Final

Archaeological Monitoring Plan for the Maipalaoa Bridge Replacement Project on Farrington Highway, Federal Aid Project No. BR-093-1(21), Lualualei Ahupuaʻa, Waiʻanae District, Oʻahu Island

TMK [1] 8-7-023 (Farrington Highway)

Prepared for

SSFM International

Prepared by

Kendy Altizer, B.A.

and

Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawaiʻi, Inc.

Kailua, Hawaiʻi

(Job Code: LUALUALEI 6)

May 2010

Oʻahu Office
P.O. Box 1114
Kailua, Hawaiʻi 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
16 S. Market Street, Suite 2N
Wailuku, Hawaiʻi 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Archaeological Monitoring Plan for the Maipalaoa Bridge Replacement Project on Farrington Highway, Federal Aid Project No. BR-093-1(21), Lualualei Ahupua‘a, Wai‘anae District, O‘ahu Island TMK [1] 8-7-023 (Farrington Highway) (Altizer and Hammatt 2010)
Date	May 2010
Project Number (s)	Federal Aid Project No. BR-093-1(21); Cultural Surveys Hawai’i (CSH) Job Code LUALUALEI 6
Investigation Permit Number	Monitoring activities associated with this project are expected to be completed under CSH’s annual archaeological permit No. 10-10 issued by State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) Chapter 13-282.
Project Location	The project area is located along a portion of Farrington Highway that extends across the mouth of Mā‘ili Stream adjacent to ‘Ulehawa Beach Park in Lualualei Ahupua‘a, Wai‘anae District, O‘ahu Island, TMK [1]8-7-023:060.
Land Jurisdiction	Hawai’i Department of Transportation (HDOT)
Funding	Federal Highways Administration (FHWA) and HDOT
Agencies	SHPD, HDOT, and FHWA
Project Description and Related Ground Disturbance	The existing Maipalaoa Bridge was originally constructed in 1970 and is a four-lane bridge (two lanes in each direction) with narrow shoulder space and sidewalks that span over the City and County’s M-4 Drainage Channel, also known as Mā‘ili Stream. The bridge is in a state of disrepair and is nearing the end of its useful life. HDOT is proposing to demolish the existing bridge and replace it with a concrete structure that complies with current State and Federal codes and regulations. The replacement bridge will be a four-lane bridge with widened shoulders and sidewalk space. HDOT plans to continuously accommodate traffic through the construction process. Ground disturbance would include excavation, scraping, grading, and leveling to allow for re-paving and construction of the widened facilities.
Project Acreage	Approximately 5 acres
Area of Potential Effect (APE)	The proposed bridge replacement project’s APE extends no further than the project area’s approximately 5-acre footprint.

Historic Preservation Regulatory Context and Document Purpose	Because of FHWA funding, this project is a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the federal Department of Transportation Act (DTA). As an HDOT project within state right-of-way, the project is also subject to Hawai‘i State environmental and historic preservation review legislation, Hawai‘i Revised Statutes [HRS] Chapter 343 and HRS 6E-8/ HAR Chapter 13-13-275, respectively. As part of Section 106 consultation efforts, the project proponent consulted with SHPD regarding the need for an archaeological study of the proposed project area. SHPD noted that Maipalaoa Bridge is not over 50 years and, therefore, not considered a historic property; however a monitoring program was recommended as a precautionary mitigation measure because the vicinity of the project area is considered archaeologically sensitive (LOG No. 2010.0479, DOC No 1002NM68). This archaeological monitoring program was prepared in consideration of the Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation, and is to be implemented as a precautionary mitigation measure, to facilitate the identification and treatment of any burials that might be discovered during subsurface disturbance, and to mitigate the project’s effect on any non-burial cultural resources[1] that might be uncovered during project construction. In consultation with SHPD, this monitoring plan is designed to fulfill the state requirements for monitoring plans [HAR Chapter 13-279-4].

[1] In historic preservation parlance, cultural resources are the physical remains and/or geographic locations that reflect the activity, heritage, and/or beliefs of ethnic groups, local communities, states and/or nations. Generally, they are at least 50 years old, although there are exceptions, and include: buildings and structures; groupings of buildings or structures (historic districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and, in some instances, natural landscape features and/or geographic locations of cultural significance.

Historic Properties[2] Potentially Affected	Based on background research, one historic property has been identified in the project area: SIHP # 50-80-7-6824, Farrington Highway, constructed in the 1930s as part of the Territorial Highway System, determined National and Hawai‘i Register eligible under Criterion D[3] (McDermott and Tulchin 2006). Research of historic documents and previous archaeological studies indicate there is little potential for intact subsurface cultural deposits in the project area.
Recommended Monitoring	On-site archaeological monitoring is recommended for all ground disturbing activities. Any departure from this full-time, on-site monitoring, would require consultation with, and the written approval of, SHPD.

[2] Historic properties, as defined under federal historic preservation legislation, are cultural resources that are at least 50 years old (with exceptions) and have been determined eligible for inclusion in the National Register of Historic Places based on their integrity and historic/cultural significance in terms of established significance criteria. Determinations of eligibility are generally made by a federal agency official in consultation with SHPD. Under federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated. Under Hawai‘i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their historic/cultural significance under state law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties determined eligible, based on their integrity and historic/cultural significance in terms of established significance criteria, for inclusion in the Hawai‘i Register of Historic Places). Determinations of eligibility to the Hawai‘i Register result when a state agency official's historic property "significance assessment" is approved by SHPD, or when SHPD itself makes an eligibility determination for a historic property.

[3] Cultural resource significance is evaluated and expressed as eligibility for listing on the National and/or Hawai‘i Register of Historic Places (National and Hawai‘i Registers). To be considered eligible for listing on the National and/or Hawai‘i Register a cultural resource must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet one or more of the following broad cultural/historic significance criteria: "A" reflects major trends or events in the history of the state or nation; "B" is associated with the lives of persons significant in our past; "C" is an excellent example of a site type/work of a master; "D" has yielded or may be likely to yield information important in prehistory or history; and, "E" (Hawaii Register only) has traditional cultural significance to an ethnic group, includes religious structures and/or burials.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of SSFM International, Cultural Surveys Hawai‘i has prepared this archaeological monitoring plan for the proposed Maipalaoa Bridge Replacement Project on Farrington Highway, Federal Aid Project No. BR-093-1(21), Lualualei Ahupua‘a, Wai‘anae District, O‘ahu Island TMK [1] 8-7-023 (Farrington Highway). The project area is located along a portion of Farrington Highway that extends across the mouth of Mā‘ili Stream adjacent to ‘Ulehawa Beach Park in Lualualei Ahupua‘a, Wai‘anae District, O‘ahu Island, Tax Map Key (TMK) [1]8-7-023:060.The project area is depicted on a portion of the 1998 U.S. Geological Survey Wai‘anae Quadrangle Topographic Map (Figure 1), TMK map [1]8-7-023:060 (Figure 2), and an aerial photograph (Figure 3).

Maipalaoa Bridge, originally constructed in 1970, is located in Wai‘anae on the western coast of the island of O‘ahu. The existing bridge is a four-lane bridge (two lanes in each direction) with narrow shoulder space and sidewalks that spans over the City and County’s M-4 Drainage Channel, also known as Mā‘ili Stream. The bridge is in a state of disrepair and is nearing the end of its useful life. The Hawai‘i Department of Transportation (HDOT) is proposing to demolish the existing bridge and replace the bridge with a concrete structure that complies with current State and Federal codes and regulations. The replacement bridge will be a four-lane bridge with widened shoulders and sidewalk space. HDOT plans to continuously accommodate traffic through the construction process. Ground disturbance would include excavation, scraping, grading, and leveling to allow for re-paving and construction of the widened facilities.

Because of Federal Highways Administration (FHWA) funding, this project is a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the federal Department of Transportation Act (DTA). As an HDOT project within state right-of-way, the project is also subject to Hawai‘i State environmental and historic preservation review legislation, Hawai‘i Revised Statutes [HRS] Chapter 343 and HRS 6E-8/Hawai‘i Administrative Rules [HAR] Chapter 13-13-275, respectively.

As part of Section 106 consultation efforts, the project proponent consulted with the State Historic Preservation Division (SHPD) regarding the need for an archaeological study of the proposed project area. SHPD noted that Maipalaoa Bridge is not over 50 years and, therefore, not considered a historic property; however a monitoring program was recommended as a precautionary mitigation measure because the vicinity of the project area is considered archaeologically sensitive (LOG No. 2010.0479, DOC No 1002NM68; see Appendix A).

This archaeological monitoring program was prepared in consideration of the Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation, and is to be implemented as a precautionary mitigation measure to facilitate the identification and treatment of any burials that might be discovered during subsurface disturbance, and to mitigate the project’s effect on any non-burial cultural resources that might be uncovered during project

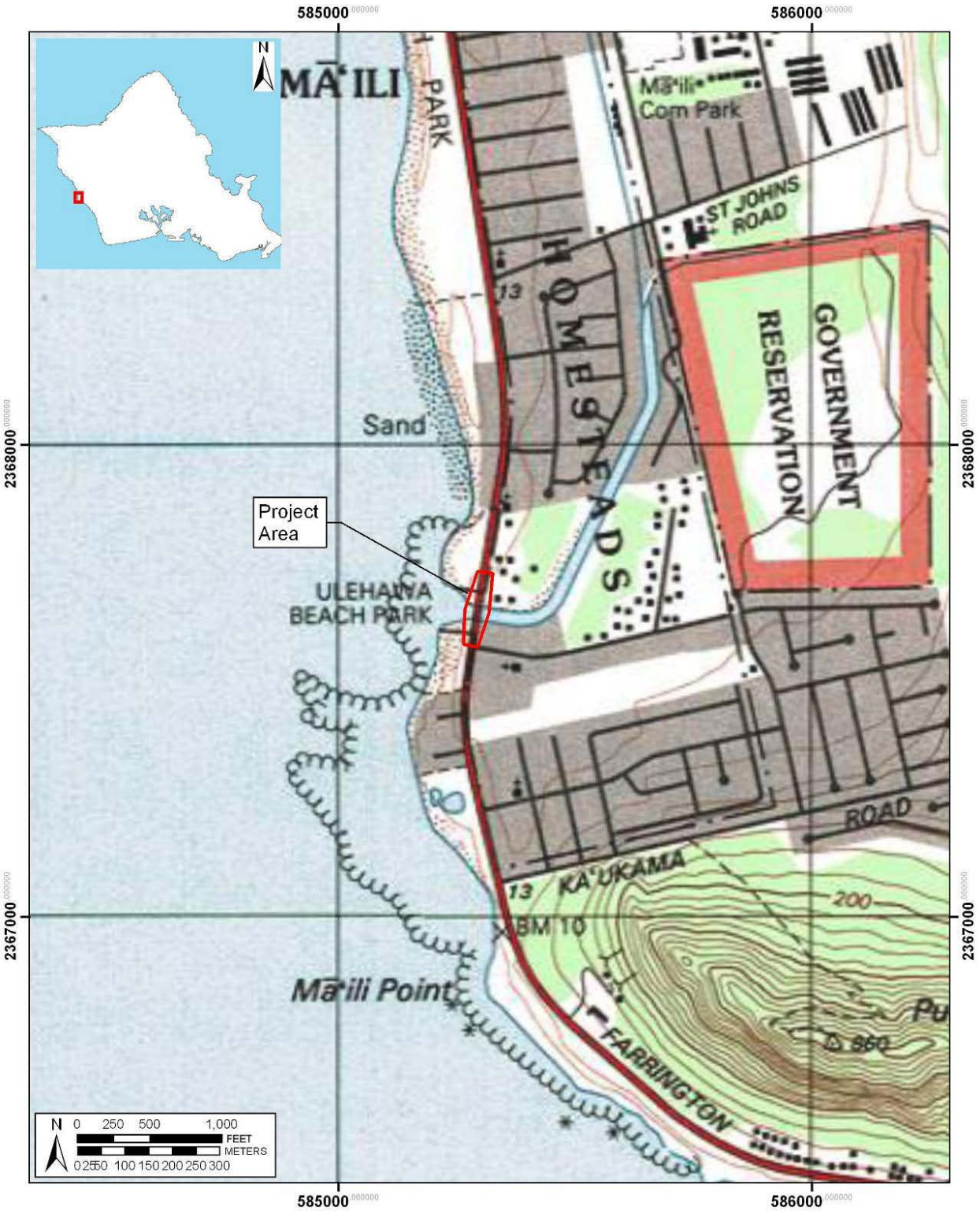

Figure 1. U.S. Geological Survey 7.5 Minute Series Topographic Map, Wai‘anae Quadrangle (1998), showing the location of the project area

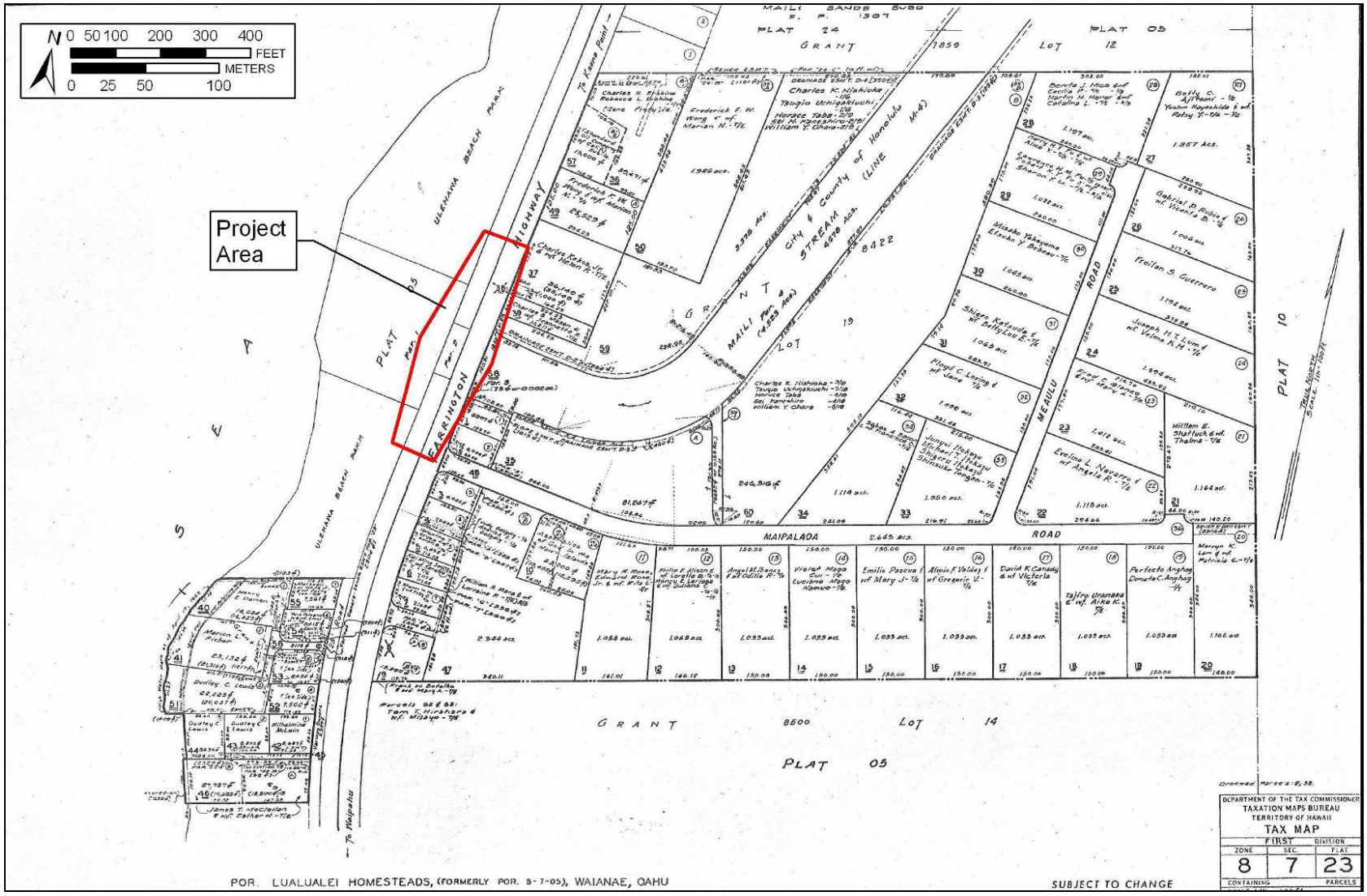

Figure 2. TMK: (1) 8-7-23 showing project area location

Figure 3. Aerial photograph showing the location of the project area (U.S. Geological Survey Orthoimagery 2005)

construction. In consultation with SHPD, this monitoring plan is designed to fulfill the state requirements for monitoring plans [HAR Chapter 13-279-4].

1.2 Environmental Setting

1.3.1 Natural Environment

The project area receives an average of approximately 600 mm (23.6 in.) of annual rainfall (Giambelluca et al. 1986). The project area is approximately 8 to 10 ft. above average mean sea level (AMSL), and varies between 200 and 250 ft. inland from the coast line. Soils present in the project area include Keaau stony clay (KmaB) and Mokuleia clay (Mtb) (Figure 4). Soils of the Keaau Series consist of “poorly drained soils on coastal plains…developed in alluvium deposited over reef limestone or consolidated coral sand…used for sugarcane and pasture” (Foote et al. 1972). Soils of the Mokuleia Series consist of “well-drained soils along coastal plains…formed in recent alluvium deposited over coral sand…used for sugarcane, truck crops, and pasture” (Foote et al. 1972).

Topography in the project area is generally flat because of the built, urban landscape and the nature of the project area, a portion of highway. The project area is on the Lualualei coastal flat, with Lualualei Valley and the Wai‘anae Mountain range further inland. Mā‘ili Stream, also referred to as the M-4 Drainage Channel is present in the project area, flowing underneath the Maipalaoa Bridge. Vegetation within the project area consists primarily of *kiawe* trees, *koa haole*, and exotic grasses and shrubs.

1.3.2 Built Environment

The project area is a built highway spanning the mouth of Mā‘ili Stream (M-4 Drainage Channel). The west side of the project area, *makai* of Farrington Highway, is comprised of the stream mouth and is adjacent to ‘Ulehawa Beach Park. The eastern side consists of a small residential area and small businesses. The northern and southern boundaries are comprised of Farrington Highway.

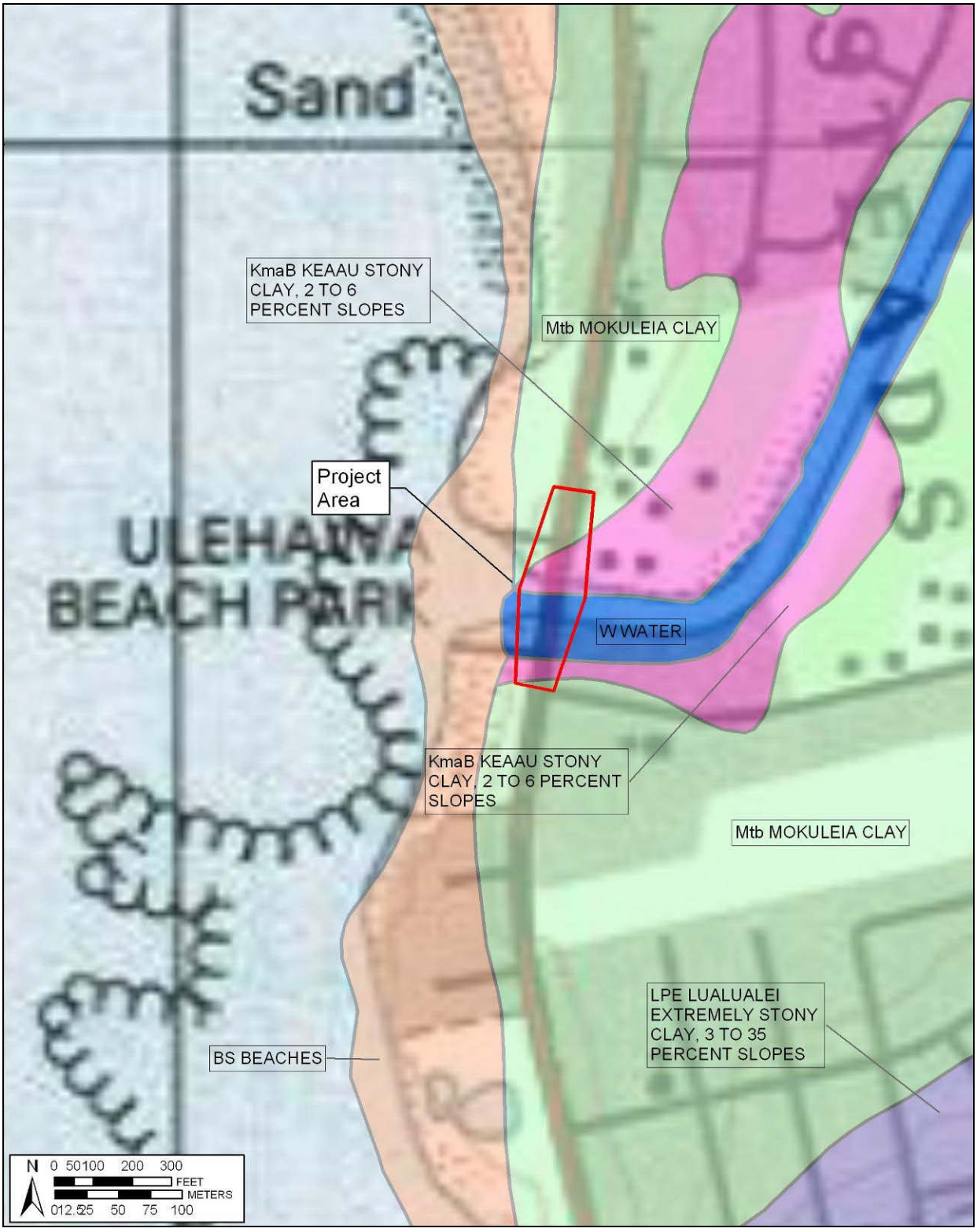

Figure 4. Overlay of Soil Survey of the State of Hawai‘i, indicating soil types within the project area (Foote et al. 1972; U.S. Department of Agriculture 2001)

Section 2 Background Research

Background research for this document included a review of previous archaeological studies on file at SHPD/DNLR. Archaeological reports, historic maps, and photographs contained within the CSH library were also consulted. In addition, *Māhele* records were examined from the Waihona'Aina database (www.waihona.com). This research provided the environmental, cultural, and archaeological background for the project area.

This section begins with a truncated review of documentary evidence for the general character of Lualualei Ahupua‘a as it evolved before western contact in the later 18th century. This section is meant to give the reader a general background overview of the project area; for more in depth analysis of traditional background please see the cultural impact assessment for this project (Cruz and Hammatt 2010). The development of Lualualei and its environs during the 19th century and into the 20th century was recorded in increasingly abundant documentation - including government records, private accounts, newspapers, maps, and photographs. These documents, which allow a more precise focus on the project area, are discussed in the remainder of this section.

2.1 Traditional and Historical Background

The District of Wai‘anae extends from Nānākuli on the west coast of O‘ahu north to Ka‘ena Point, and once incorporated eight *ahupua‘a*, including Wai‘anae. In ancient times the District of Wai‘anae was known for its multitude of fish, and especially for deep sea fishing off Ka‘ena where the ocean currents meet. The meaning of Wai‘anae (mullet water) also implies an abundance of fish — *‘anae* means the full grown mullet (*Mugil cephalus*) (Pukui et al. 1974). In 1840, Wilkes made the following comment: "The natives are much occupied in catching and drying fish, which is made a profitable business, by taking them to O‘ahu, where they command a ready sale" (Wilkes 1845: 81-82). Handy and Handy (1972) attribute the naming of Wai‘anae to a large fresh water pond for mullet called Pueha [sic] (Puehu). Today, Wai‘anae is still considered one of the best fishing grounds on O‘ahu.

Wai‘anae was also known for the independent lifestyle and attitudes of its inhabitants, another trend that continues today. This independence was a factor in many of the political struggles of the pre-contact and early historic period when the district was the scene of battles and rebellions and often the refuge of dissidents and/or contentious factions. This independent spirit is often attributed to many generations coping with marginal environments, as many areas of Wai‘anae, and especially Lualualei, were notorious for their inhospitable climate.

The *ahupua‘a* of Lualualei is located on the west coast of O‘ahu in the *moku* or district of Wai‘anae. Lualualei Ahupua‘a is bounded by four *ahupua‘a*: on the north by Wai‘anae Kai Ahupua‘a, on the south by Nānākuli Ahupua‘a, on the east by Honouliuli Ahupua‘a and on the northeast by Wai‘anae Uka Ahupua‘a. Lualualei is more commonly known as Mā‘ili and is home to two popular surf spots- Mā‘ili Point, located near the project area in the southern portion of the *ahupua‘a*, and Green Lanterns located in the northern portion.

3.1.1 Mythological and Traditional Accounts

There are two traditional meanings given to the name Lualualei. One meaning, “flexible wreath” is attributed to a battle formation used by Mā‘ilikūkahi against four invading armies in the battle of Kīpapa in the early 15th century (Sterling and Summers 1978: 68). A second, and perhaps more recent meaning, offered by John Papa ‘Ī‘ī, is “beloved one spared”. This meaning relates to a story of a relative who was suspected of wearing the king’s *malo* (loincloth). The punishment was death by fire. ‘Ī‘ī writes:

> The company, somewhat in the nature of prisoners spent a night at Lualualei. There was a fish pond there on the plain and that was where the night was spent...
>
> After several days had passed, the proclamation from the king was given by Kula‘inamoku, that there was no death and that Kalakua did not wear the king’s loin cloth. Thus was the family of Luluku spared a cruel death. For that reason, a child born in the family later was named Lualualei. (‘Ī‘ī 1959: 23)

Mary Pukui believed the first meaning, “flexible wreath”, to be the more appropriate one for Lualualei (Sterling and Summers 1978: 63). According to Kelley (1991: 317), the fish pond on the plain is Puehu fish pond, which is actually located just over the border in Wai‘anae. The fish pond no longer exists today and was probably destroyed during the sugar plantation era. Perhaps, a third association to the name Lualualei is an older reference to one of Māui’s sisters, who went by the same name.

Numerous Hawaiian legends, in addition to archaeological evidence, reveal the Wai‘anae coast and *mauka* (towards the mountains) interior to be an important center of Hawaiian history. It is here, in Wai‘anae, that the famous exploits of Māuiakalana (Māui) are said to have originated. Traditional accounts of Lualualei focus on the mischievous adventures of the demi-god Māui. It was here that Māui learned the secret of making fire for mankind and perfected his fishing skills. Other famous accounts tell of the place where Māui’s adzes were made, and of the magic fishhook, Mānaiakalani and the snare for catching the sun, and his kite flying expedition. Pu‘u Heleakalā is the ridge that separates Nānākuli from Lualualei. It was at Pu‘u Heleakalā where Hina, Māui’s mother, lived in a cave and made her *kapa* (bark cloth) (Sterling and Summers 1978: 62).

Samuel Kamakau tells us that Māui’s genealogy can be traced from the ‘Ulu line thru Nana‘ie:

> Wawena lived with Hina-mahuia, and Akalana, a male, was born; Akalana lived with Hina-kawea, and Maui-mua, Maui-waena, Maui-ki‘iki‘i, and Maui-akalana, all males, were born.
>
> Ulehawa and Kaolae, on the south side of Waianae, Oahu, was their birthplace. There may be seen the things left by Maui-akalana and other famous things: the tapa-beating cave of Hina, the fishhook called Manai-a-kalani, the snare for catching the sun, and the places where Maui’s adzes were made and where he did his deeds. However, Maui-akalana went to Kahiki after the birth of his children in Hawai‘i. (Kamakau 1991: 135)

3.1.2 Early Historic Period

In January 1778, Captain James Cook sighted Wai‘anae from a distance but chose to continue his journey and landed off Waimea, Kaua‘i instead. Fifteen years later, Captain George Vancouver approached the coast of Wai‘anae from Pu‘uloa and wrote in his log:

> The few inhabitants who visited us [in canoes] from the village earnestly entreated our anchoring . . . And [they] told us that, if we would stay until morning, their chief would be on board with a number of hogs and a great quantity of vegetables; but that he would not visit us then because the day was taboo poory [a *kapu* day]. The face of the country did not however, promise an abundant supply [of water]; the situation was exposed." (Vancouver quoted in McGrath et al. 1973: 17)

Vancouver was not impressed with what he saw of the Wai‘anae coastline, stating in his log that the entire coast was "one barren, rocky, waste nearly destitute of verdure, cultivation or inhabitants."

Vancouver did not anchor at Wai‘anae. But had he done so, he would have been pleasantly surprised, at least by portions of the coastline. Even though the dry, arid coast presented a dismal forecast, the ocean provided an abundant supply of fish, the lowlands provided *‘uala* (*Ipomoea batatas*) and *niu* (*Cocos nucifera*), and the inland valley areas were planted in *kalo* (*Colocasia esculenta*) and *wauke* (*Broussonetia papyrifera*). The upland forest regions provided various woods needed for weapons and canoes.

By 1811, sandalwood merchants began actively exploiting the Hawai‘i market and huge amounts of sandalwood were exported to China. Traditionally, Hawaiians used sandalwood for medicinal purposes and as a scent to perfume their *kapa*. Kamehameha I and a few other chiefs controlled the bulk of the sandalwood trade. Kamakau (1992: 204) writes, "The chiefs also were ordered to send out their men to cut sandalwood. The chief immediately declared all sandalwood to be the property of the government."

The sandalwood trade greatly impacted Hawaiian culture, and the traditional lifestyle Hawaiians had always pursued was altered drastically. In an effort to acquire western goods, ships, guns and ammunition, the chiefs had acquired massive debts to American merchants (‘Ī‘ī 1983: 155). These debts were paid off in shiploads of sandalwood. When Kamehameha found out how valuable the sandalwood trees were, he ordered the people not to let the felled trees fall on the young saplings, to ensure their protection for future trade (Kamakau 1992: 209-210). According to Samuel Kamakau:

> The debts were met by the sale of sandalwood. The chiefs, old and young, went into the mountains with their retainers, accompanied by the king and his officials, to take charge of the cutting, and some of the commoners cut while others carried the wood to the ships at the various landings; none was allowed to remain behind. Many of them suffered for food . . . and many died and were buried there. The land was denuded of sandalwood by this means. (Kamakau 1992:252)

Kamakau comments about the plight of the common people and the general state of the land during this time:

> This rush of labor to the mountains brought about a scarcity of cultivated food throughout the whole group. The people were forced to eat herbs and tree ferns, hence the famine called Hīlaulele, Hāhāpilau, Laulele, Pualele, ‘Ama‘u, or Hāpu‘u, from the wild plants resorted to. (Kamakau 1992: 204)

In 1816, Boki Kama‘ule‘ule was made governor of O‘ahu (and chief of the Wai‘anae district) and served in that capacity until 1829, when he sailed to New Hebrides in search of sandalwood. ‘Ī‘ī writes:

> It was Boki’s privilege to assign work, for he had been governor of the island of O‘ahu from the time Kamehameha I ordered all the chiefs to O‘ahu in 1816 to expel the Russians. (‘Ī‘ī 1983: 145)

The sandalwood era was short lived and by 1829, the majority of the sandalwood trees had been harvested and the bottom fell out of the trade business. It is unclear how extensive Lualaulei’s sandalwood resources were, however, the effects of sandalwood gathering, population shifts, and disruption of traditional lifestyles and subsistence patterns would undoubtedly have affected the population of Lualualei.

The Reverend William Ellis visited the Hawaiian Islands in 1823. At that time, he estimated the population on the island of O‘ahu to be about 20,000 (Ellis 1963: 19). The missionaries were the first to gather systematic figures regarding population statistics throughout the various districts on each island. The first census figures were gathered from 1831-1832 and 1835-1836. Population figures for Lualualei were not given, however population numbers given for all of Wai‘anae were 1,868 and 1,654 respectively (Schmitt 1973: 9).

Following western encroachment into the Wai‘anae Coast, a swift decline in population occurred due to disease and a "tendency to move to the city where there was more excitement" (McGrath et al. 1973: 25). The *‘ōku‘u* epidemic of 1804 (thought to be cholera) undoubtedly had a major effect on the native population, not only in Wai‘anae, but throughout the rest of the islands as well. John Papa ‘Ī‘ī (1983: 16) relates that the *‘ōku‘u* “broke out, decimating the armies of Kamehameha I” [on O‘ahu]. Other diseases also took their toll. In 1835, a missionary census listed 1,654 residents on the Wai‘anae Coast. The population of the Wai‘anae Coast was decimated by a smallpox epidemic in late 1853. In 1855, the Wai‘anae tax collector recorded 183 taxpayers on the leeward coast, which is thought to represent a total population of about 800 people. This catastrophic depopulation facilitated the passing of large tracts of land into the hands of a few landholders, and led to the decline of the traditional economy that once supported the region (Hammatt et al. 1993: 10-11).

3.1.3 Mid- to late-1800s

The Organic Acts of 1845 and 1846 initiated the process of the *Māhele* - the division of Hawaiian lands - that introduced private property into Hawaiian society. In 1848, the crown and the *ali‘i* (royalty) received their land titles. *Kuleana* awards to commoners for individual parcels within the *ahupua‘a* were subsequently granted in 1850. At the time of the *Māhele*, the *ahupua‘a* of Wai‘anae, which included Lualualei, was listed as Crown lands and was claimed by King Kamehameha III as his personal property (Board of Commissioners 1929: 28) (Figure 5). As such, the land was under direct control of the King. Many of the chiefs had run up huge debts to

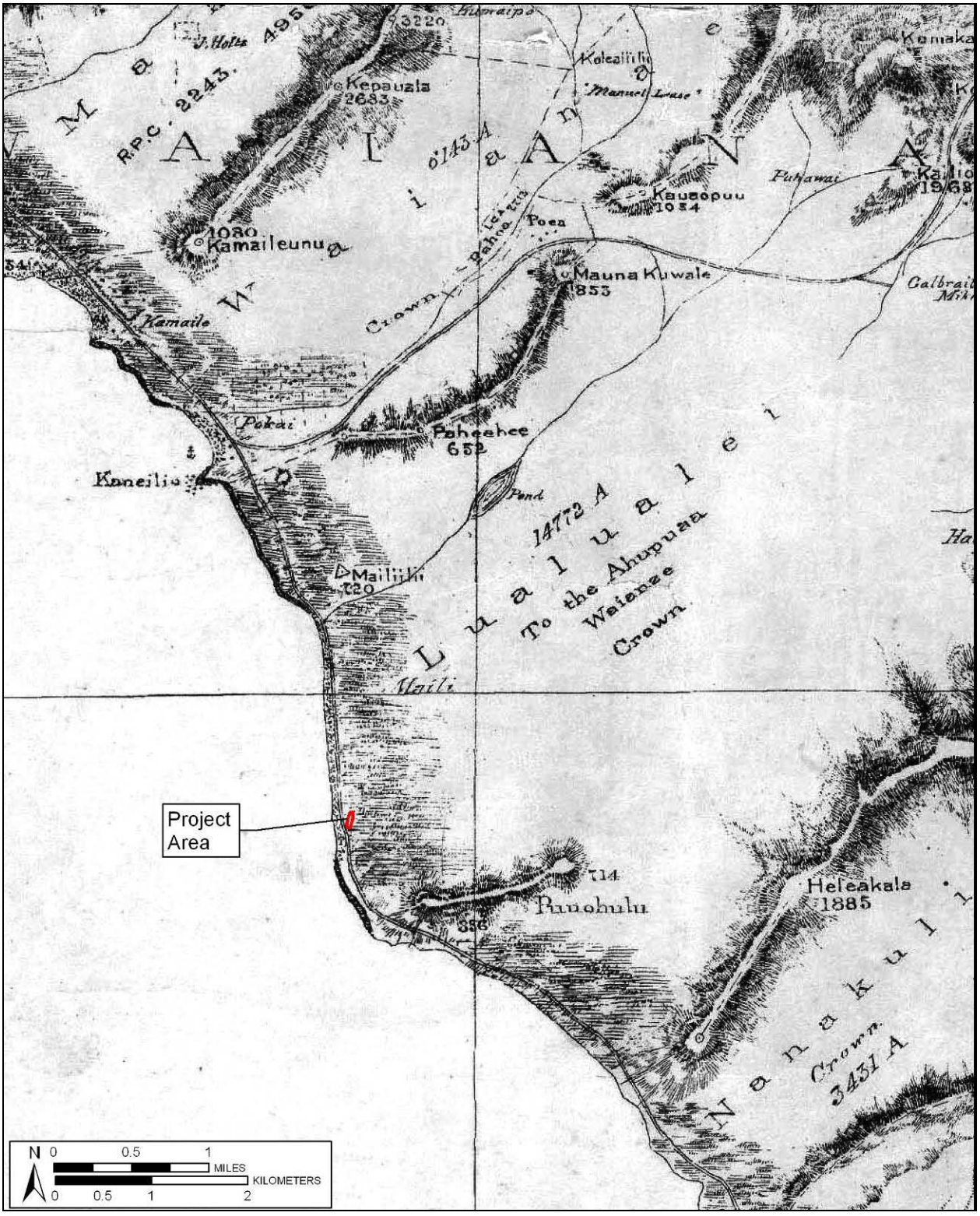

Figure 5. A portion of an 1881 Hawaiian Government Survey map of O‘ahu Island showing the location of the current project area

American merchants throughout the early historic period and continuing up into the mid 1800s. A common practice at the time was to lease (or mortgage) large portions of unused land to other high chiefs and foreigners to generate income and pay off these earlier debts. Until the passage of the Act of January 3, 1865, which made Crown Lands inalienable, Kamehameha III and his successors did as they pleased with the Crown Lands, selling, leasing, and mortgaging them at will (Chinen 1958:27).

In 1850, the Privy Council passed resolutions that would affirm the rights of the commoners or native tenants. To apply for fee-simple title to their lands, native tenants were required to file their claim with the Land Commission within the specified time period of February 1846 and February 14, 1848. The *Kuleana* Act of 1850 confirmed and protected the rights of native tenants. Under this act, the claimant was required to have two witnesses who could testify they knew the claimant and the boundaries of the land, knew that the claimant had lived on the land for a minimum of two years, and knew that no one had challenged the claim. The land also had to be surveyed.

Not everyone who was eligible to apply for *kuleana* lands did so and, likewise, not all claims were awarded. Some claimants failed to follow through and come before the Land Commission, some did not produce two witnesses, and some did not get their land surveyed. For whatever reason, out of the potential 2,500,000 acres of Crown and Government lands “less than 30,000 acres of land were awarded to the native tenants” (Chinen 1958:31).

A total of twelve land claims were made in Lualualei, however only six were actually awarded. All six awards were located upland in the *‘ili* of Pūhāwai, far *mauka* of the current project area. No quiet land titles were claimed near the coast. From the claims, it can be determined that at least eight families were living in Pūhāwai at the time of the Māhele in 1848. Together, they cultivated a minimum of 163 *lo‘i* (wetland agriculture). The numerous *lo‘i* mentioned in the claims indicate the land was ideal for growing wetland taro and that this livelihood was actively pursued by the awardees. In addition, dry land crops were grown on the *kula* (plains), *wauke* was being cultivated, and one claimant was making salt.

Information on occupation of Lualualei at the time of the Māhele, aside from historical accounts of scattered coastal hamlets, is from archival records indicating there were nine taxpayers at Mā‘ili near the coast and 11 taxpayers at Pūhāwai in the upper valley (Cordy et al. 1998: 36). Mā‘ili is located along the eastern edge of the *ahupua‘a* and Pūhāwai is well *mauka*. Based on these numbers, Cordy estimates a population of 90 people for coastal Lualualei and 55 people for the upper valley in 1855 (Cordy et al. 1998: 36). Regardless of the population estimate, the existence of 20 taxpaying adults in Lualualei indicates that the area was inhabited and worked. In this case, the Māhele documents are only a partial reflection of the population and actual land use during the time.

3.1.4 1850-1900

With strong financial backing from King Kalākaua, Hermann A. Widemann, a German immigrant, was able to initiate the Waianae Sugar Plantation in 1879. This plantation would extend into Lualualei. Although it was never a large scale plantation by modern standards, it was one of the first and last to be served by a plantation railroad. Some 15 miles of 30-inch narrow-gauge railroad delivered harvested cane to the mill. All the sugar was shipped by inter-island

vessels to Honolulu departing from Wai‘anae Landing, until the O‘ahu Railway and Land Company (OR&L) railroad was extended to Wai‘anae and beyond in 1889. The OR&L railroad ran along the *makai* (toward the sea) side of Farrington Highway. The J. M. Dowsett Estate sold the plantation to American Factors (now Amfac/JMB-Hawai‘i) in 1931, and the OR&L railroad closed in 1947.

The first longhorn cattle were brought to O‘ahu from Hawai‘i Island in 1809 by John Young and Kamehameha I (Kamakau 1992:268). One of the first areas to be utilized for ranching on the Wai‘anae coast was in Lualualei. Hawai‘i Bureau of Land Conveyances (1845-1869) records show that William Jarrett leased approximately 17,000 acres of land from Kamehameha III in 1851. This was the beginning of Lualualei Ranch. The lease was written for 30 years with a lease fee of $700 per year (DLNR 4: 616-618.). It seems that Jarrett sold Paul F. Marin, son of Don Francisco de Paula Marin, one-half of his interest in the ranch. Marin lived on the ranch and managed it until 1864, when a dispute arose over the profits of the ranch. Apparently, Marin had never turned over any ranch profits to Jarrett during the time he managed it. After the dispute was settled, Jarrett took on George Galbraith as a new partner (DLNR 18:31).

In 1869, Jarrett sold the remaining years of his son’s interest in Lualualei Ranch to James Dowsett (DLNR 29: 16-18). James Dowsett was a descendant of a British sea captain and is noted for being the first Anglo-Saxon child born in Honolulu (Nakamura and Pantaleo 1994: 21). Dowsett was an entrepreneur of sorts and dabbled in many different business ventures, such as:

> …a whaling fleet, a dairy, a salt works, an extensive trade in *awa* (a Hawaiian narcotic drink) and numerous land holdings . . . He also ran cattle at different times in Nānākuli, Mikilua and Lualualei. (McGrath et al. 1973: 32).

In 1880, George Bowser traveled through Wai‘anae and wrote about Lualualei in his journal:

> Leaving Wai‘anae, a ride of about two miles brought me to the Lualualei Valley, another romantic place opening to the sea and surrounded in every direction by high mountains. This valley is occupied as a grazing farm by Messrs. Dowsett & Galbraith, who lease some sixteen thousand acres from the Crown. Its dimensions do not differ materially from those of the Wai‘anae Valley, except that it is broader – say, two miles in width by a length of six or seven miles. The hills which enclose it, however, are not so precipitous as those at Wai‘anae, and have, therefore, more grazing land on their lower slopes, a circumstance which adds greatly to the value of the property as a stock farm. Although only occupied for grazing purposes at present, there is nothing in the nature of the soil to prevent the cultivation of the sugar cane, Indian corn, etc. Arrangements for irrigation, however, will be a necessary preliminary to cultivation. (Bowser 1880:493-494)

Bowser’s comments imply that though water was still a problem, Lualualei seemed to have some potential for development.

In 1894, Link McCandless entered the ranching scene:

> …he and a man named Tom King chartered the brigantine Oakland in Seattle, filled her hole with cattle and the cabins with feed, and sailed for Hawai‘i. By the turn of the century, McCandless’ ranching empire covered much of the Wai‘anae

> Coast, including land at Nānākuli, 4,000 acres at Lualualei, San Andrews' property in Mākua and pastures toward Ka‘ena Point. (McGrath et al. 1973: 31)

An 1894 description of Lualualei by the Commissioner of Crown Lands described the land as "one of the best and most valuable of the Crown lands on the Island of O‘ahu…surpassing any of the other lands for richness and great fertility of the soil" (Commissioner of Crown Lands 1894: 36).

The sugar industry came to the Wai‘anae coast in 1878 when the first sugar cane was planted in upper Wai‘anae Valley. By 1892, at least 300 acres of cane was planted in Lualualei. In addition to the cultivated lands, a railroad, irrigation ditches, flumes, reservoirs, and plantation housing were constructed to support the sugar industry. The cane from the *mauka* areas of Lualualei was loaded onto a railroad and transported to the mill at Wai‘anae.

The O‘ahu Railway and Land Company (OR&L) signed its charter on February 4, 1889. The Railway was the brainchild of Benjamin Franklin Dillingham. Along with James Castle and others, he had invested in large tracts of land for speculation and resale, but the idea was slow to catch on because "the land lay too far from Honolulu, at least 12 miles." (McGrath et al.1973: 54) He foresaw an economic opportunity. The railway was a means to provide transportation to the country and promote development of unoccupied lands, as well as connect with the sugar plantations in ‘Ewa, Wai‘anae, Waialua, and Kahuku. Construction on the railway began in March of 1889. The first length of the railway was completed and opened to the public by January 1, 1890. Five years later, on July 4, 1895 the railway finally reached Wai‘anae. The Railway served the Wai‘anae coast until 1946 when the Wai‘anae Sugar Plantation closed down.

3.1.5 Early 1900s to Present

Sugar and Cattle

By 1901, the Wai‘anae Sugar Company had obtained a five-year lease on 3,332 acres of land at Lualualei to be used for raising cane as well as for ranching (Commissioner of Crown Lands 1902). Sugar and ranching continued to dominate the Lualualei landscape during the early years of the 20th century. The determining factor in the success of Lualualei for sugar production was always the water.

Throughout the first half of the 20th century, the Wai‘anae Sugar Company continued cultivating their sugar lands in Lualualei. By the 1940s, Wai‘anae Sugar Company could no longer compete with foreign labor. This, in addition to drought problems, labor unions, and land battles, caused the undermining of Wai‘anae Sugar Company. In 1946, the Company was liquidated and the land was sold.

Homesteading

After the overthrow of the Hawaiian monarchy in 1893, Crown Lands and Government Lands were combined to become Public Lands. The Crown Lands were no longer indistinguishable and inalienable. In 1895, the Republic of Hawaii decided to open up lands for homesteading in the hopes of attracting a "desirable class of immigrants" — Americans and those of Caucasian decent (Kuykendall and Day 1961: 204). In anticipation of the Dowsett-Galbraith lease expiring in 1901, the Government intended to auction off these lands to the highest bidder.

There were two waves of homesteading on the Wai‘anae Coast (McDermott and Hammatt 2000). The first impacted Lualualei and coincided with homesteading occurring at Wai‘anae Kai. In 1902, the government ran ads in the local newspapers stating their intent to open up land in Lualualei for homesteads (Kelly 1991: 328). Due to the lack of water, the lots were classified as second-class pastoral land, rather than agricultural land. The homesteads were sold in three series between the years 1903 and 1912. In Lualualei, the first series was for *mauka* lots purchased by McCandless, who ranched most of his land until 1929, subletting use rights to the Sandwich Island Honey Company. The second and third series were for lots in the lower valley and along the coast, *mauka* of the government road. By the early 1920s, about 40 families had settled on homestead lots in Lualualei (Kelly 1991: 331-332). The big name families that obtained homestead lots at this time were Von Holt, McCandless, and Dowsett.

Despite promises by the government to supply water, there was none, and what little there was, was not enough to go around. Competition between the Waianae Plantation and the homesteaders for water caused friction within the community. The lack of water placed a hardship on the homesteaders. Water had to be carried in, and many lost their crops. The Wai‘anae Sugar Company had a lease with the government to take 2.5 million gallons of water daily from government lands, but even after their lease had expired, the plantation continued to take the water. In 1924, the government made an agreement with the plantation to release 112,000 gallons of water daily for the homesteaders.

Examination of the 1928-29 U.S. Geological Survey, Nānākuli Quadrangle, shows the current project area just *makai* of the Mā‘ili Tract of Lualualei Homesteads and a salt pond (Figure 6).

Salt Pond

The 1928-29 U.S. Geological Survey map (See Figure 6), a 1943 War Department map (Figure 7), and a 1949 aerial photograph (Figure 8) show the presence of a salt pond *mauka* of the current project area.

Salt making had been common throughout all the islands for centuries. In the account of Cook’s Third Voyage, printed in 1784, salt production is mentioned:

> Amongst their arts, we must not forget that of making salt, with which we were amply supplied, during our stay at these islands, and which was perfectly good of its kind. Their saltpans are made of earth, lined with clay; being generally six or eight feet square, and about eight inches deep. They are raised up a bank of stones near the high-water mark, from whence the salt water is conducted to the foot of them, in small trenches, out of which they are filled, and the sun quickly performs the necessary process of evaporation. The salt we procured at Kauai and Niihau, on our first journey, was of a brown and dirty sort; but that which we afterward got in Kealakekua Bay, was white, and of most excellent quality, and in great abundance. Besides the quantity we used in salting pork, we filled all our empty casks, amounting to sixteen puncheons in the Resolution only. (Cook Volume 3 1784:151)

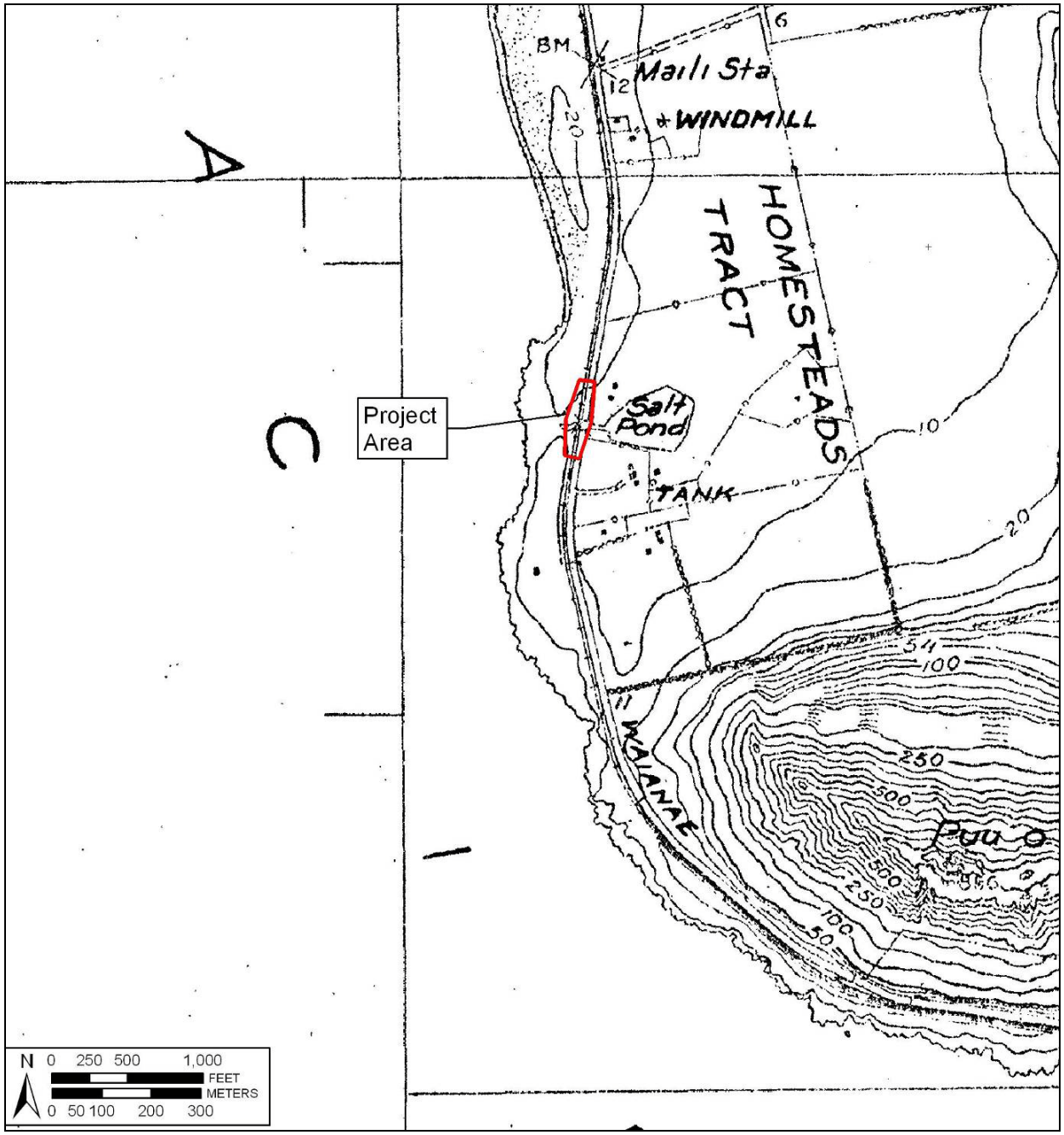

Figure 6. 1928-29 U.S. Geological Survey Topographic Map, Nānākuli Quadrangle showing the current project area

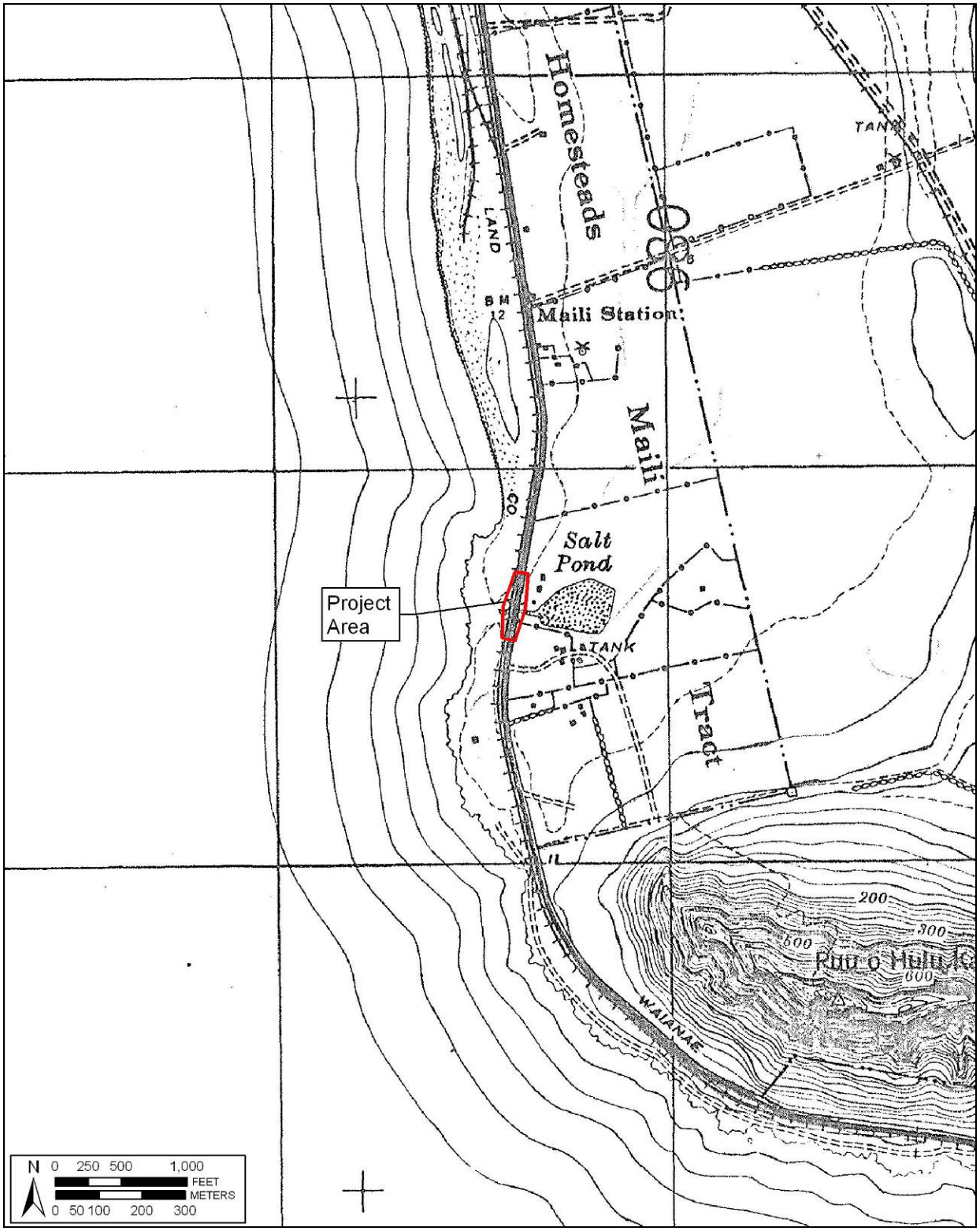

Figure 7. 1943 War Department Map, Nānākuli Quadrangle showing the current project area.

Figure 8. 1949 aerial photograph with the project area and salt pond indicated (R.M. Towill Corp).

Ellis (1839) provided an additional account of the salt procurement process:

> We saw a number of their pans, in the disposition of which they display great ingenuity. They have generally one large pond near the sea, into which the water flows by a channel cut through the rocks, or is carried thither by the natives in large calabashes. After remaining there some time, it is conducted into a number of smaller pans, about six to either inches in depth, which are made with great care, and frequently lined with large evergreen leaves, in order to prevent absorption. Along the narrow banks or partitions between the different pans, we saw a number of large evergreen leaves placed. They were tied up at each end, so as to resemble a shallow dish, and filled with sea water, in which the crystals of salt were abundant. (Ellis 1969:397-398)

A 1974 aerial photograph shows that by this time the marsh lands *mauka* of the project area have been drained and filled (Figure 9).

3.1.6 Transportation on the Wai‘anae Coastline (1880 –1930)

Prior to the 1880s, the Wai‘anae coastline may not have undergone much alteration. The old coastal trail likely followed the natural contours of the local topography. With the introduction of horses, cattle, and wagons in the nineteenth century, many of the coastal trails were widened and graded to accommodate these new introductions. However, the changes probably consisted of superficial alterations to existing trails and did not entail major realignments. Kuykendall (1953: 26) describes mid-nineteenth century road work: “Road making as practiced in Hawai‘i in the middle of the nineteenth century was a very superficial operation, in most places consisting of little more than clearing a right of way, doing a little rough grading, and supplying bridges of a sort where they could not be dispensed with.”

The first real alteration to the Wai‘anae coastline likely resulted from growth of the Waianae Sugar Company. The company cultivated sugarcane in Mākaha, Wai‘anae, and Lualualei Valleys and, to more easily transport their cane to the dock and to the mill at Wai‘anae Kai, a railroad was constructed in 1880. Additional alteration to the Wai‘anae coastline occurred in the late nineteenth century with the extension of Dillingham’s OR&L rail line into the Leeward Coast. Construction of the railroad would have had an impact on the natural landscape, such as the sand dunes, as well as human-made features, particularly the fishponds and saltponds maintained in the coastal zone. One reporter writes a glowing story of the railroad trip to Wai‘anae at its opening on July 4, 1895:

> For nine miles the road runs within a stone’s throw of the ocean and under the shadow of the Wai‘anae Range. With the surf breaking now on the sand beach and now dashing high on the rocks on one side, and with the sharp craigs and the mountains interspersed with valleys on the other, patrons of the road are treated to some of the most magnificent scenery the country affords (McGrath et al. 1973: 56).

This report indicates the railroad hugged the ocean during a good portion of the trip. The railway’s grade requirements demanded considerable alteration to natural landscapes in order to make them feasible for transport, including curve and slope reduction. An 1884 map illustrates the alignment of the old Government Road (Alexander 1884; Figure 10), which was likely a

Figure 9. 1974 aerial photograph showing increased development in the vicinity of the project area (R.M. Towill Corp.)

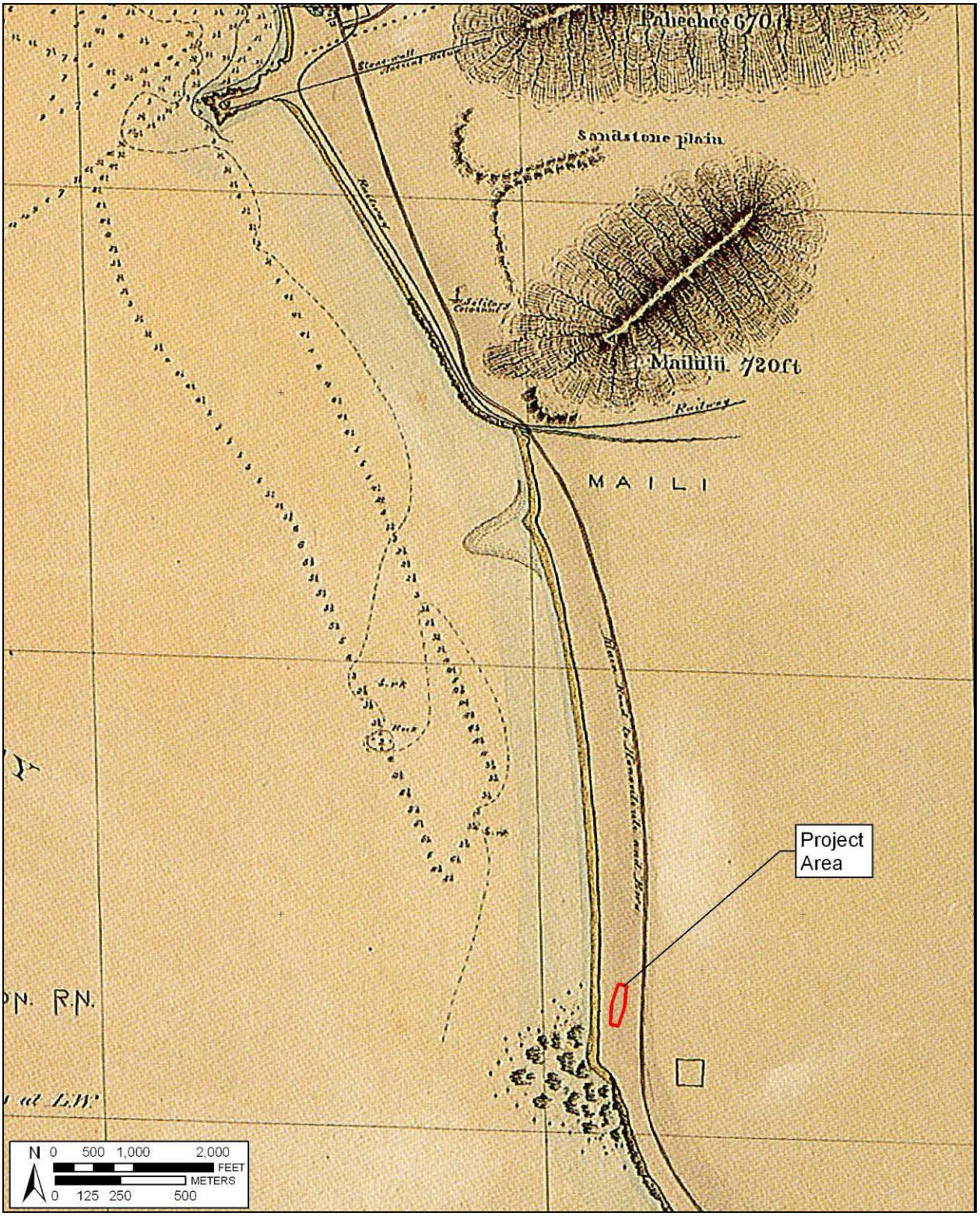

Figure 10. A portion of an 1884 Government Survey map produced by W.D Alexander showing the current project area in close proximity to the Old Government Road.

modified version of the original coastal trail. After the Belt Road was completed, further roadwork was carried out in the 1930s on what was called the “Wai‘anae Road”, later named Farrington Highway.

O‘ahu Railway and Land Company

Benjamin Dillingham, a prominent business man and developer, envisioned populating the western side of O‘ahu by introducing agriculture; however, the lack of water proved to be an obstacle until the discovery of artesian water solved the issue in the early 1880s. Dillingham saw that reliable transportation was needed to move crops from the west side of the island into Honolulu. With the help of several other businessmen and the Hawai‘i state legislature, Dillingham formed the O‘ahu Railway and Land Company (OR&L) in February 1889. The first few miles of track were laid and functional by the end of that year. The OR&L stretched as far as Kahuku by 1899 and agricultural interests were using the rail to ship produce to Honolulu, for the benefit of all. By 1914 track had been laid to Wahiawa to ship pineapple from the Dole Plantation.

The military also used the rail system during development of Pearl Harbor and Schofield Barracks, and during World War II the OR&L carried ammunition, supplies, troops and defense workers. Passenger fares also added to the profitability of the rail in the early part of the 20th century.

Following are two railroad chants in honor of Queen Lili‘uokalani, documented by Historian Nathan E. Napoka in 1979:

MAKALAPUA

Eia mai au ‘o Makalapua,	Here am I, Makalapua
Hō‘ alo i ka ihu o ka Lanakila.	Traveling companion of the Lanakila.
O ke ku‘e aa ka hao ka i Kuwili	The piston works at Kuwili
Ka ihona olu iho a o Halawa.	Down the pleasant descent to Halawa.
Ua lawa ka ‘ikena i ke awa lau	Satisifying is the view of the locks
Iā Ewa, ka i ‘a hāmau leo.	Of Ewa, land of the silent fish.
Ua pua ka uwahi a i Manana,	The smoke rises at Manana
‘Awe ‘awe i ke kula a o Waipi‘o	And streams along at Waipio.
I kai ho‘i au o Honouliuli	The lowland of Honouliuli is reached
Ahulwale ke ko‘a a o Polea.	Where the coral of Polea lies exposed.
Ha‘ina ia mai ana ka puana	This is the conclusion of my song
Hō ‘alo i ka ihu o ka Lanakila. companion.	Telling of the Lanakila’s travelling
He inoa no Lili‘uokalani.	In honor of Lili‘uokalani

Lanakila ke Ka‘ahi Alii

‘O Lanakila ke Ka‘ahi ali‘i	Victory is the name of the Queen’s train
Nana i hali mai kohu aupuni.	That brought the ruler of the kingdom.
A hiki o ka lani i Moanalua	Here is your highness at Moanalua
I ka uwapo holuholu a o Halawa.	At the swaying bridge at Halawa.
Alawa iho ‘oe ma ka ‘ao ‘ao	Glance won’t you at the side
Hana no me ka huila i ke alahao.	And hear the clatter of the wheels.
A‘ohe ou loa a‘e Manana	It is not far to Pearl City,
I ke ku‘upau a nā wiliki.	With the speed of the engineer.
Ha‘awi ke aloha wehe papale	With a tip of the hat love is extended
Nā kini nā kupa ou e ka lani.	From all your loyal subjects.
Ho‘okahi no leo a o ke kuini	One command by the Queen
Ho‘opa‘a ia mai no mikini	And the train comes to an immediate halt.
A kau o ka lani i ke ka‘a pi‘o	The rode your Highness in her coach
Huli aku huli mai h‘ola ‘ila‘.	Turning calmly from side to side.
Heaku mākou o mai ‘oe	We call out to you
O Lili‘uokalani la he inoa.	Liluokalani is your name.
He inoa no Lili‘uokalani.	In honor of Liliuokalani.

After World War II the railroad was utilized less as the use of motorized vehicles became more economical. The 1946 tsunami destroyed long sections of tracks on the cliffs near Ka‘ena Point and along the Wai‘anae Coast. The lines were not rebuilt and by 1947 all rail operations ceased outside of Honolulu. The Department of the Navy took over the OR&L in 1950. The remnants of the OR&L, which consist of approximately 15 miles of track from Barbers Point to the Lualualei Naval Station, are the longest set of surviving tracks in Hawai‘i (Cummins 1974; Conde and Best 1973).

The Government Road

Farrington Highway was originally constructed in the 1930s. Its predecessor along the Wai‘anae Coast was variously termed the “Government Road” or “Old Wai‘anae Road” and provided less than ideal travel and transport conditions for the Wai‘anae District. Farrington Highway’s predecessor was described as a “mud hole in the winter and billowed dust in the summer” (McGrath et al. 1973:51). The Old Wai‘anae Road was not paved and there were no bridges to cross streams. Because of the transport limitations over the Old Wai‘anae Road, prior to the construction of Farrington Highway, most transport and travel between Wai‘anae and Honolulu was made using the OR&L Railroad or steamer ship (McGrath et al. 1973).

The construction of Farrington Highway was a component of the overall Territorial Highway System. It was only after 1925 that Territorial officials made use of available federal funding assistance for road and bridge construction. This led to abundant bridge and road construction

after 1925 in Hawai‘i. Further federal assistance became available in the 1930s as part of the Works Progress Administration and National Reclamation Association programs; this funding lead to additional standardization and improvement of the Territorial Highway System (Thompson 1983: III-15). These improvements were significant events that greatly facilitated intra-island travel, transportation, and communication. Farrington Highway was eventually named after Wallace Rider Farrington (1871-1933), a former Honolulu Newspaper man, Mayor of Honolulu, and Territorial Governor of Hawai‘i (1921-1929), who was influential in expanding Hawai‘i’s roadways.

Once constructed, Farrington Highway became an important transportation and communication corridor that connected Oahu’s Wai‘anae District with Honolulu and the rest of the island. Figure 11 is a photograph of the “Old Wai‘anae Road” in Mākaha, north of the current project area, facing south towards Wai‘anae. Figure 12 shows the rural nature of Farrington Highway along the Waianae Coast in the 1940s. Figure 13 shows Farrington Highway in Nānākuli, just south of the current project area, during World War II.

3.1.7 Modern Land Use

The Maipalaoa Bridge construction was completed in 1970, and it is likely that Farrington Highway was widened around the same time as bridge construction, to its current four-lane capacity. The 1974 aerial photo shows the project area in much the same condition as it exists today (see Figure 9). Currently, the project area is comprised primarily of Farrington Highway, and spans the City and County’s M-4 Drainage Channel, also known as Mā'ili Stream. ‘Ulehawa Beach Park, local businesses, and a small residential development are also present in the area.

2.2 Previous Archaeological Research

2.2.1 Early Archaeological Studies in Lualualei

The earliest attempt to record archaeological sites in Lualualei was in the early 1900s by Thomas G. Thrum. In the early 1930s, J. Gilbert McAllister conducted a survey of important archaeological sites on the island of O‘ahu. One of McAllister’s tasks was to try to relocate the *heiau* Thrum had recorded 20 years earlier, as well as locate any other important archaeological sites such as house sites and petroglyphs. McAllister provided detailed information on two of the *heiau* that Thrum located in proximity of the current project area in Lualualei. Thrum describes *heiau* as belonging to certain classifications such as *pookanaka* and *luakini*, both of which were considered high importance and were only built by kings on sites where temples had previously been constructed (Stokes 1991:32–33). These two types of *heiau* were considered sacrificial and when this type of *heiau* was being built, “its consecration required not merely hundreds of pigs, bunches of bananas and coconuts, with numerous other offerings and gifts, but also a human victim” (Stokes 1991:33). In 1907, Thrum listed the Nioiula Heiau in Lualualei as follows:

> Nioiula. Halona, Lualualei. A paved and walled heiau of pookanaka class, about 50 square feet, in two sections; recently destroyed. (Thrum 1907:47)

McAllister provided the following information on Nioiula Heiau:

Figure 11. Photograph of the old Wai‘anae Road (McGrath et al. 1973:51).

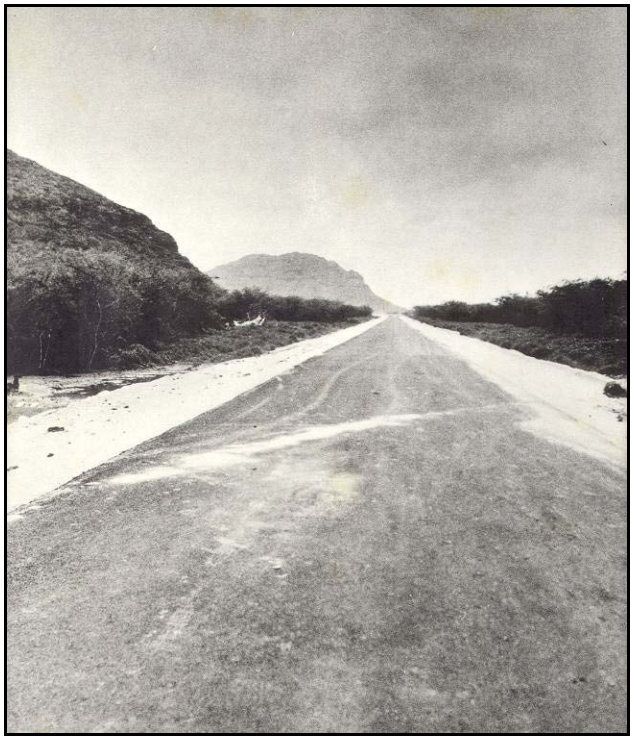

Figure 12. Photograph of Farrington Highway, late 1940s, along the Waianae Coast (McGrath et al. 1973:144)

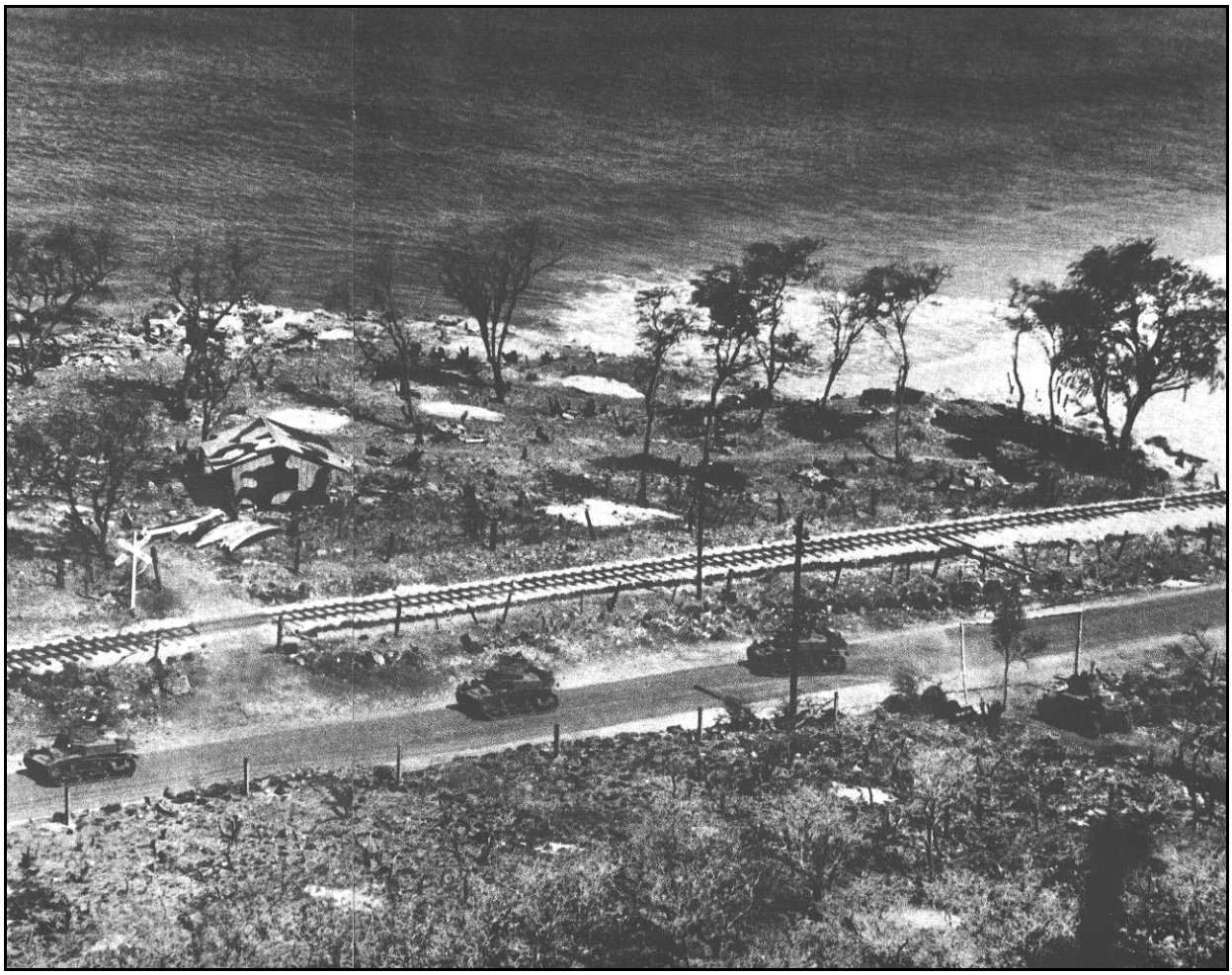

Figure 13. Photograph of Farrington Highway in Nānākuli, just south of the current project area, taken during World War II (McGrath et al. 1973:138-139).

> Site 149. Nioiula heiau, Halona ridge in Lualualei, just southwest of the Forest Reserve line.A paved and walled heiau said to be of the pookanaka class. The northern portion has been almost completely destroyed, the stones having been used for a cattle pen on the McCandless property. Since cattle put into the pen sickened and died, it was seldom used and is now abandoned. The heiau probably had three inclosures and three platforms open to the west side, but so little remains of the northern part of the heiau that it is difficult to discern inclosures and terraces. This is probably the heiau on which was placed the body of the boxer killed by Kawelo and offered as a sacrifice to the gods. The temple is said to have been very ancient, belonging to the chief, Kakuihewa. (McAllister 1933:110).

Thrum also mentions Kakaio Heiau in his 1907 study:

> Kakaio. Puhawai. A small heiau of which nothing now remains but its sacred spring, and the sound of its drums and conchs on the nights on Kane" (Thrum 1907:47).

McAllister provided the same information regarding Kakaio Heiau:

> Site 151. Kakaio heiau was located at Puhawai, Lualualei. Thrum notes: "A small heiau of which nothing now remains but its sacred spring, and the sound of its drums and conchs on the nights on Kane" (McAllister 1933:110).

McAllister also provided information on a House Site in Lualualei:

> Site 150. House sites or heiaus, middle of Lualualei at the foot of the cliffs, Pahoa.
>
> Innumerable walls and small terraces that have been house sites or possibly very old heiaus whose sites have long since been forgotten by the natives are located on the ends of small ridges, the sea sides of most of which are covered with rough lava rocks. These small prominences have been leveled off and some have been walled and paved with smooth stones. None of the sites are sufficiently preserved to indicate a plan, for this has been a cattle range almost since the coming of Europeans, and the cattle have scattered many a wall and terrace in grazing (McAllister 1933:110).

Sterling and Summers noted the presence of house sites and a petroglyph rock at ‘Ulehawa Beach Park, first reported by McAllister in 1933, adjacent to the current Project area (Figure 14):

> Near the dried swamp, opposite light pole #152 in the public park along the beach edge, house or camping sites were found. Also a rock with petroglyphs was found which had previously been reported to the Museum. This was on a sandstone slab and was removed to the Bishop Museum. April 1954 (Sterling and Summers 1978: 67).

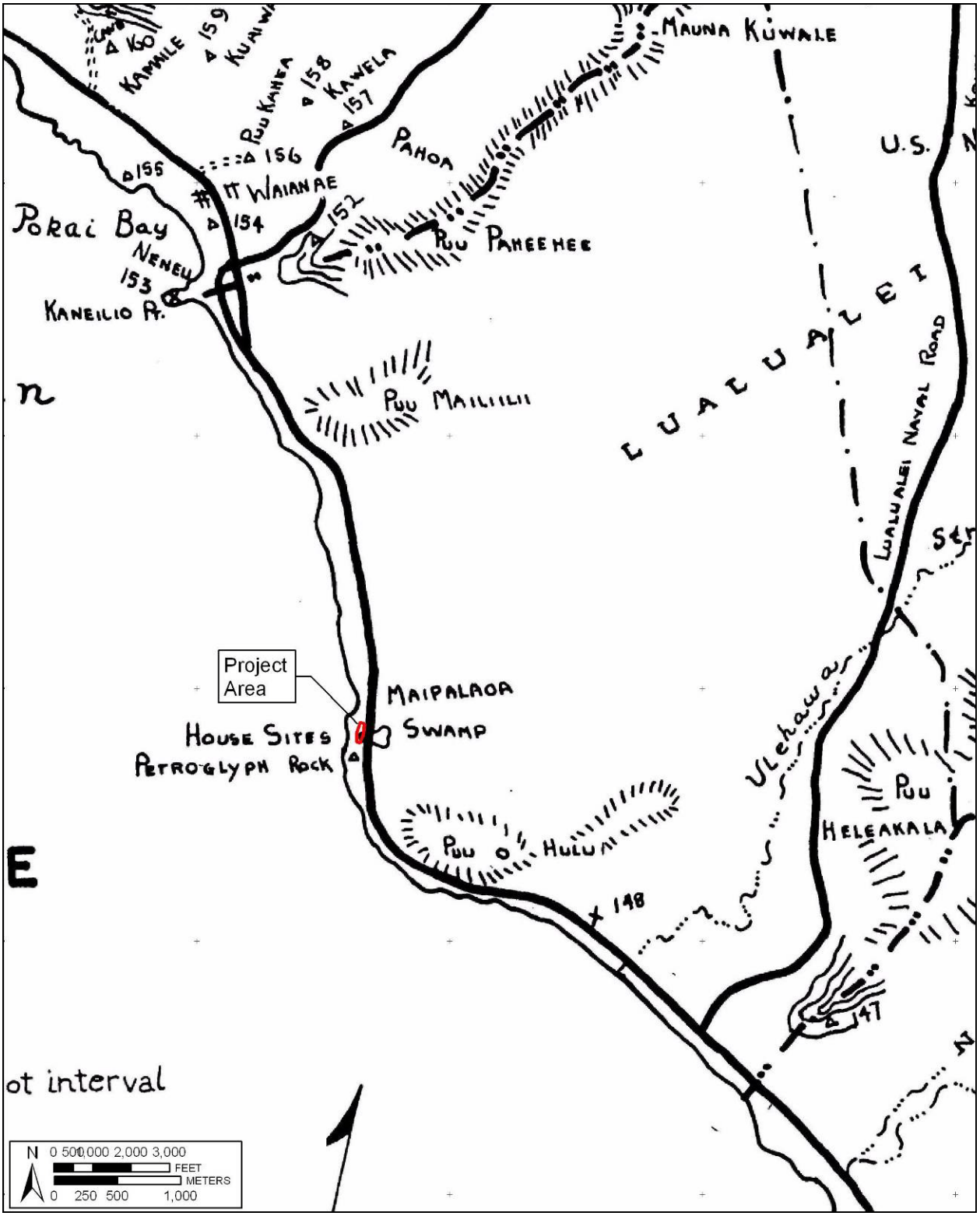

Figure 14. 1959 Bishop Museum map showing archaeological sites in coastal Lualualei identified by McAllister (1933) (adapted from Sterling and Summers 1978)

2.2.2 Archaeological Studies in Lualualei

Between McAllister’s published work in 1933 and the 1970s, there is a paucity of archaeological research on O‘ahu in general, but particularly the Leeward side of the island. As environmental legislation was passed at the state and national levels, the need for more cultural study and documentation became apparent. By the late 1980s, law makers were systematically pressing developers to consider historic properties when conducting ground disturbing activities. Therefore archaeological data, usually in support of development activities, is more readily available after about 1990. Figure 15 shows previous archaeological studies within Lualualei Ahupua‘a; Table 1 presents archaeological studies within Lualualei Ahupua‘a, which are summarized below, and the next subsection presents studies in close proximity to the current project area.

In 1975, William Barrera conducted an archaeological inventory survey of approximately 80 acres in Mā‘ili. Barrera recorded six sites including five stone configurations and a single midden scatter. Of these, four of the stone structures were considered either of modern origin or too amorphous to assess. However, one site, Site Ch-Oa-1, was thought to be, “quite probably an ancient religious structure” (Barrera 1975:9).

In October of 1975, Ross Cordy conducted an archaeological excavation of Site Ch-Oa-1. Cordy observed no cultural deposits and concluded the structure was not of ancient religious significance, but rather a quite recent structure (likely built no earlier than 1930 or 1940), and of unknown function (Cordy 1975).

Also in 1975, Cordy conducted an archaeological survey of an additional 130 acres in Mā‘ili. As a result, Cordy identified 19 sites including stone walls, mounds, enclosures, platforms, C-shapes, a trench with bridge, and a trail. Cordy notes that much of the surveyed land had been recently impacted by bulldozing activity for quarrying purposes and concluded “Most of the sites found in this survey are walls, highly disturbed sites, or seemingly recent (ca. AD 1890-1970) sites” (Cordy 1976:21). His conclusions are largely based on associated historic or modern surface artifacts. He recommended archaeological test excavations of a C-shape enclosure, five platforms, and a rock enclosure.

In 1977 Bordner conducted a reconnaissance level survey for the proposed Nānākuli landfill (Bordner 1977). The survey area included land on both sides of Lualualei Naval Road, continuing up slope to Pu‘u Heleakalā. No archaeological sites were identified.

An archaeological reconnaissance survey for the proposed Wai‘anae Corporation Yard was completed in 1983 (Kennedy 1983). No archaeological sites were found in the project area, which was on the coast along Mā‘ili Point, south of the present study area.

In 1991, several burials were inadvertently discovered during excavation work associated with improvements to the Mā‘ili water system, located approximately 750 m north of the current project area (Hammatt and Shideler 1991). The water main work uncovered seven burials found in calcareous beach sand. A total of five of the burials were removed and two were left in situ. The five sets of removed human remains were examined to determine ethnicity and all were found to be of Polynesian decent. The report concludes that the concentration of burials indicates

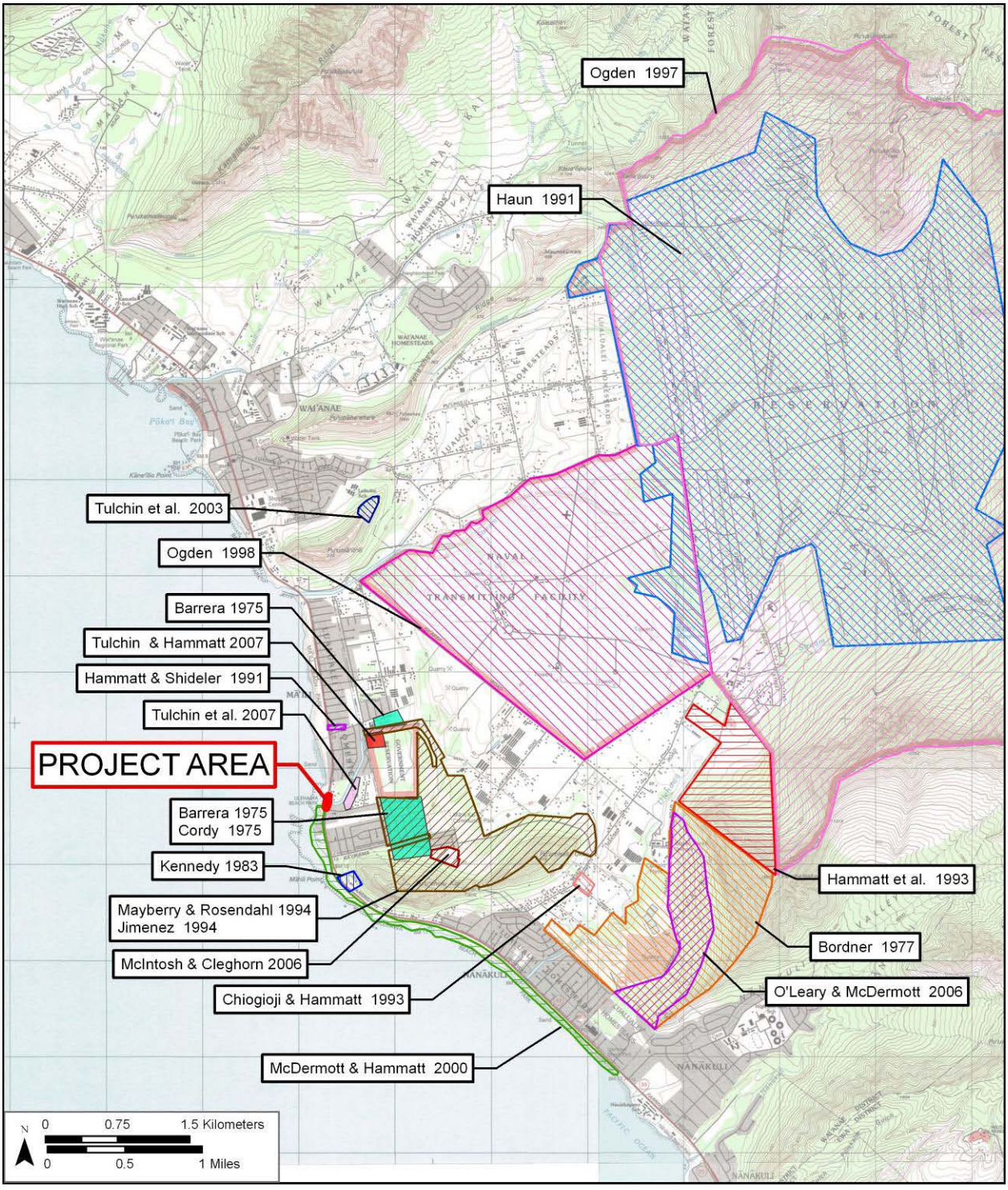

Figure 15. Map showing previous archaeological studies in Lualualei Ahupua‘a

Table 1. Previous archaeological studies in Lualualei Ahupua‘a

Reference	Location	Description and Results
McAllister 1933	Lualualei Ahupua‘a	Island-wide Survey: McAllister recorded eight sites in or near Lualualei: Site 147, ‘Ilihune Heiau; Site 148, rock called Maui; Site 149, Nioiula Heiau on Hālona ridge; Site 150, House sites or heiau at Pahoa cliffs; Site 151, Kakioe Heiau at Pūhāwai; Site 152 Pu‘u Pāhe‘ehe‘e Heiau; Site 153, Kū‘īlioloa Heiau; and Site 162, Mauna Kūwale burial cave, house sites and a Petroglyph rock in ‘Ulehawa Beach Park
Barrera 1975	Mā‘ili, Kaiser Pacific Prop. Corp. Land	Archaeological Survey: six sites were identified including a religious structure; C-shaped feature; two house site features; a possible site; and a midden scatter.
Cordy 1975	Mā‘ili, Kaiser Pacific Prop. Corp. land	Excavation of Site CH-0A-1, the religious structure in Barrera’s (1975) report. No evidence was recovered to confirm the site as a religious structure. Cordy concluded it was a modern structure built no earlier than 1930 or 1940.
Bordner 1977	Lualualei Ahupua‘a TMK 8-7-9	Archaeological Reconnaissance Survey conducted on the proposed site for the Nānākuli landfill. The area included land on both sides of Lualualei Naval Road, continuing up-slope to Pu‘u Heleakalā. No historic properties were observed.
Kennedy 1983	Mā‘ili, TMK 8-7-06:32	Reconnaissance Survey of the proposed Wai‘anae Corporation Yard site. No historic properties were identified on or within 50 feet of the proposed project boundary.
Hammatt and Shideler 1991	Mā‘ili, Liopolo Street Burial (Site 50-80–08-4244)	Archaeological Monitoring and Osteological Analysis during the installation of a Board of Water Supply 8-inch water main. A total of seven burials were discovered in calcareous beach sand. Of these, five burials were removed and two were left in situ.
Haun 1991	Naval Magazine and Naval Communications Area Transmission Facility TMK 8-6; 8-7; 8-8-01	Archaeological Reconnaissance Survey included an 8,184-acre parcel and a 700-acre parcel encompassing the entire inland portion of Lualualei Valley. A total of 131 sites and 1,004 features were identified. The features included “alignments, C-shapes, L-shapes, U-shapes, walls, terraces, enclosures, mounds, platforms, walled terraces and paved terraces” (Haun 1991; vii). The features are related to habitation, rituals, ceremonies, agriculture, the procurement of lithic material, and the manufacture of stone tools. Historical and recent structures associated with cattle ranching and military uses were also identified.

Reference	Location	Description and Results
Chiogioji and Hammatt 1993	Lualualei Ahupua‘a TMK 8-7-21:17	Archaeological Survey and Testing (revised from the 1992 ‘Archaeological Investigations’ report) on a five acre parcel, formerly a basil farm, situated between Pu‘u o Hulu and ‘Ulehawa Stream. No historic properties were observed.
Hammatt et al. 1993	Lualualei Ahupua‘a Lualualei Golf Course TMK 8-7-9:2; 8-7-10:6 and 10; 8-7-19:1	Archaeological Inventory Survey identified eight sites within the project area including two traditional Hawaiian sites including one habitation complex and the remnants of one wall, and six historic sites including a cattle wall, a furnace, wells, a house lot, and cement foundation structure.
Mayberry and Rosendahl 1994	Mā‘ili, TMK 8-7-10:2, 14	Reconnaissance Survey of in the Mā‘ili Kai project area. A total of 26 sites were located; 24 of these sites dated to the 20th century. Of the 24 sites, 22 dated from 1930 to the present. The remaining two sites consisted of rock features, possibly pre-dating the 20th century.
Jimenez 1994	Mā‘ili Kai TMK 8-7-10:2	Additional Inventory Survey conducted at four previously inventoried sites in the Mā‘ili Kai project area. This survey identified intact pre-contact and historic cultural deposits at two sites. A total of 25 of the 26 sites were considered significant for scientific information content and required no additional data collection. The remaining site was considered significant and recommended for additional data recovery.
Ogden Environ-mental and Energy Services Co., Inc. 1997	Lualualei Ahupua‘a Lualualei Navel Magazine	Cultural Resource Literature Review: this survey reviewed existing information on sites in the previously listed locations. Sites reviewed within NAVMAG-LLL included 197 sites with 1020 recorded features and also an additional 400 sites that had been reported but not recorded; five sites with 11 features in NAVMAG-Waikele; two sites in NAVMAG-West Loch; and Kolekole Rock was located near NAVMAG-LLL. Three sites listed in the National Register of Historic Places (NRHP) were located in the project area. They include the Nioiula Heiau in NAVMAG-LLL; ‘Oki‘okiolepe Fishpond in NAVMAG-West Loch; and the Pearl Harbor National Historic Landmark, Site 50-80-13-9992
Ogden Environment al and Energy	Lualualei Ahupua‘a Radio Transmission	Archaeology Reconnaissance Survey located on a 260-acre parcel in Lualualei. A total of three sites were identified including Site -5591, features associated with the sugarcane industry of the 19th and 20th centuries; and Sites -1886 and -

Reference	Location	Description and Results
Services 1998	Facility	5592, a permanent habitation site and a rock mound associated with traditional Hawaiian habitation.
McDermott and Hammatt 2000	Mā‘ili, ‘Ulehawa Beach Park, TMK 8-7-05:01, 03 and 05; 8-7-06:03; 8-7-08:01, 8-7-08:26; 8-7-08:26	Archaeological Inventory Survey of ‘Ulehawa Beach Park. A total of three sites, including features related to a WWII era bunker (SIHP # 5761), and two subsurface cultural layers (SIHP #s -5762 and 5763), were documented during test excavations. Deposits consisted of midden (marine shell, fish bone, etc.) and both indigenous (fish hooks, volcanic and basalt flakes) and historic (glass, metal and concrete fragments) artifacts. Both layers appeared to date to late pre-contact or very early post-contact periods.*
Tulchin et al. 2003	Lualualei Ahupua‘a, Pu‘u Mā‘ili‘ili	Archaeological Inventory Survey: for the proposed Wai‘anae 242 Reservoir and Access Road project area, on the northeast ridge of Pu‘u Mā‘ili‘ili. A total of two possible field shelters and a cave were investigated, but there was little evidence that these were traditional Hawaiian sites.
O’Leary and McDermott 2006	Lualualei Ahupua‘a, southwestern slopes of Pu‘u Heleakalā	Archaeological Inventory Survey for the proposed Nānākuli B site materials recovery facility and landfill. Historic properties identified include a pre-contact rock shelter (SIHP # 50-80-08-6699) and a WWII concrete bunker (SIHP #50-80-08-6681).
McIntosh and Cleghorn 2006	‘Ulehawa Beach Park, (TMK: (1) 8-7-005:001)	Archaeological Monitoring of ‘Ulehawa Beach Park identified SIHP # 50-80-07-6771, a pre-contact component of at least two human burials and a post-contact component of two recent trash pits.
Tulchin and Hammatt 2007	Mā‘ili, TMK: [1] 8-7-010:007	Archaeological Assessment; no historic properties were observed.
Tulchin et al. 2007	Waianae Sustainable Communities Plan Project, TMK [1] 8-7-023:060	Archaeological Assessment; no historic properties were observed.*

* Archaeological study conducted in close proximity to the current project area.

a “specific burial ground for one or more Hawaiian families of the Mā‘ili area during prehistoric or early historic times” (Hammatt and Shideler 1991:23).

An archaeological reconnaissance survey of the “Naval Magazine, Lualualei (NAVMAG LLL) and Naval Communications Area Master Station Eastern Pacific Radio Transmitting

Facility, Lualualei (RTF LLL)" was conducted in the mid-1980s (Haun 1991). The survey encompassed more than 9,000 acres including, "the entire half of the large amphitheater-shaped valley, and approximately one-third of the coastal half" (Haun 1991:4). A total of 131 sites, including 1,004 features, were identified during the survey. Traditional Hawaiian feature types were recorded including alignments, C-shapes, L-shapes, U-shapes, walls, terraces, enclosures, mounds, platforms, walled terraces and paved terraces. The features recorded relate to activities including habitation, rituals, ceremonies, agriculture, the procurement of lithic raw material, and the manufacture of stone tools. Historical and modern structures associated with cattle ranching and military activities were also identified. A total of 14 shovel probes provided datable materials (charcoal and volcanic glass), as well as cultural materials (artifacts and midden). Radiocarbon dates range from A.D. 1420 to 1950. It is suggested that the interior of Lualualei Valley was initially occupied on a temporary basis by people cultivating the area. This may have begun as early as the mid-1400s, continuing up to the mid-to-late 1700s or early 1800s. Permanent habitation sites were occupied, and population of the valley evidently increased rapidly, based on the dense distribution of habitation and agricultural features (Haun 1991:vii).

CSH conducted an archaeological study on a 5-acre parcel, formerly a basil farm; no archaeological remains were documented (Chiogioji and Hammatt 1993). The parcel was situated between Pu‘u o Hulu and ‘Ulehawa, north of the current study area.

An archaeological inventory survey of an approximately 170-acre parcel, located southeast of the Naval Magazine, was conducted by CSH (Hammatt et al. 1993). The parcel is described as comprising "vacant, unused lands. It is undeveloped and contains several remnant and abandoned historic structures" (Hammatt et al. 1993:7). A total of eight archaeological sites were identified, including "two traditional Hawaiian sites and six historic sites related to ranching and military activities" (Hammatt et al. 1993:i). The two traditional Hawaiian sites, a site complex likely representing pre-contact, recurrent habitation in the foothills of Pu‘u Heleakalā (SIHP #50-80-08-4366) and a wall remnant (SIHP # 50-80-08-4367), were attributed to traditional Hawaiian activity. Site SIHP #50-80-08-4367, a remnant wall section present adjacent to an intermittent streambed, indicates agricultural usage, and was possibly constructed to retain or divert water. Given the weathered condition of the structure, the site was likely pre-contact (Hammatt et al. 1993:28).

In 1993, Jimenez conducted subsurface testing of the sites recommended for further testing during the Rosendahl study (Jimenez 1994). The sink well and wall (SIHP # 50-80-08-3335) had been destroyed during Phase I of the development, so no further archaeological testing could be conducted on that site. Of the remaining sites tested, only one, SIHP # 50-80-08-3750, produced evidence of pre-contact use. This C-shaped enclosure yielded small amounts of lithics, midden, and charcoal. Radiocarbon dates indicate the site was used as a temporary habitation during the late pre-contact period. Further data collection was recommended for this site.

The areas surveyed by Barrera and Cordy in the 1970s were subsumed in a 415-acre "Mā‘ili Kai Property project area" (TMK 8-7-10: 2, 14) that was the subject of an archaeological reconnaissance survey conducted by Paul H. Rosendahl, Inc. in December of 1987. The survey report (Mayberry and Rosendahl 1994) noted that "large scale ranching, land clearing, and quarrying from 1851 to the present have been destructive to the natural and cultural environments" of the project area (Mayberry and Rosendahl 1994). The report documented 12

new sites and the reinvestigation of 14 sites previously recorded by Barrera and Cordy. A total of 24 of the 26 sites in the project area were dated to the 20th century. Only two small sites, rock features without associated artifacts, may pre-date the 20th century (Mayberry and Rosendahl 1994:ii). Of these, five sites were recommended for subsurface testing including SIHP # 50-80-08-3344, a platform; SIHP #50-80-08-3750, a C-shape enclosure; SIHP # 50-80-08-3755, a rock mound/platform; SIHP #50-80-08-3335, a sink well and wall; and SIHP # 50-80-08-3339, a stone enclosure and wall.

A literature review and reconnaissance survey was conducted by Ogden Environmental and Energy Service Co., Inc. (1997) within NAVMAG-LLL and included 197 sites with 1,020 recorded features. An additional 400 sites were reported but not recorded. These included 5 sites with 11 features in NAVMAG-Waikele; 2 sites in NAVMAG-West Loch; and Kolekole Rock was located near NAVMAG-LLL. A total of three sites listed on the National Register of Historic Places (NRHP) were located in the project area. They include Nioiula Heiau in NAVMAG-LLL; ‘Oki‘okiolepe Fishpond in NAVMAG-West Loch; and the Pearl Harbor National Historic Landmark, NRHP Site 50-80-13-9992.

An archaeological survey of 260 acres of the Lualualei Ahupua‘a Radio Transmission Facility was carried out to locate archaeological sites and incorporate them into a Cultural Resource Management Plan (Ogden Environmental and Energy Services Co., Inc. 1998). A total of three sites were located including features associated with the sugarcane industry of the 19th and 20th centuries (SIHP # 50-80-08-5591), a permanent habitation site (SIHP # 50-80-08-5592), and a rock mound (SIHP # 50-80-08-1886). All are considered traditional Hawaiian sites. The report indicates that areas inland from the coast may once have been more heavily settled.

CSH (Tulchin et al. 2003) conducted an inventory survey of the proposed Wai‘anae 242 Reservoir and Access Road project area, on the northeast ridge of Pu‘u Mā‘ili‘ili. A total of two possible field shelters and a cave were investigated, but little evidence was observed to indicate these were traditional Hawaiian sites.

In 2006, CSH completed an archaeological inventory survey of the 200-acre project area for the Proposed Nānākuli B Site Materials Recovery Facility and Landfill (O’Leary and McDermott 2006). A total of two historic properties were identified: SIHP # 50-80-08-6699, a pre-contact rock shelter, and SIHP #50-80-08-6681, a WWII concrete bunker. Test excavations at SIHP # 50-80-08-6699 resulted in the recovery of lithic materials, transported marine shell and coral, and charcoal. A small scoop hearth was also observed, and the charcoal collected was dated to a late ore-contact period prior to European contact.

In 2006 McIntosh and Cleghorn conducted archaeological monitoring in support of construction activities for ‘Ulehawa Beach Park. A multi-component site was documented as SIHP # 50-80-07-6771 and consisted of a pre-contact component of at least two human burials and a post-contact component of two recent trash pits. The site is located approximately 1.2 km southeast of the current project area. Charcoal associated with one of the burials was dated to AD 1300 to 1430.

In 2007, Cultural Surveys Hawai‘i conducted an archaeological assessment of 6-acre parcel located approximately 1.1 km northeast of the current project area. No historic properties were observed. Tulchin and Hammatt concluded that disturbances associated with historic land use

activities including historic agriculture and U.S. military activities, as well as modern trash dumping and bulldozing, have removed the presence of any surface historic properties and/or artifacts that may have been present within the project area (Tulchin and Hammatt 2007).

2.2.3 Archaeological Studies in Proximity to the Current Project Area

In 1999, CSH (McDermott and Hammatt 2000) conducted an inventory survey on a 57.65-acre parcel of ‘Ulehawa Beach Park. A total of two subsurface cultural layers (SIHP # 50-80-08-5762 and SIHP # 50-80-08-5763), and the remnants of WWII era concrete bunkers (SIHP # 50-80-07-5761) were found during test excavations that covered approximately 2% of the project area. The cultural deposits consisted of midden (marine shell, fish bone, etc.) and both indigenous (fish hooks, volcanic and basalt flakes) and historic (glass, metal, and concrete fragments) artifacts. Of particular interest was a nearly complete, barb-less pearl shell fishhook with an unusually deep v-bend reminiscent of Marquesan or Tahitian hooks. This type of fishhook is considered atypical for Hawaiian fishhooks. Both cultural layers appeared to date to late pre-contact or very early post-contact times. The scant midden and artifact assemblages recovered indicate there is little evidence of permanent or recurrent habitation along the coastal area and further enforce the consensus that traditional Hawaiian settlement was concentrated inland. Both of these cultural layers were observed in the southern portion of the ‘Ulehawa Beach Park project area, approximately 2.5 km south of the current project area.

During the inventory survey for ‘Ulehawa Beach Park, three test trenches and one shovel test were excavated (Trenches 41, 42, and 43, and Shovel Test 11) in close proximity to the *makai* boundary of the current project area, on either side of Mā‘ili Stream (M-4 drainage) (Figure 16). Stratigraphy observed consisted of a top layer of landscape-quality sandy loam, with several layers of disturbed and natural beach sand underneath. Excavations were terminated at approximately 2 m below current ground surface. Modern refuse and associated charcoal were observed; however, no cultural properties were observed within these test units. Also, there was no evidence of the house sites reported by McAllister in 1933 and Sterling and Summers in 1978. Bands of dark staining, along with modern trash, were observed on the south side of the channel and appeared to be modern. The remnant of a WW II era bunker (SIHP # 50-80-07-5761, Feature C) was also documented in ‘Ulehawa Beach Park, on the *makai* side of the bus stop, approximately 125 m north of the current project area (McDermott and Hammatt 2000).

In 2007 subsurface testing was conducted for the Wai‘anae Sustainable Communities Plan Project, located approximately 40 m east of the current project area (Tulchin et al. 2007). No artifacts or historic properties were observed and extensive disturbance associated with the dredging of a drainage canal, the filling of marshlands, and the construction of a now defunct subdivision had removed the presence of any historic properties that may have been present within the project area. Additionally, any subsurface cultural deposits that may have been present would have been severely disturbed or completely destroyed by the installation of subsurface utilities (water, sewer, electric, etc.) within the project area associated with the construction of the defunct subdivision.

2.2.4 Field Inspection of the Current Project Area

A field inspection of the project area was conducted on May 20, 2009 by CSH archaeologist Kendy Altizer, B.A. Fieldwork required one person-day to complete and was conducted under

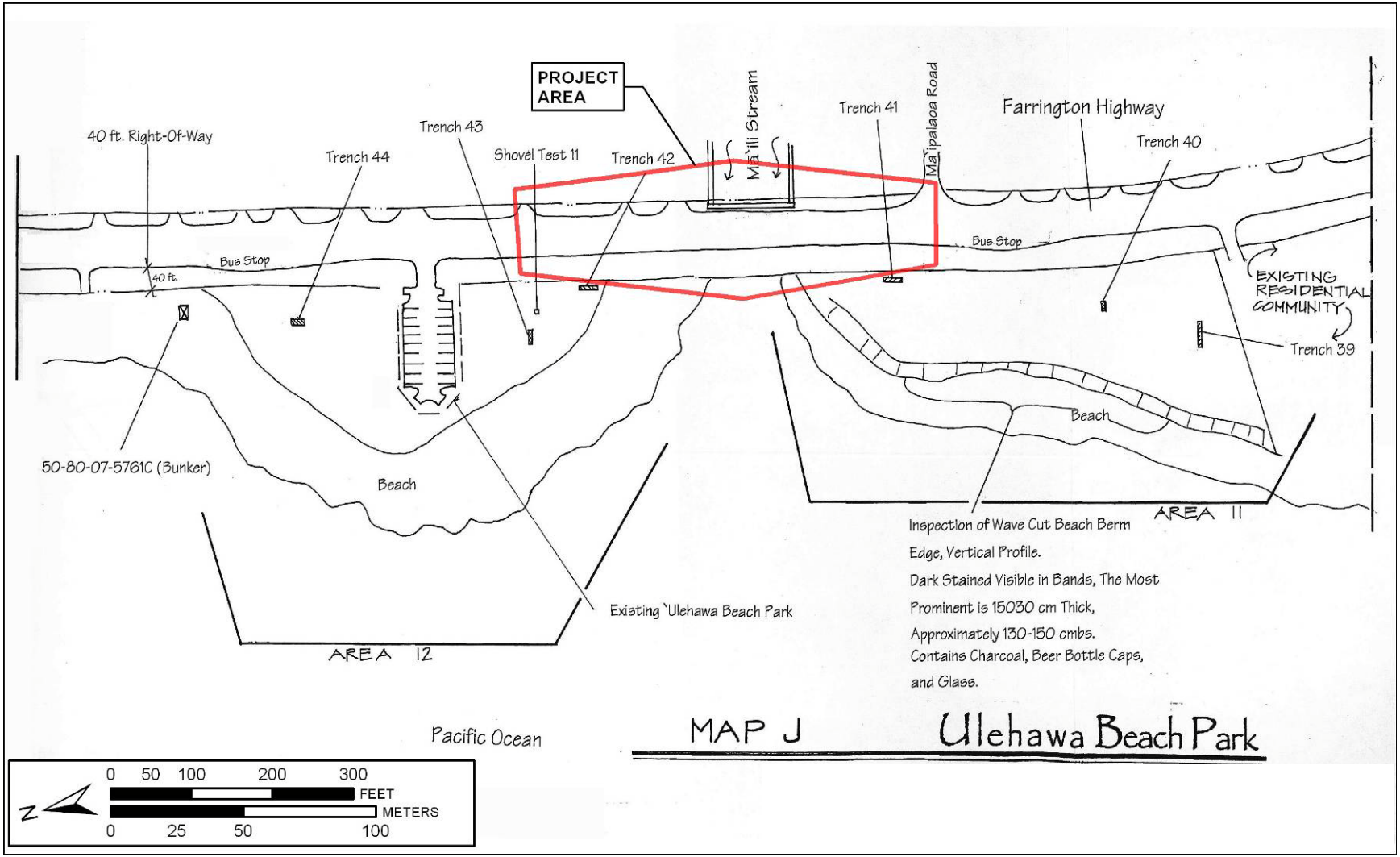

Figure 16. Map showing subsurface testing conducted just outside of the current project area (McDermott and Hammatt 2000: 132).

the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The field inspection served to confirm that the project area is in an urban built environment.

A 100 percent pedestrian inspection of the current project area surface confirmed that there were no surface historic properties within the project area, other than Farrington Highway itself (SIHP # 50-80-07-6824). Pedestrian inspection also confirmed that the entire project area has been heavily disturbed by modern construction activity. Disturbance includes the construction and maintenance of Farrington Highway through the middle of the project area, small businesses on the northeast side, private residences on the southeast side, the M-4 Drainage Channel flowing underneath the bridge, and ‘Ulehawa Beach Park on the west side of the project area (

Figure 17-Figure 21).

Figure 17. Photo of the eastern side of the project area. Note business and private residences in the vicinity; view southeast

Figure 18. Photo of Maipalaoa Bridge and channelized drainage on the eastern side of the project area; view south

Figure 19. Photo of the west side of the project area showing the mouth of the channel. Note the flat area of the beach park at center left of photo; view northeast

Figure 20. Photo of the west side of the project area showing the grassy picnic area on the south of the channel mouth where Test Trench 41 was located (McDermott and Hammatt 2000); view north

Figure 21. Photo of the west side of the project area showing the grassy area on the north side of the channel mouth where Test Trenches 42 and 43, and Shovel Test 11 were located (McDermott and Hammatt 2000); view south

Farrington Highway

Farrington Highway, which extends through the length of the project area, is oriented roughly north-south, and continues outside the project area along the Wai‘anae Coast. The portion of Farrington Highway within the project area measures approximately 509 ft. long (N-S) by 33 ft. wide, including shoulders (NE-SW). Construction of this portion of road included grading with subsequent asphalt paving, and a concrete bridge. The road surface is painted with two solid white lines marking the road boundaries, while double solid yellow lines divide the road into two lanes of opposing traffic. The road is asphalt paved and the shoulders are gravel and sand base course. The Maipalaoa Bridge portion of Farrington Highway is concrete with concrete pedestrian walk ways present on both sides. Overhead utility lines are present and strung between creosote-treated wooden utility poles. Based on background research, Farrington Highway is an important subsurface utilities corridor, with water, sewer, and fiber optic lines within the highway's right-of-way.

Originally constructed in the early 20th Century, the portion of Farrington Highway within the project area has been greatly modified in the last 30 or 40 years with the addition of traffic lanes and roadway appurtenances. A 1949 aerial photo and a World War II photo of Farrington Highway show its original construction as a two-lane asphalt road (see Figure 8 and Figure 11); whereas a 1974 aerial photo and more recent photos of the current project area illustrate that the highway has been upgraded to include four traffic lanes, accompanying appurtenances, and a concrete bridge (see Figure 9 and Figure 17-Figure 21). These upgrades to Farrington Highway have altered its integrity, as it pertains to the National and State Registers of Historic Places criteria. Because it has been so extensively modified from its original construction, this portion of Farrington Highway no longer displays integrity of design, setting, materials, workmanship, feeling, or association. Therefore, it no longer has the integrity to convey its significance as a portion of the Territorial Highway System. Though a portion of Farrington Highway, located further north along the Wai‘anae coastline in Mākaha, has been determined eligible to the National and State Register under Criterion D for its information content (SIHP # 50-80-07-6824-McDermott and Tulchin 2006), the portion of Farrington Highway in the current project area would likely not be eligible under any criteria because it no longer retains integrity.

Potential Subsurface Archaeological Deposits

A previous inventory survey was conducted in ‘Ulehawa Beach Park, in close proximity to the *makai* boundary of the current project area (McDermott and Hammatt 2000). A total of three test trenches and one shovel test were excavated (Trenches 41, 42, and 43, and Shovel Test 11) on either side of Mā‘ili Stream (M-4 drainage) (see Figure 16); however no historic properties were observed. Bands of dark staining, along with modern trash, were documented on the south side of the channel and it was concluded that these deposits were modern.

During the current field inspection, the mouth of (Mā‘ili Stream (M-4 drainage) was examined and showed an abundance of modern refuse including bottle caps and glass, plastic bags, beer and soda cans, and food wrappers. There was no evidence of subsurface cultural deposits on either side of the channel or the bands of staining observed during the ‘Ulehawa Beach Park survey. It is likely that routine dredging and constant wave action have had a

significant impact on the drainage mouth and adjacent beaches. Therefore, it is possible that any subsurface cultural material that may have been present has eroded away.

Historically, the OR&L railroad was present in this portion of the current project area, along the *makai* side of Farrington Highway (see Figure 6 and Figure 7), however no remnants of the track were observed during the field inspection. It is likely that the OR&L infrastructure was removed prior to the widening of Farrington Highway in the late 1960s and no subsurface remnants were encountered during subsurface testing in ‘Ulehawa Beach Park, which took place in the general area of the original OR&L right-of-way (McDermott and Hammatt 2000). The 1949 aerial photo of the project area (see Figure 8) clearly shows the OR&L railroad, the original Maipalaoa Bridge and Farrington Highway as a two lane road; while the 1974 aerial photo of the current project area (see Figure 9) shows Farrington Highway as a four lane highway, the Maipalaoa Bridge currently being proposed for replacement, and there appears to be no remnant of the OR&L railroad. There is a small possibility that remnants related to the OR&L railroad could be encountered during construction related ground disturbing activities associated with the current project.

The Maipalaoa Bridge spans a drainage channel that is routinely dredged to facilitate flow. Aerial photos of the project area show the progression of Mā‘ili Stream (M-4 drainage) as a natural drainage from the salt pond in 1949 (see Figure 8), to a built drainage system in 1974 (see Figure 9). The 2005 aerial photo clearly depicts the current project area as a maintained drainage with concrete siding (see Figure 3). In addition, subsurface testing conducted in ‘Ulehawa Beach Park and the nearby Wai‘anae Sustainable Communities Plan project area produced no cultural deposits or artifacts. Because of these factors, there is little potential for subsurface cultural deposits within the current project area.

2.3 Background Summary and Anticipated Finds

2.3.1 Background Summary

Based on available evidence, it appears that the pre-contact settlement pattern within Lualualei Ahupua‘a had three basic zones: coastal, intermediate, and upland. The most resource rich were near the sea and in the upland mountains, where there was sufficient rainfall for agriculture and forest resources. The intervening lands between the sea and the mountains were dry scrubland. Although potentially useful for dry land agriculture in the wet winter months, there is little evidence to indicate Native Hawaiians intensively utilized this area. The settlement pattern prior to western contact for this appears to be dispersed residences concentrated at the sea and in the mountains. Based on the season and the available resources, the resident population most likely used multiple residences, perhaps one at the seaside and another *mauka*, to reduce resource transport time. It is also possible, as is indicated by the account provided by Pukui (cited in McGrath et al. 1973: 10), that an informal exchange network existed where by coastal dwellers traded marine resources for agricultural and forest resources of the inland dwellers.

The population along the Wai‘anae coast may have always been quite low. The immediate current project area and immediate vicinity lacked water for cultivation and was proverbial for its poverty. Vancouver, in 1785, noted “few inhabitants” in “the barren, rocky waste.” Whitman, in

1815, referred to the area as an “uncultivated plain.” Oral history accounts emphasize the “crops were always poor and miserable.”

By the mid-1800s the traditional Native Hawaiian lifestyle in the valley of Lualualei was in decline. The sandalwood trade, which ended circa 1829, undoubtedly had a negative effect on the Native Hawaiian population. Lualualei began its cattle ranching period about this time. The introduction of sugar plantations brought more foreigners and the OR&L railroad, which was linked to Wai‘anae in 1895. Based on the paucity of Land Commission Awards (LCAs) claimed within the area, and the early population figures, it appears the Native Hawaiian population was quite low in the latter half of the 19th century. Population numbers slowly increased when homesteading was instituted in the early 1900s. Military use of the land began in 1917, and WWII greatly affected the landscape of the Wai‘anae coast by placing bunkers, gun emplacements, and barbed wire along the waterfront.

Numerous archaeological investigations have taken place within Lualualei Valley. The studies have demonstrated a pattern of high intensity land use in only the *mauka* and *makai* portions of Lualualei Valley, with a relative gap in archaeological remains in the middle sections, as discussed above. The studies of the *mauka* portions of the valley (Haun 1991; Ogden Environmental Services 1997) have identified more than 500 archaeological sites, which include well over 1,000 features. The identified features included “alignments, C-shapes, L-shapes, U-shapes, walls, terraces, enclosures, mounds, platforms, walled terraces and paved terraces” (Haun 1991: vii). These features relate to habitation, agriculture, rituals, ceremonies, and the procurement and manufacture of stone tools.

Evidence of pre-contact Native Hawaiian activity has also been documented in *makai* sections of the *ahupua‘a*, immediately adjacent to the ocean. A total of seven Native Hawaiian burials were inadvertently discovered during water system improvements located approximately 750 m north of the current project area (Hammatt and Shideler 1991); and two cultural layers containing charcoal deposits, pit hearths, midden, and artifacts associated with pre-contact occupation were documented during the ‘Ulehawa Beach Park survey (McDermott and Hammatt 2000). The cultural layers were observed in the southern end of the survey area, approximately 2.5 km south of the current project area.

In contrast to the abundance of traditional Hawaiian sites and features encountered at the *mauka* and *makai* portions of Lualualei Valley, the sites recorded during the studies in the central section of Lualualei Valley are relatively minimal in number and are generally of post-contact origin. Pre-contact Hawaiian sites in this area consist of trails, lithic scatters, and temporary habitation sites, indicating intermittent use of the central portion of Lualualei Valley. The paucity of traditional Hawaiian sites in this central area may reflect not only a less intensive use during pre-contact times, but also the extensive disturbance of this area by historic ranching, sugar agriculture, and U.S. Military occupation.

2.3.2 Anticipated Finds

Based on previous historic document and archaeological research, and the previous inventory surveys conducted in close proximity to the current project area, cultural deposits that may be encountered during construction related ground disturbing activities include transportation infrastructure related to Farrington Highway (SIHP# 50-80-07-6824), possibly some remnants of

the OR&L Railroad (SIHP # 50-80-12-9714), WWII era military infrastructure, and subsurface cultural deposits related to pre-contact Traditional Hawaiian occupation. Other types of cultural material that may be encountered during construction activities include historic trash deposits, pre-contact shell midden, artifacts, and human burials.

Section 3 Archaeological Monitoring Provisions

In consultation with SHPD, it was determined that a monitoring program was warranted as a precautionary mitigation measure for the proposed Maiapaloa Bridge Replacement Project (see Appendix A). The following discussion outlines the provisions and procedures that will govern the project's archaeological monitoring program.

Under Hawai‘i State historic preservation legislation, "Archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities which may adversely affect historic properties" (HAR Chapter 13-279-3). For this project, the proposed monitoring program will serve as a precautionary mitigation measure to insure proper documentation should historic properties be encountered during construction activities.

Hawai‘i State historic preservation legislation governing archaeological monitoring programs requires that each monitoring plan discuss eight specific items (HAR Chapter 13-279-4). The monitoring provisions below address those eight requirements in terms of archaeological monitoring for construction within the project area.

1. Anticipated Historic Properties:

   Cultural deposits that may be encountered during construction related ground disturbing activities include transportation infrastructure related to Farrington Highway (SIHP# 50-80-07-6824), possibly some remnants of the OR&L Railroad (SIHP # 50-80-12-9714), WWII era military infrastructure, and subsurface cultural deposits related to pre-contact Traditional Hawaiian occupation. Other types of cultural material that may be encountered during construction activities include historic trash deposits, pre-contact shell midden, artifacts, and human burials.

2. Locations of Historic Properties:

   Historic properties may be encountered anywhere within the project area.

3. Fieldwork:

   On-site monitoring is recommended for all ground disturbing activities which take place. A qualified archaeologist will monitor all ground disturbance associated with the project's construction. Any departure from this will only follow consultation with, and written concurrence from, SHPD/DLNR.

   The monitoring fieldwork will likely encompass the documentation of subsurface archaeological deposits (e.g. subsurface cultural layers or subsurface historic structural remnants) and will employ current standard archaeological recording techniques. This will include drawing and recording the stratigraphy of excavation profiles where cultural features or artifacts are exposed as well as representative profiles. These exposures will be photographed, located on project area maps, and sampled. Photographs and representative profiles of excavations will be taken even if no historically significant sites are documented. As appropriate, sampling will include the collection of representative artifacts, bulk sediment samples, and/or the on-site screening of measured volumes of feature fill to determine feature contents.

Should significant historic properties be encountered during construction activities related to the current project, then CSH will strive to answer the following research questions:

a. Can the site help further define the chronological sequence of the Wai‘anae Coast?

b. should structural remnants related pre-contact habitation, the OR&L railroad, or WW II-era building foundations be encountered, these remnants will be documented by sketch drawings, scale elevations and/or profiles, and photographs.

If human remains are identified, no further work will take place, including no screening of back dirt, no cleaning and/or excavation of the burial area, and no exploratory work of any kind unless specifically requested by SHPD. All human skeletal remains that are encountered during construction will be handled in compliance with HRS Chapter 6E-43, HAR Chapter 13-300, and in consultation with SHPD/DLNR.

4. Archaeologist’s Role:

The on-site archaeologist will have the authority to stop work immediately in the area of any findings so that documentation can proceed and appropriate treatment can be determined. In addition, the archaeologist will have the authority to slow and/or suspend construction activities in order to insure that the necessary archaeological sampling and recording can take place.

5. Coordination Meeting:

Before work commences on the project, the on-site archaeologist shall hold a coordination meeting to orient the construction crew to the requirements of the archaeological monitoring program. At this meeting the monitor will emphasize his or her authority to temporarily halt construction and that all historic finds, including objects such as bottles, are the property of the landowner and may not be removed from the construction site. At this time it will be made clear that the archaeologist must be on site during all subsurface excavations.

6. Laboratory work:

Laboratory analysis of non-burial related finds will include standard artifact and midden recording as follows: Artifacts will be documented as to provenience, weight, length, width, type of material, and presumed function. Bone and shell midden materials will be sorted down to species, when possible, then tabulated by provenience, and presented in table form.

7. Report Preparation:

One of the primary objectives of the report will be to present a stratigraphic overview of the project area which will allow for predictive assessments of adjacent properties, which may be the subject of future development. The report will contain a section on stratigraphy, description of archaeological findings, monitoring methods, and results

of laboratory analyses. Should significant historic properties be encountered during monitoring activities, then the monitoring report will document the research objectives discussed below and appropriate analysis will be conducted to support those objectives. The report will address the requirements of a monitoring report (HAR section 13-279-5). Photographs of excavations will be included in the monitoring report even if no historically significant sites are documented. Should burial treatment be completed as part of the monitoring effort, a summary of this treatment will be included in the monitoring report. Should burials and/or human remains be identified, then other letters, memos, and/or reports may be requested by the Burial Sites Program.

8. Archiving Materials:

   All burial materials will be addressed as per SHPD/DLNR instructions. Materials not associated with burials will be temporarily stored at the contracted archaeologist's facilities until an appropriate curation facility is selected, in consultation with the landowner and SHPD.

9. Research Focus:

   Based on past archaeological work, pre-contact and historic cultural deposits are present in Lualualei, in proximity to the current project area. A total of seven Native Hawaiian burials were inadvertently discovered during water system improvements located approximately 750 m north of the current project area (Hammatt and Shideler 1991); and two pre-contact cultural layers (SIHP # 50-80-08-5762 and SIHP # 50-80-08-5763) containing charcoal deposits, pit hearths, midden, and artifacts associated with pre-contact occupation were documented during the ‘Ulehawa Beach Park survey (McDermott and Hammatt 2000). The cultural layers were observed in the southern end of the ‘Ulehawa Beach Park survey area, approximately 2.5 km south of the current project area.

   Historic cultural resources observed in proximity to the project area include: the remnants of WWII era concrete bunkers (SIHP # 50-80-07-5761) in ‘Ulehawa Beach Park approximately 125 m north of the current project area; Farrington Highway (SIHP # 50-80-07-6824); and remnants of the OR&L Railroad (SIHP # 50-80-12-9714) which was present historically in the project area but is no longer visible on the existing ground surface.

   The current project may provide the opportunity to gather additional information pertaining to the sites listed above. Research questions that could be answered as a result of monitoring activities related to the proposed Maipalaoa Bridge Replacement project include:

   a Should pre-contact cultural deposits be encountered, are they related to the deposits observed in ‘Ulehawa Beach Park?

   b. Should additional transportation infrastructure related to SIHP # 50-80-07-6824 and SIHP # 50-80-12-9714 be encountered, what are the geographic extents of these historic properties?

c. What types of activities and land use are reflected in the archaeological record of coastal Lualualei?

If the above questions can be addressed as a result of monitoring activities associated with the Maipalaoa Bridge Replacement project, then we may be able to better characterize past land-use of coastal Lualualei, and the archaeological deposits that can be expected in the area.

Section 4 References Cited

Alexander, W.D.

1884 Government Survey Map of O‘ahu. Copies available from the Cultural Surveys Hawai‘i Library, Waimanalo, HI.

Barrera, W. Jr.

1975 *Archaeological Site Survey at Mā'ili, O‘ahu*, Chiniago, Inc., Honolulu, HI.

Board of Commissioners

1929 Indices of Awards made by the Board of Commissioners to Quiet Land Titles in the Hawaiian Islands. Star-Bulletin Publishing, Honolulu, HI.

Bordner, Richard M.

1977 *Archaeological Reconnaissance of the Proposed Nanakuli Landfill Site, Wai‘anae, O‘ahu Island, ARCH #14-103*, Lawai, Kauai, HI.

Bowser, George

1880 The Hawaiian Kingdom: Statistical and Commercial Directory and Tourist Guide, 1880-1881, G. Bowser & Co, Honolulu and San Francisco.

Chinen, Jon J.

1958 *The Great Māhele, Hawai‘i's Land Division of 1848*, University of Hawai‘i Press, Honolulu, HI.

Chiogioji, Rodney and Hallett H. Hammatt

1993 *Archaeological Investigations of a 5-acre Parcel in the Ahupua‘a of Lualualei, Island of O‘ahu (TMK 8-7-21:17)*. Cultural Surveys Hawai‘i, Kailua, HI.

Commissioner of Crown Lands

1894 Reports of the Commissioner of Crown Lands, Provisional Government, Honolulu, HI, State Archives: Honolulu.

1902 Reports of the Commissioner of Crown Lands, Provisional Government, Honolulu, HI, State Archives: Honolulu.

Condé, Jesse C and Gerald M. Best

1973 *Sugar Trains, Narrow Gauge Rails of Hawai‘i*, Glenwood Publishers, Felton, CA.

Cook, James

1784 A voyage to the Pacific Ocean … for Making Discoveries in the Northern Hemisphere in the “Resolution” and “Discovery” …. Vols. 1-3 and atlas, London (Volume 3 by James King)

Cordy, Ross

1975 *Archaeological Excavation at CH-Oa-1, Maili, O‘ahu*. Manuscript on file; Department of Land and Natural Resources–Historic Sites Section.

1976 *An Archaeological Survey of Kaiser Pacific Properties’ Land, Maili Kai, O‘ahu.* Manuscript on file; Department of Land and Natural Resources–Historic Sites Section.

Cordy, Ross, W. Bruce Masse, Nathaniel Pak, Lou Jane Moana Lee, and Carina Johnson

1990 *Status Report 3* DHHL-DLNR Nanakuli Archaeological Survey.

1998 *Ka Moku O Wai‘anae: He Mo‘olelo O Ka Wa Kahiko*. State Historic Preservation Division, State of Hawaii, Honolulu, HI

Cruz, Brian and Hallett H. Hammatt

2010 *Cultural Impact Assessment for the Farrington Highway Replacement of Ma‘ipalaoa Bridge Project, Federal Aid Project No. BR-093-1(21) Lualualei Ahupua‘a, Wai‘anae District, O‘ahu Island TMK [1] 8-7-023:058 (Farrington Highway).* Cultural Surveys Hawai‘i, Kailua, HI.

Cummins, Gary

1974 *National Register of Historic Places Nomination Form for the Hisotric O‘ahu Railway and Land Company Right-of-Way*. Copies available from the State Historic Preservation Division, Kapolei, HI.

Department of Land and Natural Resources (DLNR)

1845-1903 Liber. (Land Record Books). Territory of Hawai‘i: Commissioner of Public Lands.

Ellis, William

1963 *Journal of William Ellis: Narrative of a Tour of Hawai‘i with Remarks on the History and Traditions*, Advertiser Publishing Company, Ltd. Honolulu, HI.

1969 *Polynesian Researches: Hawai‘i*, Charles E. Tuttle Co., Rutland, Vermont & Tokyo, Japan

Foote, Donald E., E.L. Hill, S. Nakamura, and F. Stephens

1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii*. U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Giambelluca, Thomas W., Nullett, Michael A. and Thomas A. Schroeder

1986 *Rainfall Atlas of Hawai‘i*, Department of Land and Natural Resources, SHPD/DLNR, State of Hawai‘i, Honolulu, HI.

Hammatt, Hallett H. and David W. Shideler

1991 *Archaeological Monitoring at Liopolo Street, Mā‘ili 8" Water System, Part III, Mā‘ili, Wai‘anae, O‘ahu (With a Discussion of Burials S.S. No. 50-80-08-4244)*, Cultural Surveys Hawai‘i, Kailua, HI.

Hammatt, Hallett H., Jennifer Robins and Mark Stride

1993 *An Archaeological Inventory Survey for the Proposed Lualualei Golf Course, Lualualei, Wai‘anae, O‘ahu*, Cultural Surveys Hawai‘i, Kailua, HI.

Handy, E. S. Craighill and Elizabeth Green Handy

1972 *Native Planters in Old Hawai‘i: Their Life, Lore, and Environmen*t. Bishop Museum Press, Honolulu, HI.

Haun, Alan E.

1991 *An Archaeological Survey of the Naval Magazine & Naval Communications Area Transmission Facility, Lualualei, O‘ahu, Hawai‘i, Ms. 100191,* B.P. Bishop Museum, Honolulu, HI.

Hawai‘i TMK Service

N. D. Hawai‘i TMK Service, 222 Vineyard St Ste 401, Honolulu, Hawai‘i. Tax Map Key [3] 7-5-010:64 and 7-5-017:20

Hawaiian Government Survey

1881 *Government Survey Map of Oahu Island.* Copies available from the Cultural Surveys Hawai‘i Library, Waimanalo, HI.

‘Ī‘ī, John Papa

1959 *Fragments of Hawaiian History*, Bishop Museum Press, Honolulu, HI.

1983 *Fragments of Hawaiian History*, Revised, Bishop Museum Press, Honolulu, HI.

Jimenez, Joseph A.

1994 *Additional Archaeological Inventory Survey, Maili Kai Project Area, Land of Lualualei, Waianae District, Island of O‘ahu*, Paul H. Rosendahl, Ph.D., Inc., Hilo, HI.

Kamakau, Samuel Manaiakalani

1991 *Tales and Traditions of the People of Old: Nā Mo‘olelo o Ka Po‘e Kahiko*, The Bishop Museum, Honolulu, HI.

1992 *Ruling Chiefs of Hawai‘i* (Revised Edition). Kamehameha Schools Press, Honolulu, HI.

Kelly, Marion

1991 “Notes on the History of Lualualei”, in: An Archaeological Survey of the Naval Magazine & Naval Communications Area Transmission Facility, by Alan E. Haun, Bishop Museum, Honolulu, HI.

Kennedy, Joseph

1983 *A Walk-Through Surface Survey of the Proposed Waianae Corporation Yard (TMK:8-7-06:32) at Lualualei, Island of Oahu*. Archaeological Consultants of Hawaii, Inc. Honolulu, HI.

Kuykendall, Ralph S.

1953 *The Hawaiian Kingdom, Volume 2 1854-1874*, University of Hawai‘i Press, Honolulu, HI.

Kuykendall, Ralph S. and A. Grove Day

1961 *Hawai‘i: A History From Polynesian Kingdom to American Statehood*. Prentice-Hall, Inc., Englewood Cliffs.

Mayberry, J.D. and P.H. Rosendahl

1994 *Archaeological Reconnaissance Survey for Environmental Impact Statement (EIS) Maili Kai Property, Land of Lualualei, Waianae District, Island of O‘ahu (TMK: 8-7-10:2, 14).* Paul H. Rosendahl, Ph.D. Inc., Hilo.

Mc Allister, J. Gilbert

1933 *Archaeology of Oahu*. Bulletin 104. Bishop Museum, Honolulu, HI.

Mc Dermott, Matt and Hallett H. Hammatt

2000 *Archaeological Inventory Survey of the 57.65 Acre ‘Ulehawa Beach Park Parcel, Ahupua‘a of Lualualei, Wai‘anae District, Island of O‘ahu (TMK: 8-7-05:01, 03 and 05; 8-7-06:03; 8-7-08:01, 8-7-08:26; 8-7-08:26),* Cultural Surveys Hawai‘i, Kailua, HI.

McDermott, Matt and Jon Tulchin

2006 *Archaeological Inventory Survey for the Proposed Replacement of Mākaha Bridges 3 and 3A, Farrington Highway, Mākaha Ahupua‘a, Wai‘anae District, Island of O‘ahu*. Cultural Surveys Hawai‘i, Inc., Kailua, HI.

McGrath, E. J., Jr., K. M. Brewer and Robert Krauss

1973 *Historic Wai‘anae, A Place of Kings,* Island Heritage Ltd., Norfolk Island, Australia.

McIntosh, James and Paul L. Cleghorn

2006 *Archaeological Monitoring Services During Construction at ‘Ulehawa Beach Park, Ahupua‘a of Lualualei, District of Wai‘anae, Island of O‘ahu (TMK: (1) 8-7-005:001)* Pacific Legacy, Inc.

Nakamura, Barry and Jeffrey Pantaleo

1994 *Aspects of the History of Lualualei and Nānākuli, Wai‘anae, O‘ahu*. Aki Sinoto Consulting.

Ogden Environmental and Energy Services Co.

1997 *Final Report Cultural Resources Overview Survey Naval Magazine Lualualei, Island of O‘ahu, Hawai‘i, in Conjunction with Department of Defense Legacy Resources Management Program: Demonstration Project #70.* Prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor, HI.

1998 *Final Archaeological Report, Phase I Reconnaissance Survey, Naval Radio Transmitter Facility Lualualei (RTF Lualualei), Oahu, Hawaii*, Ogden Environmental and Energy Services Co., Inc.

O’Leary and Matt McDermott

2006 *Archaeological Inventory Survey of 200 Acres for the Proposed Nānākuli B Site Materials Recovery Facility and Landfill*, Lualualei Ahupua‘a, Wai‘anae District, Island of O‘ahu, Hawai‘i. Cultural Surveys Hawai‘i Inc., Kailua, Hawai‘i.

Pukui, Mary Kawena, Elbert, Samuel H and Esther T. Mookini

1974 *Place Names of Hawai‘i*, University of Hawaii Press, Honoulu, HI.

R.M. Towill Corporation

1949 *Aerial photograph of Lualualei*. On file at R.M. Towill Corp., Honolulu.

1974 *Aerial photograph of Lualualei*. On file at R.M. Towill Corp., Honolulu.

Schmitt, Robert C.

1973 *The Missionary Census of Hawaii*. Bishop Museum Press, Honolulu, HI.

Sterling, Elspeth P. and Catherine C. Summers
1978 *Sites of Oahu*. Bishop Museum Press, Honolulu, HI.

Stokes, John F.G.
1991 *Heiau of the Island of Hawai‘i*. Bishop Museum Press, Honolulu.

Thompson, Bethany
1983 *Historic Bridge Inventory, Island of Oahu*, prepared for the State of Hawaii, Dept. of Transportation, Highways Division in cooperation with the U. S. Dept. of Transportation Federal Highway Administration, Unknown publisher.

Thrum, Thomas
1922 Hawaiian Place Names, Appendix to 1922 Edition of *A Dictionary of the Hawaiian Language*, by Lorrin Andrews, pp. 625 – 674. The Board of Commissioners Public Archives, Honolulu.

Tulchin, Todd, Constance R. O’Hare and Hallett Hammatt
2003 A*rchaeological Inventory Survey in Support of the Proposed Wai‘anae 242 Reservoir and Access Road Project, Lualualei Ahupua‘a, Wai‘anae District, Island of O‘ahu*. Cultural Surveys Hawai‘i., Kailua Hawai‘i.

Tulchin, Jon and Hallett Hammatt
2007 *Archaeological Assessment for the Leeward Coast Emergency Homeless Shelter Project, Lualualei Ahupua‘a, Wai‘anae District, Island of O‘ahu, TMK: [1] 8-7-010:007*. Cultural Surveys Hawai‘i., Kailua Hawai‘i.

Tulchin, Jon, Kathryn Whitman, and Hallett Hammatt
2007 *Archaeological Assessment for the Waianae Sustainable Communities Plan Project, Lualualei Ahupua’a, Waianae District, O’ahu Island TMK [1] 8-7-023:060*. Cultural Surveys Hawai‘i., Kailua Hawai‘i.

U.S. Department of Agriculture
2001 Soils Survey Geographic Database (SSUGRO).

U.S. Geological Survey
1928-1929 Wai‘anae Topographic Quadrangle 7.5 Minute Series Map
1998 Wai‘anae Topographic Quadrangle 7.5 Minute Series Map
2005 Orthoimagery of Wai‘anae Topographic Quadrangle

U.S. War Department
1943 Map of O‘ahu Island. Copies available from Cultural Surveys Hawai‘i Library, Waimānalo, HI.

Waihona ‘Aina
2000 *The Māhele Database*. Electronic document, www.waihona.com.

Wilkes, Charles
1845 *Narrative of the United States Exploring Expedition*, Volume 4, Lea and Blanchard, Philadelphia, PA

Appendix A SHPD Correspondence

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

February 24, 2010

RECEIVED
MAR 0 1 2010

Douglas Zang, AICP, Project Planner
SSFM
501 Sumner Street, Suite 620
Honolulu, HI 96817

LOG NO: 2010.0479
DOC NO: 1002NM68

dkz

FILE COPY

FILE

Dear Mr. Zang:

Subject: **National Historic Preservation Act Review— (DOT)**
Farrington Highway Replacement of Maipalaoa Bridge Federal Aid Project No. BR-0393-1(21) Pre assessment Consultation DEA
Waianae Oahu, Hawai‘i
TMK: (1)

The Bridge is not over 50 years and therefore not an historic site. But the area is archaeological sensitive with Native Hawaiian burials and cultural deposits. As a precautionary mitigation measures we recommend that a qualified archaeologist monitor the construction activity associated with this project.

We recommend the following condition be attached:

1) A qualified archaeological monitor shall be present during all ground-altering activities conducted in the project area in order to document any historic properties which may be encountered during the proposed undertaking and to provide mitigation measures as necessary. An acceptable archaeological monitoring plan will need to be submitted to the State Historic Preservation Division for review, prior to the commencement of any ground-altering activities. An archaeological monitoring plan must contain the following nine specifications: (1) The kinds of remains that are anticipated and where in the construction area the remains are likely to be found; (2) How the remains and deposits will be documented; (3) How the expected types of remains will be treated; (4) The archaeologist conducting the monitoring has the authority to halt the construction in the immediate area of the find in order to carry out the plan; (5) A coordination meeting between the archaeologist and construction crew is scheduled, so that the construction team is aware of the plan; (6) What laboratory work will be done on remains that are collected; (7) A schedule of report preparation; (8) Details concerning the archiving of any collections that are made; and (9) An acceptable report documenting the findings of the monitoring activities shall be submitted to the State Historic Preservation Division for review following the completion of the proposed undertaking.

2) The State Historic Preservation Division (O‘ahu office) shall be notified via facsimile upon the on-set and completion of the proposed undertaking.

3) 2). If significant historic sites are found, then a burial treatment plan, shall be submitted for review and approval by SHPD.

Mr. Zang
Page 2

The Hawai`i State Preservation Division website contains a listing of local firms hhttp://www.hawaii.gov/dlnr/hpd/archcon.htm).

Please call me at (808) 692-8015 if you have any questions or concerns regarding this letter.

Aloha,

Nancy A. McMahon

Nancy A. McMahon (Deputy SHPO),
Archaeology and Historic Preservation Manager