicted on historical Sanborn Maps. Additionally, this evaluation did not undertake an intensive study of the local history. Yet, based on the 1955 Los Angeles map (Volume 45), this area appears to have undergone little development. It is described simply as the Sepulveda Flood Control Basin. No recorded historic archeological sites were identified within the record, the literature search boundaries, or within or close to the APE. No sites were identified during field reconnaissance, and no traditional cultural properties have been identified within the APE.

Historic and Architectural Resources

Tillman was within the Section 106 APE of the Wastewater Facilities Plan Update and was evaluated as a result of the Section 106 compliance process in 1989. The 1989 APE was extended beyond the Tillman property to the limits defined as Victory Boulevard to the north, Woodley Avenue to the west, Burbank Boulevard to the south, and I-405 to the east. At the time of the 1989 survey, none of the buildings, structures, or objects in the Tillman APE was determined to be eligible for the *National Register*.

The Los Angeles Flood Control District was constructed after the flood of 1938, and associated elements in the Tillman APE might have reached 50 years of

age, which would require evaluation under the *National Register* and *California Register* criteria.

Consultation with SHPO will be required to determine if properties within the Tillman APE need to be re-evaluated because of their increased age or changes in evaluation methods or criteria that might have occurred since 1989.

Tillman is recommended as not eligible for listing in the NRHP. Tillman is also recommended as not eligible for listing in the CRHR.

Los Angeles-Glendale Water Reclamation Plant

Paleontological Resources

LAG is located in an area where surface geology includes younger alluvium, Pleistocene nonmarine alluvium, and the Puente, Monterey, and Fernando Formations. The Los Angeles River drainage consists chiefly of Holocene younger gravels. The Pleistocene non-marine alluvium and Puente, Monterey, and Fernando Formations have high paleontological resources sensitivity.

The LACM reported that fossil locality LACM 1880 northeast of the Los Angeles River in this area yielded bony fish remains from hatchetfish (*Argyropelecus bullockii*), bristlemouth (*Cyclothone*), herring (*Etringus*), rockfish (*Scorpaenidae*), extinct deep sea fish (*Chauliodus*), slickheads (*Alepocephalidae*), cod (*Eclipes*), and croaker (*Lompoquia*) from the Puente Formation at unrecorded depths.

Archaeological Resources

The 1930 Sanborn Map of Los Angeles (Volume 40) covers the area east of the Los Angeles River, from Colorado Boulevard south to Goodwin Avenue. The map depicts a variety of commercial structures including a foundry, winery, ornamental streetlight post manufacturers, and stucco manufacturing company. By 1951, the area had become increasingly industrial, and businesses included the Pacific Coast Elevator Company, perfume manufacturers, and foundries. The Sanborn Maps do not cover the area immediately adjacent to, and east of, the Los Angeles River. However, structures are known to exist as far west as APN 5593020012, at the western termination of Goodwin Avenue. In 1930 the parcel contained four structures associated with stucco manufacturing. In 1951 four structures including a laboratory, a woodworking business, and a small aggregate warehouse were depicted on the parcel. None of the structures depicted on the Sanborn maps are within the LAG footprint. The records and literature search indicates that one historic resource was identified in the Glendale area. Structural remains and a refuse deposit were discovered at the site of the former Glendale Sanitarium on Wilson Avenue. Monitoring during construction at the site (19-002914) retrieved a variety of artifacts associated with the day-to-day activities at the Sanitarium between 1888 and 1924 (Warren, 2001).

No recorded archaeological resources were identified within the APE of the LAG plant site, and no sites were identified during field reconnaissance. Finally, no traditional cultural properties have been identified within the APE.

Historic and Architectural Resources

LAG, located at the southeast junction of the Los Angeles River Flood Control Channel and Colorado Boulevard between Griffith Park and the City of Glendale, was within the Section 106 APE of the Wastewater Facilities Plan Update, and was evaluated as a result of the Section 106 compliance process in 1989. The 1989 APE was extended beyond the LAG property to limits defined as Colorado Boulevard to the north, the Los Angeles River to the west, Goodwin Avenue to the south, and San Fernando Road to the east. At the time of that survey, none of the buildings, structures, or objects in the LAG APE was found eligible for the *National Register*. In 1989, the buildings within the LAG APE that were evaluated and found ineligible for the *National Register* included:

- Renfrow Foundry, 4552 Colorado Boulevard, built 1963
- EECO Elevator Equipment Building, 4059 Goodwin Avenue, built 1929
- Robert E. McKee, Inc., 4701 San Fernando Road, built around 1942

Consultation with SHPO will be required to determine if these or other properties within the LAG APE need to be re-evaluated because of their increased age or changes in evaluation methods or criteria that might have occurred since 1989.

LAG is recommended as not eligible for listing in the NRHP. LAG is also recommended as not eligible for listing in the CRHR.

NEIS II

Paleontological Resources

Younger alluvium and Pleistocene non-marine alluvium are the dominant formations that occur along the length of the proposed NEIS II construction site. Exposures of the Monterey and Puente Formations are also within the surrounding area.

The NEIS II West Alignment tunnel would be constructed in an area where Quaternary younger alluvium and Pleistocene older non-marine alluvium are present. However, most of the Alignment would be constructed within the Pleistocene non-marine alluvium. Puente and Monterey Formations may be present in the southern portion of the NEIS II Alignment. The Pleistocene alluvium and Puente and Monterey Formations have a high potential to contain fossil resources and have high paleontological resource sensitivity.

The LACM reported that fossil locality LACM 1880 northeast of the Los Angeles River in this area yielded bony fish remains from hatchetfish (*Argyropelecus bullockii*), bristlemouth (*Cyclothone*), herring (*Etringus*), rockfish (Scorpaenidae), extinct deep sea fish (*Chauliodus*), slickheads (Alepocephalidae), cod (*Eclipes*), and croaker (*Lompoquia*) from the Puente Formation at unrecorded depths. Localities LACM 3882, 6934, 7017, and 7507 in the area near I-5 and I-110 produced the holotype specimen of the fossil cetotheriid baleen whale, *Mixocetus elysius,* a second baleen whale skull, a

bony fish, and a snake mackerel (*Thyrsocles kriegeri*) from the Puente Formation, also at unrecorded depths.

Archaeological Resources
Because an alignment has not been selected, Sanborn maps of alignment alternatives were not examined.

Sanborn Maps provide no coverage of the shaft sites with the exception of the Verdant site. The 1951 map depicts the site as vacant land associated with the Gladding McBean and Co. Glendale Plant. The company manufactured pottery, tile, and sewer pipe at the plant. The Glendale Sanitarium site discussed above also falls within the record search boundaries.

No previously recorded sites were identified within the APE, and no sites were located during field reconnaissance. Finally, no traditional cultural properties have been identified within the APE.

Historic and Architectural Resources
Division Street. The Division Street shaft site was previously evaluated as part of a Section 106 study for NEIS (Phase 1) in 2001. The Section 106 study never reached formal SHPO review and concurrence. The following building within the APE for this site was found eligible for the *National Register*, and concurrence with this finding would be requested from SHPO as part of the current project Section 106 compliance.

- Hemphill Diesel School at 2121 San Fernando Road, built 1923, eligible for the *National Register* under criterion C at the local level for embodying modest but distinctive characteristics of the Streamline Moderne style of architecture as applied to an industrial school building.

The Hemphill Diesel School is recommended to be eligible for listing in the NRHP and the CRHR.

Griffith Park at Crystal Springs. The Crystal Springs shaft site would be constructed within an approximate 1.8-acre triangular-shaped piece of land located immediately to the south east of the Griffith Park Headquarters, between Crystal Springs Drive and the I-5 Freeway.

Verdant Street at Alger Street. One aboveground building within the APE for the Verdant Street shaft site, a light industrial warehouse located at 4200-4220 Verdant Street, is less than 50 years of age.

The light industrial warehouse is not currently designated under a federal, state, or local historic preservation law, and because it is less than 50 years of age and has no known overriding significance, it would not require further evaluation under Section 106 and CEQA.

GBIS

Paleontological Resources

GBIS would follow a segment of the Los Angeles River where younger alluvium is underlain by Pleistocene older alluvium. Sediments within the Los Angeles River drainage itself consist chiefly of Holocene gravels.

Pleistocene older alluvium, a paleontologically sensitive unit, underlies the younger alluvium. This area, therefore, has the potential to contain fossil resources when the older alluvium and older sediments are exposed. Sediments within the Los Angeles River drainage itself consist chiefly of Holocene younger gravels with little or no potential to contain fossil resources.

The LACM reported that fossil locality LACM 6970 near the SR 134 and Lankershim Boulevard yielded ground sloth (*Glossothereium harlani*), elephant (*Proboscidea*), camel (*Camelops hesternus*), and bison (*Bison antiquus*) remains from Pleistocene older alluvium at depths of up to 60 to 80 feet during Metrorail excavations. Localities LACM 6306, 6385, and 6386 produced stickleback fish (*Gasterosteidae*), frog (*Rana* and *Hylidae*), lizard (*Gerrhonotus* and *Uta*), snake (*Thamnophis* and *Tantilla*), bird (*Aves*), shrew (*Sorex*), rabbit (*Sylvilagus*), and rodent (*Perognathus, Thomomys, Dipodomys, Micortus,* and *Peromyscus*) at depths between 40 to 60 feet.

Archaeological Resources

Sanborn maps provide no coverage of the GBIS shaft sites.

The records and literature search indicates site 19-0001110 is located on Troost Street in Studio City. A cellar excavation in 1981 exposed more than 1,000 human bone fragments, ground stone tools, flaked stone tools, and shell (Singer and Schupp-Wessel, 1981). Also identified within literature search boundaries are sites 19-000797, located in Griffith Park, the resource is identified as a pre-1843 limekiln on the south side of Zoo Drive in the vicinity of Travel Town; 19-003304, a mid- to late twentieth century refuse dump, located in Weddington Park, Toluca Lake; and 19-001418, a nineteenth and twentieth century refuse dump in the vicinity of the Tujunga Wash in North Hollywood.

No previously recorded sites were identified within the APE and no sites were identified during field reconnaissance. Finally, no traditional cultural properties have been identified.

Historic and Architectural Resources

Los Angeles Zoo at Zoo Drive and Heritage Drive. No aboveground buildings were identified within the proposed APE for the Los Angeles Zoo shaft site that would require evaluation under Section 106 and CEQA.

Travel Town. No aboveground buildings were identified within the APE for the Travel Town shaft site that would require evaluation under Section 106 and CEQA.

Barham Shaft Site. One aboveground building is located within the APE for the Barham shaft site. The Oakwood Apartments, an apartment complex built in 1971, located at 3500 Barham Boulevard, is adjacent to the Barham shaft site. The property is less than 50 years of age.

The Oakwood Apartments currently are not designated under a federal, state, or local historic preservation law, and because they are less than 50 years of age and have no known overriding significance, they would not require further evaluation under Section 106 and CEQA.

Woodbridge Park Shaft Site. Woodbridge Park, located at 11240 Moorpark Street, is less than 50 years of age, does not appear to be a historic park and would not require further evaluation under Section 106 and CEQA.

A residential block located along the west side of Elmer Avenue, across the street from the proposed Woodbridge Park Shaft Site, contains nine single-family residences, and one two-story apartment building. These 10 aboveground buildings are within the APE for the Woodbridge Park shaft site and are more than 50 years of age. They are listed as follows:

- Single-Family Residence, 4333 Elmer Avenue (1940)
- Single-Family Residence, 4339 Elmer Avenue (1946)
- Single-Family Residence, 4343 Elmer Avenue (1946)
- Single-Family Residence, 4349 Elmer Avenue (1946)
- Single-Family Residence, 4355 Elmer Avenue (1938)
- Single-Family Residence, 4359 Elmer Avenue (1940)
- Single-Family Residence, 4365 Elmer Avenue (1937 and 1943)
- Single-Family Residence, 4369 Elmer Avenue (1937)
- Single-Family Residence, 4375 Elmer Avenue (1939 and 1944)
- Apartment Building, 11302 Moorpark Street (1955)

In addition, Oakwood School, a private elementary school is located on the parcel adjacent to Woodbridge Park, to the east. The Oakwood School is more than 50 years of age.

- Oakwood School, 11230 Moorpark Street (1952 and 1958)

None of these buildings is currently designated under a federal, state, or local historic preservation law, but they would require further evaluation under *National Register* criteria for the purposes of Section 106 and *California Register* criteria for the purposes of CEQA.

The nine single-family residences, one apartment building, and one school are recommended to be not eligible for listing in the NRHP or the CRHR.

Riverside East Shaft Site. One building located at 1311 Garden Street will require no further evaluation because it was constructed in 1967 and does not meet the 50-year age criterion of the *National Register* and *California Register*.

Known historic properties and historic resources were identified within Griffith Park, including the Griffith Observatory, Greek Theatre, Ferndell,

Mount Hollywood, the Bird Sanctuary, the Astronomer's Monument, the Los Feliz Adobe, the Merry-Go-Round, the Harding Golf Course Clubhouse, Swimming Pool and Building, the Boys Camp, and the Mulholland Fountain. Mature trees, including oaks and sycamores, rock walls, retaining walls, bridle paths, and fences distinguish the park landscape.

- Griffith Park – 11240 Riverside Drive, Los Angeles 91602

Fifteen aboveground buildings within the APE for the Riverside East shaft site are more than 50 years of age. Two of the 15 buildings are maintenance structures in this portion of Griffith Park:

- Pump house
- Maintenance building of unknown use

The remaining 13 buildings are single-family residences located in two residential blocks along the east side of Garden Street in the City of Glendale:

- Single-Family Residence, 1309 Garden Street (1935 and 1940)
- Single-Family Residence, 1321 Garden Street (1939 and 1941)
- Single-Family Residence, 1329 Garden Street (1939 and 1944)
- Single-Family Residence, 1403 Garden Street (1937 and 1945)
- Single-Family Residence, 1409 Garden Street (1937 and 1939)
- Single-Family Residence, 1415 Garden Street (1939)
- Single-Family Residence, 1419 Garden Street (1937)
- Single-Family Residence, 1425 Garden Street (1939 and 1944)
- Single-Family Residence, 1429 Garden Street (1939)
- Single-Family Residence, 1433 Garden Street (1940 and 1945)
- Single-Family Residence, 1435 Garden Street (1952)
- Single-Family Residence, 1447 Garden Street (1940)
- Single-Family Residence, 322 Sonora Avenue (1939)

These buildings currently are not designated under a federal, state, or local historic preservation law, but would require evaluation under *National Register* criteria for the purposes of Section 106 and *California Register* criteria for the purposes of CEQA.

These structures are recommended to be not eligible for listing in the NRHP or the CRHR.

Valley Heart. Four aboveground buildings greater than 50 years old are located on a residential block of Valley Heart Drive within the APE for the Valley Heart shaft site, as follows:

- Single-Family Residence, 1500 W. Valley Heart Drive (1940 and 1942)
- Single-Family Residence, 1510 W. Valley Heart Drive (1950 and 1954)
- Single-Family Residence, 1522 W. Valley Heart Drive (1937)
- Single-Family Residence, 905 S. Beachwood Drive (1939 and 1950)

These buildings currently are not designated under a federal, state, or local historic preservation law, but would require evaluation under *National Register*

criteria for the purposes of Section 106 and *California Register* criteria for the purposes of CEQA.

These structures are recommended to be not eligible for listing in the NRHP or the CRHR.

Riverside West Shaft Site. One building located at 529 N. Catalina Street would require no further evaluation because it was constructed in 1980 and does not meet the 50-year age criterion of the *National Register* and *California Register*.

Four aboveground buildings within the APE for the Riverside West shaft site are more than 50 years of age, as follows:

- Single-Family Residence, 515 N. Catalina Street (1949 and 1956)
- Single-Family Residence, 521 N. Catalina Street (1950 and 1952)
- Single-Family Residence, 525 N. Catalina Street (1948 and 1972)
- Apartment, 2900 W. Riverside Drive (1941)

These buildings currently are not designated under a federal, state, or local historic preservation law, but would require evaluation under *National Register* criteria for the purposes of Section 106 and *California Register* criteria for the purposes of CEQA.

These structures are recommended to be not eligible for listing in the NRHP and the CRHR.

3.7.2.6 Program-Level Components

The archaeological setting for the program-level components would be the setting as described under the general archaeological setting above.

VSLIS

Paleontological Resources

The VSLIS Alignment would be constructed in the San Fernando Valley where Quaternary younger alluvium is present at the surface and underlain by Pleistocene older alluvium and older geologic units. The exact alignment of VSLIS has not been determined, but the currently proposed alignment would cross a small area just north of U.S. 101 where Pleistocene non-marine sediments are present at the surface. The proposed VSLIS generalized alignment, therefore, has the potential to contain paleontological resources where Pleistocene older alluvium and older geologic units are present.

The LACM reported four fossil localities in the vicinity of the proposed VSLIS generalized alignment: LACM 1146, LACM 3263, LACM 3822, and LACM 6208). LACM 1146 yielded mastodon (*Mammut americanum*), horse (*Equus occidentalis*) and camel (*Camelidae*) from a gravel pit at depths of 160 to 170 feet. LACM 3263, LACM 3822, and LACM 6208 yielded horse (*Equus*) at 14 feet, bison at 20 feet, extinct peccary (*Platygonus*), camel (*Camelops*), and bison (*Bison*) remains at 75 to 100 feet below the surface.

Archaeological Resources

Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources. Archaeological resources could be identified within the HSA after the specific location of VSLIS is determined.

Historic and Architectural Resources

The specific alignment options for VSLIS have not yet been identified or developed. VSLIS could be constructed using either tunneling or open-trench construction methods. If VSLIS is constructed using tunneling methods, and assuming that it would be constructed at similar depths as those for GBIS and NEIS II, construction and operation would have little or no potential to damage or otherwise affect a building, structure, or object at surface level.

However, VSLIS would involve construction of shaft sites and surface staging areas. The construction of shaft sites might or might not affect historic resources, depending on whether or not such resources are present.

If VSLIS is constructed using open-trench methods, construction for the most part would be confined to public street right of ways, where little or no likelihood would exist for significant impacts to potential historic resources that might be located on adjacent parcels.

If historic resources are present along a right of way, their sensitivity to open trench construction and construction activities at shaft sites and surface staging areas would be evaluated. Those found to be potentially eligible for listing would be evaluated according to Section 106 and CEQA regulations.

Recycled Water

Paleontological Resources

The recycled water distribution facilities would be constructed throughout the HSA and TISA (see Figure 3.7-1). Recycled water distribution facilities would be implemented in areas where Quaternary younger alluvium is underlain by Pleistocene older alluvium and older geologic units. Throughout the HSA and TISA, Quaternary younger alluvium through Miocene Topanga Formation are present at the surface. The exact locations of the recycled water facilities have not yet been determined, but the proposed locations for recycled water facilities have the potential to contain paleontological resources where Pleistocene older alluvium and older geologic units are present.

In the vicinity of Terminal Island, the LACM reported numerous fossil localities, including LACM 4167 and LACM 4587. These sites yielded remains of ground sloth (*Xenartha*), fur seal (*Arctocephalis*), whale *(Cetacea*), rockfish (*Sebastes*), and camel (*Camelops*) from a depth of 12 feet. South of Ballona Creek, localities LACM 1180, LACM 3264, LACM 3789, LACM 4942, LACM 7332 and LACM 1024 yielded remains of mammoth (*Mammuthus*), rabbit (*Lepus*), horse (*Equus*), bison (*Bison*), rodents (*Rodentia*), flounder (*Citharichthys stigmaeus*), and marine mammals such as fur seals and sea lions from Pleistocene deposits at depths between 2 and 70 feet. Locality LACM 1024

produced holotype specimens of two clams (*Rochefortia reyana* and *Bornia cooki*) and a sea bird (*Moris reyana*) from uplifted cliffs at a depth of only 2 to 4 feet.

North of Ballona Creek, the pipelines would enter Pleistocene marine and nonmarine sediments near the surface. In this area, the LACM reported localities LACM 3366, LACM 3367, LACM 3368, LACM 3369, LACM 3370, and LACM 4250, yielding camel (*Camelops*), mastodon (*Mammut*), horse (*Equus*), saber-tooth cat (*Smilodon*), and mammoth (*Mammuthus*) remains, respectively, at depths as shallow as 6 feet. Fossilized human remains were found in localities LACM 1159 and LACM 4232.

North of U.S. 101 in the Echo Park area, high sensitivity Upper Miocene marine deposits (Puente Formation) are present. The LACM reported that locality LACM 4967 in this vicinity produced the holotype specimen of an extinct herring (*Clupea tiejei*) from an unrecorded depth.

Pipelines extending south of the U.S. 101 in the Woodland Hills-Tarzana area would enter areas containing high sensitivity Upper Miocene marine deposits (Puente Formation). In this area, the LACM reported localities such as LACM 3173, LACM 5657, and LACM 6186 that yielded remains of shearwater (sea bird) (*Puffinus*), baleen whale (*Mysticeti*), whale (*Cetacea*), sea lion (*Allodesmus*), and a suite of fish including bonito shark (*Isurus hastalis* and *Isurus planus*), tiger shark (*Galeocerdo aduncus*), white shark (*Carcharocles*), herring (*Ganolytes*), and a rare extinct marine mammal (*Paleoparadoxia*) from unrecorded depths.

In the area around Hansen Dam, localities LACM 1146, LACM 3263, LACM 3822, and LACM 6208 occurred in Pleistocene older alluvium underlying Holocene younger alluvium, yielding horse (*Equus occidentalis*), camel (*Camelidae* and *Camelops*), bison (*Bison*), mastodon (*Mammut americanum*), and peccary (*Platygonus*).

The floor of the west-central San Fernando Valley consists largely of high-sensitivity Pleistocene older alluvium underlying younger alluvium. High-sensitivity Miocene marine deposits (Monterey, Puente, and Topanga Formations) are present along the western and southern edges of the valley. LACM 3397, LACM 7152, and LACM 1733 produced bison *(Bison*), fossil mammoth (*Mammuthus)*, and horse (*Equus*) in Quaternary old alluvium and terrace deposits to the north of the Project boundary in this area.

Archaeological Resources

The presence or absence of known prehistoric and historic archaeological resources in the vicinity of recycled water distribution facilities currently is not known because the specific locations of the facilities have not yet been determined. Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources, and archaeological resources could be identified within the HSA once the locations of recycled water distribution facilities are determined.

Historic and Architectural Resources

The presence or absence of known historic and architectural resources in the vicinity of recycled water distribution facilities currently is not known because the specific locations of the facilities have not yet been determined. Historic and architectural resources have been found within the HSA. Historic and architectural resources could be identified within the HSA once the locations of recycled water distribution facilities are determined.

Dry Weather Runoff – Smart Irrigation

The installation of smart irrigation devices would occur throughout the City, but they would be devices that are connected with existing and new automated irrigation systems. Such devices would not be expected to affect archaeological, paleontological, or historic resources.

Dry Weather Runoff – Low-flow Diversions

Paleontological Resources

Dry weather runoff – low-flow diversions would be constructed adjacent to the Santa Monica Bay (see Figure 3.7-1) where Quaternary Dune Sand through Tertiary Sespe Formation are present at the surface. Additionally, low-flow diversion would be constructed in the San Fernando Valley where Quaternary younger alluvium is underlain by older alluvium and older geologic units. Low-flow diversions would be constructed southeast of downtown Los Angeles, an area where Quaternary younger alluvium through Miocene Monterey Formation are known to be present. The exact locations of the low-flow diversions have not yet been determined, but the proposed low-flow diversion locations have the potential to contain paleontological resources where Pleistocene older alluvium and older geologic units are present.

The LACM reported that locality LACM 6384 in Pacific Palisades yielded white shark (*Carcharocles* and *Carcharodon carcharias*) specimens from unrecorded depths in the Fernando Formation.

Between Ballona Creek and LAX, the LACM reported that localities LACM 1180, LACM 3264, LACM 3789, LACM 4942, and LACM 7332 yielded the remains of mammoth (*Mammuthus*), rabbit (*Lepus*), horse (*Equus*), bison (*Bison*), rodent (*Rodentia*), flounder (*Citharichthys stigmaeus*), and marine mammals such as fur seals and sea lions from Pleistocene deposits at depths as shallow as 13 feet. Locality LACM 1024 produced holotype specimens of two clams (*Rochefortia reyana* and *Bornia cooki*) and a sea bird (*Moris reyana*).

The western San Fernando Valley floor generally is lacking in recorded fossil localities, but the LACM reported that LACM 4506 southeast of Chatsworth Reservoir yielded specimens of bony fish (*Osteichthyes*) from an unrecorded depth and that lanternfish remains (*Myctophidae*) were found at an unrecorded depth in LACM 5125 in Woodland Hills. Typical fossil localities recorded from Pleistocene older alluvium in the general vicinity (LACM 1146, LACM 3263, LACM 3822, and LACM 6208) yielded mastodon (*Mammut americanum*), horse (*Equus occidentalis*), camel (*Camelidae* and *Camelops*), bison (*Bison*), and peccary (*Platygonus*) remains at depths as shallow as 14 feet.

The nearest locality to the area southeast of downtown Los Angeles reported by the LACM is LACM 6971 in the western downtown area that yielded remains of eagle ray (*Myliobatis*), white shark (*Carcharodon carcharias*), bonito shark (*Isurus oxyrinchus*), requiem shark (*Carcharhinus*), and sheephead fish (*Semicossyphus*) from the Fernando Formation at unrecorded depths.

Archaeological Resources

The presence or absence of known prehistoric and historic archaeological resources in the vicinity of dry weather runoff – low-flow diversions currently is not known because the specific locations of the diversions have not yet been determined. Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources, and archaeological resources could be identified within the HSA once the locations of low-flow diversions are determined.

Historic and Architectural Resources

The presence or absence of known historic and architectural resources in the vicinity of dry weather runoff – low-flow diversions currently is not known because the specific locations of the facilities have not yet been determined. Historic and architectural resources have been found within the HSA, and historic and architectural resources could be identified within the HSA once the locations of low-flow diversions are determined.

Dry Weather Runoff – Urban Runoff Plants or Treatment Wetlands

Paleontological Resources

Dry weather runoff – urban runoff plants or treatment wetlands would be constructed at the head of Ballona Creek, in Quaternary nonmarine deposits and Quaternary marine deposits, and on Compton Creek where Quaternary nonmarine terrace deposits are present at the surface. Urban runoff plants or treatment wetlands in the western San Fernando Valley would be implemented where Quaternary younger alluvium is underlain by Pleistocene older alluvium and older units.

Additionally, URPs or treatment wetlands would be constructed in the western San Fernando Valley where Quaternary younger alluvium is underlain by older alluvium and older geologic units.

The exact locations of the URPs or treatment wetlands have not yet been determined, but the general URPs and treatment wetlands locations (Figure 3.7-1) have the potential to contain paleontological resources where Pleistocene older alluvium and older geologic units are present.

The LACM reported that localities LACM 3366, 3367, 3368/3369, 3370, and 4250 near the head of Ballona Creek yielded fossil camel (*Camelops*), mastodon (*Mammut*), horse (*Equus*), sabertooth cat (*Smilodon*), and mammoth (*Mammuthus*), respectively, at depths as shallow as 6 feet. Fossilized human remains were found in localities LACM 1159 and LACM 4232 at depths of 19 and 12 feet, respectively.

The LACM reported that fossil localities LACM 3382 and 4206 near Compton Creek yielded remains of mammoth (*Mammuthus*) from Pleistocene sediments at depths as shallow as 5 feet.

The western San Fernando Valley floor generally is lacking in recorded fossil localities, but the LACM reported that LACM 4506 just southeast of Chatsworth Reservoir yielded specimens of bony fish (*Osteichthyes*) from an unrecorded depth and that lanternfish remains (*Myctophidae*) were found at an unrecorded depth in LACM 5125 in Woodland Hills. Typical fossil localities recorded from Pleistocene older alluvium in the general vicinity (LACM 1146, LACM 3263, LACM 3822, and LACM 6208) yielded mastodon (*Mammut americanum*), horse (*Equus occidentalis*), camel (*Camelidae* and *Camelops*), bison (*Bison*), and peccary (*Platygonus*) remains at depths as shallow as 14 feet.

Archaeological Resources

The presence or absence of known prehistoric and historic archaeological resources in the vicinity of dry weather runoff – urban runoff plants or treatment wetlands currently is not known because the specific locations of the URPs or treatment wetlands have not yet been determined. Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources. Archaeological resources could be identified within the HSA once the locations of URPs and treatment wetlands are determined.

Historic and Architectural Resources

The presence or absence of known historic and architectural resources in the vicinity of Dry Weather Runoff – Urban Runoff Plants or Treatment Wetlands currently is not known because the specific locations of the facilities have not yet been determined. Historic and architectural resources have been found within the HSA. Historic and architectural resources could be identified within the HSA after the locations of URPs or treatment wetlands are determined.

Wet Weather Runoff – Onsite Management

Paleontological Resources

The wet weather runoff – onsite management facilities would be constructed throughout the HSA(Figure 3.7-1). Onsite management facilities would be implemented in areas where Quaternary younger alluvium is underlain by Pleistocene older alluvium and older geologic units. Throughout the Project, Quaternary younger alluvium through Miocene Topanga Formation are present at the surface. The exact locations of the onsite management facilities have not yet been determined, but the proposed facilities locations have the potential to contain paleontological resources where Pleistocene older alluvium and older geologic units are present.

Numerous fossil localities have been identified in the HSA as described above under VSLIS, recycled water, dry weather runoff – low-flow diversion, and dry weather runoff – URPs or treatment wetlands.

Archaeological Resources

The presence or absence of known prehistoric and historic archaeological resources in the vicinity of wet weather runoff – onsite management facilities currently is not known because the specific locations of the facilities have not yet been determined. Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources. Archaeological resources could be identified within the HSA once the locations of facilities are determined.

Historic and Architectural Resources

The presence or absence of known historic and architectural resources in the vicinity of wet weather runoff – onsite management facilities currently is not known because the specific locations of the facilities have not yet been determined. Historic and architectural resources have been found within the HSA, and historic and architectural resources could be identified within the HSA once the locations of onsite management facilities are determined.

Wet Weather Runoff – Urban Treatment Plants

Paleontological Resources

The wet weather urban treatment plant near Hyperion would be constructed where Recent dune sand is underlain by Pleistocene nonmarine terrace deposits and older geologic units.

The wet weather urban treatment plant on the Santa Monica Bay would be constructed where Pleistocene nonmarine alluvium, Pliocene marine (Fernando Formation), Late Miocene marine (Puente Formation), and Oligocene nonmarine (Sespe Formation) deposits are known to be present.

The wet weather urban treatment plant would be placed southwest of the existing Terminal Island Treatment Plant near Point Fermin and would be constructed along the coastline where Middle Miocene marine sediments (Monterey Formation) are present.

Between Ballona Creek and LAX, near Hyperion, the LACM reported that fossil localities LACM 1180, LACM 3264, LACM 3789, LACM 4942, and LACM 7332 yielded remains of mammoth (*Mammuthus*), rabbit (*Lepus*), horse (*Equus*), bison (*Bison*), rodents (*Rodentia*), flounder (*Citharichthys stigmaeus*), and marine mammals such as fur seals and sea lions from Pleistocene deposits at depths as shallow as 13 feet. Locality LACM 1024 produced holotype specimens of two clams (*Rochefortia reyana* and *Bornia cooki*) and a sea bird (*Moris reyana*) from uplifted cliffs at a depth of only 2 to 4 feet.

The LACM reported a fossil locality (LACM 6384) in the Pacific Palisades area on the south end of Santa Monica Bay that yielded specimens of white shark (*Carcharocles* and *Carcharodon carcharias*) from unrecorded depths in the Fernando Formation.

The LACM reported that localities LACM 1280, LACM 1348, and LACM 6118, southwest of the existing Terminal Island Treatment Plant, yielded remains of herring (*Clupeidae*), a rare specimen of leatherback sea turtle (*Dermochelyidae*),

and dolphin (*Odontoceti*), respectively, from the Altamira Shale Member of the Monterey Formation. These resources were recovered from rocks and boulders that had fallen or eroded from cliffs above the shoreline.

Archaeological Resources

The presence or absence of known prehistoric and historic archaeological resources in the vicinity of Wet Weather Runoff – Urban Treatment Plants currently is not known because the specific locations of the facilities have not yet been determined. Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources, and archaeological resources could be identified within the HSA once the locations of urban treatment plants are determined.

Historic and Architectural Resources

The presence or absence of known historic and architectural resources in the vicinity of Wet Weather Runoff – Urban Runoff Plants currently is not known because the specific locations of the facilities have not yet been determined. Historic and architectural resources have been found within the HSA, and historic and architectural resources could be identified within the HSA once the locations of urban runoff plants are determined.

Wet Weather Runoff – Non-Urban Regional Recharge

Paleontological Resources

Wet Weather Runoff – Non-Urban Regional Recharge would use the existing spreading grounds located in the Hansen Dam-Pacoima area of the eastern San Fernando Valley where Quaternary younger alluvium is underlain by Pleistocene older alluvium and older geologic units. The location of the alignment of a new pipeline to facilitate the regional water recharge has not been determined, but the pipeline and spreading grounds have the potential to contain paleontological resources where Pleistocene older alluvium and older geologic units are present.

The LACM reported four fossil localities in the Hansen Dam-Pacoima area (LACM 1146, LACM 3263, LACM 3822, and LACM 6208) that yielded mastodon (*Mammut americanum*), horse (*Equus occidentalis*), camel (*Camelidae* and *Camelops*), bison (*Bison*), and peccary (*Platygonus*) remains from Pleistocene older alluvium at depths as shallow as 14 feet.

Archaeological Resources

The presence or absence of known prehistoric and historic archaeological resources in the vicinity of wet weather runoff – non-urban recharge facilities currently is not known because the specific locations have not yet been determined. Prehistoric and historic archaeological resources have been found within the HSA, particularly near permanent freshwater sources, and archaeological resources could be identified within the HSA once the locations of non-urban recharge facilities are determined.

Historic and Architectural Resources
The presence or absence of known historic and architectural resources in the vicinity of wet weather runoff – non-urban recharge facilities is not currently known because the specific locations of the facilities have not yet been determined. Historic and architectural resources have been found within the HSA, and historic and architectural resources would be identified within the HSA once the locations of non-urban recharge facilities are determined.

3.7.3 Environmental Impacts

3.7.3.1 Background

Presented below are brief discussions of the regulatory framework, methodology, and thresholds of significance used to analyze each Alternative and program-level component.

Regulatory Framework

Potential impacts to paleontological, archaeological, and historic and architectural resources are regulated at the federal, state, and local levels as summarized below.

Federal Regulations
Paleontological Resources. NEPA implies the protection of significant paleontological resources under its mandate to "enrich the understanding of the ecological systems and natural resources important to the Nation..." (Title 42 USC § 4321) and to "preserve important historic, cultural, and natural aspects of our national heritage" (Title 42 USC § 4331(b)4).

Archaeological Resources. Funding for the project components could involve an application to the SRF Loan Program administered by the State Board, Division of Clean Water Programs. Because the SRF Loan Program is funded partially by EPA, projects funded by SRF Loan Program are subject to Section 106 of the NHPA and its implementing regulations (36 CFR Part 800). For the purpose of this study and to ensure adequate compliance with the SRF Loan Program requirements, impacts to archaeological resources also were evaluated in accordance with Section 106 requirements.

Section 106 requires federal agencies take into account the effects of their actions on historic properties, to assess resource integrity, and to evaluate site significance according to the *National Register* and *California Register* as described above. The 2004 guidelines governing the State Board/federal environmental review process stipulate:

> *If the project involves an SRF loan, the Division must ensure that federal agencies are afforded adequate review of environmental documents for projects that will be federally funded. We will [the SWRCB] send[s] copies of the CEQA document directly to federally designated agencies as part of the "CEQA-Plus" process.*

Development of an APE is identified as a critical first step in the State Board/ federal review process. By definition "all construction areas, borrow pits, haul roads, staging areas, etc.," as well as the areas that could indirectly be affected

should be considered part of the APE. The APE for the four Project Alternatives is discussed in greater detail below.

NHPA further requires the Agency to identify and mitigate impacts that cannot be avoided during project construction. The State Board recognizes the following short- and long-term impacts to Cultural Resources on water management projects:

- Facilities construction impacts
- Pipeline alignment excavation impacts
- Erosion impacts
- Inundation from ponds
- Impacts from land application of effluent

Where impacts are unavoidable, mitigation measures would be required to minimize the loss of significant cultural resources. Close coordination with the State Board was followed in establishing an APE, evaluating archaeological sensitivity, and ensuring compliance at the "CEQA-Plus" level.

In addition, if the IRP involves SRFs, federal Thresholds of Significance, 36 CFR §800.5(a), would apply to architectural and historic resources that are found eligible for the *National Register.*

State Regulations

Paleontological Resources. Both the California Public Resources Code and Administrative Code prohibit destruction or wrongful removal of paleontological materials (PRC § 5097.5; 14 Ca. Admin. Code § 4307).

Archaeological Resources. CEQA mandates public disclosure of the potential impacts of a project on archaeological sites, historic properties, and Native American sacred places. With regard to cultural resources, CEQA specifies that where "a project may cause a substantial change in the significance of an historic resource," the Project "may have a significant effect on the environment" (Section 21084.1). If an archaeological resource is not important in terms of *National Register* and *California Register* criteria, it need not be considered further in the CEQA process. If a site is determined to be eligible for listing on the CRHR, and if avoidance is not feasible, the project proponent must develop a plan for mitigating the impact to the project on the qualities that make the resource significant. To fulfill state requirements for archaeological resources, resource-specific mitigation recommendations must be developed.

Historic and Architectural Resources. Section 15064.5(b) of the CEQA Guidelines, entitled "Determining the Significance of Impacts on Historical and Unique Archaeological Resources" would apply to architectural and historic resources that are found eligible for the *California Register* or meet the other significance criteria in Section 15064.5(a) of the CEQA Guidelines.

Local Regulations

Paleontological Resources. The City of Los Angeles endorses the protection of paleontological resources through Standard Specifications for Public Works Construction § 6-3.2, which calls for the cessation of excavations until items of paleontological interest can be evaluated and recovered (Bureau of Engineering Special Order 5007-0590).

In determining resource significance and project impacts on a local level for a City of Los Angeles project, two set of guidelines prevail; the *Draft L.A. CEQA Threshold Guide* (City of Los Angeles, 1998) and the City Engineering Bureau guidelines for the protection of archaeological and paleontological resources.

Archaeological Resources. The *Draft L.A. CEQA Threshold Guide* indicates that a project normally would have a significant impact upon archaeological resources if it would result in the disturbance, damage, or degradation of archaeological resources or its setting is found to be important under criteria of CEQA (City of Los Angeles, 1998). When drafted in 1998, Appendix K applied. Under CEQA today, the criteria established under the *California Register* have been adopted.

The City Engineer, Robert Horii, incorporated the Guidelines for the Protection of Archaeological and Paleontological Resources as a standard in the Bureau Procedures. These guidelines outline a number of steps that the Environmental Management Section must follow in determining if an area would be likely to yield archaeological or paleontological resources. Following examination of internal files, if the Environmental Management Section determines that the Project would be located in an area likely to yield cultural resources, the UCLA Archaeological Survey would be contacted to conduct a record search and make recommendations on how to proceed. Recommendations could include:

1. That the Project would not be likely to disturb archaeological resources; therefore, no further action is required.

2. That the Project could encounter archaeological or paleontological resources, and a monitor is recommended during excavation activities.

When cultural resources are found, that:

1. A field investigation (surface survey) may be recommended prior to Project construction because of the sensitive nature of the potential cultural resource.

2. If the Project scope and site is such that testing is required, then testing would be supervised by a qualified archaeologist.

Section III of the guidelines describes actions to be taken in the case of the discovery of human remains.

Historic and Architectural Resources. Section 22.132 of the City of Los Angeles Charter and Administrative Code, entitled "Permits Required" would apply to

any resource that has been identified as a City of Los Angeles Historic-Cultural Monument, as follows:

> *No permit for the demolition, substantial alteration or removal of any building, structure or site contained in said list shall be issued, and no such site, building or structure shall be demolished, substantially altered or removed by the City without first referring the matter to the Commission, except where the Superintendent of Building or the City Engineer determines that demolition, removal or substantial alteration of any such building, structure or site is immediately necessary in the interest of the public health, safety, or general welfare.*

Methodology

Paleontological Resources

Impacts to paleontologic resources were assessed by first determining the paleontological sensitivity of the component site or general area, followed by a determination of the potential to encounter paleontological resources. Paleontologic sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, history of the rock unit in producing significant fossils, and fossil localities that are recorded from that unit. The latter would be determined, in part, through a literature search of past recorded localities. Paleontologic sensitivity would be derived from the fossil data collected from the entire geologic unit, not just from a geographically specific survey.

A three-tiered classification system for paleontological sensitivity, recommended by the Society of Vertebrate Paleontology (SVP) and recognized in California is listed below:

> *High sensitivity – Indicates fossils are currently observed onsite, localities are recorded within the study area, and/or the unit has a history of producing numerous significant fossil remains.*
>
> *Low sensitivity – Indicates significant fossils are not likely to be found because of a random fossil distribution pattern, extreme youth of the rock unit and/or the method of rock formation, such as alteration by heat and pressure.*
>
> *Indeterminate Sensitivity – Unknown or undetermined sensitivity indicates that the rock unit has not been sufficiently studied or lacks good exposures to warrant a definitive rating. This rating is treated initially as having a high sensitivity or potential. After further study or monitoring, the unit may be fall into one of the other categories.*

A summary of geologic units present in the HSA and their paleontological sensitivity is presented in Section 3.7.2.1, Table 3.7-1 and shown in Figure 3.7-1.

Archaeological Resources

Limited archival research was performed to define previous land use within the site-specific areas of the four Project Alternatives and to evaluate the

potential for the presence of archaeological resources. Historical Sanborn fire insurance maps, lithographs, and other relevant historical documents and literature search results were gathered from several locations including the following regional facilities: South Central Coastal Information Center, Los Angeles Public Library, The Natural History Museum of Los Angeles County, and Library of Congress web site.

The South Central Coastal Information Center search included a review of the California Points of Historical Interest, the California Historical Landmarks, the California Register of Historic Places, the National Register of Historic Places, the California State Historic Resources Inventory, and the City of Los Angeles Cultural Monuments list. The search was conducted within a 0.5-mile radius of 20 separate locations. These locations were selected to encompass the Hyperion, Tillman, and LAG plants and all components of the NEIS II and GBIS alignment variations.

In addition to the archival research, an archaeologist participated in the IRP site tour on September 21, 2004. The tour included visits to Hyperion, Tillman, and LAG, at which time an initial archaeological assessment was made. Later, a vehicular survey of the sewer alignments and associated components was conducted.

Pedestrian and vehicular surveys were conducted on March 27, 2005, of all known shaft sites, drop sites, diversion structure sites, air treatment facility sites, and alignment variations for the NEIS II and GBIS. The areas inspected fell into two general categories: the built urban environment, and landscaped parkland. For the purpose of archaeological survey, visibility within the built environment of the sewer alignments was 0 percent. The shaft sites were either paved, or covered with gravel, grass, or other dense vegetation. Native sediments were visible only where exposed by erosion or other ground-disturbing activity.

Prior to issuing an NOP, the NAHC was informed of the Project by City of Los Angeles staff. The NAHC was asked to provide a list of Native American representatives in the Los Angeles area who might have concerns regarding the implementation of the Project. In March 2005, Native American notification was initiated to all individuals and tribes appearing on the list provided by NAHC.

Based on the records and literature search, site visits, topographical evidence, Native American input and known construction specifications, an archaeological sensitivity study was developed. The potential for impacts (defined as ground-disturbing activities) generally are categorized as high or low for archaeological resources, traditional cultural properties, and human remains. High, and low potential for impacts are defined as follows:

High potential for impacts to cultural resources would be considered likely when the proposed component or Alternative is:

- Located within, immediately adjacent to, or within 0.25-mile of a previously recorded, NRHP- or CRHR-eligible archaeological site as revealed by the records search.
- Revealed by site inspection to have cultural resources present within the area of impact of the proposed component or alternative.
- Located within an area depicted as developed on historical maps.
- Located within 0.25-mile of a permanent water source such as the Los Angeles River, Tujunga Wash, or Ballona Creek. This criteria is based on the well-founded observation on the part of archaeologists that river courses, major drainages, and other permanent water sources are common locations of human occupation or use.
- Confirmed that the presence of definite landscape characteristics are known to correspond to the presence of resources

Low potential for impacts to cultural resources would be considered likely when the proposed component or Alternative is:

- Located in an area where no previously recorded archaeological sites were found nearby as revealed in the records search
- Located in an area depicted as undeveloped on historical maps
- Revealed by site inspection to have no indication of cultural resources
- Located where known ground disturbances have occurred

Indeterminate potential for impacts to cultural resources would be considered likely when the proposed component or Alternative does not currently provide adequate detail, including the area of potential direct impact, to accurately define potential impacts to cultural resources. When this rating is applied, a standard cultural resources analysis would be anticipated to be undertaken to include a cultural and paleontological resources literature search, and field inventory of Project components and Alternatives once sufficient Project details are determined.

When a component is determined to have low or indeterminate potential for impacts, it is recognized that isolated archaeological deposits could be present at the component site and uncovered during ground-disturbing activities.

Historic and Architectural Resources

A literature search was conducted for the APE for each Alternative to determine the presence or absence of known historic and architectural resources for project-level components (resources eligible or not eligible for listing in the NRHP or CRHR, identified as a historic resource for purposes of CEQA, or identified as a City of Los Angeles Historic-Cultural Monument). Additionally, a field survey of the project-level components was completed to determine the presence or absence of historic and architectural resources within the Project APE. In the event an historic or architectural resource is

identified within the APE of the project-level component, a recommendation for eligibility for the NRHP or CRHR would be provided. Coordination with the SHPO would be required for concurrence of eligibility and potential effect to resources determined to be eligible.

Thresholds of Significance

An Alternative would have a significant impact to cultural resources if it would:

CUL-1: Directly or indirectly destroy a unique paleontological resource or site.

CUL-2: Disturb, damage, or degrade an archaeological resource defined as important under CEQA.

CUL-3: Disturb, damage, or degrade a traditional cultural property considered important to the local or regional Native American communities.

CUL-4: Disturb, degrade, or remove human remains. According to CEQA, human remains will be treated in accordance with the provisions of Section 7050.5 of the Health and Safety Code. Burials are also protected under California PRC, Sections 5097.9, 5097.98, and 5097.99.

CUL-5: Damage or degrade a historic resource defined as important under CEQA.

For CUL-1, impacts to paleontological resources would be considered significant if important nonrenewable fossil resources were damaged or destroyed as a result of excavation or other ground-disturbing activities associated with implementation of the Project. The LACM considers a range of variables in determining the importance of individual fossils, including, but not limited to, geologic context, stratigraphic location and provenience, condition of the bone (degree to which it is complete and is diagnostic), and its association with other remains (McLeod, personal communication). Thus, the *Draft L.A. City CEQA Thresholds Guide* calls for the determination of significance to be made on a case-by-case basis of fossil identification in the field (City of Los Angeles, 1998).

Under CUL-5, impacts to historic resources found to meet CEQA Guidelines §15064.5(a) would be considered significant if §15064.5(b) of the CEQA Guidelines is applied and the proposed project would "cause a substantial adverse change in the significance of an historical resource … [meaning] physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

If the implementation of IRP were to involve the use of the SRF, impacts to architectural and historic resources listed in or eligible for listing in the *National Register* would be considered significant if any of the federal Criteria of Adverse Effects (36 CFR §800.5) apply or if the Project would "alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the *National Register* in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."

3.7.3.2 Component Impacts

Project-Level Component Impacts

Hyperion Expansion to 500 mgd

Ground-disturbing activities at the Hyperion Plant would include grading and excavation associated with construction of the new secondary clarifiers (three modules), new truck-loading facility, and digesters (to a depth of approximately 40 feet below ground surface).

Paleontological Resources. Quaternary (Pleistocene) marine terrace deposits present at Hyperion would have high potential to contain paleontological resources. Additionally, fossil localities have been identified by LACM between Ballona Creek and LAX. Therefore, implementation of this project-level component would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. No previously recorded archaeological sites are recorded within the Hyperion APE and no archaeological resources were identified during a field survey of the site because Hyperion is wholly developed. Prehistoric deposits have been uncovered approximately 0.5-mile north of Hyperion on LAX property. The Hyperion site was first developed in 1925 as the Los Angeles City Sewage Treatment Plant. Significant historic archaeological deposits associated with this facility or of an earlier period, that would meet the *National Register* or *California Register* criteria, would be unlikely to be present due to previous site disturbance. The expansion of Hyperion to 500 mgd would have low potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within 0.5-mile of Hyperion. The expansion of Hyperion to 500 mgd would have low potential to disturb, damage, or degrade traditional cultural properties considered important to the Native American community.

No human remains have been recorded within 0.5-mile of Hyperion. This component would have low potential for activities to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No historic or architectural resources that meet federal, state, or local criteria were identified at Hyperion; therefore, expansion of Hyperion to 500 mgd would not result in impacts to federal, state, or local historic and architectural resources.

Hyperion Process Upgrades

Ground-disturbing activities due to implementation of the Hyperion Process Upgrades would result in belowground disturbances from construction of the new secondary clarifiers (two modules), new truck loading facility, and digesters.

Paleontological Resources. Hyperion Process Upgrades would occur within the same APE as Hyperion, discussed above. As with Hyperion Expansion to

500 mgd, Hyperion Process Upgrades would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. Hyperion Process Upgrades would occur within the same APE as Hyperion, discussed above. As with Hyperion Expansion to 500 mgd, Hyperion Process Upgrades would have low potential to disturb, damage, or degrade archaeological resources; disturb, damage, or degrade traditional cultural properties considered important to the Native American communities; or disturb, degrade, or remove human remains.

Historic and Architectural Resources. Hyperion Process Upgrades would occur within the same APE as Hyperion, discussed above. As with the Hyperion Expansion to 500 mgd, Hyperion Process Upgrades would not result in impacts to federal, state, or local historic and architectural resources.

Tillman Expansion to 100 mgd

Improvements under the Tillman Expansion to 100 mgd component would include grading and excavation during construction of the new primary clarifiers/equalization tanks, aeration basins, and secondary clarifiers, which would result in extensive belowground disturbance to a depth of up to approximately 16 feet below ground surface.

Paleontological Resources. Quaternary (Pleistocene) older alluvium present at Tillman would have a high potential to contain paleontological resources. Also, fossil localities have been identified in the vicinity. Therefore, expanding Tillman to 100 mgd would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. No previously recorded prehistoric archeological sites were identified within the literature search boundaries or within the APE of the proposed Tillman Expansion site. The Tillman area is not depicted on historical Sanborn Maps and no known historic archaeological properties exist in the area. The 1955 Los Angeles map (Volume 45) describes the area simply as "Sepulveda Flood Control Basin." No archaeological resources were identified during a field survey of the APE. Expansion of Tillman to 100 mgd Expansion would have low potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within 0.5-mile of Tillman. Expansion of Tillman to 100 mgd would have low potential to disturb, damage, or degrade traditional cultural properties considered important to the Native American community.

No human remains have been recorded within 0.5-mile of Tillman. Tillman Expansion to 100 mgd would have low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No historic or architectural resources that meet federal, state, or local criteria were identified at Tillman; therefore,

expanding Tillman to 100 mgd would not result in impacts to federal, state, or local historic and architectural resources.

Tillman Expansion to 80 mgd

The Tillman Expansion to 80 mgd option would include grading and excavation associated with the new secondary clarifiers, which would result in extensive belowground disturbance.

Paleontological Resources. Tillman Expansion to 80 mgd would occur within the same APE as the expansion of Tillman to 100 mgd, discussed above. As with the Tillman Expansion to 100 mgd, expanding Tillman to 80 mgd would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. Tillman Expansion to 80 mgd would occur within the same APE as the expansion of Tillman to 100 mgd, discussed above. As with Tillman Expansion to 100 mgd, Tillman Expansion to 80 mgd would: have low potential to disturb, damage, or degrade archaeological resources; have low potential to disturb, damage, or degrade traditional cultural properties considered important to the Native American communities; have low potential to or disturb, degrade, or remove human remains.

Historic and Architectural Resources. Tillman Expansion to 80 mgd would occur within the same APE as Tillman Expansion to 100 mgd, discussed above. As with the expansion of Tillman to 100 mgd, Tillman Expansion to 80 mgd would not result in a significant effect on federal, state, or local historic and architectural resources.

Tillman Process Upgrades

Under the Tillman Process Upgrade option, the treatment process would be upgraded from a Title 22 plant to advanced treatment with membrane technology. This option would include plant facility upgrades but little belowground disturbance.

Paleontological Resources. No excavations are indicated for installation of the Tillman Process Upgrade option. This option, therefore, has no potential to impact paleontological resources.

Archaeological Resources. Proposed plant upgrades would not result in significant belowground disturbances. Tillman process upgrades would have no potential to disturb, damage, or degrade archaeological resources; disturb, damage, or degrade traditional cultural properties considered important to the Native American communities; or disturb, degrade, or remove human remains.

Historic and Architectural Resources. Tillman Process Upgrades would occur within the same APE as Tillman Expansion to 100 mgd, discussed above. As with the expansion of Tillman to 100 mgd, Tillman Process Upgrades would not result in a significant effect on federal, state, or local historic and architectural resources.

Tillman Wastewater Storage

The proposal to provide wastewater storage at Tillman would result in grading and excavation associated with the installation of a 60-mgd storage tank, piping, and accessory structures. The storage tank would be installed underground and estimated to be approximately 450 feet wide, 700 feet long, and would be installed to a depth of approximately 27 feet below ground surface.

Paleontological Resources. Tillman Wastewater Storage would occur within the same APE as the expansion of Tillman to 100 mgd, discussed above. As with Tillman Expansion to 100 mgd, Tillman Wastewater Storage would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. Tillman Wastewater Storage would occur within the same APE as the expansion of Tillman to 100 mgd, discussed above. As with the Tillman Expansion to 100 mgd, Tillman Wastewater Storage would have low potential to disturb, damage, or degrade archaeological resources; disturb, damage, or degrade traditional cultural properties considered important to the Native American communities; or disturb, degrade, or remove human remains.

Historic and Architectural Resources. Tillman wastewater expansion would occur within the same APE as the expansion of Tillman to 100 mgd expansion, discussed above. As with Tillman Expansion to 100 mgd, Tillman Wastewater Storage would not result in a significant effect on federal, state, or local historic and architectural resources.

LAG Expansion to 30 mgd

The expansion of LAG would result in grading and excavation associated with installation of new clarifiers, construction of advanced treatment facilities, installation of a new 5-MG recycled water storage tank, and a 5-MG diurnal storage tank. Extensive belowground disturbance up to approximately 16 feet below ground surface at LAG would be anticipated.

Paleontological Resources. Quaternary nonmarine alluvium and Miocene Fernando, Puente, and Monterey Formations are exposed at LAG. Additionally, fossil localities have been identified in the vicinity. Therefore, implementation of this component would have high potential to result in impacts to paleontological resources.

Archaeological Resources. No previously identified archaeological sites are recorded within the LAG APE and no archaeological resources were identified during the field survey of the site. Prior disturbance at the storage tank site is limited. No historic properties were identified within the LAG APE, including the proposed location for tank installation. Therefore, facility expansions at LAG would have low potential to disturb, damage, or degrade prehistoric archaeological resources and low potential to disturb, damage, or degrade historic archaeological resources.

No traditional cultural properties have been identified within 0.5-mile of LAG. LAG expansion to 30 mgd would have low potential to disturb, damage, or degrade traditional cultural properties considered important to the Native American community.

No human remains have been recorded within 0.5-mile of LAG and no historical ethnographic villages are known to have existed within the APE. LAG 30-mgd expansion would have low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No historic or architectural resources that meet federal, state, or local criteria were identified at LAG; therefore, LAG Expansion to 30 mgd would not result in impacts to federal, state, or local historic and architectural resources.

LAG Operational Storage

The need for operational facilities at LAG would result in grading and excavation associated with the installation of a new 5-MG recycle water storage tank and a new 5-MG diurnal flow storage tank. Extensive belowground disturbance up to 16 feet below ground surface at the plant site would be anticipated.

Paleontological Resources. LAG operational storage would occur within the same APE as expansion of LAG to 30 mgd, discussed above. As with the LAG 30-mgd expansion, operational storage would have high potential to result in impacts to paleontological resources.

Archaeological Resources. LAG operational storage would occur within the same APE as the expansion of LAG to 30 mgd, discussed above. As with the LAG 30-mgd expansion, operational storage would have low potential to disturb, damage, or degrade prehistoric archaeological resources and low potential to disturb, damage, or degrade historic archaeological resources. Operational storage would have low potential to disturb, damage, or degrade traditional cultural properties considered important to the Native American communities and low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No historic or architectural resources that meet federal, state, or local criteria were identified at LAG; therefore, LAG Operational Storage would not result in impacts to federal, state, or local historic and architectural resources.

NEIS II West Alignment

For the most part, the NEIS II West Alignment would be tunneled below a level where impacts to archaeological deposits would be anticipated. However, shaft sites and manhole structures originating at the surface would be placed periodically along the Alignment. Each shaft would be approximately 60 feet in diameter and up to 180 feet deep. Maintenance hole structures could be up to 10 feet in finished diameter.

In addition, surface construction for accessory structures would occur in and around the alignments. Below ground disturbances and construction staging areas and work sites could have the potential to result in impacts to buried cultural resources.

Paleontological Resources. Quaternary nonmarine alluvium and older geologic units present along the NEIS II West Alignment would have high potential to contain paleontological resources. Additionally, fossil localities have been identified in the vicinity. Therefore, implementation of the component would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. Tunnel bores do not have the potential to affect archaeological resources because they would occur at a depth well below the geologic units within which archaeological resources are known to occur (i.e., Holocene-aged). Belowground disturbance would occur at shaft sites, diversion structures, drop structures, connecting sewers, maintenance holes, and all construction staging areas and work sites and are included in the APE.

No previously identified archaeological sites are recorded within the NEIS II West Alignment APE and no archaeological resources were identified during a field survey of the shaft sites. The amount of modern development surrounding shaft sites varies greatly and some locations remain undisturbed. Much of the NEIS II West Alignment would be located close to a permanent water source, the Los Angeles River. Those portions of the NEIS II West Alignment located within 0.25-mile of the Los Angeles River would be considered to have high sensitivity for impact to cultural resources. The remainder of the NEIS II West Alignment would have low potential to disturb, damage, or degrade archaeological resources.

A review of historical Sanborn Maps provided no coverage of the shaft sites with the exception of the Verdant site. No evidence of significant historical events is indicated at the Verdant site. Other significant historic archaeological sites are known to exist within general proximity to the NEIS II West Alignment, although none occur within 0.25-mile of the alignment. The Glendale Sanitarium site, for example, yielded a variety of artifacts associated with the day-to-day activities of this important nineteenth century institution. The NEIS II West Alignment would have low potential to disturb, damage, or degrade historic archaeological resources.

No traditional cultural properties have been identified within 0.5-mile of the shaft sites. The NEIS II West Alignment would have low potential to disturb, damage, or degrade traditional cultural properties considered important to Native American communities.

No human remains have been reported within a 0.5-mile of the alignment and no historical ethnographic villages are known to have existed along the alignment. Much of the NEIS II West Alignment would be located in proximity to a permanent water source, the Los Angeles River. Those portions

of the NEIS II West Alignment located within 0.25-mile of the Los Angeles River would be considered to have high sensitivity for impact to human remains. The remainder of the NEIS II West Alignment would have low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. At the Division Street shaft site, the Hemphill Diesel School at 2121 San Fernando Road, was found eligible for the *National Register*, pending SHPO concurrence. The building was built in 1923, and is eligible for the *National Register* under criterion C at the local level for embodying modest but distinctive characteristics of the Streamline Moderne style of architecture as applied to an industrial school building. It also would meet *California Register* criterion 3, for the same reasons.

The Hemphill Diesel School is located across San Fernando Road from the Division Street shaft site, which is already being used for NEIS II construction; therefore, the Project would not have direct effect on the building, and any indirect visual effects would be temporary during the construction phase of the Proposed Project.

Under CEQA and Section 106, no significant or adverse effect on the Hemphill Diesel School would occur because the Proposed Project would not "cause a substantial adverse change in the significance of an historical resource … [meaning] physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

No other historic or archaeological resources eligible for listing on the NRHP or CRHR would be located in the NEIS II West Alignment APE.

Therefore, the NEIS II West Alignment would have no potential to damage or degrade a historic resource defined as important under CEQA or Section 106.

NEIS II East Alignment

For the most part, the NEIS II East Alignment would be tunneled below a level where impacts to archaeological deposits would be anticipated. Belowground disturbance would occur at shaft sites, diversion structures, drop structures, connecting sewer, maintenance holes, and all construction staging areas and work sites; hence, this would have the potential to result in impacts to buried cultural resources.

Paleontological Resources. Quaternary nonmarine alluvium and older geologic units present along the NEIS II – East Alignment have high potential to contain paleontological resources. Additionally, fossil localities have been identified in the vicinity. Therefore, implementation of the component would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. Tunnel bores would not have the potential to affect archaeological resources because they would occur at a depth well below the geologic units within which archaeological resources are known to occur (i.e.,

Holocene-aged). Belowground disturbance would occur at shaft sites, diversion structures, drop structures, connecting sewers, maintenance holes, and all construction staging areas and work sites and are included in the APE.

No previously identified archaeological sites are recorded in the NEIS II East Alignment APE, and no archaeological resources were identified during a field survey of the shaft sites. The amount of modern development surrounding shaft sites varies greatly and some locations remain undisturbed. Much of the NEIS II East Alignment would be located in general proximity to a permanent water source, the Los Angeles River. Those portions of the NEIS II East Alignment located within 0.25-mile of the Los Angeles River would be considered to have high sensitivity for impact to cultural resources. The remainder of the NEIS II East Alignment would have low potential to disturb, damage, or degrade archaeological resources.

A review of historical Sanborn Maps provided no coverage of the shaft sites with the exception of the Verdant site. No evidence of significant historical events is indicated at the Verdant site. Other significant historic archaeological sites are known to exist within general proximity to the NEIS II East Alignment, though none occur within 0.25-mile of the alignment. The Glendale Sanitarium site, for example, yielded a variety of artifacts associated with the day-to-day activities of this important nineteenth-century institution. The NEIS II East Alignment would have low potential to disturb, damage, or degrade historic archaeological resources.

No traditional cultural properties have been identified within 0.5-mile of the shaft sites. The NEIS II East Alignment would have low potential to disturb, damage, or degrade traditional cultural properties considered important to Native American groups.

No human remains have been reported within 0.5-mile of the alignment, and no historical ethnographic villages are known to have existed along the alignment. Much of the NEIS II East Alignment would be located in general proximity to a permanent water source, the Los Angeles River. Those portions of the NEIS II East Alignment located within 0.25-mile of the Los Angeles River would be considered to have high sensitivity for impact to human remains. The remainder of the NEIS II East Alignment would have low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. As with the NEIS II West Alignment, the NEIS II East Alignment would have no direct effect on the Hemphill Diesel School building. Any indirect visual effects would be temporary during the construction phase of the Proposed Project.

GBIS South Alignment

In general, the GBIS South Alignment would be tunneled below a level where impacts to archaeological deposits would be anticipated. However, shaft sites and manhole structures originating at the surface would be placed periodically along the alignment. Belowground disturbance would occur at

shaft sites, diversion structures, drop structures, connecting sewer, maintenance holes, and all construction staging areas and work sites; hence this would have the potential to result in impacts to buried cultural resources.

Paleontological Resources. Quaternary older alluvium present along the GBIS South Alignment would have high potential to contain paleontological resources. Additionally, fossil localities have been identified by LACM within the vicinity. Therefore, implementation of this component would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. No previously identified archaeological sites are recorded within the GBIS South Alignment APE; although the record search indicated that site 19-0001110 is located on Troost Street in Studio City within 0.5-mile of the Proposed Alignment. Here, a cellar excavation exposed more than 1,000 human bone fragments, ground stone tools, flaked stone tools, and shell. The amount of modern development surrounding shaft sites varies greatly and some locations remain undisturbed. Much of the GBIS South Alignment is located near a permanent water source, the Los Angeles River. Those portions of the GBIS South Alignment located within 0.25-mile of the Los Angeles River would be considered to have high sensitivity for impact to cultural resources. The remainder of the GBIS South Alignment would have low potential to disturb, damage, or degrade archaeological resources. A review of historical Sanborn Maps provided no coverage of the shaft sites. Site 19-001418, a nineteenth- and twentieth-century refuse dump in the vicinity of Tujunga Wash in North Hollywood, demonstrates that intact subsurface historic archaeological deposits exist within this urban context, although this site would be well outside of the HSA. The GBIS South Alignment would have low potential to disturb, damage, or degrade historic archaeological resources.

No traditional properties have been identified within the GBIS South Alignment APE. The GBIS South Alignment would have low potential to disturb, damage, or degrade traditional cultural properties considered important to Native American groups.

No human remains have been reported within 0.5-mile of the GBIS South Alignment, and no historical ethnographic villages are known to have existed along the alignment. Human remains have been uncovered along Troost Street in Studio City, but this location would be well outside of the HSA. Much of the GBIS South Alignment would be located in general proximity to a permanent water source, the Los Angeles River. Those portions of the GBIS South Alignment located within 0.25-mile of the Los Angeles River are considered to have high sensitivity for impact to human remains. The remainder of the GBIS South Alignment would have low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No historic or architectural resources that meet federal, state, or local criteria were identified along the GBIS South

Alignment; therefore, this Project component would not result in an effect on federal, state, or local historic or architectural resources.

GBIS North Alignment

For the most part, the GBIS North Alignment would be tunneled below a level where impacts to archaeological deposits would be anticipated. Belowground disturbance would occur at shaft sites, diversion structures, drop structures, connecting sewer, maintenance holes, and all construction staging areas and work sites. Hence, GBIS North Alignment would have the potential to result in impacts to buried cultural resources.

Paleontological Resources. Quaternary older alluvium and older sediments present along GBIS North Alignment would have high potential to contain paleontological resources. Additionally, fossil localities have been identified by LACM in the vicinity. Therefore, implementation of this component would be anticipated to have high potential to result in impacts to paleontological resources.

Archaeological Resources. No previously identified archaeological sites are recorded within the GBIS North Alignment APE; although the record search indicated that Site 19-0001110 is located on Troost Street in Studio City within 0.5-mile of the proposed Alignment. Here, a cellar excavation exposed more than 1,000 human bone fragments, ground stone tools, flaked stone tools, and shell. The amount of modern development surrounding shaft sites varies greatly and some locations remain undisturbed. Much of the GBIS North Alignment would be located near a permanent water source, the Los Angeles River. Those portions of the GBIS North Alignment located within 0.25-mile of the Los Angeles River are considered to have high sensitivity for impact to cultural resources. The remainder of the GBIS North Alignment would have low potential to disturb, damage, or degrade archaeological resources. A review of historical Sanborn Maps provided no coverage of the shaft sites. Site 19-001418, a nineteenth- and twentieth-century refuse dump in the vicinity of Tujunga Wash in North Hollywood, demonstrates that intact subsurface historic archaeological deposits exist within this general urban context, although this site is well outside the HSA. The GBIS North Alignment would have low potential to disturb, damage, or degrade historic archaeological resources.

No traditional properties have been identified within the GBIS North Alignment APE. The GBIS North Alignment would have low potential to disturb, damage, or degrade traditional cultural properties considered important to Native American groups.

No human remains have been reported within 0.5-mile of the GBIS North Alignment and no historical ethnographic villages are known to have existed along the alignment. Human remains have been uncovered along Troost Street in Studio City, but this location is well outside the HSA. Much of the GBIS South Alignment would be located in general proximity to a permanent water source, the Los Angeles River. Those portions of the GBIS North Alignment

located within 0.25-mile of the Los Angeles River would be considered to have high sensitivity for impact to human remains. The remainder of the GBIS North Alignment would have low potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No historic or architectural resources that meet federal, state, or local criteria were identified along the GBIS: North Alignment; therefore, this Project component would not result in an effect on federal, state, or local historic or architectural resources.

Program-Level Component Impacts

VSLIS

Paleontological Resources. Quaternary older alluvium and older sediments present along VSLIS Alignment would have high potential to contain paleontological resources. Additionally, fossil localities have been identified by LACM within the vicinity. Therefore, implementation of this component is anticipated to have high potential to impact paleontological resources.

Archaeological Resources. As currently envisioned, the VSLIS could be constructed using either tunneling or open-trench construction methods. All open-trench construction would result in below or at ground disturbance and has the potential to impact archaeological or Native American resources where present. Tunneling would result in impacts similar to those described for the NEIS II and GBIS Alignments. While tunneling would occur below a level where impacts to archaeological deposits would be anticipated, any shaft sites, diversion structures, drop structures, connecting sewers, maintenance holes, and all construction staging areas and work sites would result in below or at ground disturbance. Hence, this component would have the potential to result in impacts to cultural resources.

The specific alignment options for VSLIS have not yet been identified or developed and no project-specific research, including literature searches and site surveys, have been undertaken. It is unknown whether prehistoric or historic archaeological resources are located in the vicinity. Given that the VSLIS is currently conceptual, the potential to impact cultural resources would be considered indeterminate. Upon determination of a specific alignment for VSLIS, identification of the location of shaft sites, diversion structures, drop structures, connecting sewers, maintenance holes, and all construction staging areas and work sites, and selection of VSLIS construction methodology, further investigation should be completed to make an accurate assessment of potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general alignment identified for VSLIS. Upon determination of project-level details for VSLIS, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of potential to disturb, damage, or degrade traditional cultural properties important to the Native American community. Currently,

VSLIS has indeterminate potential damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general alignment identified for VSLIS. Upon determination of project-level details for VSLIS, further investigation would need to be completed to make an accurate assessment of potential to disturb, degrade, or remove human remains. Currently, VSLIS has indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. If VSLIS is constructed using tunneling methods, and assuming that it would be constructed at similar depths as those for GBIS and NEIS II, construction and operation would have little or no potential to damage or otherwise affect a building, structure, or object at surface level. Additionally, VSLIS would involve construction of shaft sites, diversion structures, drop structures, connecting sewers, maintenance holes, and all construction staging areas and work sites. The construction of these might or might not affect historic resources, depending on whether or not such resources are present.

If VSLIS is constructed using open-trench methods, it would, for the most part, be confined to public street rights-of-way, where little or no likelihood exists for significant impacts to potential historic resources that could be located on adjacent parcels. If historic resources were present along the right-of-way, their sensitivity to open-trench construction would be evaluated. Those found to be sensitive would be evaluated according to Section 106 and CEQA regulations.

Upon determination of a specific alignment for VSLIS, identification of the location of shaft sites, diversion structures, drop structures, connecting sewers, maintenance holes, and all construction staging areas and work sites, and selection of VSLIS construction methodology, further investigation would need to be completed to make an accurate assessment of potential to impact historic and architectural resources. Currently, VSLIS has indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

Recycled Water

Construction of the Recycled Water Distribution system would include excavation associated with the installation of pipelines, pumping stations, and water tanks.

Paleontological Resources. Quaternary Older Alluvium and older sediment present in the areas where recycled water distribution features would be installed have high potential to contain paleontological resources. Other geologic formations and/or previously disturbed areas would have a low potential to contain paleontological resources. Additionally, fossil locations have been identified by LACM in the areas. Therefore, implementation of recycled water distribution features in previously undisturbed Quaternary

Older Alluvium and older sediment would be anticipated to have high potential to impact paleontological resources.

Archaeological Resources. The specific location of recycled water distribution facilities have not yet been identified or developed and no project-specific research, including literature searches and site surveys, have been undertaken. It is unknown whether prehistoric or historic archaeological resources would be located in the vicinity. Many of the recycled water distribution facilities would be located in general proximity to permanent water sources, including the Los Angeles River, Tujunga Wash, Ballona Creek, Compton Creek, Arroyo Seco, and coastal areas.

Upon determination of a specific alignment for recycled water distribution facilities and selection of construction methodology, further investigation would need to be completed to make an accurate assessment of the potential to affect prehistoric and historic archaeological resources. Currently, recycled water distribution would have indeterminate potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general locations identified for recycled water distribution. Upon determination of project-level details for recycled water distribution, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of the potential to affect traditional cultural properties. Currently, recycled water distribution would have indeterminate potential to disturb, damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general locations identified for recycled water distribution. Upon determination of project-level details for recycled water distribution, further investigation would need to be completed to make an accurate assessment of potential to result in impacts to human remains. Currently, recycled water distribution would have indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No project-specific research, including literature searches and site surveys, has been undertaken for historic and architectural resources within the vicinity of recycled water distribution facilities. It is currently unknown whether historic and architectural resources are located in the vicinity. Upon determination of specific locations for recycled water distribution facilities and selection construction methodology, further investigation would need to be completed to make an accurate assessment of the potential to impact historic and architectural resources. Currently, recycled water distribution facilities would have indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

Dry Weather Runoff – Smart Irrigation

Paleontological Resources. Dry Weather Runoff – Smart Irrigation would be implemented over a broad area characterized under the general setting (Section 3.7.2.1). However, as an aboveground program related to in-place irrigation systems, smart irrigation would have no potential to affect paleontological resources.

Archaeological Resources. Smart irrigation would have little or no ground disturbance associated with the installation of smart irrigation devices. Smart irrigation has no potential to disturb, damage, or degrade archaeological resources and traditional cultural properties and no potential to disturb, degrade, and remove human remains.

Historic and Architectural Resources. Smart Irrigation devices would be small, external, automated irrigation devices. Smart irrigation would not result in an effect on federal, state, or local historic or architectural resources.

Dry Weather Runoff – Low-Flow Diversions

Installation of the Dry Weather Runoff – Low-Flow Diversions would include grading and excavation associated with the construction of pumping stations, diversion structures, and pipelines.

Paleontological Resources. Quaternary older alluvium and older sediment present in the areas where low-flow diversions would be installed have high potential to contain paleontological resources. Additionally, fossil locations have been identified by LACM in the areas. Therefore, implementation of low-flow diversions would be anticipated to have high potential to impact paleontological resources.

Archaeological Resources. The specific locations of low-flow diversions have not yet been identified or developed and no project-specific research, including literature searches and site surveys, have been undertaken. It is unknown whether prehistoric or historic archaeological resources would be located in the vicinity. Many of the low-flow diversions would be located in general proximity to permanent water sources, including the Los Angeles River, Tujunga Wash, Ballona Creek, Compton Creek, Arroyo Seco, and coastal areas.

Upon determination of a specific location for low-flow diversions and selection of construction methodology, further investigation would need to be completed to make an accurate assessment of potential to affect prehistoric and historic archaeological resources. Currently, low-flow diversions would have indeterminate potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general locations identified for low-flow diversions. Upon determination of project-level details for low-flow diversions, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of potential to result in impacts to traditional cultural properties. Currently, low-flow diversions would have indeterminate potential to disturb, damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general locations identified for low-flow diversions. Upon determination of project-level details for low-flow diversions, further investigation would need to be completed to make an accurate assessment of potential to result in impacts to human remains. Currently, low-flow diversions have indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No project-specific research, including literature searches and site surveys, has been undertaken for historic and architectural resources within the vicinity of low-flow diversions. It is currently unknown whether historic and architectural resources would be located in the vicinity. Upon determination of specific locations for low-flow diversions and selection construction methodology, further investigation would need to be completed to make an accurate assessment of potential to impact historic and architectural resources. Currently, low-flow diversions would have indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

Dry Weather Runoff – Urban Runoff Plants or Treatment Wetlands
Dry Weather URPs or Treatment Wetlands would be used to treat runoff prior to reuse or discharge. Site development activities would include grading and excavation associated with the Project.

Paleontological Resources. Quaternary older alluvium and older sediment present in the areas where URPs or treatment wetlands would be installed have high potential to contain paleontological resources. Additionally, fossil locations have been identified by LACM in the areas. Therefore, implementation of URPs or treatment wetlands in previously undisturbed Quaternary older alluvium and older sediment would be anticipated to result in high potential to impact paleontological resources.

Archaeological Resources. The specific location of urban runoff plants or treatment wetlands have not yet been identified or developed and no project-specific research, including literature searches and site surveys, have been undertaken. It is unknown whether prehistoric or historic archaeological resources would be located in the vicinity. Many of the urban runoff plants or treatment wetlands generally are located near permanent water sources, including the Los Angeles River, Tujunga Wash, Ballona Creek, Compton Creek, Arroyo Seco, and coastal areas.

Upon determination of specific locations for URPs or treatment wetlands and selection of construction methodology, further investigation would need to be completed to make an accurate assessment of potential to affect prehistoric and historic archaeological resources. Currently, URPs or treatment wetlands have indeterminate potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general locations identified for URPs or treatment wetlands. Upon determination of project-level details for URPs or treatment wetlands, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of potential to result in impacts to traditional cultural properties. Currently, URPs or treatment wetlands would have indeterminate potential to disturb, damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general locations identified for urban runoff plants or treatment wetlands. Upon determination of project-level details, further investigation would need to be completed to make an accurate assessment of potential to result in impacts to human remains. Currently, urban runoff plants or treatment wetlands have indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No project-specific research, including literature searches and site surveys, has been undertaken for historic and architectural resources within the vicinity of urban runoff plants or treatment wetlands. It is currently unknown whether historic and architectural resources would be located in the vicinity. Upon determination of specific locations for urban runoff plants or treatment wetlands and selection construction methodology, further investigation would need to be completed to make an accurate assessment of potential to impact historic and architectural resources. Currently, urban runoff plants or treatment wetlands would have indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

Wet Weather Runoff – Onsite Management

Site development of the Wet Weather Runoff - Onsite Management system would include grading and excavation associated with construction of capture and percolation features and cisterns. All construction would result in disturbances at ground level or below.

Paleontological Resources. Quaternary older alluvium and older sediment present in the areas where onsite management features would be installed would have high potential to contain paleontological resources. Additionally, fossil locations have been identified by LACM in the areas. Therefore, implementation of onsite management would be anticipated to result in high potential to impact paleontological resources.

Archaeological Resources. The specific location of onsite management facilities have not yet been identified or developed and no project-specific research, including literature searches and site surveys, have been undertaken. It is unknown whether prehistoric or historic archaeological resources would be located in the vicinity. Many of the onsite management facilities would be located in general proximity to permanent water sources, including the Los Angeles River, Tujunga Wash, Ballona Creek, Compton Creek, Arroyo Seco, and coastal areas.

Upon determination of a specific alignment for onsite management facilities and selection of construction methodology, further investigation would need to be completed to make an accurate assessment of potential to affect prehistoric and historic archaeological resources. Currently, onsite management would have indeterminate potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general locations identified for onsite management. Upon determination of project-level details for onsite management, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of potential to affect traditional cultural properties. Currently, onsite management has indeterminate potential to disturb, damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general locations identified for onsite management. Upon determination of project-level details for recycled water distribution, further investigation would need to be completed to make an accurate assessment of potential to cause an impact to any human remains. Currently, onsite management would have indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No project-specific research, including literature searches and site surveys, have been undertaken for historic and architectural resources within the vicinity of onsite management facilities. It is currently unknown whether historic and architectural resources would be located in the vicinity. Upon determination of specific locations for onsite management facilities and selection construction methodology, further investigation would need to be completed to make an accurate assessment of potential to impact historic and architectural resources. Currently, onsite management has indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

Wet Weather Runoff – Urban Treatment Plants

Site development of Wet Weather Runoff – Urban Treatment Plants would include grading and excavation associated with construction of storage facilities approximately 400 feet wide, 400 feet, and 21 feet deep. Construction would result in disturbances at ground level or below.

Paleontological Resources. Quaternary older alluvium and older sediments present in the areas where urban treatment plants would be installed have high potential to contain paleontological resources. Additionally, fossil locations have been identified by LACM in the areas. Therefore, implementation of urban treatment plants would be anticipated to result in high potential to impact paleontological resources.

Archaeological Resources. The specific location of urban treatment plants have not yet been identified or developed and no project-specific research, including literature searches and site surveys, has been undertaken. It is unknown whether prehistoric or historic archaeological resources would be located in the vicinity. Many of the urban treatment plants would be located in general proximity to permanent water sources, including the Los Angeles River, Tujunga Wash, Ballona Creek, Compton Creek, Arroyo Seco, and coastal areas.

Upon determination of a specific alignment for urban treatment plants and selection of construction methodology, further investigation would need to be completed to make an accurate assessment of potential to affect prehistoric and historic archaeological resources. Currently, urban treatment plants would have indeterminate potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general locations identified for urban treatment plants. Upon determination of project-level details for urban treatment plants, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of potential to cause an impact to traditional cultural properties. Currently, urban treatment plants would have indeterminate potential to disturb, damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general locations identified for urban treatment plants. Upon determination of project-level details for urban treatment plants, further investigation would need to be completed to make an accurate assessment of potential to cause an impact to any human remains. Currently, urban treatment plants would have indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources. No project-specific research, including literature searches and site surveys, has been undertaken for historic and architectural resources within the vicinity of urban treatment plants. It is currently unknown whether historic and architectural resources are located in the vicinity. Upon determination of specific locations for urban treatment plants and selection construction methodology, further investigation would need to be completed to make an accurate assessment of potential to impact historic and architectural resources. Currently, urban treatment plants would have indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

Wet Weather Runoff – Non-Urban Regional Recharge

Construction of the pipeline to convey the non-urban regional recharge from the northwestern portions of the San Fernando Valley to the eastern portion of the valley would require substantial belowground disturbances, primarily in the public right-of-way. The specific alignment has not yet been determined, but it would be constructed using open-trench methods.

Paleontological Resources. Quaternary Older Alluvium and older sediment present in the areas where non-urban regional recharge features would be installed have high potential to contain paleontological resources. Additionally, fossil locations have been identified by LACM in the areas. Therefore, implementation of non-urban regional recharge features would be anticipated to have high potential to impact paleontological resources.

Archaeological Resources. The specific location of non-urban regional recharge facilities have not yet been identified or developed and no project-specific research, including literature searches and site surveys, have been undertaken. It is unknown whether prehistoric or historic archaeological resources are located in the vicinity. Many of the non-urban regional recharge facilities would be located in general proximity to permanent water sources, including the Los Angeles River, Tujunga Wash, Ballona Creek, Compton Creek, Arroyo Seco, and coastal areas.

Summary of Component Impacts

Table 3.7-2 presents a summary of the component impacts to cultural resources.

Table 3.7-2. Cultural Resources Component Impact Summary
Integrated Resources Plan EIR

Component	Significance Threshold				
	Paleontological Resources	**Archaeological Resources**	**Traditional Cultural Property**	**Human Remains**	**Historic Resources**
Project-Level					
Hyperion Expansion to 500 mgd	High to moderate potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	No aboveground historic resources have been identified that would be affected by this component.
Hyperion Process Upgrades	High to moderate potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	No aboveground historic resources have been identified that would be affected by this component.
Tillman Expansion to 100 mgd	High to moderate potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	No aboveground historic resources have been identified that would be affected by this component.
Tillman Expansion to 80 mgd	High to moderate potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	Low potential for impacts from previous disturbances within existing plant.	No aboveground historic resources have been identified that would be affected by this component.
Tillman Process Upgrade	No potential for impacts as no belowground disturbances will occur.	Low potential for impacts because no belowground disturbances are anticipated.	Low potential for impacts because no belowground disturbances are anticipated.	Low potential for impacts as no belowground disturbances are anticipated.	No aboveground historic resources have been identified that would be affected by this component.

Table 3.7-2. Cultural Resources Component Impact Summary
Integrated Resources Plan EIR

Component	Significance Threshold				
	Paleontological Resources	**Archaeological Resources**	**Traditional Cultural Property**	**Human Remains**	**Historic Resources**
Tillman Wastewater Storage	High potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Low potential for buried tank to impact archaeological resources.	Low potential for buried tank to impact archaeological resources.	Low potential for buried tank to impact archaeological resources.	No aboveground historic resources have been identified that would be affected by this component.
LAG Expansion to 30 mgd Storage	High potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Generally, low potential for impacts from previous disturbances within existing plant. Low potential for impacts to archaeological resources exists in proposed storage tank areas.	Generally, low potential for impacts from previous disturbances within existing plant. Low potential for impacts to archaeological resources exists in proposed storage tank areas.	Generally, low potential for impacts from previous disturbances within existing plant. Low potential for impacts to archaeological resources exists in proposed storage tank areas.	No aboveground historic resources have been identified that would be affected by this component.
LAG Operational Storage	High potential during ground disturbance for impacts to paleontologic resources with regional or statewide significance.	Generally, low potential for impacts from previous disturbances within existing plant. Low potential for impacts to archaeological resources exists in proposed storage tank areas.	Generally, low potential for impacts from previous disturbances within existing plant. Low potential for impacts to archaeological resources exists in proposed storage tank areas.	Generally, low potential for impacts from previous disturbances within existing plant. Low potential for impacts to archaeological resources exists in proposed storage tank areas.	No aboveground historic resources have been identified that would be affected by this component.

Table 3.7-2. Cultural Resources Component Impact Summary
Integrated Resources Plan EIR

Component	Significance Threshold				
	Paleontological Resources	**Archaeological Resources**	**Traditional Cultural Property**	**Human Remains**	**Historic Resources**
NEIS II West Alignment (1) and NEIS II East Alignment (2)	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	All cut-and-cover construction, (shaft sites, diversion and drop structure pits, maintenance holes, and connecting sewers) resulting in belowground disturbances have high potential to impact archaeological resources when occurring within 0.25-mile of Los Angeles River or tributary. The following ancillary facilities are located within 0.25-mile of Los Angeles River and, therefore, have high potential for impact to archaeological resources: ■ Division St. Shaft Site ■ Griffith Park Shaft Site ■ Los Angeles Zoo Shaft Site ■ Observatory Shaft Site ■ Pecan Grove Shaft Site ■ Chevy Chase Diversion Structure at West End ■ Brazil Street Shaft Site ■ LAG Diversion in Colorado Boulevard	All cut-and-cover construction, (shaft sites, diversion and drop structure pits, maintenance holes, and connecting sewers) resulting in belowground disturbances have high potential to impact archaeological resources when occurring within 0.25-mile of Los Angeles River or tributary. The following ancillary facilities are located within 0.25-mile of Los Angeles River and, therefore, have high potential for impact to archaeological resources: ■ Division St. Shaft Site ■ Griffith Park Shaft Site ■ Los Angeles Zoo Shaft Site ■ Observatory Shaft Site ■ Pecan Grove Shaft Site ■ Chevy Chase Diversion Structure at West End ■ Brazil Street Shaft Site ■ LAG Diversion in Colorado Boulevard	All cut-and-cover construction, (shaft sites, diversion and drop structure pits, maintenance holes, and connecting sewers) resulting in belowground disturbances have high potential to impact archaeological resources when occurring within 0.25-mile of Los Angeles River or tributary. The following ancillary facilities are located within 0.25-mile of Los Angeles River and therefore have high potential for impact to archaeological resources: ■ Division St. Shaft Site ■ Griffith Park Shaft Site ■ Los Angeles Zoo Shaft Site ■ Observatory Shaft Site ■ Pecan Grove Shaft Site ■ Chevy Chase Diversion Structure at West End ■ Brazil Street Shaft Site ■ LAG Diversion in Colorado Boulevard	At the Division Street Shaft Site, the Hemphill Diesel School at 2121 San Fernando Road, was found eligible for the *National Register*, pending SHPO concurrence, and is eligible for the *California Register*. The Hemphill Diesel School is located across San Fernando Road from the Division Street Shaft Site, which is already being used for NEIS II construction. Under CEQA, there would be no significant effect, and if Section 106 applies, there would be no adverse effect. No other aboveground historic resources would be affected.

Table 3.7-2. Cultural Resources Component Impact Summary
Integrated Resources Plan EIR

Component	Significance Threshold				
	Paleontological Resources	**Archaeological Resources**	**Traditional Cultural Property**	**Human Remains**	**Historic Resources**
GBIS South Alignment (1) and GBIS North Alignment (2)	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	All cut-and-cover construction, (shaft sites, diversion and drop structure pits, maintenance holes, and connecting sewers) resulting in belowground disturbances have high potential to impact archaeological resources when occurring within 0.25-mile of Los Angeles River or tributary. The following ancillary facilities are located within 0.25-mile of Los Angeles River or Tujunga Wash and therefore have high potential for impact to archaeological resources: ■ Los Angeles Zoo Shaft Site ■ Observatory Shaft Site ■ Pecan Grove Shaft Site ■ Barham Shaft Site ■ Riverside East Shaft Site ■ Valley Heart Shaft Site ■ Riverside West Shaft Site ■ Weddington Park ■ Acama Vineland ■ NOS Diversion at Sonora Extended ■ NOS Diversion at Woodbridge ■ Brazil Street Shaft Site ■ LAG Diversion in Colorado Boulevard	All cut-and-cover construction, (shaft sites, diversion and drop structure pits, maintenance holes, and connecting sewers) resulting in belowground disturbances have high potential to impact archaeological resources when occurring within 0.25-mile of Los Angeles River or tributary. The following ancillary facilities are located within 0.25-mile of Los Angeles River or Tujunga Wash and, therefore, have high potential for impact to archaeological resources: ■ Los Angeles Zoo Shaft Site ■ Observatory Shaft Site ■ Pecan Grove Shaft Site ■ Barham Shaft Site ■ Riverside East Shaft Site ■ Valley Heart Shaft Site ■ Riverside West Shaft Site ■ Weddington Park ■ Acama Vineland ■ NOS Diversion at Sonora Extended ■ NOS Diversion at Woodbridge	All cut-and-cover construction, (shaft sites, diversion and drop structure pits, maintenance holes, and connecting sewers) resulting in belowground disturbances have high potential to impact archaeological resources when occurring within 0.25-mile of Los Angeles River or tributary. The following ancillary facilities are located within 0.25-mile of Los Angeles River or Tujunga Wash and, therefore, have high potential for impact to archaeological resources: ■ Los Angeles Zoo Shaft Site ■ Observatory Shaft Site ■ Pecan Grove Shaft Site ■ Barham Shaft Site ■ Riverside East Shaft Site ■ Valley Heart Shaft Site ■ Riverside West Shaft Site ■ Weddington Park ■ Acama Vineland ■ NOS Diversion at Sonora Extended ■ NOS Diversion at Woodbridge	No aboveground historic resources have been identified that would be affected by this component.

Table 3.7-2. Cultural Resources Component Impact Summary
Integrated Resources Plan EIR

Component	Significance Threshold				
	Paleontological Resources	**Archaeological Resources**	**Traditional Cultural Property**	**Human Remains**	**Historic Resources**
Program-level					
VSLIS	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.
Recycled Water Distribution	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.
DWR – Smart Irrigation	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	Low potential for impacts as no belowground disturbances are anticipated.	Low potential for impacts because No belowground disturbances are anticipated.	Low potential for impacts as no belowground disturbances are anticipated..	No aboveground historic resources have been identified that would be affected by this component.
DWR – Low-Flow Diversions	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.

Table 3.7-2. Cultural Resources Component Impact Summary
Integrated Resources Plan EIR

Component	Significance Threshold				
	Paleontological Resources	**Archaeological Resources**	**Traditional Cultural Property**	**Human Remains**	**Historic Resources**
DWR – URPs or Treatment Wetlands	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.
WWR – Onsite Management	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.
WWR – Urban Treatment Plants	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.
WWR – Non-Urban Recharge	Low to High. Construction activities have low to high potential to impact paleontological resources depending on paleontological sensitivity of geologic units in which activities occur.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No specific studies have been undertaken. Potential is currently unknown.	No aboveground historic resources have been identified that would be affected by this component.

Upon determination of the location of non-urban regional recharge facilities and selection of construction methodology, further investigation would need to be completed to make an accurate assessment of potential to cause an impact to prehistoric and historic archaeological resources. Currently, non-urban regional recharge would have indeterminate potential to disturb, damage, or degrade archaeological resources.

No traditional cultural properties have been identified within the general locations identified for non-urban regional recharge. Upon determination of project-level details for non-urban regional recharge, further investigation, including additional consultation with Native American individuals and tribes, would need to be completed to make an accurate assessment of potential to cause an impact to traditional cultural properties. Currently, non-urban regional recharge would have indeterminate potential to disturb, damage, or degrade traditional cultural properties important to the Native American community.

No human remains have been identified within the general locations identified for non-urban regional recharge. Upon determination of project-level details for non-urban regional recharge, further investigation would need to be completed to make an accurate assessment of potential to cause an impact to any human remains. Currently, non-urban regional recharge would have indeterminate potential to disturb, degrade, or remove human remains.

Historic and Architectural Resources

No project-specific research, including literature searches and site surveys, has been undertaken for historic and architectural resources within the vicinity of non-urban regional recharge facilities. It is currently unknown whether historic and architectural resources are located in the vicinity. Upon determination of specific locations for non-urban regional recharge facilities and selection construction methodology, further investigation would need to be completed to make an accurate assessment of potential to impact historic and architectural resources. Currently, non-urban regional recharge facilities would have indeterminate potential to result in an effect on federal, state, and local historic or architectural resources.

3.7.3.3 Alternative Impacts

Alternative 1

Components of Alternative 1 are described in Section 2.3.4.

Impact CUL-1

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 1 has been evaluated for its potential to result in an impact to paleontological resources of regional or statewide importance. The following is a summary of the significance of primary and secondary impacts under Alternative 1. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. Potential for significant impact to paleontologic resources is dependent upon presence or absence of geologic units considered to have high potential to contain paleontologic resources of local or regional significance (see Table 3.7-1).

Geologic units considered to have high potential to contain paleontological resources are present within the study area. Therefore, implementation of Alternative 1 could result in significant impacts to paleontologic resources.

Secondary Impacts. No secondary impacts to paleontological resources would be anticipated under Alternative 1.

Mitigation. The following applicable measures would be implemented to mitigate potential paleontological resource impacts:

CUL-MM-1 (paleo)
Paleontological Resources Awareness materials for the IRP will be developed by a qualified paleontologist and provided to staff on projects, as applicable. Paleontologic Resources Awareness materials will include, but will not be limited to, the following:

- Preconstruction orientation for construction site and management personnel to educate staff on the sensitivity of paleontological resources, including resource types previously encountered and geologic units in and depths at which previous paleontological resources have been located in the vicinity of specific components
- Procedures to follow in the event resources are identified during ground-disturbing activities

CUL-MM-2 (paleo)
All excavations in geologic formations with high potential to contain paleontological resources will be monitored for paleontological resources by a qualified paleontologist. All geologic formations, except surficial Quaternary or younger alluvium and Recent dune sand, have high potential to contain paleontological resources.

The qualified paleontologic monitor will be present during excavation of undisturbed soils and will use professional judgment to determine actual sediment conditions at the site. Monitoring will be eliminated if a potentially fossiliferous geologic unit is not present in the subsurface at the Project site, or, if present, is determined by the qualified paleontologist upon exposure and examination to have low potential to contain fossils.

CUL-MM-3 (paleo)
The paleontologic monitor will be equipped to salvage fossils of regional or statewide significance at the time that they are unearthed to avoid construction delays. Monitors will be empowered to halt temporarily or divert construction activities to allow removal of abundant or large specimens of regional or statewide significance.

Recovery of discovered resources will be undertaken by a qualified paleontologist, and construction in the vicinity of that discovery will resume once those inadvertently discovered resources have been recovered properly. Staff will continue construction work in the area only after directed by the qualified paleontologist.

Recovered paleontological resources specimens will be prepared to a point of identification of regional or statewide significance.

CUL-MM-4 (paleo)
Recovered paleontological resources specimens of regional and statewide significance will be curated to a qualified museum repository with permanent retrievable storage (such as the LACM).

To the extent possible, all paleontological resources of regional or statewide significance recovered during implementation of the IRP Facilities Plan will be curated at the same location and will be made available for educational study by qualified individuals.

CUL-MM-5 (paleo)
In the event any paleontological resources are uncovered during ground-disturbing activities, a Report of Findings will be prepared with an appended itemized inventory of the recovered specimens. Individual Reports of Finding, inventories, and museum curation agreements will be prepared upon completion of the construction of each component and copies will be submitted to the project file and LACM.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-1 (paleo) through CUL-MM-5 (paleo) would reduce impacts to paleontological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to paleontological resources that result from tunnel excavation in geologic units with high potential for paleontological resources would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impact to paleontological resources.

Impact CUL-2
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 1 has been evaluated for its potential to cause an impact to archaeological resources defined as important under CEQA. The following is a summary of the significance of primary and secondary impacts under Alternative 1. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. Geologic deposits in the HSA older than approximately 10,000 years (older than Holocene) would have no potential to contain prehistoric or historic archaeological resources.

Hyperion and Tillman would have no to low potential to disturb, damage, or degrade significant archaeological deposits because extensive ground disturbance has occurred in the past at the plants, and both plant sites are wholly developed.

LAG has low potential to destroy, damage, or degrade significant prehistoric archaeological resources during tank installation.

Implementation of NEIS II and GBIS would result in high potential to destroy, damage, or degrade significant archaeological resources for only those portions of the alignments within 0.25-mile of the Los Angeles River and other primary and/or secondary tributaries, based on the well-founded observation on the part of archaeologists that river courses, major drainages, and other permanent water sources are common locations of human occupation or use. All other NEIS II and GBIS Project components would be considered to have low potential for impact to significant archaeological resources.

The specific location of ground-disturbing activities for the program-level components is not identified at this time. No ground-disturbing activities would occur during implementation of Dry Weather – Smart Irrigation. In the absence of this information, program-level components, except Dry Weather – Smart Irrigation, would have indeterminate potential to disturb, damage, or degrade archaeological resources.

Therefore, Alternative 1 would result largely in indeterminate to low potential to result in significant impacts to archaeological resources under significance threshold CUL-2. However, those Project components located within 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries would be considered to have high potential to disturb, damage, or degrade archaeological resources.

Secondary Impacts. No secondary impacts to archaeological resources would be anticipated under Alternative 1.

Mitigation. Implementation of CUL-MM-6 (archaeo), CUL-MM-7 (archaeo), CUL-MM-8 (archaeo), CUL-MM-9 (archaeo) and CUL-MM-10 (archaeo) will reduce potential impacts to archaeological resources under Alternative 1 to a less-than-significant level.

CUL-MM-6 (archaeo)
A Cultural Resources Monitoring Plan for the IRP will be developed by a Registered Professional Archaeologist in coordination with the State Historic Preservation Office (SHPO), if Section 106 applies to implementation of a specific Alternative component. The Plan will be provided to staff, as applicable.

The Cultural Resources Monitoring Plan for the IRP will include, but not be limited to, the following:

- Preconstruction orientation for construction site and management personnel to educate staff on the sensitivity of archaeological resources, traditional cultural properties, and human remains.
- Field procedures, including procedures to follow in the event resources are identified during ground-disturbing activities
- Depths at which previous archaeological resources have been located in the vicinity of specific components

A qualified cultural resources specialist will identify the location (surface extent and depth) of Holocene deposits that have the potential to contain archaeological deposits; the locations that contain Holocene deposits will be included in the Plan. The Plan also will identify areas (surface extent and depth) where Holocene deposits do not exist or are known to be highly disturbed.

CUL-MM-7 (archaeo)
All ground-disturbing activities, using surface construction methods, in Holocene sediments with high potential to contain archaeological resources (as defined in Section 3.7.3.1, Methodology) will be monitored by a qualified archaeologist. Side walls and spoils will be inspected, as safety conditions permit, to identify any artifacts or cultural features that could be exposed during construction.

The archaeological monitor will be empowered to divert construction activities if any cultural resources are encountered, and a qualified archaeologist will evaluate the eligibility of the resources for listing on the NRHP or CRHR, as applicable. Staff will continue construction work in the area only after directed by the qualified archaeologist.

CUL-MM-8 (archaeo)
Prior to construction, a Discovery and Treatment Plan for the IRP will be developed by a qualified archaeologist. The Discovery and Treatment Plan will meet NRHP and CRHR standards and will be submitted to the State Board if the implemented component is funded through the State Revolving Fund.

The Discovery and Treatment Plan will describe in detail procedures to follow upon discovery of prehistoric and historic resources, resources determined not to be eligible for listing on the NRHP and CRHR, resources determined to be eligible for listing on the NRHP and CRHR, and human remains. Additionally, the Plan will describe requirements for recordation, reporting, curation, and coordination with culturally affiliated Native Americans.

CUL-MM-9 (archaeo)
In the event any archaeological resources are uncovered during ground-disturbing activities, a Report of Findings will be prepared with an appended

itemized inventory of the recovered specimens. Individual Reports of Findings, inventories, and museum curation agreements will be prepared upon completion of the construction of each component, and copies will be submitted to the Project file and to appropriate agencies. The report, inventory, and museum curation agreement, if applicable, would signify completion of the program to mitigate impacts to archaeological resources.

CUL-MM-10 (archaeo)
Program-level components will require project-level studies, including literature searches, to determine the cultural resources sensitivity of the component location prior to initiation of site development and/or construction. These studies will include recommendations for evaluation, treatment, and recovery of cultural resources determined to be eligible for listing in the NRHP and CRHR. A report will be prepared to document the results of the studies, will be reviewed and approved by the City, and will meet State Board SRF requirements where they apply.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-6 (archaeo) through CUL-MM-10 (archaeo) would reduce impacts to archaeological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to archaeological resources that result from tunnel excavation in Holocene and younger sediments would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impact to archaeological resources.

Impact CUL-3
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 1 has been evaluated for its potential to cause an impact to traditional cultural properties considered important to local or regional Native American communities. The following is a summary of the significance of primary and secondary CUL-3 impacts under Alternative 1. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impact. Based on the records and literature search, Alternative 1 would not result in an impact to any known traditional cultural properties. The NAHC was notified prior to issuance of the NOP. A review of the Sacred Lands File maintained by the NAHC identified one archaeological site of concern (CA-LAN-1575/H). This site lies outside the APE defined for Alternative 1 components.

Additionally, the NAHC provided a Native American Contact List. All individuals and tribes listed by the NAHC were contacted in writing during March 2005. All individuals and tribes were contacted by phone after April 7, 2005. No traditional cultural properties were identified within the APE of Alternative 1 by individuals or tribes that were contacted.

A representative from the Gabrielino Tongva stated that Alternative 1 contains components that would cross historic Gabrielino Tongva territory and requested further notification of project design and implementation.

The location of ground-disturbing activities for the program-level components is not specifically identified at this time. No traditional cultural properties were identified within the general vicinity of Project components; however, more information would be required to make a final determination of the presence or absence of traditional cultural properties within the program-level APE.

Therefore, Alternative 1 would result in low potential for significant impacts to traditional cultural properties under significance threshold CUL-3.

Secondary Impacts. No secondary impacts to traditional cultural properties would be anticipated under CUL-3.

Mitigation. Implementation of CUL-MM-6 (archaeo), CUL-MM-7 (archaeo), CUL-MM-8 (archaeo), CUL-MM-9 (archaeo), and CUL-MM-11 (archaeo) will reduce potential impacts to traditional cultural properties under Alternative 1 to a less-than-significant level.

CUL-MM-11 (archaeo)
Once the location and method of construction are determined for each program-level component, further coordination with Native American individuals and tribes will be conducted to document the presence or absence of traditional cultural properties within the specific APEs of the program-level components.

Impacts after Mitigation. No impacts would be anticipated under CUL-3 after implementation of mitigation.

Impact CUL-4
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 1 has been evaluated for its potential to result in an impact to human remains. The following is a summary of the significance of primary and secondary CUL-4 impacts under Alternative 1. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. Geologic deposits in the HSA older than approximately 10,000 years (older than Holocene) would have no potential to contain prehistoric and historic archaeological resources.

The NAHC was notified prior to issuance of the NOP. A review of the Sacred Lands File maintained by the NAHC identified one archaeological site of concern (CA-LAN-1575/H) where human remains previously had been exposed. This site lies outside the APE defined for Alternative 1. Human remains also were exposed on Troost Street in Studio City; this site is 0.5-mile from the proposed GBIS alignment and will not be impacted as a result of construction of Alternative 1. No human remains have been recorded within the APE of Alternative 1.

Hyperion and Tillman have low potential to disturb, degrade, or remove human remains because extensive ground disturbance has occurred in the past at the sites, and both are wholly developed.

LAG has low potential to disturb, degrade, or remove human remains during tank installation, with exception of any ground-disturbing activity that might take place within 0.25-mile of the Los Angeles River, in which case the potential would be considered high.

Generally, implementation of NEIS II and GBIS would result in low potential to disturb, degrade, or remove human remains. However, those project components located within 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries would be considered to have high potential to disturb, degrade, or remove human remains, based on the well founded observation on the part of archaeologists that river courses, major drainages, and other permanent water sources are common locations of human occupation or use.

The specific location of ground-disturbing activities for the program-level components is not identified specifically at this time. No ground-disturbing activities would occur during implementation of Dry Weather – Smart Irrigation. In the absence of this information, program-level components, except Dry Weather – Smart Irrigation, have indeterminate to low potential to disturb, degrade, or remove human remains.

Therefore, Alternative 1 would result largely in low potential to result in significant impacts to human remains under significance threshold CUL-4. However, those Project components located within 0.25-mile of the Los Angeles River would be considered to have high potential to disturb, degrade, or remove human remains.

Implementation of CUL-MM-6 (archaeo), CUL-MM-7 (archaeo), CUL-MM-8 (archaeo), CUL-MM-9 (archaeo), and CUL-MM-10 (archaeo) would reduce the potential to result in impacts to human remains under Alternative 1.

Secondary Impacts. No secondary impacts to archaeological resources would be anticipated under Alternative 1.

Mitigation

CUL-MM-12 (archaeo)

In the event of an accidental discovery of human remains in a location other than a dedicated cemetery, the steps and procedures specific in Health and Safety Code 7050.5, State CEQA Guidelines 15064.5(3), and Public Resources Code 5097.98 find must be implemented.

Impacts after Mitigation. Any disturbance, degradation, or removal of human remains would be considered a significant environmental impact under CEQA. Impacts to cemeteries, human remains, or Native American burials cannot be mitigated. Significant impacts are not anticipated.

Impact CUL-5

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 1 has been evaluated for its potential to result in an impact to historic resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-5 impacts under Alternative 1.

Primary Impacts. The Division Street shaft site, a component of NEIS II, would be the only component of Alternative 1 where a historical building has been identified. At the Division Street shaft site, the Hemphill Diesel School at 2121 San Fernando Road, was found eligible for the *National Register*, pending SHPO concurrence, and is eligible for the *California Register*. The Hemphill Diesel School is located across San Fernando Road from the Division Street shaft site, which currently is being used for NEIS (Phase 1) construction. Under CEQA, no significant effect would occur and, if Section 106 applies, no adverse effect would occur. No other aboveground historic resources would be affected.

Secondary Impacts. No secondary impacts on historic resources were identified.

Mitigation. Because no impacts were identified, no mitigation would be required for historic resources.

Impacts after Mitigation. No impacts were identified and no mitigation is proposed for historic resources under Alternative 1.

Alternative 2

Components of Alternative 2 are described in Section 2.3.5.

Impact CUL-1

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 2 has been evaluated for its potential to impact paleontological resources of regional or statewide importance. The following is a summary of the significance of primary and secondary CUL-1 impacts under Alternative 2. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used,

significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 2 would be the same as those for Alternative 1. Underground construction activities within geologic units known to have high potential for paleontological resources potentially could result in significant impacts to paleontological resources of regional or statewide significance. Therefore, Alternative 2 could have high potential to result in significant impacts to paleontological resources under significance threshold CUL-1.

Implementation of CUL-MM-1 (paleo), CUL-MM-2 (paleo), CUL-MM-3 (paleo), CUL-MM-4 (paleo), and CUL-MM-5 (paleo) would reduce potential impacts to paleontological resources under Alternative 2 to a less-than-significant level.

Secondary Impacts. No secondary impacts to paleontological resources would be anticipated under Alternative 2.

Mitigation. Mitigation measures CUL-MM-1, CUL-MM-2, CUL-MM-3, CUL-MM-4, and CUL-MM-5, as described above under Alternative 1, will be implemented to mitigate potential impacts to paleontological resources.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-1 (paleo) through CUL-MM-5 (paleo) would reduce impacts to paleontological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to paleontological resources that would result from tunnel excavation in geologic units with high potential for paleontological resources would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, potentially could result in significant unavoidable impacts to paleontological resources.

Impact CUL-2
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 2 has been evaluated for its potential to result in an impact to archaeological resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-2 impacts under Alternative 2. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 2 are the same as those for Alternative 1. Hyperion, Tillman, and LAG would have low potential to disturb, damage, or degrade significant archaeological deposits. NEIS II and GBIS would have low and high potential to destroy, damage, or

degrade significant archaeological resources, based on whether impacts fall within or outside 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries. Similar to Alternative 1, program-level components would have indeterminate to low potential to result in impacts to archaeological resources.

Therefore, Alternative 2 would result largely in indeterminate to low potential to result in significant impacts to archaeological resources under significance threshold CUL-2. However, those Project components located within 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries would be considered to have high potential to disturb, damage, or degrade archaeological resources.

Secondary Impacts. As with Alternative 1, no secondary impacts to known prehistoric or historic archaeological resources would be a result of Alternative 2.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-10, as described above under Alternative 1, will be implemented to mitigate potential archaeological resource impacts.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-6 (archaeo) through CUL-MM-10 (archaeo) would reduce impacts to archaeological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to archaeological resources that result from tunnel excavation in Holocene and younger sediments would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impact to archaeological resources.

Impact CUL-3

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 2 has been evaluated for its potential to result in an impact to traditional cultural properties considered important to local or regional Native American communities. The following is a summary of the significance of primary and secondary CUL-3 impacts under Alternative 2. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts for implementing Alternative 2 would be the same as those for Alternative 1. No traditional cultural properties have been identified within the study area. Similar to Alternative 1, the program-level components of Alternative 2 would have an indeterminate to low potential to affect traditional cultural properties. Therefore, Alternative 2

potentially could result in significant impacts to traditional cultural properties under significance threshold CUL-3.

Secondary Impacts. As with Alternative 1, no secondary impacts to traditional cultural properties would be a result of Alternative 2.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-11, as described previously under Alternative 1, will be implemented to mitigate potential impacts to traditional cultural properties.

Impacts after Mitigation. Following implementation of CUL-MM-11, impacts regarding traditional cultural properties will be reduced to a less-than-significant level.

Impact CUL-4

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 2 has been evaluated for its potential to result in an impact to human remains. The following is a summary of the significance of primary and secondary CUL-4 impacts under Alternative 2. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 2 would be the same as those for Alternative 1. Hyperion, Tillman, LAG, NEIS II, and GBIS generally would have low potential to disturb, degrade, or remove human remains. However, those Project components within 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries would have high potential to impact human remains.

Similar to Alternative 1, the program-level components of Alternative 2 largely would have an indeterminate potential to affect human remains. Therefore, Alternative 2 would result in indeterminate potential for impacts to human remains under significance threshold CUL-4.

Secondary Impacts. No secondary impacts to human remains are anticipated under Alternative 2.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-11, as described above under Alternative 1, will be implemented to mitigate potential impacts to human remains.

Impacts after Mitigation. Any disturbance, degradation, or removal of human remains would be considered a significant environmental impact under CEQA. Impacts to cemeteries, human remains, or Native American burials cannot be mitigated.

Impact CUL-5

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 2 has been evaluated for its potential to affect historic resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-5 impacts under Alternative 2. Mitigation measures are identified where applicable.

Primary Impacts. As with Alternative 1, the Hemphill Diesel School at 2121 San Fernando Road was found eligible for the *National Register*, but the school would not be affected adversely or significantly by Alternative 2.

Secondary Impacts. No secondary impacts on historic resources would be anticipated under Alternative 2.

Mitigation. Because no impacts were identified, no mitigation would be required for historic resources.

Impacts after Mitigation. No impacts were identified and no mitigation was proposed for historic resources.

Alternative 3

Components of Alternative 3 are described in Section 2.3.6.

Impact CUL-1

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 3 has been evaluated for its potential to result in an impact to the paleontological resources of regional or statewide importance. The following is a summary of the significance of primary and secondary CUL-1 impacts under Alternative 3. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 3 would be the same as those for Alternative 1. Underground construction activities within geologic units known to have high potential for paleontological resources potentially would result in significant impacts to paleontological resources of regional or statewide significance. Therefore, Alternative 3 could result in high potential for significant impacts to paleontological resources under significance threshold CUL-1.

Secondary Impacts. No secondary impacts to paleontological resources would be anticipated under Alternative 3.

Mitigation. Mitigation measures CUL-MM-1, CUL-MM-2, CUL-MM-3, CUL-MM-4, and CUL-MM-5, as described previously under Alternative 1, will be implemented to mitigate potential impacts to paleontological resources.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-1 (paleo) through CUL-MM-5 (paleo) would reduce impacts to paleontological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to paleontological resources that result from tunnel excavation in geologic units with high potential for paleontological resources would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impact to paleontological resources.

Impacts CUL-2
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 3 has been evaluated for its potential to result in an impact to archaeological resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-2 impacts under Alternative 3. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 3 would be the same as those for Alternative 1. Hyperion, Tillman, and LAG have low potential to disturb, damage, or degrade significant archaeological deposits. Implementation of NEIS II and GBIS would result in high potential to destroy, damage, or degrade significant archaeological resources for those portions of the alignments within 0.25-mile of the Los Angeles River and other primary and/or secondary tributaries, based on the well-founded observation on the part of archaeologists that river courses, major drainages, and other permanent water sources are common locations of human occupation or use. All other project components would be considered to have low potential for impact to significant archaeological resources.

Similar to Alternative 1, the program-level components of Alternative 3 have a largely indeterminate potential to affect archaeological resources.

Therefore, Alternative 3 would result largely in indeterminate to low potential to result in significant impacts to archaeological resources under significance threshold CUL-2. However, those Project components located within 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries would be considered to have high potential to disturb, damage, or degrade archaeological resources.

Secondary Impacts. No secondary impacts to archaeological resources would be anticipated under Alternative 3.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-10, as described under Alternative 1, will be

implemented to mitigate potential archaeological resource impacts under Alternative 3.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-6 (archaeo) through CUL-MM-10 (archaeo) will reduce impacts to archaeological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to archaeological resources that result from tunnel excavation in Holocene and younger sediments would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impacts to archaeological resources.

Impact CUL-3
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 3 has been evaluated for its potential to result in an impact to traditional cultural properties considered important to local or regional Native American communities. The following is a summary of the significance of primary and secondary CUL-3 impacts under Alternative 3. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts for implementing Alternative 3 would be the same as those for Alternative 1. No traditional cultural properties have been identified within the study area. Similar to Alternative 1, the program-level components of Alternative 3 would have a largely indeterminate to low potential to affect traditional cultural properties. Therefore, Alternative 3 would result in low potential for significant impacts to traditional cultural properties under significance threshold CUL-3.

Secondary Impacts. Similar to Alternative 1, no secondary impacts to traditional cultural properties would be a result of Alternative 3.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-11, as described above under Alternative 1, will be implemented to mitigate potential impacts to traditional cultural properties.

Impacts after Mitigation. Following implementation of mitigation measures, impacts regarding traditional cultural properties and areas of Native American concern would be reduced to a less-than-significant level.

Impact CUL-4
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 3 has been evaluated for its potential to result in an impact to human remains. The following is a summary of the significance of primary

and secondary CUL-4 impacts under Alternative 3. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 3 would be the same as those for Alternative 1. Hyperion, Tillman, and LAG would have low potential to disturb, damage, or degrade significant archaeological deposits. Implementation of NEIS II and GBIS would result in high potential to disturb, degrade, or remove human remains only for those portions of the alignments within 0.25-mile of the Los Angeles River and other primary and/or secondary tributaries, based on the well-founded observation on the part of archaeologists that river courses, major drainages, and other permanent water sources are common locations of human occupation or use. All other project components would be considered to have low potential to disturb, degrade, or remove human remains. Similar to Alternative 1, the program-level components of Alternative 3 would have an indeterminate to low potential to affect human remains. Therefore, Alternative 3 would result in indeterminate to low potential for significant impacts to human remains under significance threshold CUL-4.

Secondary Impacts. No secondary impacts to human remains would be anticipated under Alternative 3.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-11, as described under Alternative 1, will be implemented to mitigate potential impacts to human remains.

Impacts after Mitigation. Any disturbance, degradation, or removal of human remains would be considered a significant environmental impact under CEQA. Impacts to cemeteries, human remains, or Native American burials cannot be mitigated.

Impact CUL-5

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 3 has been evaluated for its potential to result in an impact to historic resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-5 impacts under Alternative 3. Mitigation measures are identified where applicable.

Primary Impacts. As with Alternative 1, the Hemphill Diesel School at 2121 San Fernando Road was found eligible for the *National Register*, but the school would not be affected adversely or significantly by Alternative 3.

Secondary Impacts. No secondary impacts on historic resources would be anticipated under Alternative 3.

Mitigation. Because no impacts were identified, no mitigation is required for historic resources.

Impacts after Mitigation. No impacts were identified and no mitigation was proposed for historic resources.

Alternative 4

Components of Alternative 4 are described in Section 2.3.7.

Impact CUL-1

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 4 has been evaluated for its potential to result in an impact to paleontological resources of regional or statewide importance. The following is a summary of the significance of primary and secondary CUL-1 impacts under Alternative 4. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 4 would be the same as those for Alternative 1. Underground construction activities within geologic units known to have high potential for paleontological resources potentially would result in significant impacts to paleontological resources of regional or statewide significance. Therefore, Alternative 4 potentially could result in significant impacts to paleontological resources under significance threshold CUL-1.

Secondary Impacts. No secondary impacts to paleontological resources would be anticipated under Alternative 4.

Mitigation. Mitigation measures CUL-MM-1, CUL-MM-2, CUL-MM-3, CUL-MM-4, and CUL-MM-5, as described under Alternative 1, will be implemented to mitigate potential paleontological resources impacts.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-1 (paleo) through CUL-MM-5 (paleo) would reduce impacts to paleontological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to paleontological resources that result from tunnel excavation in geologic units with high potential for paleontological resources would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impact to paleontological resources.

Impact CUL-2

In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 4 has been evaluated for its potential to result in an impact to archaeological resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-2 impacts under Alternative 4. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would

be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 4 would be the same as those for Alternative 1. Hyperion, Tillman, and LAG would have low potential to disturb, damage, or degrade significant archaeological deposits. Implementation of NEIS II and GBIS would result in high potential to disturb, degrade, or remove human remains for those portions of the alignments within 0.25-mile of the Los Angeles River and other primary and/or secondary tributaries, based on the well-founded observation on the part of archaeologists that river courses, major drainages, and other permanent water sources are common locations of human occupation or use. All other Project components are considered to have low potential to disturb, degrade, or remove human remains.

Similar to Alternative 1, the program-level components of Alternative 4 would have an indeterminate to low potential to affect archaeological resources.

Therefore, Alternative 4 would result largely in indeterminate to low potential to result in significant impacts to archaeological resources under significance threshold CUL-2. However, those Project components located within 0.25-mile of the Los Angeles River or other primary and/or secondary tributaries would be considered to have high potential to disturb, damage, or degrade archaeological resources.

Secondary Impacts. No secondary impacts to archaeological resources would be anticipated under Alternative 4.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-10, as described under Alternative 1, will be implemented to mitigate potential archaeological resource impacts under Alternative 4.

Impacts after Mitigation. Implementation of mitigation measures CUL-MM-6 (archaeo) through CUL-MM-10 (archaeo) would reduce impacts to archaeological resources due to surface construction methods to a less-than-significant level.

Potentially significant impacts to archaeological resources that would result from tunnel excavation in Holocene and younger sediments would remain after implementation of mitigation. Tunneling activities associated with implementation of various pipeline features, including, but not limited to, NEIS II, GBIS, and potentially VSLIS, could result in significant unavoidable impacts to archaeological resources.

Impact CUL-3
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 4 has been evaluated for its potential to result in an impact to traditional cultural properties considered important to local or regional Native

American communities. The following is a summary of the significance of primary and secondary CUL-3 impacts under Alternative 4. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts for implementing Alternative 4 would be the same as those for Alternative 1. No traditional cultural properties have been identified within the study area. Similar to Alternative 1, the program-level components of Alternative 4 have a largely indeterminate to low potential to affect traditional cultural properties. Therefore, Alternative 4 would result in low potential for significant impacts to traditional cultural properties under significance threshold CUL-3.

Secondary Impacts. No secondary impacts to traditional cultural properties would be anticipated under Alternative 4.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-11, as described previously under Alternative 1, will be implemented to mitigate potential impacts to traditional cultural properties.

Impacts after Mitigation. Following implementation of specified mitigation measures, impacts regarding traditional cultural properties and areas of Native American concern would be reduced to a level less than significant.

Impact CUL-4
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 4 has been evaluated for its potential to result in an impact to human remains. The following is a summary of the significance of primary and secondary CUL-4 impacts under Alternative 4. Mitigation measures are identified where applicable. Upon implementation of mitigation measures, potentially significant impacts would be reduced to less-than-significant levels. If the tunneling construction method were used, significant impacts could be unavoidable even after implementation of mitigation measures.

Primary Impacts. The primary impacts of implementing Alternative 4 would be the same as those for Alternative 1. Hyperion, Tillman, LAG, NEIS II, and GBIS have largely low potential to disturb, degrade, or remove human remains.

Similar to Alternative 1, the program-level components of Alternative 4 have an indeterminate to low potential to affect human remains. Therefore, Alternative 4 would result in indeterminate to low potential for significant impacts to human remains under significance threshold CUL-4.

Secondary Impacts. No secondary impacts to human remains would be anticipated under Alternative 4.

Mitigation. Mitigation measures CUL-MM-6, CUL-MM-7, CUL-MM-8, CUL-MM-9, and CUL-MM-11, as described above under Alternative 1, will be implemented to mitigate potential impacts to human remains.

Impacts after Mitigation. Any disturbance, degradation, or removal of human remains would be considered a significant environmental impact under CEQA. Impacts to cemeteries, human remains, or Native American burials cannot be mitigated.

Impact CUL-5
In Section 3.7.2.5, Project-Level Components, each of the components in Alternative 4 has been evaluated for its potential to result in impacts to historic resources defined as important under CEQA. The following is a summary of the significance of primary and secondary CUL-5 impacts under Alternative 4. Mitigation measures are identified where applicable.

Primary Impacts. As with Alternative 1, the Hemphill Diesel School at 2121 San Fernando Road was found eligible for the *National Register*, but the school would not be affected adversely or significantly by Alternative 4.

Secondary Impacts. No secondary impacts to historic resources would be anticipated under Alternative 4.

Mitigation. Because no impacts were identified, no mitigation is required for historic resources.

Impacts after Mitigation. No impacts were identified and no mitigation was proposed for historic resources.

No Project Alternative

The No Project Alternative, for purposes of this EIR, is no action. Under this Alternative, integrated improvements to the wastewater treatment and collection system, recycled water system, or runoff system would not occur.

Individual wastewater, recycled water, or runoff projects are still likely to be necessary to meet regulatory requirements and future demands, but such individual projects would be designed and constructed as the needs arise rather than being planned in a systemwide integrated manner. In this case, each individual project would be subject to its own environmental clearance in the future.

Cumulative Impacts

Each Project Alternative has the potential to significantly affect paleontological resources if construction were to occur in sensitive geologic formations. Actual construction in such formations might or might not encounter paleontologic resources. With the exception of the NEIS II, GBIS, and VSLIS, impacts of each Project Alternative would be reduced to a level less than significant. The NEIS II, GBIS, and VSLIS components of each Alternative have the potential to result in unavoidable significant impacts to paleontological resources because they would be constructed at substantial depth and with tunneling methods that do not allow for recovery.

The related plans and projects would require construction that could occur in paleontologically sensitive geologic formations, but mitigation would be expected to minimize impacts. None of the related plans and projects is expected to require deep construction or tunneling methods like NEIS II, GBIS, or VSLIS. Although each Project Alternative could encounter paleontological resources, they are not expected to result in significant cumulative impacts to paleontological resources because implementation of mitigation (for the Alternative and the related plans/projects) would minimize most impacts to such resources; or because the related plans/projects would not occur at depths approaching NEIS II, GBIS, or VSLIS. Therefore, each Alternative, in conjunction with the related plans or projects, would not have the potential to result in cumulative impacts to paleontological resources that might be present in geologic formations at those depths.

Each Project Alternative has a low potential to affect archaeological resources (historic archaeologic resources, traditional cultural properties, and human remains) at Hyperion, Tillman and LAG. NEIS II and GBIS construction within 0.25-mile of the Los Angeles River significantly could affect archaeological resources or human remains, if present. Mitigation has been added to each Alternative to ensure that impacts to archaeological resources are minimized.

The related plans and projects would require construction that also could affect archaeological resources, but mitigation that would be applied to these projects would be expected to minimize impacts. Although NEIS II, GBIS, and VSLIS under each Alternative could result in project-level impacts to archaeological resources from damage to such resources from tunneling, significant cumulative impacts are not anticipated because none of the related plans and projects would be expected to affect similar resources at depth, and because mitigation would be implemented for each Alternative and the related plans and projects.

None of the Project Alternatives would affect historic resources, and, as such, none of the Alternatives (in conjunction with the related plans or projects) would result in significant cumulative impacts to historic resources.