

FILE COPY

**From:** [Nagato, Jonathan](#)  
**To:** [HI Office of Environmental Quality Control](#); [Segundo, Leslie](#)  
**Cc:** [Pruder, Sina L](#); [Hayashida, Chane](#)  
**Subject:** Publication Form - Section 106 - 'Ele'ele Subdivision Sewer Collection System Rehabilitation  
**Date:** Monday, December 24, 2018 07:04:14  
**Attachments:** [50-12 S106 PubForm 2018-12-21.doc](#)  
[50-12 S106 ltr 2018-12-21 SHPD encrypted .pdf](#)

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Dear OEQC,

Please post the attached Publication Form (Word file) for the publication date of January 8, 2019. Also attached is a PDF file, which contains a copy of the Section 106 letter and its enclosures that were sent to the State Historic Preservation Division.

Please confirm receipt of this email and the two (2) attachments.

Please let me know if you have any questions or require any further information or documents.

Thank you,

Jon Nagato, PE

State of Hawai'i | Department of Health  
Wastewater Branch | Clean Water State Revolving Fund  
2827 Waimano Home Rd., Rm. 207, Pearl City, HI 96782  
(808) 586-4294 | [jonathan.nagato@doh.hawaii.gov](mailto:jonathan.nagato@doh.hawaii.gov)

OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

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19-207

**NON-CHAPTER 343 DOCUMENT  
PUBLICATION FORM  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL**

**Project Name:** 'Ele'ele Subdivision Sewer Collection System Rehabilitation

**Applicable Law:** 36 CFR Part 800

**Type of Document:** National Historic Preservation Act Section 106

**Island:** Kaua'i

**District:** 'Ele'ele Ahupua'a, Kona District

**TMK:** (4) 2-1-001, -003, -004, -005 (various)

**Permits Required:** N/A

**Applicant or Proposing Agency:**

*(Address, Contact Person, Telephone, E-mail)*

State of Hawaii, Department of Health, Environmental Management Division, Wastewater Branch  
2827 Waimano Home Road, Rm. 207

Pearl City, HI 96782

Contact and Phone: Jon Nagato, (808) 586-4294, jonathan.nagato@doh.hawaii.gov

**Approving Agency or Accepting Authority:**

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State of Hawaii, Department of Health, Environmental Management Division, Wastewater Branch  
2827 Waimano Home Road, Rm. 207

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Contact and Phone: Jon Nagato, (808) 586-4294, jonathan.nagato@doh.hawaii.gov

**Consultant:**

*(Address, Contact Person, Telephone, E-mail)*

HDR, Inc.

1132 Bishop Street, Suite 1200

Honolulu, Hawaii 96813

Contact and Phone: Aaron Kreitzer, (808) 697-6202, aaron.kreitzer@hdrinc.com

**Status: Comments due no later than February 7, 2019 to:**

Attn: Jon Nagato

Department of Health, Wastewater Branch

2827 Waimano Home Road, Rm. 207

Pearl City, HI 96782

Email: [wwb@doh.hawaii.gov](mailto:wwb@doh.hawaii.gov)

**Project Summary:**

(Summarize proposed action and purpose/need in less than 200 words in the space below):

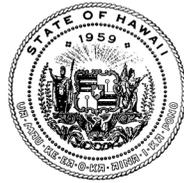
The Department of Health (DOH) initiated Section 106 of the NHPA consultation with the State Historic Preservation Division (SHPD) in accordance with 36 CFR Part 800. In 1990, the U.S. Environmental Protection Agency (EPA) designated the DOH to act on EPA's behalf, pursuant to 36 CFR §800.2 (c) (4), when

initiating Section 106 of the NHPA process in connection with projects funded under the Hawaii Clean Water State Revolving Fund (CWSRF). The DOH is providing funding under the CWSRF to the County of Kaua'i, Department of Public Works, Wastewater Management Division for the 'Ele'ele Subdivision Sewer Collection System Rehabilitation. The proposed project will utilize federal funding and is considered an undertaking, as defined by Section 106 of the NHPA, 54 U.S.C. §306101 et seq., and 36 CFR Part 800.

The undertaking consists of the rehabilitation of 12,462 linear feet of the 'Ele'ele Subdivision sewer system located in 'Ele'ele Ahupua'a, Kona District, Island of Kaua'i. New construction associated with the undertaking will include the installation of approximately 1,190 linear feet of new 8-inch and 10-inch sewer pipe, eight new manholes, and six new lateral lines to subdivision residences. Rehabilitation work will generally involve minimal ground disturbance. However, approximately 166 linear feet of trenching will be done to support point repair work to the sewer pipe. Rehabilitation will mainly be accomplished by accessing existing sewer lines through existing manholes and then employing a Cured-In-Place Pipe (CIPP) technique. CIPP is an internal lining method that in most cases requires no new excavation.

The DOH has engaged SHPD to determine the presence of potential sites of historic importance within the vicinity of the project area as well as the potential impact of the project on such sites, if present.

DAVID Y. IGE  
GOVERNOR OF HAWAII



BRUCE S. ANDERSON, Ph.D.  
DIRECTOR OF HEALTH

**STATE OF HAWAII**  
**DEPARTMENT OF HEALTH**  
P. O. BOX 3378  
HONOLULU, HI 96801-3378

In reply, please refer to:  
File:

50-12 S106 ltr 2018-12-21 SHPD.docx

December 21, 2018

Alan S. Downer, PhD, Administrator  
State of Hawai'i, Department of Land and Natural Resources  
State Historic Preservation Division  
601 Kamokila Boulevard, Rm. 555  
Kapolei, HI 96707  
Email: [dlnr.intake.shpd@hawaii.gov](mailto:dlnr.intake.shpd@hawaii.gov)

Dear Dr. Downer:

**Subject:** National Historic Preservation Act, Section 106 and HRS Chapter 6E Consultation  
'Ele'ele Subdivision Sewer Collection System Rehabilitation  
'Ele'ele Ahupua'a, Kona District, Island of Kaua'i, Hawai'i  
TMKs: (4) 2-1-001, -003, -004, -005 (various)

On behalf of the Environmental Protection Agency (EPA), the Hawai'i Department of Health (DOH) would like to invite you to participate in consultation for the proposed 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project located in 'Ele'ele Ahupua'a, Kona District, Island of Kaua'i (Figure 1). This project is federally funded through the EPA's Clean Water State Revolving Fund and has therefore been identified as a federal undertaking, as defined by Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). The EPA has authorized the DOH to act on behalf of the EPA regarding NHPA Section 106 notification and consultation. This letter is to initiate Section 106 consultation with the State Historic Preservation Division (SHPD) in accordance with Title 36 of the *Code of Federal Regulations* (CFR), Section 800.3.

### **Overview of the Undertaking**

The undertaking consists of the rehabilitation of 3,800 linear meters (12,462 linear feet) of the 'Ele'ele Subdivision sewer system located in 'Ele'ele Ahupua'a, Kona District, Island of Kaua'i (Figures 1 and 2). New construction associated with the undertaking will include the installation of approximately 363 linear meters (1,190 linear feet) of new 8-inch and 10-inch sewer pipe, eight new manholes, and six new lateral lines to subdivision residences (Figure 3).

In addition to new construction, the project will also rehabilitate a significant portion of the existing 'Ele'ele Subdivision sewer system. Rehabilitation work will generally involve minimal ground disturbance. However, approximately 50 linear meters (166 linear feet) of trenching will be done to support point repair work to the sewer pipe. Rehabilitation will mainly be accomplished by accessing existing sewer lines through existing manholes and then employing a Cured-In-Place Pipe (CIPP) technique. CIPP is an internal lining method that in most cases requires no new excavation. All of the purple-lined sewer lines in Figure 3, for example, will

involve no ground disturbance. The only CIPP work that will involve ground disturbance are the green-lined sewer lines. These will be accessed at one or two localized points.

An Archaeological Assessment Report was completed to identify the Area of Potential Effect (APE) and identify any structures of potential historical significance that would be affected by the undertaking. The Archaeological Assessment Report is included as Attachment A. The APE for the undertaking includes all areas in which excavation will occur to repair, replace, or install elements of the 'Ele'ele Subdivision sewer system. Figure 3 shows the entire project and the locations of all such excavation work. Red lines indicate new sewer mainlines, laterals, and manholes that will be installed. Notably, most of these are under existing roadways. Purple and green lines indicate existing sewer lines that will be rehabilitated using the CIPP technique. Excavation for CIPP rehabilitation will only include point excavations along the green lines. The precise locations for point access excavation have not yet been determined. It should be noted, however, that this excavation will occur within previously disturbed sediments. Finally, the single orange line indicates a single sewer line segment that will be "upsized." No secondary or offsite effects have been identified for this undertaking.

The Area of Potential Effect for the undertaking is therefore restricted to the red, parts of the green, and orange-lined areas shown on Figure 3. New sewer line excavation, the most significant aspect of the project from an archaeological perspective, includes 363 linear meters of line covering less than 0.1-acres in combined area. Trench openings will be three (3) feet wide with depths ranging from 4 to 13 feet below surface.

A staging area will be established at a previously-cleared and leveled turn-around at the end of Keokeo Road (see lower right of Figure 3). Staging activities will not involve ground disturbance.

## **Historical and Archaeological Overview**

Expectations for subsurface historic properties within the undertaking APE fall into three basic categories, each associated with a major period of regional land-use: 1) traditional Hawaiian occupation, 2) ranching, and 3) sugar cane cultivation. The earliest and most temporally extensive period is that of traditional (including early historic period) Hawaiian occupation. The precise beginning of this period is unclear from an archaeological standpoint, but is not really necessary to know. Land-use in the region consisted of habitation and subsistence activities centered along the coastline and the banks of the Hanapēpē River. 'Ele'ele 'Ili, including the project APE, is in close proximity to both the coastline and the river and it is quite likely that Hawaiians utilized this land in some manner during the many centuries prior to Western contact. Importantly, however, the project APE is situated on a topological shelf, standing well above the coast and river in relative elevation. It seems unlikely, therefore, that it was ever a significant hub of occupation. Early historic accounts note the high level of productivity in the general region, but do not remark on any settlements or dry-land agricultural activities in the project area. Importantly, there were no *kuleana* Land Commission Awards (LCA) claims within the project area and the whole of 'Ele'ele was awarded as a single LCA to Mataio Kekuanao'a, the Governor of O'ahu and Kaua'i. This stands in stark contrast to the 66 *kuleana* claims awarded in adjacent Hanapēpē. Those claims demonstrate the high importance of wetland taro cultivation, dryland agriculture (to a far lesser degree), and residential habitation generally. So although the area was regionally active and well populated, the 'Ele'ele area specifically appears to have been somewhat peripheral. Archaeological investigations in the region, although spotty in their coverage, have likewise turned up very little in the way of subsurface cultural deposits, although this may be attributable to post-depositional land use, as discussed below.

The next major land-use in the APE was ranching, which coincided closely with the new ownership established under the Māhele. Cattle operations at Wailua Ranch, and then later McBryde Ranch, persisted into the late 1800s, but sugarcane production soon displaced grazing on the parcel—possibly as early as the 1870s. Cattle grazing is a low-impact activity, from an archaeological standpoint, and likely left very little trace. The subsequent plantation activities, however, were highly disruptive to local soils, resulting in the complete mixing of up to 24 inches or more of sediment. This is expected to have had a devastating impact on any traditional Hawaiian deposits that may have been present. As noted, these are expected to have been sparse, given the information contained in early historic documents and modern archaeological findings. The plantation period did, however, produce a range of historic properties associated with: 1) the housing of an ethnically diverse labor force, 2) early commercial enterprises such as J. I. Silva's Homestead Store, and 3) the water and rail infrastructure features necessary to irrigate and transport crops. Although some of these features may still be found in the region, particularly on undeveloped lands, none have survived within the undertaking APE. Wholesale development of the APE as a modern residential subdivision by the early 1960s has erased any surface historic properties associated with plantation activities.

Given the low intensity of pre-Contact and early Historic Period Hawaiian activities within the APE, and the high intensity of subsequent Plantation Era disturbance, it is unlikely that undisturbed traditional Hawaiian subsurface historic properties are present. Early historic features associated with the Planation Era are more likely, although still probably quite sparse on the modern residential landscape. Major infrastructure and engineering features (e.g., ranch roads, irrigation works), if present, were apparently removed to make way for the present subdivision. Buried isolated artifacts and features associated with the plantation may yet be present. However, the historical significance and information value of such deposits is highly questionable.

### **Preliminary Assessment Conclusions**

Historic documents, maps, photos, and previous archaeological research indicate an upward progression in land-use intensity that mitigates against the survival of significant historic properties within the 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project's APE. This process peaked in the late 1800s with utilization of the landscape for commercial agriculture, an activity that involved large-scale sediment disturbance within the APE. This was followed in the mid-twentieth century by a final phase of high intensity land modification—the development of the current 'Ele'ele residential subdivision with its constituent houses, transportation infrastructure, and supporting utilities. We therefore conclude that the likelihood for significant intact traditional Hawaiian deposits within the APE is very low. Furthermore, the likelihood of historic properties associated with Historic Period land-use, including commercial ranching and sugar cane cultivation, is also very low. Expected historic materials include only isolated artifacts of questionable information value.

The 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project, as currently designed, is unlikely to affect significant historic properties. There are no previously recorded archaeological sites within the APE, the 'Ele'ele Subdivision more broadly, or even its vicinity (see Figure 4), despite numerous past archaeological investigations on adjacent parcels (see Figure 5).

## Consultations

Concurrent with this SHPD consultation, other appropriate agencies and parties are being consulted on the undertaking consistent with Section 106 requirements. These parties include the Office of Hawaiian Affairs, the Queen Deborah Kapule Hawaiian Civic Club, the Kaumuali'i Hawaiian Civic Club, and the Kaua'i Historical Society (Attachment B).

Section 106 notice will be published in Office of Environmental Quality Control (OEQC) The Environmental Notice. Native Hawaiian organizations and Native Hawaiian descendants with ancestral, lineal or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area are asked to provide a response within 30 days of notification.

We welcome any comments you have on this project's proposed improvements. We are particularly interested in any information you may have on historic and cultural sites that may be in the area. In addition, if you are acquainted with any persons or organization that is knowledgeable about the proposed project area, or any descendants with ancestral, lineal or cultural ties to or cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information.

We ask that you review the information provided in this letter and respond with formal comment within thirty (30) days of receipt. Please address any written comments you may have to email: [jonathan.nagato@doh.hawaii.gov](mailto:jonathan.nagato@doh.hawaii.gov) or the following:

Attn: Jon Nagato  
Department of Health, Wastewater Branch  
2827 Waimano Home Road, Room 207  
Pearl City, HI 96782

If you have any questions, please call Jon Nagato of our Wastewater Branch at 586-4294.

Sincerely,



SINA PRUDER, P.E., CHIEF  
Wastewater Branch

JN:sp

Figures 1 through 5  
Attachment A: Draft Archaeological Assessment  
Attachment B: Consulted Parties

C: Mr. Lyle Tabata, County of Kaua'i (via email at [LTabata@kauai.gov](mailto:LTabata@kauai.gov))  
Mr. Jason Kagimoto, County of Kaua'i (via email at [JKagimoto@kauai.gov](mailto:JKagimoto@kauai.gov))  
Mr. Donn Kakuda, County of Kaua'i (via email at [DKakuda@kauai.gov](mailto:DKakuda@kauai.gov))  
Mr. Aaron Kreitzer, HDR, Inc. (via email [Aaron.Kreitzer@hdrinc.com](mailto:Aaron.Kreitzer@hdrinc.com))

**Figures 1 - 5**

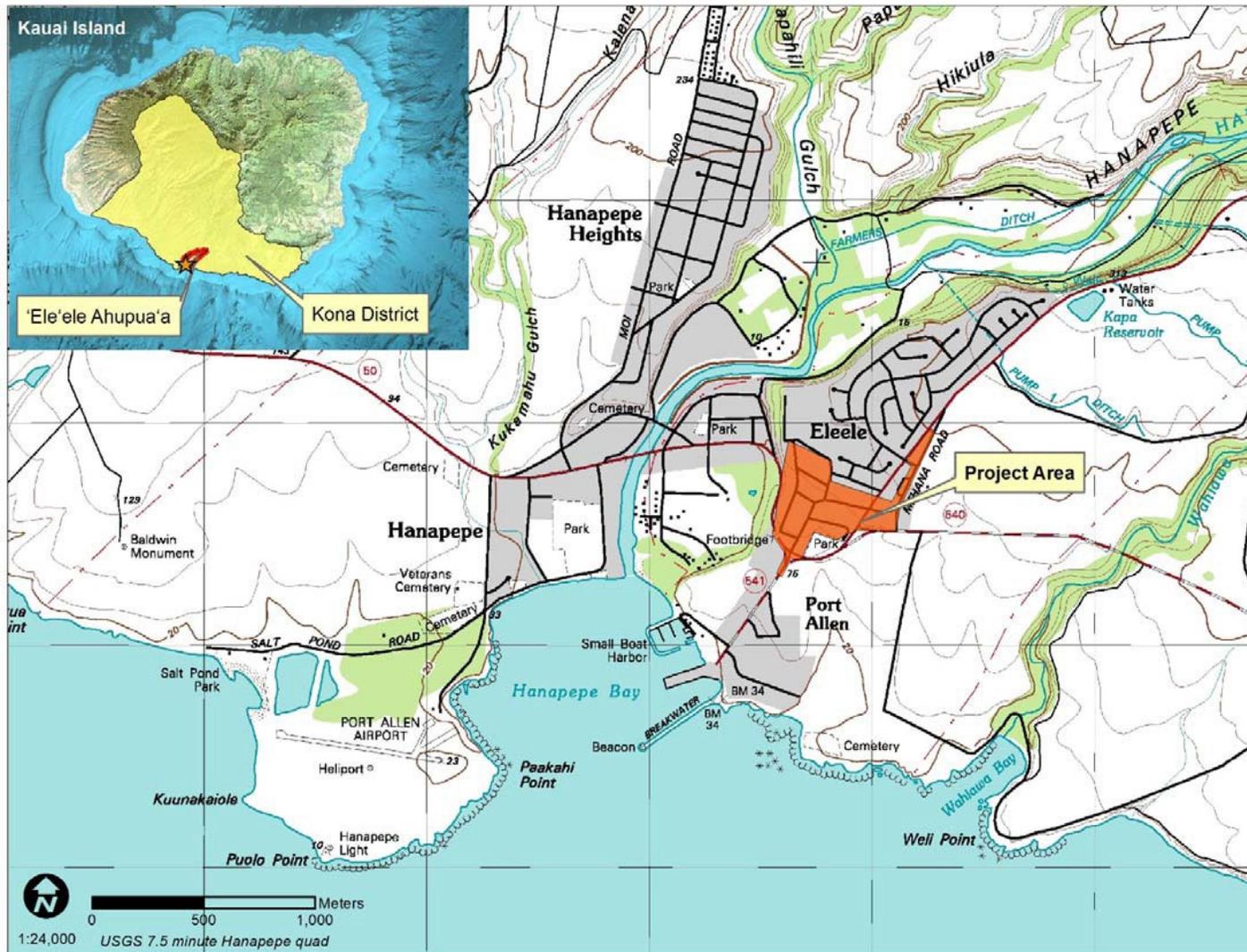


Figure 1. Location of project on 2004 USGS 7.5 minute Hanapepe quadrangle, Kona District, Island of Kauai.



Figure 2. Location of project (yellow outline) on 2016 Google Earth map.



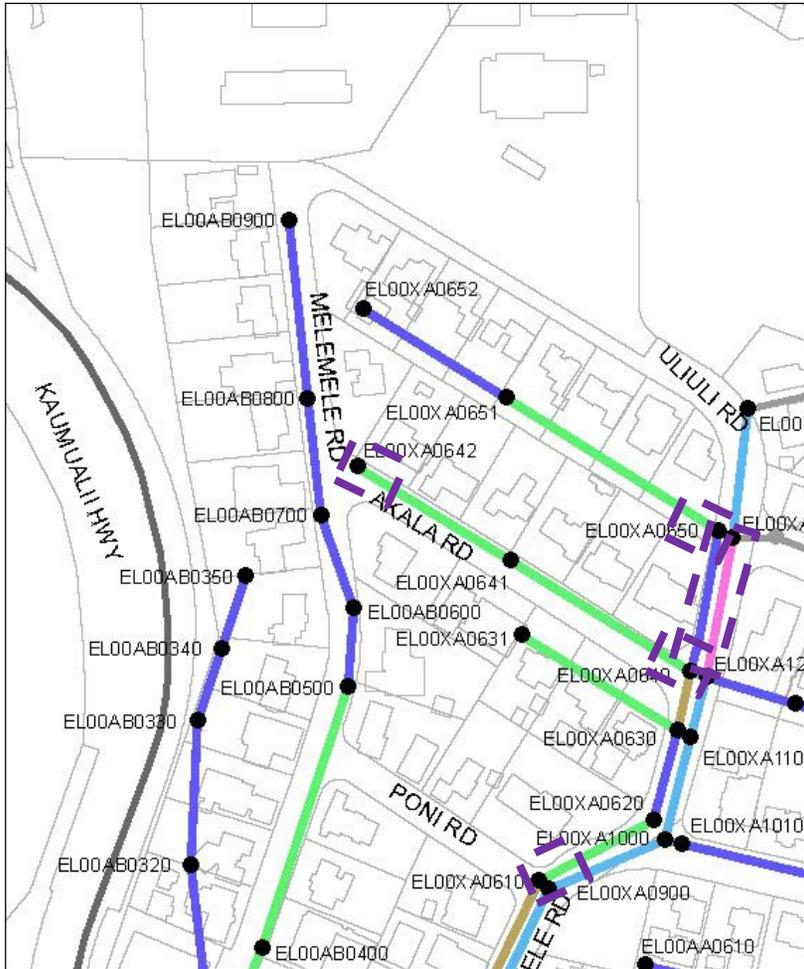


Figure 3A. Area of Potential Concern (APE)

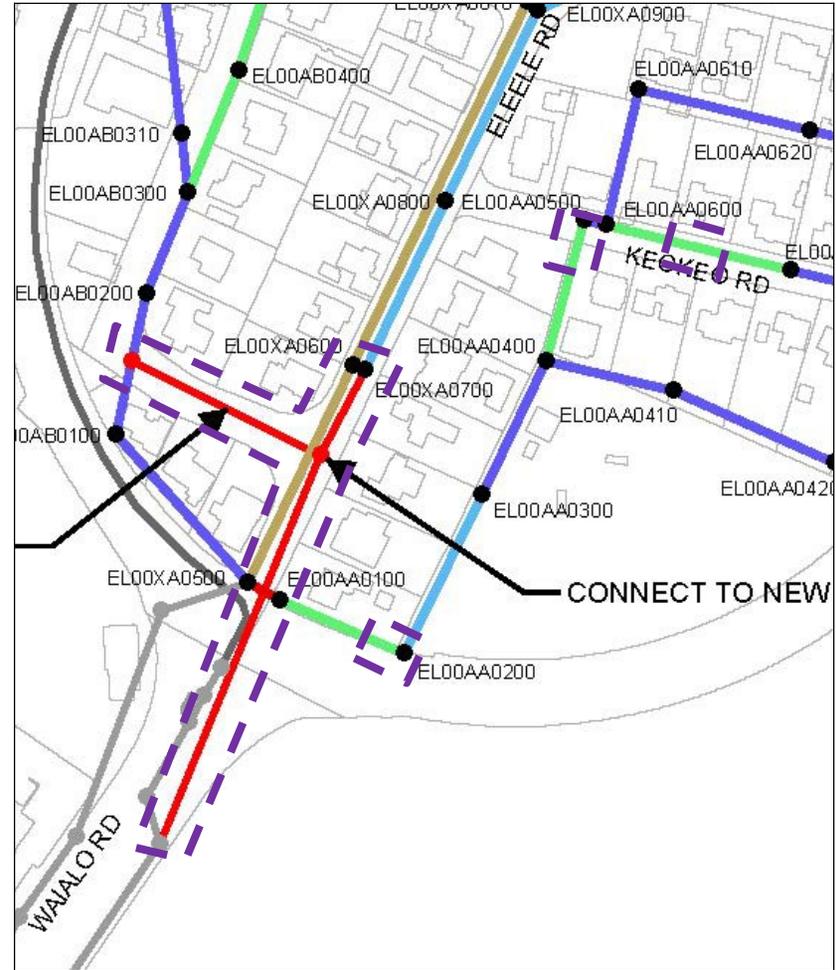


Figure 3B. Area of Potential Concern (APE)

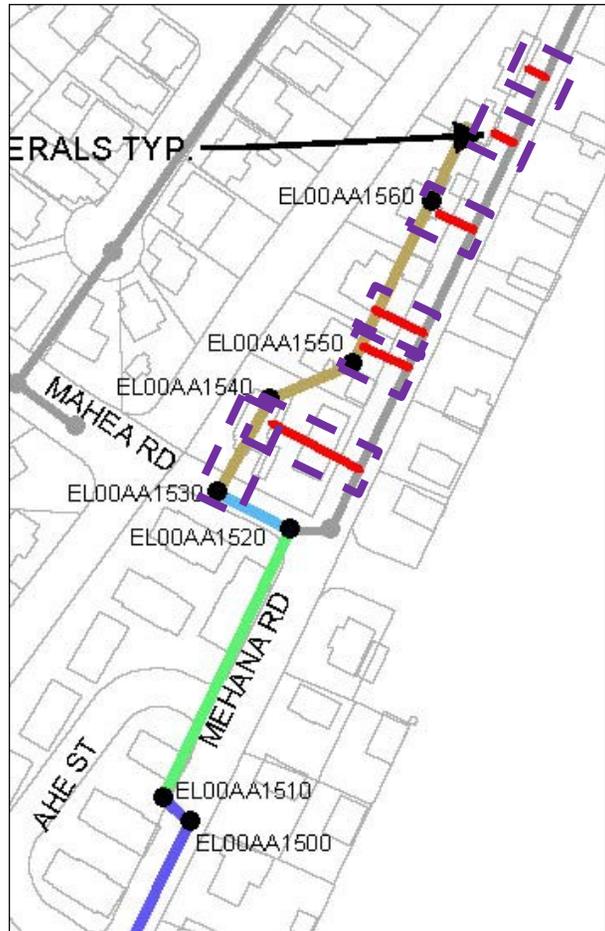


Figure 3C. Area of Potential Concern (APE)

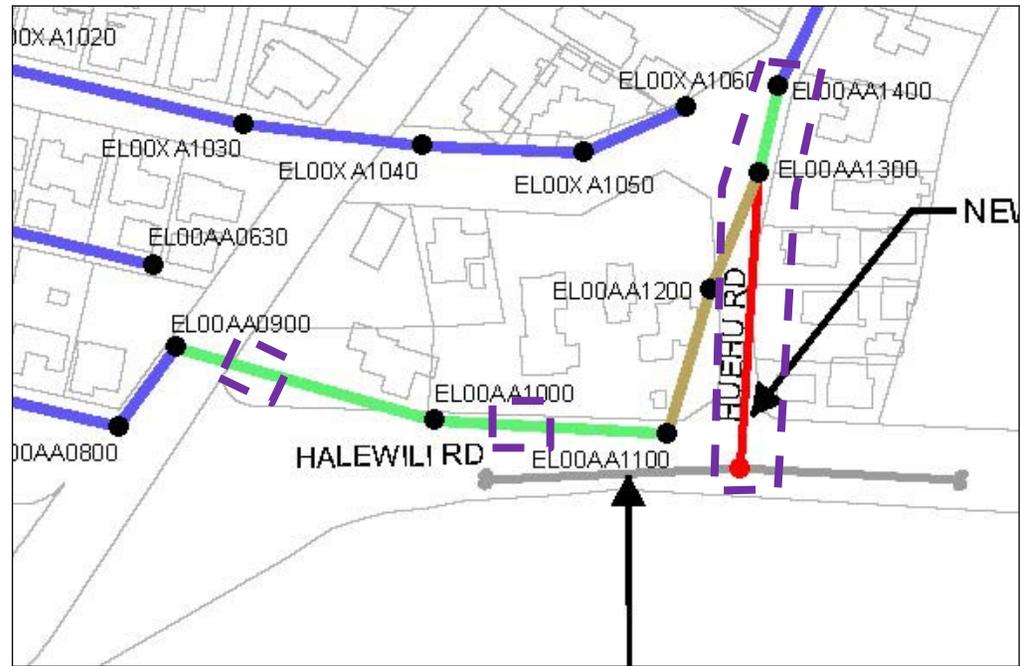


Figure 3D. Area of Potential Concern (APE)

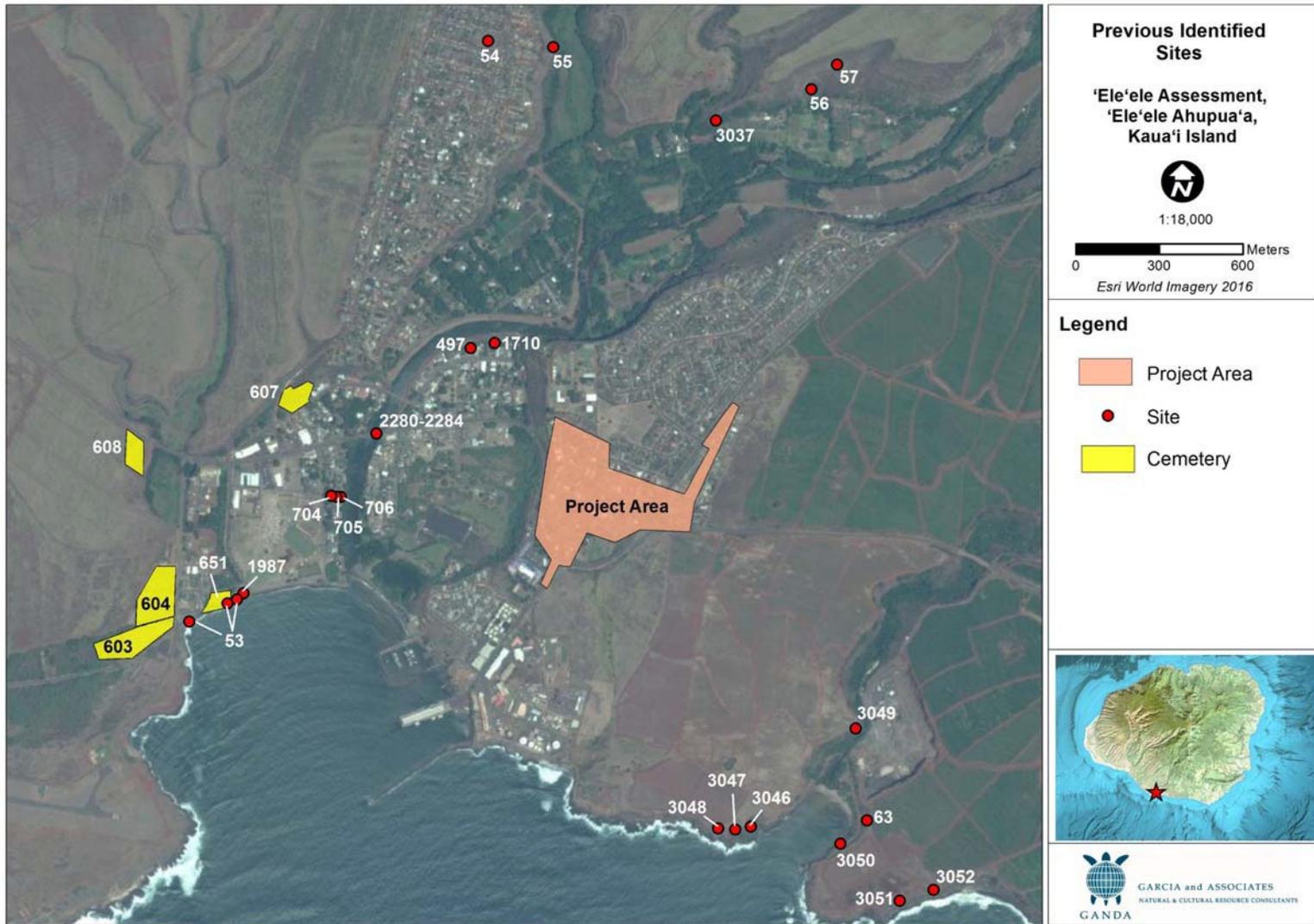


Figure 4. Previously recorded archaeological sites in the vicinity of the project area.

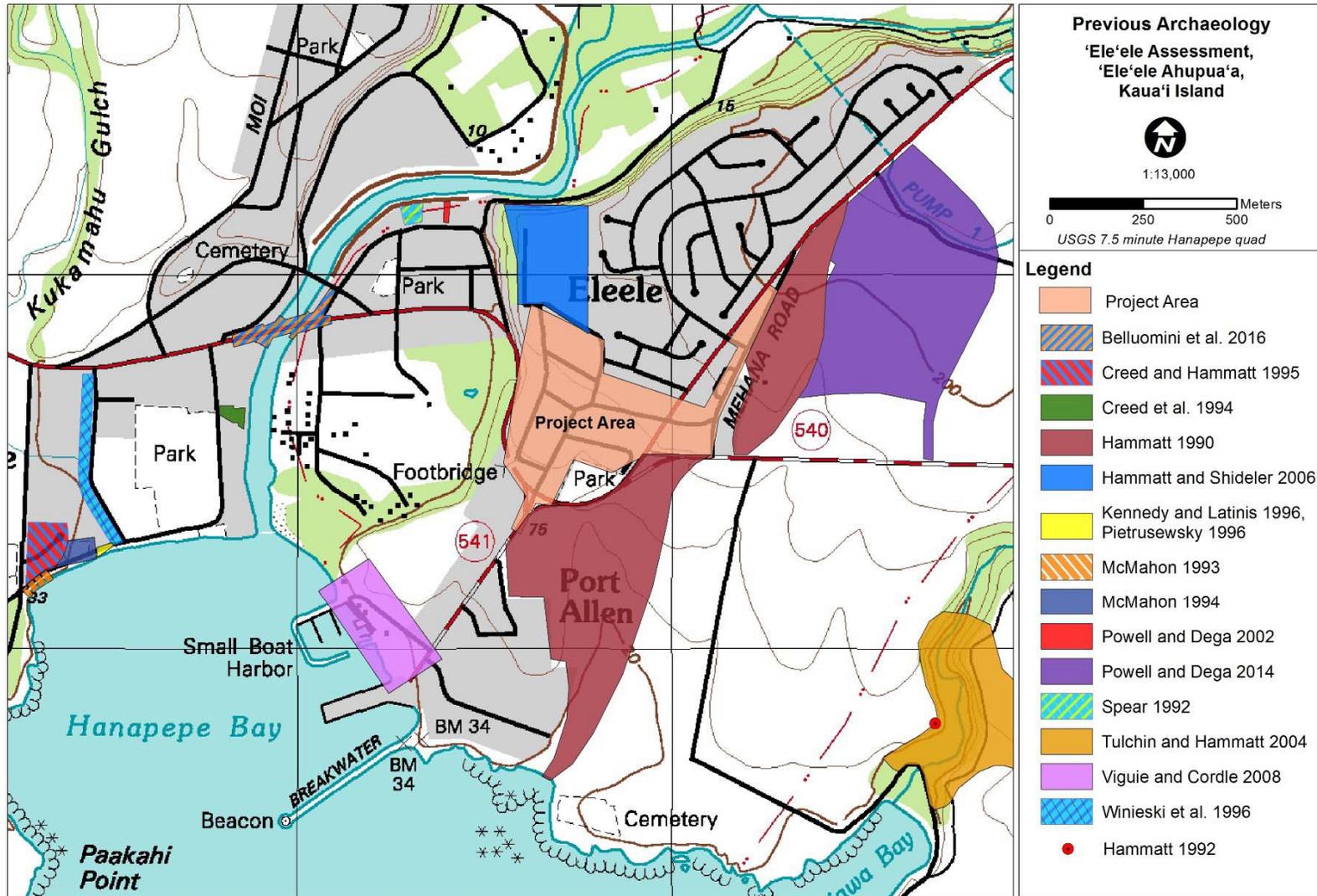


Figure 5. Previous archaeological investigations in the vicinity of the 'Ele'ele Subdivision.

# Attachment A

**DRAFT—Archaeological Assessment for the Proposed  
‘Ele‘ele Subdivision Sewer Collection System  
Rehabilitation Project, ‘Ele‘ele Ahupua‘a, Kona District,  
Island of Kaua‘i, Hawai‘i**

TMKs (4) 2-1-001, -003, -004, -005 (various)

**Prepared For:**

HDR  
1132 Bishop St., Suite 1200  
Honolulu, Hawai‘i 96813



**Prepared By:**

David Byerly, BA  
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Garcia and Associates  
146 Hekili St., Suite 101  
Kailua, Hawai‘i 96734

Hawai‘i SHPD Permit No. 16-27

GANDA Report No. 2371-1



20 April 2017



## **MANAGEMENT SUMMARY**

At the request of HDR Engineering, Inc., Garcia and Associates conducted an archaeological assessment for the proposed 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project, 'Ele'ele Ahupua'a, Kona District, Island of Kaua'i. The archaeological assessment is intended to support National Historic Preservation Act Section 106 consultation for the undertaking as well as Hawaii Revised Statutes §6E-42 compliance. Undertaking activities of concern include the excavation of 460 linear meters of new 8-inch sewer line and six laterals to residences, as well as point-access excavation along selected existing sewer lines,

Because most undertaking activities will occur under existing roadways, the archaeological assessment involved no subsurface testing but rather included the investigation of archival documents, historic maps, archaeological reports, and previous ethnohistoric research. Assessment results indicate that: 1) traditional Hawaiian activities in the APE were minimal and unlikely to have generated significant archaeological deposits, and 2) there has been extensive prior ground disturbance within the project APE associated with historic sugarcane cultivation and the construction of the current residential subdivision. Ground disturbing undertaking activities are therefore unlikely to affect significant historic properties.



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## **1.0 INTRODUCTION**

At the request of HDR Engineering, Inc., Garcia and Associates conducted an archaeological assessment in support of the proposed 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project, 'Ele'ele Ahupua'a, Kona District, Island of Kaua'i (Figures 1 and 2). The objectives of the assessment are to: 1) determine the types and densities of historic properties that may exist within the undertaking's "area of potential effect", 2) evaluate the potential of the undertaking to affect such historic properties, and 3) develop recommendations to mitigate potential adverse effects to historic properties. Because most undertaking activities will occur under existing roadways, the archaeological assessment was restricted to the investigation of archival documents, historic maps, archaeological reports, and previous ethnohistoric research.

### **1.1 Project Authority**

This archaeological assessment was conducted to meet the project proponent's cultural resource compliance obligations on both state and federal levels. On the state level, the assessment supports Chapter 6E-42 (Hawai'i Revised Statutes) compliance and was completed in accordance with Hawai'i Administrative Rules §13-276, Rules Governing Standards for Archaeological Inventory Surveys and Reports.

Due to its federal funding, the 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project has also been identified as a National Historic Preservation Act Section 106 undertaking. Section 106 consultation will be led by the State of Hawai'i's Department of Health, Wastewater Branch. The archaeological assessment is intended to provide data to support of the Wastewater Branch's development of a 'determination of effect' for the undertaking, and their Section 106 consultation effort generally.

### **1.2 The Undertaking**

The undertaking consists of the rehabilitation of 3,800 linear meters (12,462 linear feet) of the 'Ele'ele Subdivision sewer system located in 'Ele'ele Ahupua'a, Kona District, Island of Kaua'i (Figure 3). New construction associated with the undertaking will include the installation of three new manholes, three new 8-inch sewer lines, and six new lateral lines to subdivision residences. In addition to new construction, the project will also rehabilitate a significant portion of the existing 'Ele'ele Subdivision sewer system. Rehabilitation work, however, will involve minimal to no ground disturbance. Rehabilitation will be accomplished by accessing existing sewer lines through existing manholes and then employing a Cured-In-Place Pipe (CIPP) technique. CIPP is an internal lining method that in most cases requires no new excavation. All of the purple sewer lines in Figure 3, for example, will involve no ground disturbance. The only CIPP work that will involve ground disturbance are the green sewer lines. The green lines shown in Figure 3 will be accessed at one or two localized points.

### **1.3 The Area of Potential Effect**

The Area of Potential Effect for the undertaking includes all areas in which excavation will occur to repair, replace, or install elements of the 'Ele'ele Subdivision sewer system. Figure 3 shows the entire project and the locations of all such excavation work. Red lines indicate new

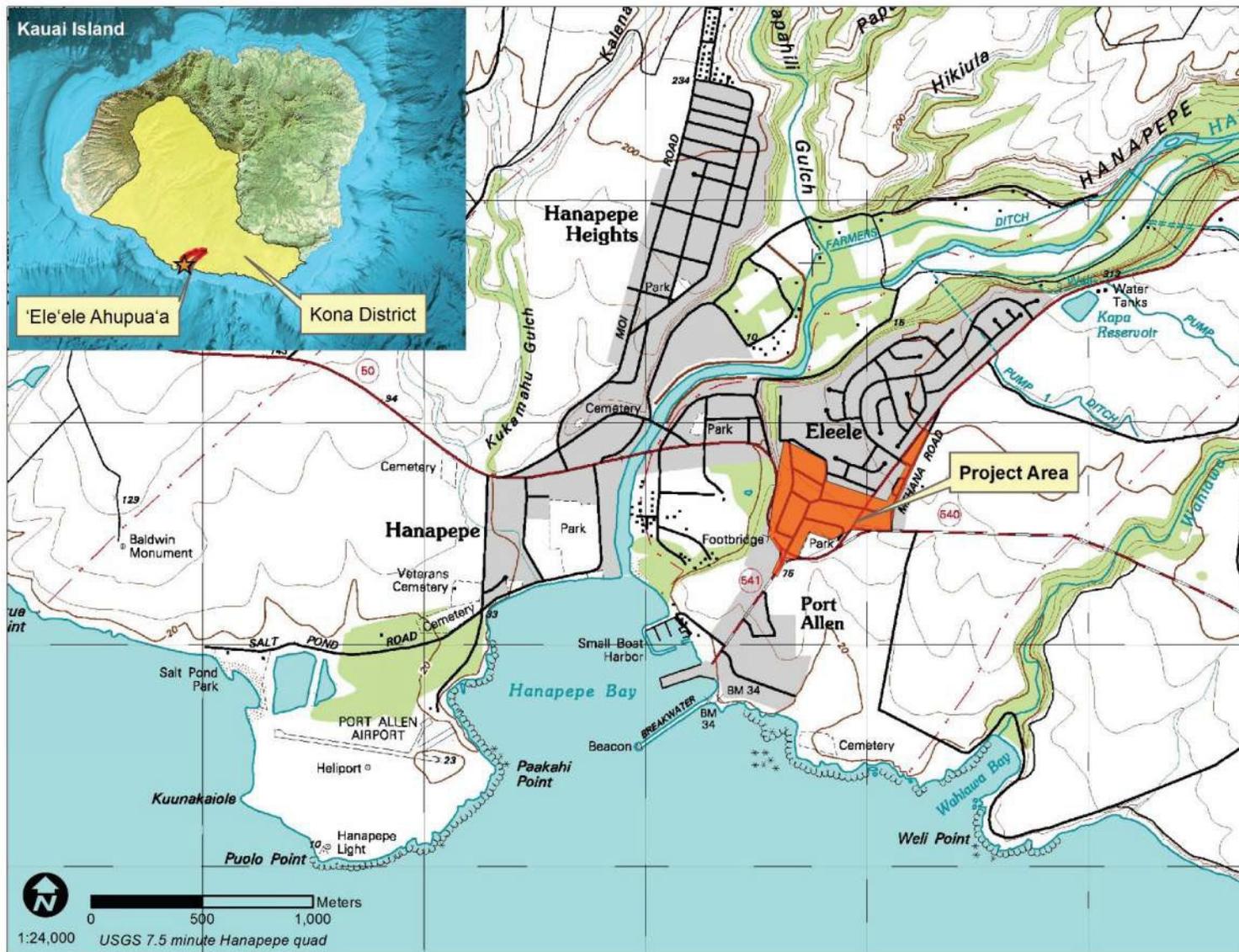


Figure 1. Location of project on 2004 USGS 7.5 minute Hanapepe quadrangle, Kona District, Island of Kauai.



Figure 2. Location of project (yellow outline) on 2016 Google Earth map.

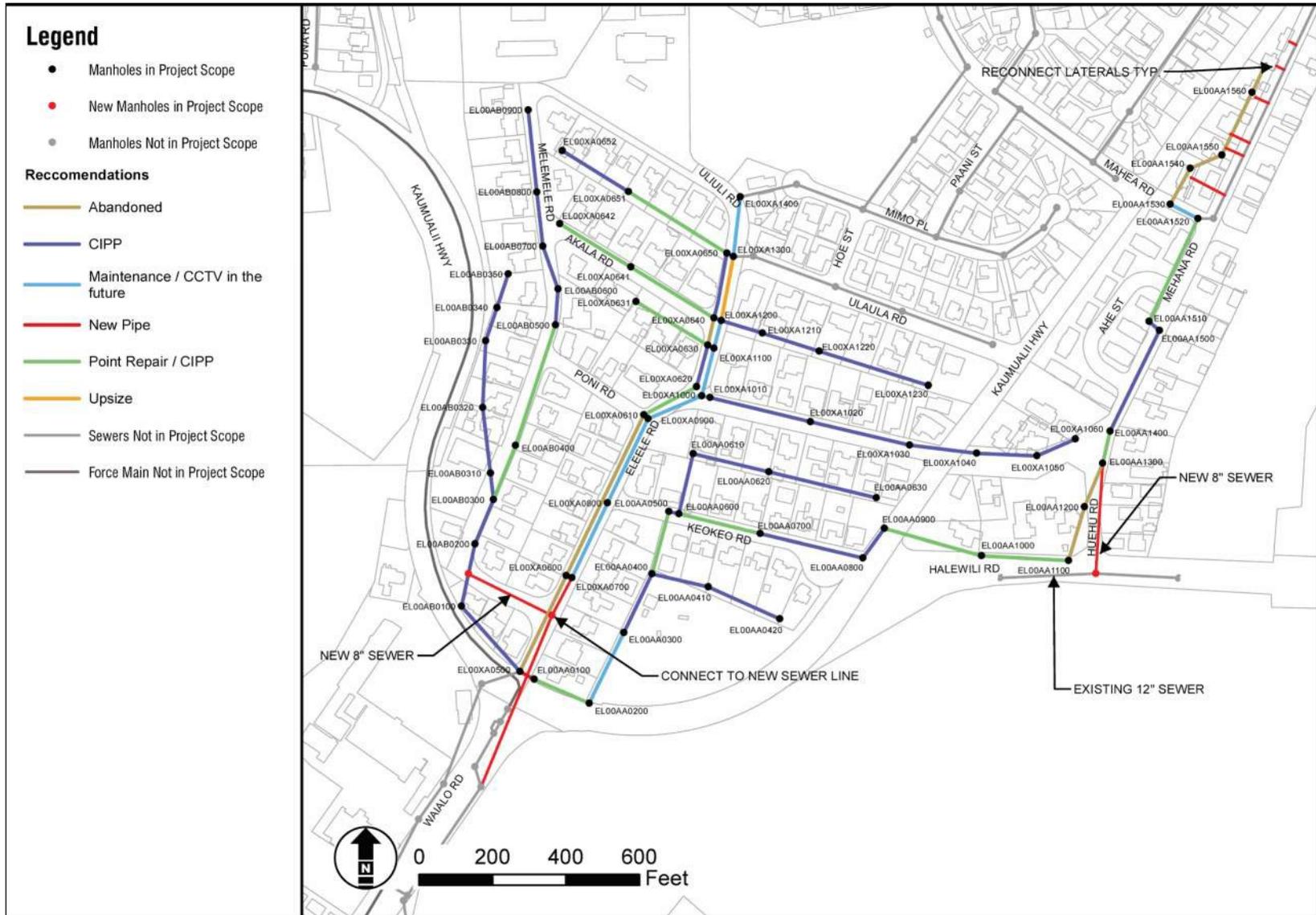


Figure 3. Area of Potential Effect (red, green, and orange lines).

sewer mainlines, laterals, and manholes that will be installed. Notably, most of these are under existing roadways. Purple and green lines indicate existing sewer lines that will be rehabilitated using the CIPP technique. Excavation for CIPP rehabilitation will only include point excavations along the green lines. The precise locations for point access excavation have not yet been determined. It should be noted, however, that this excavation will occur within previously disturbed sediments. Finally, the single orange line indicates a single sewer line segment that will be “upsized.” No secondary or offsite effects have been identified for this undertaking.

The Area of Potential Effect for the undertaking is therefore restricted to the red, green, and orange-lined areas shown on Figure 3. New sewer line excavation, the most significant aspect of the project from an archaeological perspective, includes 460 linear meters of line.

#### **1.4 Assessment Methodology**

This assessment is intended to evaluate the potential of the undertaking to affect National Register of Historic Places-eligible historic properties. Since the undertaking will not affect any existing buildings or structures within the APE, nor create any new above-ground features, there are no historic architectural or historic landscape concerns.

This assessment focuses exclusively on the potential for subsurface historic properties within the APE. As mentioned previously, the assessment is based on a literature review of the previous archaeology and land-use history of the APE and vicinity. No subsurface testing was conducted for this study. Such testing, although a standard practice, would be highly impractical in this case due to the fact that new sewer line construction will occur largely under existing roadways. Furthermore, point-access excavation locales for the CIPP work (through previously excavated sediments) have yet to be determined, and may be modified right up until the time of construction. Given these factors, it was concluded that a desk-top assessment of archaeological potential for the project area was the most prudent and reasonable approach. Results of this assessment can be used by Section 106 consulting parties to better evaluate the need for archaeological test excavation.

Research for the assessment was conducted at the State Historic Preservation Division Library, the Hawai‘i State Archives, and the archives of the Bernice P. Bishop Museum. Previous archaeological studies conducted in the vicinity of the project area were reviewed, as well as historic maps and photographs of the ‘Ele‘ele area. Information on LCAs was accessed through the Papakilo database (<http://www.papakilodatabase.com>) and the Kipuka database (<http://kipukadatabase.com>), both maintained by the Office of Hawaiian Affairs.

## **2.0 ENVIRONMENTAL CONTEXT**

The Area of Potential Effect is located in the ‘Ele‘ele Subdivision within ‘Ele‘ele Ahupua‘a, which is bounded by Hanapēpē Ahupua‘a to the west and Wahiawa Ahupua‘a to the east. The subdivision is largely a built environment consisting of residential homes, paved roadways, and underground utilities. Historical sugarcane cultivation and the subsequent development of the subdivision have almost completely altered the area’s natural vegetation, which now consists primarily of landscaped yards with ornamental and fruit bearing trees. The ‘Ele‘ele rainfall station, situated at an elevation of 50 m, documents a mean annual rainfall of 74.2 cm with 68 percent of the rain falling occurring between October and March (Giambelluca et al. 2013).

## 2.1 Soils

The land between Hanapēpē and Wahiawa, including ‘Ele‘ele, was formed by the Kōloa Volcanic Series. These lava flows occurred 1.5 million years after Kaua‘i’s primary shield-building stage had ceased (MacDonald et al. 1960:52). The formation of soil occurred rapidly due to the warm humid climate weathers volcanic ash. After a long period of volcanic inactivity, erosion and perennial streams weathered and cut the surface to form gulches and valleys we see today.

Soils within the project area are associated with the Makaweli soil series and consist of two types of Makaweli silty clay loam: Makaweli silty clay loam, 0 to 6 percent slopes and Makaweli silty clay loam, 6 to 12 percent slopes (Foote et al. 1972:90) (Figure 4). The Makaweli soil series consists of well drained soils developed from material weathered from basic igneous rock. These soils are gently sloping to steep with elevations ranging from nearly sea level to 500 feet. Makaweli silty clay loam, 0 to 6 percent slopes consist of a dusky red (10R 3/2) silty clay loam about 12 inches thick. The subsoil is a dusky red (10R 3/4) friable silt loam and silty clay loam that has a prismatic and subangular blocky structure. The substratum is soft, weathered basic igneous rock. Permeability is moderate, runoff is slow, and the erosion hazard slight. Makaweli silty clay loam, 6 to 12 percent slopes differs slightly in that runoff is medium and the erosion hazard moderate. Soils of the Makaweli series were typically used for sugarcane cultivation, pastures lands, and habitation.

## 3.0 CULTURAL AND HISTORIC CONTEXT

The historic cultivation of sugarcane and subsequent modern land use practices have destroyed or obscured much of the archaeological evidence related to pre-Contact Period occupation in project region. This area has been altered to such an extent that even large agricultural features and *heiau* have been destroyed. In fact, the locations and histories of many *heiau* and other archaeological resources that once existed in the vicinity of the project area are known only through the early research conducted by Thrum (1907). Resources related to initial Polynesian colonization were probably even more heavily impacted by these activities as they would likely have been located in coastal areas that have been especially susceptible to development and alteration.

The following discussion of the pre-Contact Period follows the four-period chronological sequence model proposed by Kirch (2010:128). This is a reconfiguration of an earlier sequence posed by Kirch (1985:298) and is based largely on recent reviews of radiocarbon dates from key archaeological sites. This sequence is presented merely as an organizational tool under which important aspects of pre-Contact occupation can be discussed.

The four-period sequence starts with the Foundation Period (AD 1000–1200), which is characterized by initial settlement of the archipelago in ecologically favorable windward valleys and coastal areas where water and marine resources were plentiful. These sites were isolated and occupied by small populations. This is followed by the Early Expansion Period (AD 1200–1400), which is characterized by marked population increase, technological change, subsistence-based adaptations to local environments, and the development of large irrigated taro systems. The third

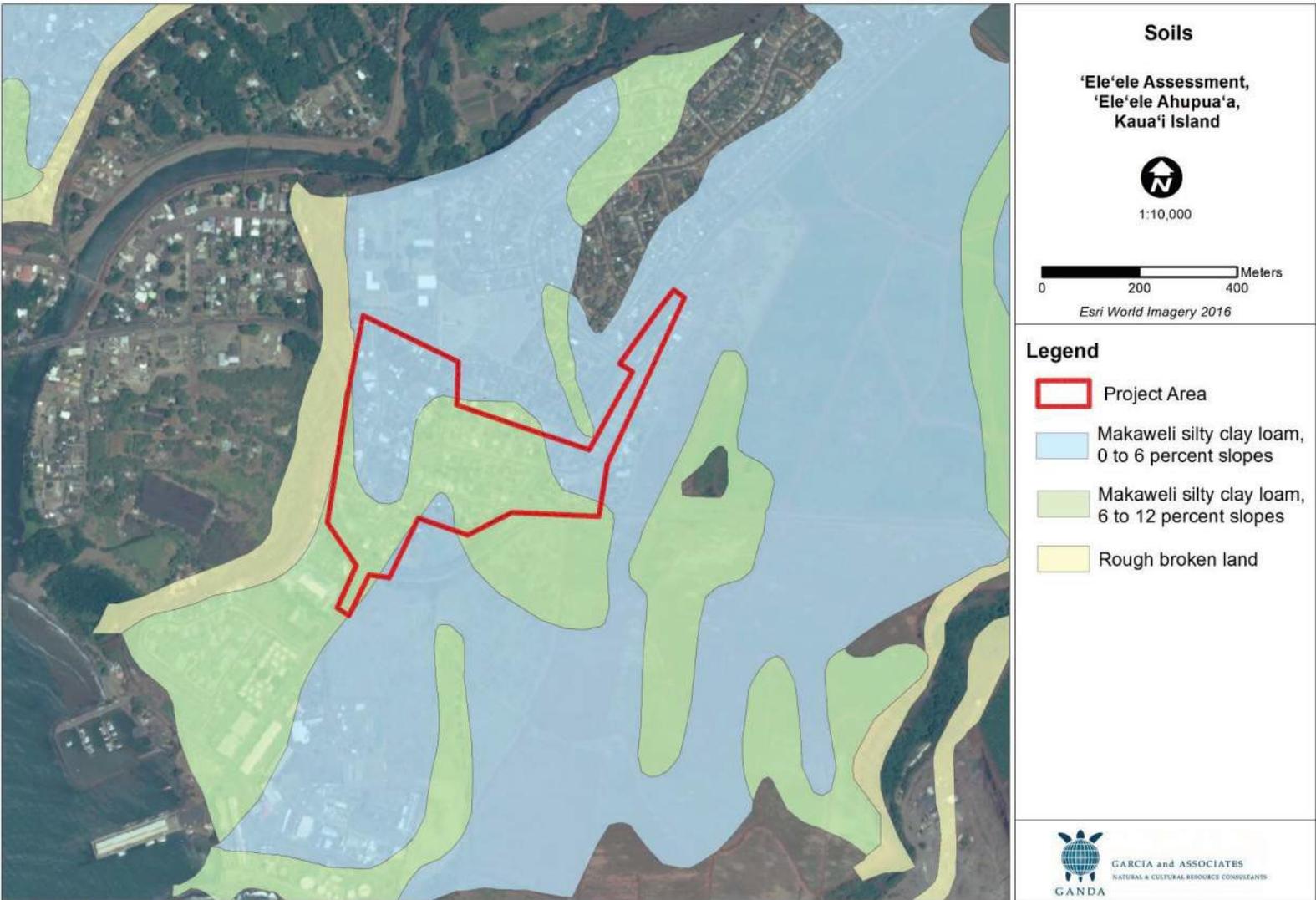


Figure 4. Project area soils.

period is the Late Expansion Period (AD 1400–1650) and is characterized by the firm establishment of communities within the ecologically favorable and resource-rich areas of the windward coast and valleys, substantial increase in population, and the resulting socioeconomic stress as these resource-rich areas reached their carrying capacity. This period is also marked by an increase in social stratification, expansion into marginal zones of the islands, intensification of *mauka* dry land agriculture, monumental architecture, and the emergence of archaic states. The Protohistoric Period (AD 1650–1778) is the final pre-Contact period and is characterized by large stable populations with people occupying all ecological zones of the islands, intensification of the dryland field systems, and endemic conquest and warfare (Kirch 2010:128).

A review and synthesis of radiocarbon samples collected on Kauaʻi (Carson 2006) and paleoenvironmental investigations (Burney and Burney 2003, Burney and Kikuchi 2006) indicate that the southern coast may have been occupied as early as AD 1000. An islandwide radiocarbon synthesis of samples collected on Kauaʻi included a very small number of samples that dated older than AD 1200 (Carson 2006:176). A general “chronometric hygiene” procedure was applied which rejected dates obtained from highly questionable samples. It turns out that none of the previous samples that dated before AD 1200 were from short-lived plant taxa. The majority of acceptable samples reviewed were associated with dates after AD 1400. Within the Kona District of Kauaʻi, 134 radiocarbon samples from 22 separate project areas were evaluated. Most of the samples (N=81 or 60%) post-date AD 1400. Very few samples (N=10 or 7.5%) dated before AD 1300. One of these samples had a very wide calibration range of AD 150 to 800. This sample, however, is not supported by other dates from the same site. Additional investigations in the same area have also not been able to replicate this early date. Radiocarbon samples collected in the vicinity of the current project area include a cultural deposit documented at the First United Church of Christ that produced a date range of AD 1360–1590 (Spear 1992) and a cultural deposit recorded at a house lot along the Hanapēpē River that produced a date range of 1811–1827 (Creed et al. 1994).

Indirect evidence of early occupation of the southern coast of Kauaʻi come from paleoenvironmental investigations conducted at Kekupua Fishpond (Burney and Burney 2003) and from the Makauwahi limestone sinkhole (Burney and Kikuchi 2006). The first presence of charcoal particles from sediment cores taken at Kekupua Fishpond were observed at a depth of 1.4 meters. This influx of charcoal was dated to AD 1050–1095 or AD 1140–1280 (at one standard deviation). The earliest clear indication of human presence from the Makauwahi limestone sink is from the pelvis of a Polynesian-introduced Pacific rat (*Rattus exulans*) recovered from a depth of 3.05–3.15 meters below surface. The rat pelvis dated to AD 1039–1241 or 1160–1270 (at one standard deviation). It is important to note that not all scholars agree with the use of indirect evidence of anthropogenic disturbance as indicators of early Hawaiian settlement (Kirch 2011:20). Some scholars simply reject all dates from charcoal in sediments cores and dates on rat bones.

### **3.1 Political Boundaries**

As traditional Hawaiian populations expanded, several terms, such as *moku*, *ahupuaʻa*, and *ʻili* were used to delineate land into manageable sections (Kamakau 1961:54–55). The island of Kauaʻi was traditionally divided into five *moku* (districts) consisting of, Haleleʻa, Kona, Koʻolau, Nāpali, and Puna. The names and the delineation of these district-sized land units were changed after the Kauaʻi Rebellion in 1824, in which the Kauaʻi lands were redistributed between the

chiefs of the Hawaiian Kingdom. The new *moku* names were Hanalei, Kawaihau, Līhu‘e, Kona, and Waimea. These *moku* contained smaller land units call *ahupua‘a* which were usually narrow land sections that stretched from the ocean inland to the mountains. In general, the native populations who lived in an individual *ahupua‘a* had access to all the natural resources from the ocean to the mountains. This allowed each *ahupua‘a* to be self-sufficient and provided the people with resources from all environmental zones (Lyons 1875:111). Within *ahupua‘a* were smaller land units called *‘ili* which were managed by the people of the land and their extended families. Traditionally, the *‘ili* of ‘Ele‘ele was a part of the *ahupua‘a* of Hanapēpē, however, these boundaries may have changed after the rebellion in 1824 when ‘Ele‘ele was claimed and awarded to a single individual. Current State of Hawai‘i TMK maps delineate ‘Ele‘ele as its own *ahupua‘a*.

### 3.2 Traditional Land Use History

The traditional Hawaiian economy was focused on agricultural production, coastal exploitation of marine resources, and the collection of wild plants and animals (Kirch 1985:2–3). The native Hawaiian people grew a wide variety of cultigens, the most important being taro (*Colocasia esculenta*) and sweet potato (*Ipomoea batatas*). Taro was grown wherever there was adequate rainfall or water. River valleys, where pond fields could be irrigated, provided ideal conditions for growing taro and were among the most agriculturally productive. Dryer areas, which could not support taro cultivation, were planted with sweet potato. Other cultigens were also grown including arrowroot (*Tacca leontopetaloides*), sugarcane (*Saccharum officinarum*), ti (*Cordyline terminalis*), banana (*Musa paradisiacal*), and coconut (*Cocos nucifera*). The coastal exploitation of marine resources centered on fishing, the collection of *limu* (seaweed) and marine invertebrates, and aquaculture. Hanapēpē was especially noted for its vast salt works along the coast.

The construction of fishponds along the coast was a unique and advanced innovation that was developed to trap and raise fish such as mullet (*Mugil cephalis*) and milkfish (*Chanos chanos*) that supplemented other resource exploitation activities. While the construction of a fishpond was a labor intensive investment, the fishponds productive yield guaranteed a steady supply of fish. The *mauka* areas beyond the limits of agriculture also provided a wide range of natural resources. Use of these upper areas included the collection of wild plants for subsistence, medicinal, and ceremonial purposes, and the collection of wild fauna. These areas were also noted as a locus for the collection of bird feathers, especially from the *‘ō‘ō* (*Moho nobilis*), *‘i‘iwi* (*Vestiaria coccinea*), and *‘apapane* (*Himatione sanguinea*). These species provided colorful features, a particularly powerful symbol of chiefly power. Ornatly decorated goods with feathers including *‘ahu ‘ula* (feathered capes), *mahiolo* (helmets), and *akua hulu manu* (feathered gods) were a direct measure of a chief’s power and influence (Valeri 1985:246).

With this general subsistence model in mind, Handy and Handy (1991) describe settlement in Hanapēpē as follows:

...in nearby Hanapepe where the lower valley broadens into a fairly wide *lo‘i* area, the homesteads were here and there on bits of high ground in the midst of the *lo‘i* or on sloping grounds on the sides of the valley above the *lo‘i*. As one ascends this canyon like valley the remains of single isolated homesteads are seen above the level of high water, wherever there were flatlands or terraced hillsides that would support wet taro. [Handy and Handy 1991:287]

They also describe that Hanapēpē had a sizable inland population that did not frequently exploit coastal resources. These people were known as *kua'āina* and specialized in the gathering of freshwater resources and the development of an extensive irrigated *lo'i* system:

Kauai's areas of canyons (including Makaweli, Olokele, and Hanapepe-Koula, to the eastward of Waimea) possessed in the olden days something not known elsewhere in the Hawaiian Islands except in a very few localities: the anomaly of inland (literally backland) population which had at best but infrequent contacts with the sea. In Waimea Canyon there was an estimated terrain of about 25 linear miles of varying width along the watercourses on which irrigated cultivation was practicable...It is characteristic of this, as other less wild and inaccessible inland areas, that every foot of land that could be leveled for terracing above the floodwater stage, and to which a ditch could bring stream water, was utilized for taro *lo'i*. It is said today by the *kama'aina* (native "old-timers") that in these upland *lo'i* the green-stemmed *ha'o-kea*, a fast fast-maturing taro variety adapted to cold stream water and shallow soil, was grown. There is also a wild variety that grows in high inaccessible places in this region, and it is called *na-kalo-a-'Ola*, "the taro of 'Ola," who was an *ali'i* anciently ruling all the island, and whose name appears in many of the chants of old Kaua'i.

Above the rocky areas capable of being flooded, on not-to-rocky hillsides and in level soil pockets, sweet potatoes were planted...There is plainly no question that, with these food staples and the various supplemental items which could be cultivated alongside, the canyon areas could have supported a large and very nearly self-sufficient population. [Handy and Handy 1991:397]

### 3.3 Early Historic Accounts of the Hanapēpē Region

Early historic accounts that specifically mention the *'ili* of 'Ele'ele are scarce, however, Hanapēpē is first mentioned in the diary of George Anton Scheffer of the Russian American Company (RAC) (Pierce 1965). While on a trading expedition to Hawai'i, the RAC vessel *Bering* ran aground during a storm at Waimea in 1815. Scheffer describes Hanapēpē at the time:

[November] 30 I set out for Hanapepe, inspected the estate of Platov [Opana Kupikea] on the river Don [Hanapēpē], and found it extremely rich in taro fields. I ordered the dry land planted into cotton, tobacco, maize, and also transplanted here sufficient orange, lemon, and olive trees. I delivered there a number of brood sows and assigned two old Aleuts as watchmen. [Pierce 1965:187]

Later in 1817, Scheffer, pleased with the success of his agricultural venture, writes of the high quality of goods produced and the potential impact on overseas trade:

The oil nut [*kukui*] brings no small return. Grapes grow twice in a year; I have planted of one kind which is carefully prepared ought to make wine which should surpass Madeira. I need not mention the fruits of the bread plants, pineapples, coconuts, oranges, lemons, bananas, melons, etc. These items will bring no small price and if correctly handled can upset in one blow the trade of the English and Americans in China, ect.; of this I am convinced. [Pierce 1965:196]

Scheffer's success on Kaua'i was short-lived. His undoing was his support of Kaua'i Island chief Kaumuali'i, who was not in favor of Kamehamea's rule over the majority of the archipelago and wanted help to recapture all the other islands. Americans traders felt threatened after Scheffer made an attempt to convince Russia to annex Hawai'i. In 1822, Americans spread the word that Russia and America were at war. Startled by the potential repercussions of the news, Scheffer traveled to Waimea to protect his ship. Scheffer was forced to leave Kaua'i, abandoning all of his possessions (Joesting 1984:84).

Hiram Bingham, a protestant missionary who arrived in Hawai'i in 1820 and founded the Kawaiaha'o Church in Honolulu, frequently visited Kaua'i and described Hanapēpē during a visit in 1847:

[Hanapēpē] lies six or seven miles east of Waimea. It is a pleasant, fertile, well watered valley, about 175 rods in width, along a mile or two from the sea shore, diminishing in breadth and increasing in depth, as it recedes toward the mountains, till it becomes a very deep and narrow ravine, curving between precipitous and lofty cliffs, and grass-covered hills. A beautiful stream from the mountainous interior leaps down from high basaltic rocks, and forming a high cascade at the head of the valley. flows through it to the sea. Like the Waimea River and others at the islands, it is, at its mouth, obstructed by sand, by which the surf seems incessantly endeavoring to prevent its entrance into the ocean. Where it is thus retarded in itsflow, it is from ten to twenty rods in width and three to four feet in depth, where we cross it in a canoe, or on horseback. It escapes by a narrow channel, where it cuts through a sand-bank.

For the first half a mile from the sea, the valley seems sterile, and is little cultivated, but has a pleasant grove of cocoanut trees. The rest of the valley, more fertile and more cultivated, is sprinkled with trees and shrubs, embarcing a few orange trees, and being walled up on the east and west by bold, precipitous bluffs, rising higher and higher towards the mountains, from fifty feet to fifteen hundred, appears from one of the palis, like an extensive, well-watered plantation, interspersed with kalo beds and one hundred and forty cottages, furnishes employment and sustenance to some seven hundred inhabitants. The immense and irregular precipices shut in by each other towards the interior, obstruct the vision of the spectator looking up the valley, but beyond the pleasant opening towards the sea, the eye reaches the distant line where the ocean seems to meet the sky. [Bingham 1847:218-219]

Later still, the Bernice P. Bishop Museum's founding director, William T. Bringham, described Hanapēpē during a visit to the Hanapēpē Falls in 1864:

Tuesday morning I set out for the Hanapepe Falls. The path led down the side of the valley over ridges of deep red earth with blocks of imbedded basalt. The walls of the valley were nearly perpendicular, and from four to five hundred feet high, exhibiting in many places an irregular prismatic structure. In one place this was very beautiful where a projecting point had been naturally terraced, the portions between each flow being covered with grass and convolvulus vines which formed a drapery over the cold dark lave. In some places a prismatic vein had been broken through by an irregular

mass of clayey lava running across the direction of the valley. The stream was very rocky and as the valley was very narrow and the wall almost perpendicular, the path went from one side to the other and thus crossed the stream eighteen times. Ohias and bananas were abundant; several dykes crossed the walls at various angles, little canyons on either side opened into the gorge showing beautiful cascades at their upper end in almost every variety of form. The Falls as I measured them, were 326 feet high, and I should judge the walls on either side were at least five hundred. The water was not a large stream but fell against the rocks in such a way as to have a very beautiful effect. A branch joined the river just below the Falls, and near by were some fine orange trees. A mist came down in the afternoon. Lobelias were abundant on the hillside; ducks and herons were plentiful, and the later had carried many seashells onto the rocks to eat; small fish were in the stream which no doubt were food for these birds. [Lydgate 1991:149]

### 3.3.1 The Kaua'i Rebellion

The islands of Kaua'i and Ni'ihau remained outside control of the newly established Hawaiian Kingdom during the early 1800s, following two unsuccessful attempts to invade the islands. In 1810, Kaumauli'i, the chief of Kaua'i and Ni'ihau, negotiated with Kamehameha I off the shores of O'ahu in an effort to avoid a war between the two polities. At the meeting Kaumauli'i offered Kamehameha his land and people in which Kamehameha declines stating: "I shall not accept your land, not the least portion of your domain. Return and rule over it. But if our young chief [Liholiho] makes you a visit, be pleased to receive him" (Kamakau 1961:196). In 1821, Liholiho, Kamehameha II, sailed to Kaua'i and kidnapped Kaumauli'i. While in exile on O'ahu, Kaumauli'i married Ka'ahumanu, the former favorite wife of Kamehameha I (Kamakau 1961:252–253). In 1824, before passing away, Kaumauli'i declared his son to be his successor and said: "Let the lands be as they are: those chiefs who have lands hold on to them, those that have not to have none" (Kamakau 1961:265). Following the death of Kaumauli'i, Kahalai'a, a chief from Hawai'i Island, was announced as the new ruler of Kaua'i and Ni'hau. The announcement of a new chief from Hawai'i Island came as a shock to the chiefs and commoners of Kaua'i who had expected to be ruled by the heir of Kaumauli'i.

Kahalai'a traveled to Kaua'i and occupied Fort Elizabeth, a former Russian post located in Waimea. Kahalai'a's rule was immediately met with resistance as the discontented people of Kaua'i rejected governance by a chief from Hawai'i Island. In August of 1824, Kaumauli'i's son Humehume, with support of the leeward Kaua'i chiefs, rebelled and attacked Kahalai'a and his forces at Fort Elizabeth. The attack on the fort was unsuccessful largely due to the superior firepower of Kahalai'a's warriors. The Kaua'i warriors who survived the engagement later set up a fort at the Hanapēpē-Wahiawa border. After Kahalai'a received reinforcements of men and arms from O'ahu and Maui, including the assistance of Hoapili (ruling chief of Maui), they set out to engage the resistance forces in battle:

On August 8 [1824] the battle of Wahiawa was fought close to Hanapepe. The Hawaii men were at Hanapepe, the Kauai forces at Wahiawa, where a fort had been hastily erected and a single cannon (named Humehume) mounted as a feeble attempt to hold back the enemy. In the evening there was advance made, but the forces of Hawaii retired to Hanapepe for the night. A hard rain prevented the Kauai men from firing the grass that night and making a rush in the morning as intended. There had been a rainbow, and

Hoapili predicted, “If the base were on the other side and the tip here we should be defeated tomorrow, but since we have the base and they the tip we shall be the winners. I believe not one of our men will fall.” ...Large numbers of Kauai warriors had gathered on the battle-ground, but they were unarmed save with wooden spears, digging sticks, and javelins. Many women were there to see the fight. The men acted as if death were but a plaything. It would have been well if the gods had stepped in and stopped the battle. No one was killed on the field, but as they took flight they were pursued and slain. ...For ten days the soldiers harried the land killing men, women, and children. [Kamakau 1961:268]

The battle of Wahiawa and the defeat of the Kaua‘i chiefs marked the end of Kaua‘i’s resistance to the kingdom. The battle was latter known as the “pig eating” because it is said that many men, women, and children were killed and left for the wild pigs and dogs to eat (Kamakau 1961:233). The slain were not allowed a burial and left for the wild animals. Following the battle, the lands of Kaua‘i were redistributed:

A great deal of property was taken, among other things horses and cattle, which had become numerous on Kauai because the foreigners had given many such to Kaumuali‘i. ...After the battle the chiefs all came together and Kalanimoku redistributed the lands of Kauai. ...It was decided that Kahalai‘a should not remain ruler, but the islands turned over to the young king [Kamehameha III], and Kaikio‘ewa was appointed governor and Kahalai‘a returned. He was said to have been very bitter against Ka‘ahumanu on this account, but was consoled by being made guardian of the young king, Kauikeaouli. The lands were again divided. Soldiers who had been given lands but had returned to Oahu had their lands taken away, chiefs who had large lands were deprived of them, and the loafers and hangers-on (*palaualelo*) of Oahu and Maui obtained the rich lands of Kauai. [Kamakau 1961:268–269]

### **3.4 The Māhele and Land Tenure Change**

In 1848, the Māhele instituted a change from the traditional Hawaiian system of land tenure to a system based on the western concept of fee-simple ownership. During the Māhele, the Hawaiian chiefs and *konohiki* were required to present their claims to the Land Commission and receive awards for the land quit-claimed to them by Kamehameha III. Until an award for these lands was issued, the title remained with the government. A Land Commission Award (LCA) gave complete title to the lands with the exception of the government’s right to commutation. Upon satisfaction of the commutation, which could be settled by a cash payment or through the exchange of land of equal value, a Royal Patent was issued by the minister of the interior. A Royal Patent quitclaimed the government’s interest in the land and served as proof that the government’s right to commutation no longer existed. The Kuleana Act of 1850 provided a framework by which native commoners could apply for and be granted land to sustain their livelihood, however, the restrictions of the act made it difficult to receive a land award, thereby discouraging Hawaiians who did not actively cultivate land. The Act of August 10, 1854 provided for the dissolution of the Land Commission so that a LCA recipient was still protected if they had not obtained a Royal Patent (Chinen 1958:13–14). This act stated that “a Land Commission Award shall furnish as good and sufficient a ground upon which to maintain an action for trespass, ejectment, and other real action, against any person or persons, whatsoever, as if the claimant, his heirs or assigns, had

received a Royal Patent for the same” (Chinen 1958:14). The Māhele represents a significant shift in Hawaiian land use history with the drastic change from a redistributive economy to a market based system which resulted in decline of native land tenure and opened the way for wealthy foreign investors to purchase land.

#### **3.4.1 The *ili* of ‘Ele‘ele**

The boundary of the current project area is situated in an area known as ‘Ele‘ele. Traditionally, the *ili* of ‘Ele‘ele was located along the eastern border within Hanapēpē Ahupua‘a. After the 1827 Kaua‘i rebellion and the redistribution of the Kaua‘i lands, the *‘ili* of ‘Ele‘ele was claimed by Mataio Kekuanao‘a, the Governor of O‘ahu and Kaua‘i. He was later awarded ‘Ele‘ele (1,071 acres) during the Māhele under LCA 7712. Kekuanao‘a was of the royal lineage of Kamehameha and was married to Kalehua, his wife since the time of Kamehameha. They had a son named Pa‘alua. Kekuanao‘a later married Pauahi, who died in childbirth carrying Ruth Ke‘elikolani. Kekuanao‘a then married Elizabeth Kina‘u who was the daughter of Kamehameha I. She had five children of divine rank, David Kamehameha, Moses Kekuaiwa, Lot Kapuaiwa, Alexander Liholiho, and Victoria Kamamalu (Kamakau 1992:347).

There were no other LCA claims made for ‘Ele‘ele and there were no *kuleana* claims awarded within the project area. In the neighboring *ahupua‘a* of Hanapēpē, by contrast, there were 92 claims made of which 66 were awarded (Soehren 2010). These *kuleana* claimants list 131 *‘apana* (land parcels) in use including 528 *lo‘i*, 29 *kula* (dry land agricultural plots), and 46 *pāhale* (house lots). This information indicates that land use within Hanapēpē was heavily focused on the cultivation of wetland taro which was supported by the Hanapēpē River. Aside from the LCA 7712 awarded to Kekuanao‘a for the entire *‘ili* of ‘Ele‘ele (Figure 5), there were six LCA claims awarded in the vicinity of the current project area in neighboring Hanapēpē (Table 1). These LCA claims are all situated along or are close to the Hanapēpē River bank and are shown in Figure 6.

### **3.5 Ranching and Sugarcane**

Following the Māhele, the Hawaiian Government implemented acts which allowed foreigners the right to own land in Hawai‘i. The provisions of these acts created an opportunity for wealthy foreign investors to develop a variety of large-scale businesses. Additionally, the Reciprocity Treaty of 1875 stimulated extensive agricultural ventures in Hawai‘i by allowing goods such as sugar to be exported duty free to the United States.

In the mid-1800s, Judge Duncan McBryde arrived from Scotland to take charge of the Wailua Ranch for Hoffschlaeger & Co. (Ford 1913:151). Around 1860, McBryde acquired the lease for the lands of Wahiawa from Victoria Ka‘ahumanu, who had inherited the unclaimed lands of Wahiawa after the death Moses Kekuaiwa. After his contract with the Wailua Ranch expired, McBryde drove his cattle herd around the island to Wahiawa where he facilitated the development of a large ranch (Ford 1931:151). McBryde built his home at Mai‘aloa which became known as “Brydeswood” (Figure 7) (Damon 1931:381). The McBryde Ranch subsequently acquired additional land leases and by 1870 controlled all the lands from Lāwa‘i to ‘Ele‘ele. Damon indicates that by 1870 the McBryde ranch was firmly established and sugarcane cultivation projects were progressing favorably (Damon 1931:773–774). In 1872, the McBryde Ranch



Figure 5. LCA 7712 noted on 1949 Hawai'i Survey Office File Plan Map 474 (based on Tax Map Key: 2-1-01:004, 010, 011, 102, and 016). Project area outlined in red.

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**Table 1. LCA Claims in the Vicinity of the Project Area**

<b>LCA No.</b>	<b>Claimant</b>	<b>Land Use</b>	<b>Claims Awarded</b>
387	ABCFM (Mission)	Agriculture	Two <i>'āpana</i> , <i>kula</i> , <i>lo'i</i>
3215	Niha	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , 18 <i>lo'i</i>
3285	Waolani	Agriculture	Two <i>'āpana</i> , one <i>kula</i> , 30 <i>lo'i</i> , one pigpen
3323	Papohaku	Habitation, agriculture	One <i>'āpana</i> , one house lot, one <i>kula</i> , 40 <i>lo'i</i>
3356	Nahuina	Agriculture	One <i>'āpana</i> , one <i>kula</i> , 14 <i>lo'i</i>
3413	Pooahi	Agriculture	Two <i>'āpana</i> , two <i>kula</i> , 30 <i>lo'i</i>
3595	Kanupaka	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , 18 <i>lo'i</i> , one pigpen
5350	Puahiki, Nawaalau	Habitation, agriculture	One <i>'āpana</i> , one house lot, one <i>kula</i> , 12 <i>lo'i</i> , one pigpen
5446	Nawaalau, Ezekielia	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , 18 <i>lo'i</i>
6325	Kekauonohi	Agriculture	One <i>'āpana</i> , one cattle enclosure (not awarded)
6557	Pohakahi	Habitation, agriculture	One <i>'āpana</i> , one house lot, 13 <i>lo'i</i>
7712	Kekuaīwa (Kekuanaoa)		All unclaimed land within Wahiawa Ahupua'a (5,857 acres)
8010	Aikala	Habitation, agriculture	One <i>'āpana</i> , one house lot, one <i>kula</i> , 30 <i>lo'i</i>
8256	Hohoiea	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , two <i>lo'i</i>
9057	Kaanaana	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , 23 <i>lo'i</i> (not awarded)
10273	Meheula	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , 19 <i>lo'i</i> , one goat pen
10632	Pahao	Agriculture	One <i>'āpana</i> , 14 <i>lo'i</i> , one pigpen (not awarded)
10686	Paele	Habitation, agriculture	Two <i>'āpana</i> , one house lot, one <i>kula</i> , 21 <i>lo'i</i> , one pigpen
10946	Wailele	Agriculture	One <i>'āpana</i> , one <i>kula</i> , 10 <i>lo'i</i>
11088	Kui	Habitation, agriculture	One <i>'āpana</i> , one house lot, one <i>kula</i> , seven <i>lo'i</i> , one pigpen

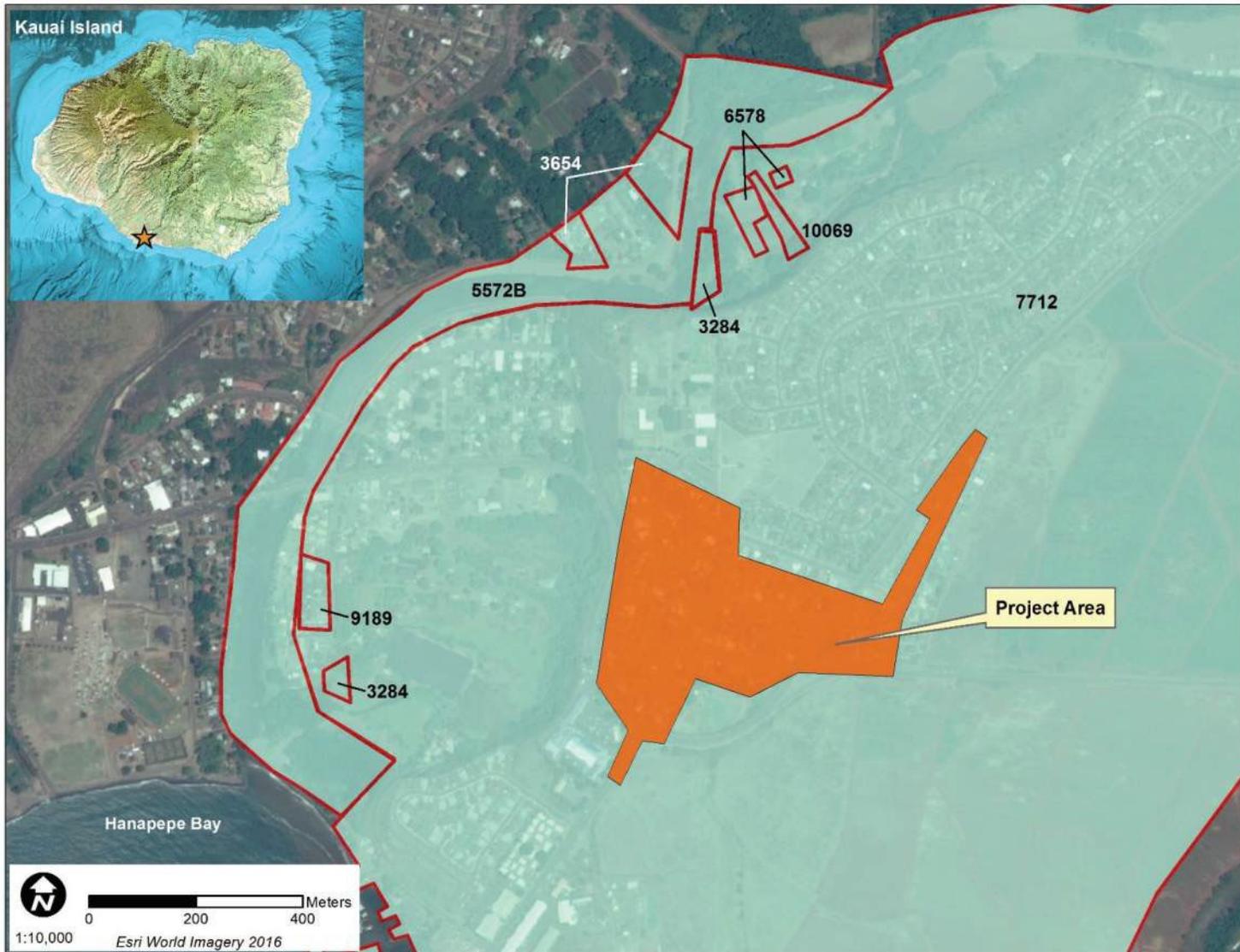
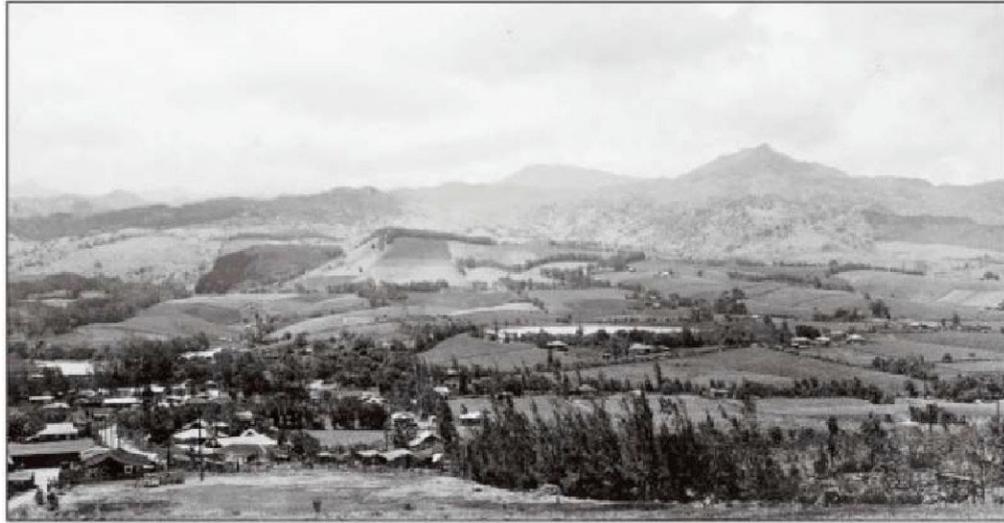


Figure 6. LCA claims in the vicinity of the project area.



**Figure 7. Wahiawa lands of the Brydeswood Ranch n.d. (Cozad 2008).**

proposed to purchase the *ahupua'a* of Wahiawa for \$4,000 of which a final price of \$4,500 was agreed. Duncan McBryde died in 1878 at the age of 52, leaving the ranch to his wife Elizabeth and their six children.

### **3.5.1 The Plantation Era**

Elizabeth McBryde, with the assistance of Judge Widemann, enlisted the help of August Dreier and formed a partnership which would develop into the 'Ele'ele Plantation (Figure 8) (Damon 1931:774). Hoffschlaeger & Co., which farmed Wailua Valley, had been an early importer of German labor. The company recruited highly trained men such as Dreier and brought them to Kaua'i but often had a difficult time retaining them after their initial contracts expired (Joesting 1984:228). Dreier, a well-known agriculturist who had been planting sugarcane in Kōloa, was sold a half interest in the 'Ele'ele Plantation (Ford 1913:151). Bernice Pauahi Bishop sold the 'ili of 'Ele'ele to Elizabeth McBryde and August Dreier in 1884 for the sum of \$5,500. In 1893, Dreier purchased the remaining McBryde interest in the 'Ele'ele Plantation (Ford 1913:151).

The lands cultivated by the plantation were considered to be “the most fertile lands in the district and an ample water supply.” The plantation also constructed a sugar mill which was located within easy access of the harbor landing which would later be known as Port Allen (Condè and Best 1973:197). Thrum reports in 1889 that the plantation was worth \$200,000 and could harvesting 1,200 tons of sugarcane annually (Thrum 1889:53). The 'Ele'ele Plantation was very successful and this attracted other supporting business ventures, most notably the pioneering establishment of a general merchandise store opened by John I. Silva and Jose De Frias in 1894 called “Frias & Silva.” This was a welcome addition to the region since the nearest general supply store was located in Līhu'e. Silva bought out his partner in 1896 and renamed the business “J. I. Silva's Homestead Store” (Siddall 1917:243) (Figure 9). Silva became an influential member of the community and took the responsibilities of Postmaster of 'Ele'ele in 1901.



**Figure 8. 'Ele'ele Plantation circa 1885, Hawai'i State Archives digital collection.**



**Figure 9. J. I. Silva's Homestead Store at 'Ele'ele circa 1900, Hawai'i State Archives digital collection.**

In 1899, Walter D. McBryde and W. A. Kinney founded the McBryde Sugar Company, a consolidation of the Koloa Agricultural Company, the 'Ele'ele Plantation, and the vast land holdings of the McBryde Ranch (Dean 1950:106). The venture was promoted by Benjamin F. Dillingham with Theo H. Davis & Co. as agents. The early plantation is described in an 1899 management report:

The plantation extends continuously eight miles along the sea coas, and this space is being connected up with a 30 lb., 30 inch gauge railway running parallel to the sea and about ½ mile distance from it. The road keeps to an elevation of about 200 feet, except at either end and crossing the Lawai Valley, where it drops down to close to sea level. The mill is located on the line of the road in open level land about one third of the way across the plantation from its west end. A spur from the main track runs along the edge of the Hanapepe Valley to drop coal to the pumping stations in the valley below. [Condè and Best 1973:191]

### **3.5.2 Infrastructure Development: Water and Rail**

The McBryde Sugar Company quickly developed plans to construct the required infrastructure to support the needs of the plantation. To irrigate the roughly 20,000 acres of land in Kalaheo, Hanapēpē, 'Ele'ele, Lawai, and Koloa, the plantation constructed an extensive system of water reservoirs and ditches to collect and transport water from the uplands to the fields (Figure 10) (Wilcox 1996:79). Additionally, artesian wells and tunnels were excavated in Hanapēpē valley and coal-burning steam plants constructed. The plantation also constructed a sugar mill in Wahiawa (Figure 11). By 1903, the water system had a combined capacity of 800 million gallons. The coal-burning steam plants pumping water proved inefficient and prohibitively expensive, placing the plantation under a heavy financial burden. To alleviate the high operational cost of the plantation, the company turned to the use of hydroelectric power. The Kaua'i Electric Company built the Wainiha Power Plant. In 1904, this company was incorporated as a subsidiary of McBryde Sugar. Fuel-related operational costs were reduced dramatically. McBryde Sugar acquired additional subsidiary companies including the Kauai Railroad Company and Kauai Pineapple. The plantation-sponsored Kauai Railway Company was incorporated in 1906, with McBryde Sugar managing the entire operation in 1907. Alexander & Baldwin took over railroad operations in 1909. By 1920, 19.2 miles of track were in use including an extension to the 'Ele'ele Landing.

### **3.5.3 Residential Development in the Twentieth Century**

The progression and intensification of 'Ele'ele a housing subdivision can be seen through a series of historic maps. A 1912 USGS map clearly shows residential development in the western portion of the 'Ele'ele Subdivision (Figure 12). A 1922 McBryde Sugar map then shows the extensive field system in the vicinity of the subdivision with a plantation camp situated in the west (Figure 13). By 1963, the area appears fully developed into residential housing (Figure 14).

Sugarcane cultivation continued to be the primary use of land in the region until late in the 20th century when growing sugarcane in Hawai'i became unprofitable due to high operational costs and competition from emerging foreign markets. McBryde Sugar continued operations until 1996 when economic pressures and the financial burden of growing sugarcane forced the company



**Figure 10. McBryde Sugar Company irrigation ditch and floodgate circa 1910, Bishop Museum archives.**



**Figure 11. McBryde Sugar Company Well #1 in Hanapepe Valley n.d., Bishop Museum archives.**

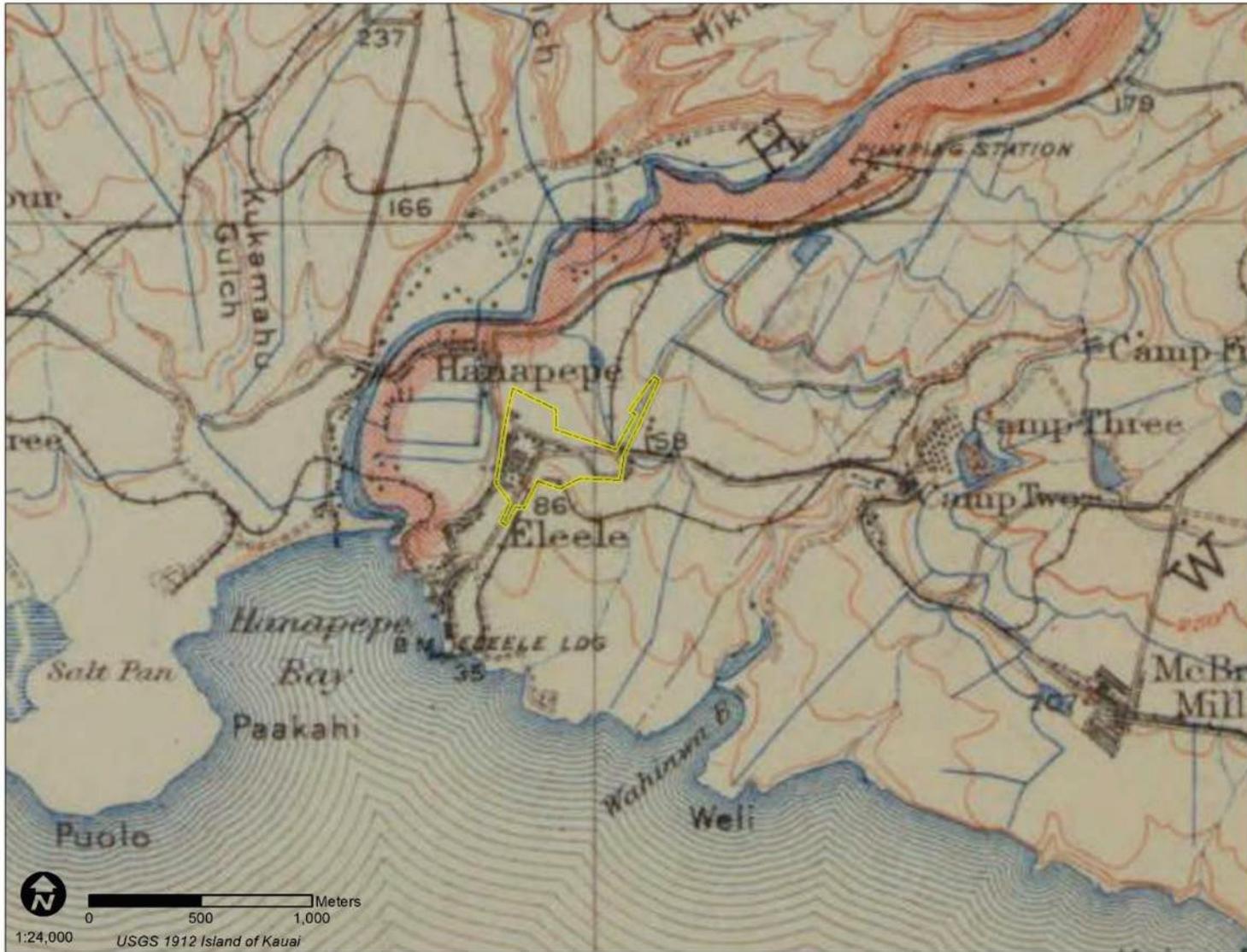


Figure 12. 1912 USGS map showing early residential development in 'Ele'ele. Project area outlined in yellow.



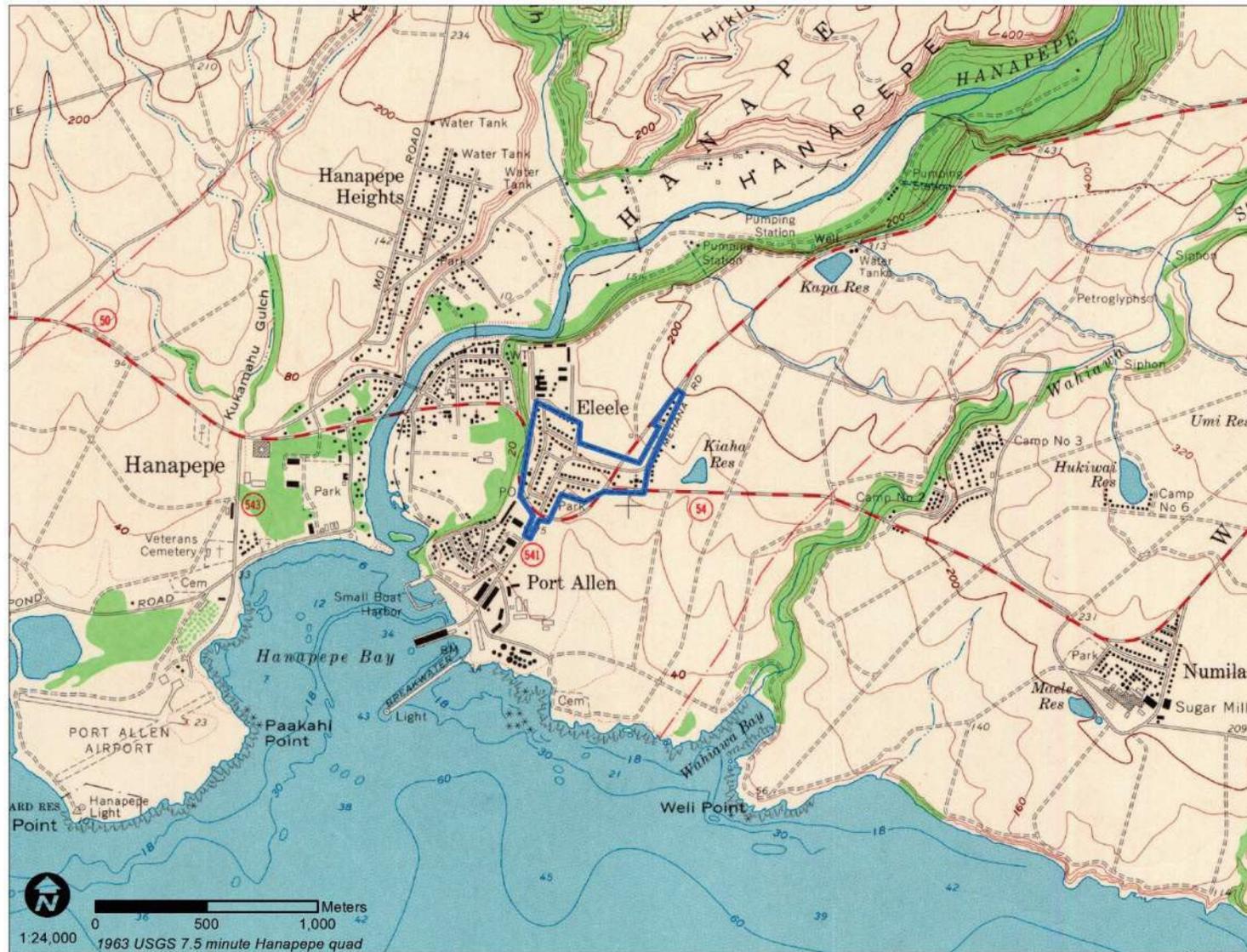


Figure 14. 1963 USGS map showing the residential development of 'Ele'ele. Project area outlined in blue.

to close down the Koloa Sugar Mill. After the closure of the sugar mill, the Kaua'i Coffee Company replaced McBryde Sugar converting much of the former sugar lands into coffee production.

#### **4.0 ARCHAEOLOGICAL RESEARCH AT 'ELE'ELE**

A number of studies conducted in the vicinity of the project area provide insight into the archaeology of 'Ele'ele. The locations of previous archaeological studies conducted within a two-kilometer radius of the project area are illustrated in Figure 15 and listed in Table 2. Locations of sites identified during these projects are presented in Figure 16 and listed in Table 3.

##### **4.1 Early Investigations**

Thomas G. Thrum (1907) made the earliest attempt to document archaeological sites, mainly large-scale structures, throughout the island of Kaua'i. Within a two-kilometer radius of the current study area, Thrum recorded four *heiau*. These *heiau* include Makole, Pualu, and an unnamed *heiau* located north of the project area within Hanapēpē Ahupua'a. Thrum also documented Huhu'akai Heiau southeast of the project area within Wahiawa Ahupua'a.

Wendell C. Bennett conducted the first systematic archaeological survey of the island of Kaua'i (Bennett 1931). Bennett attempted to relocate the *heiau* previously documented by Thrum as well as identify significant sites in the vicinity. Within the vicinity of 'Ele'ele, Bennett recorded sites 53–57 and 63 (Table 3). These sites are described in further detail below.

##### **Site 53: Burial Ground**

Bennett simply described Site 53 as a burial ground located in the sand at the northwestern side of Hanapēpē Bay (Bennett 1931:112).

##### **Site 54: Makole Heiau**

Makole Heiau was described by Thrum as a small *heiau* of platform character. The *heiau* was supposedly located on Makole Buff in Hanapēpē. It is said that the *heiau* was destroyed in the 1860s, however, a portion of the wall was said to still be there (Thrum 1907:37). Bennett was unable to confirm the location of this *heiau* during his survey (Bennett 1931 113).

##### **Site 55: Pualu Heiau**

Thrum describes Pualu Heiau as a *po'okanaka* class *heiau* located at the base of a hill in Kapahili Hanapēpē. The large *heiau* had a length of 135 feet and a width of 54 feet. The rear wall of the *heiau* stood 4 feet higher than the floor. The *heiau* was described as being in a greatly disturbed condition (Thrum 1907:37). Bennett was able to confirm the location of this *heiau* during his survey and also identified additional features in the vicinity (Bennett 1931:113).

##### **Site 56: Akowai Heiau and Site 57 House sites**

In Thrum's study, no name was given to this *heiau*. It was said to have been a small paved *heiau* located at Akowai. The *heiau* was described as being 50 feet in length and likely destroyed in 1865. Bennett confirmed the location of the *heiau* and referred to it as Akowai Heiau (Site 56). Bennett also mentions three well-paved house sites (Site 57) and a jumbled mass of wall that may have been a *heiau* in the vicinity of Akowai Heiau (Bennett 1931:113–114).

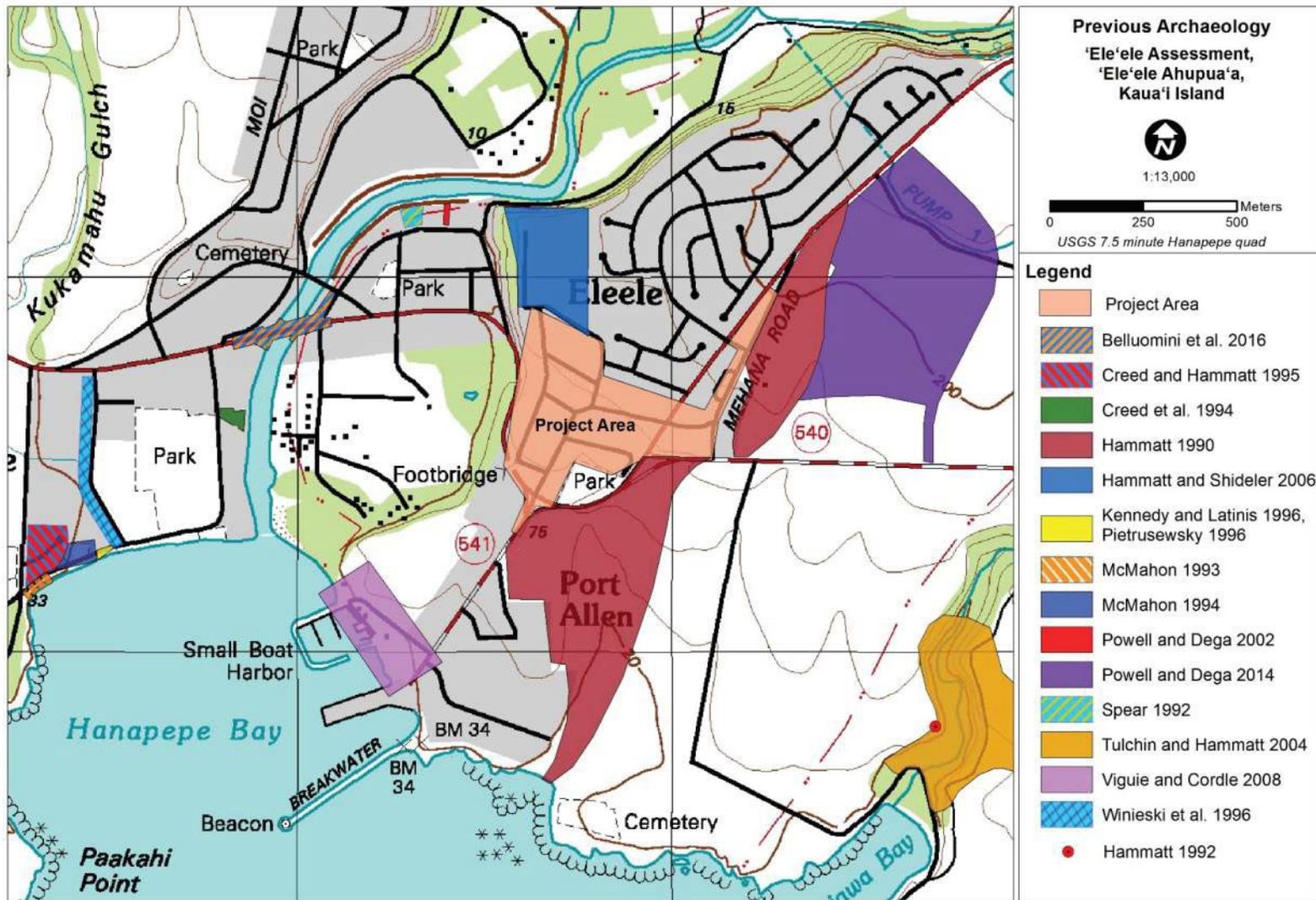


Figure 15. Previous archaeological investigations in the vicinity of the 'Ele'ele Subdivision.

**Table 2. Previous Archaeological Investigations in the Vicinity of the ‘Ele‘ele Subdivision**

<b>Reference</b>	<b>Nature of Study</b>	<b>Location</b>	<b>Results</b>
Thrum 1907	Documentation of <i>Heiau</i>	Islandwide, including Hanapēpē and Wahiawa	Within two km of ‘Ele‘ele, documented four <i>heiau</i> including Makole, Pualu, Akowai, and Huhu‘akai. Also recorded house sites near Akowai <i>Heiau</i> .
Bennett 1931	Archaeological reconnaissance survey	Islandwide, including Hanapēpē and Wahiawa	Conducted first systematic archaeological on Kaua‘i and attempted to relocate sites previously documented by Thrum.
Kikuchi 1963	Archaeological reconnaissance survey	Kona District, including Hanapēpē and Wahiawa	Documented SIHP No. 50-30-09-3037 and 50-30-09-3046–3052 within two km of ‘Ele‘ele.
Hammatt 1990	Archaeological reconnaissance survey	Hanapēpē, TMKs: (4) 2-1-001 and 2-1-001:027	No findings.
Hammatt 1992	Inspection of exposed burials	Wahiawa, Kauai Aggregates Quarry	Identified six pre-Contact human burials. Burials assigned SIHP No. 50-30-09-1893.
Kikuchi and Remoaldo 1992	Documentation of Kaua‘i cemeteries	Islandwide	Documented six cemeteries within a two km radius of the project area. These include the Hanapēpē First United Church of Christ (SIHP No. 50-30-09-0497, B012), the Catholic/Chinese Cemetery (SIHP No. 50-30-09-0603, B004), the Veteran's Cemetery (SIHP No. 50-30-09-0604, B005), the Hanapēpē Heights Japanese Cemetery (SIHP No. 50-30-09-0607, B008), the Filipino Cemetery, (SIHP No. 50-30-09-0608, B003), and the Hanapēpē Cemetery (SIHP No. 50-30-09-0651).
Spear 1992	Archaeological inventory survey with subsurface testing	Hanapēpē First United Church of Christ, TMK: (4) 1-9-004:011	Survey of the church grounds identified three burial plots. Subsurface testing resulted in the identification of pre-Contact deposit (SIHP No. 50-30-09-497).
McMahon 1993	Inadvertent burial discovery	Hanapēpē Bay TMK: 1-8-008:003	Recorded two burial site areas within SIHP No. 50-30-09-053.
Creed et al. 1994	Archaeological inventory survey	Hanapēpē, TMKs: (4) 1-9-010:002 and 003	Survey resulted in the identification of two human burials (SIHP No. 50-30-09-704 and -705) and a cultural lens (SIHP No. 50-30-09-706).
McMahon 1994	Inadvertent burial discovery	Hanapēpē, TMK: (4) 1-8-008:014	Documented a single human burial (SIHP No. 50-30-09-651).

**Table 2. (cont.)**

<b>Reference</b>	<b>Nature of Study</b>	<b>Location</b>	<b>Results</b>
Creed and Hammatt 1995	Archaeological inventory survey with subsurface testing	Hanapēpē, TMK: (4) 1-8-008:019	No findings.
Kennedy and Latinis 1996	Burial treatment plan for inadvertent burial discovery	Pu‘olo Road fronting Hanapēpē Bay	Single burial part of a larger burial area documented by Bennett 1931 (SIHP No. 50-30-09-053).
Pietrusewsky 1996	Skeletal analysis	Pu‘olo Road fronting Hanapēpē Bay	Skeletal analysis determined that human remains are probable Hawaiian.
Winieski et al. 1996	Archaeological monitoring	Hanapēpē, TMK: (4) 1-9-008:045	Monitoring resulted in the identification of one coffin burial (SIHP No. 50-30-09-1987).
Powell and Dega 2002	Burial recovery	Hanapēpē, TMK: (4) 1-9-004:008	Documented and recovered human skeletal remains (SIHP No. 50-30-09-1710).
Tulchin and Hammatt 2004	Archaeological inventory survey	Wahiawa, TMKs: (4) 2-1-01: por. 3, por 37 and 2-2-01: por. 1	Identified two historic properties including, two terraces (SIHP No. 50-30-09-393), and a single human burial (SIHP No. 50-30-09-1893).
Hammatt and Shideler 2006	Archaeological literature review and field check	‘Ele‘ele Elementary School	Background research and field check provided no indication for archaeological concern. No further work recommended.
Viguie and Cordle 2008	Archaeological monitoring	‘Ele‘ele, TMK: (4) 2-1-03:010	Monitoring resulted in the identification of plantation-era railroad tracks (SIHP No. 50-30-09-585).
Powell and Dega 2014	Archaeological inventory survey	Hanapēpē, TMK: (4) 2-1-001:054	Documented a single historic plantation-era site (SIHP No. 50-30-09-2219).
Belluomini et al. 2016	Archaeological inventory survey	Hanapēpē, TMKs: (4) 1-9-007:001 por., 013 por., 020 por., 034 por., and 1-9-010:014 por., 015 por., 046 por., 050 por.,	Identified four historic properties including, the Hanapēpē Bridge (SIHP No. 50-30-09-2280), two retaining walls (SIHP No. 50-30-09-2281 and 50-30-09-2282), and an earth and basalt berm (SIHP No. 50-30-09-2283).

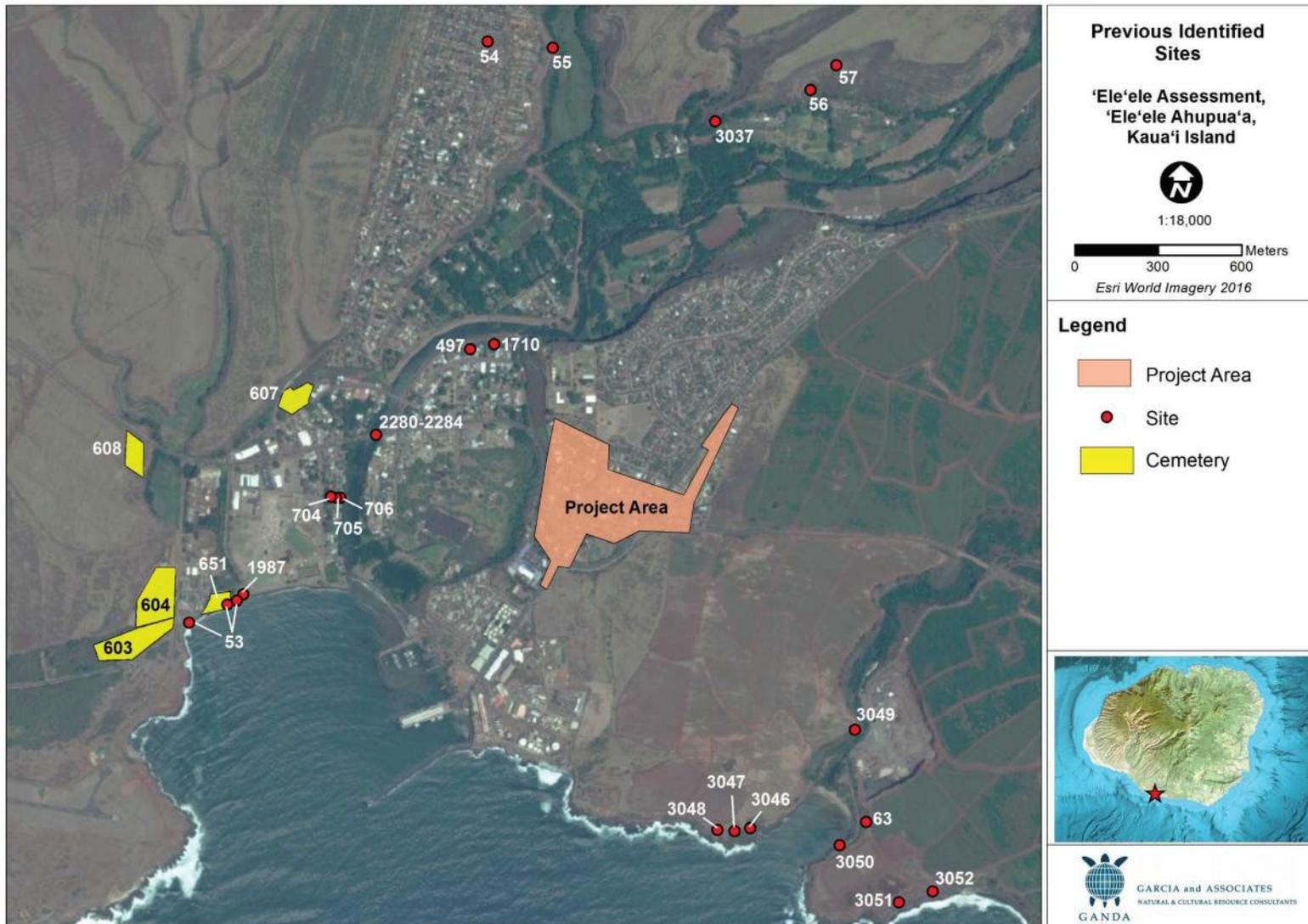


Figure 16. Archaeological sites documented in the vicinity of the 'Ele'ele Subdivision.

**Table 3. Archaeological Sites in the Vicinity of the ‘Ele‘ele Subdivision**

<b>SIHP No. 50-30-09-</b>	<b>Site Type</b>	<b>Location</b>	<b>Reference</b>
53	Burials	“In the sand on the northwest side of Hanapepe Bay”	Thrum 1907, Bennett 1931, McMahon 1993, and Kennedy and Latinis 1996
54	Makole Heiau	“on Makole buff”	Thrum 1907 and Bennett 1931
55	Pualu Heiau	East side of Kapahili Gulch	Thrum 1907 and Bennett 1931
56	Akawai Heiau	...at a place called Akawai on a steeply sloping side of a buff.”	Thrum 1907 and Bennett 1931
57	House sites	In the vicinity of Akawai Heiau	Thrum 1907 and Bennett 1931
63	Huhu‘akai Heiau	Located on Wahiawa Bay	Thrum 1907, Bennett 1931, and Kikuchi 1963
497 B012, 497	Cemetery/Inadvertent burial discovery	United Church of Christ Cemetery	Kikuchi and Remoaldo 1992 and Spear 1992
603 B004	Cemetery	Catholic/Chinese Cemetery	Kikuchi and Remoaldo 1992
604 B005	Cemetery	Veteran’s Cemetery	Kikuchi and Remoaldo 1992
607 B008	Cemetery	Hanapēpē Heights Japanese Cemetery	Kikuchi and Remoaldo 1992
608 B003	Cemetery	Filipino Cemetery	Kikuchi and Remoaldo 1992
651	Cemetery/Inadvertent burial discovery	Hanapēpē Cemetery	Kikuchi and Remoaldo 1992 and McMahon 1994
704	Burial	TMKs: (4) 1-9-010:002 and 003	Creed et al. 1994
705	Burial	TMKs: (4) 1-9-010:002 and 003	Creed et al. 1994
706	Cultural deposit	TMKs: (4) 1-9-010:002 and 003	Creed et al. 1994
1710	Inadvertent burial discovery	TMK: (4) 1-9-004:008	Powell and Dega 2002
1987	Single coffin burial	TMK: (4) 1-9-008:045	Winieski et al. 1996
2280–2284	Bridge, retaining walls, and earth and basalt berm	Hanapēpē River Bridge	Belluomini et al. 2016
3037	Burial cave	1.2 km north/northeast of the current study area	Kikuchi 1963, Kikuchi Site 1 reassigned SIHP No. 50-30-09-3037
3046–3052	Cave shelter, rock pile, calcified midden deposits, adze grinding stone, ‘Ele‘ele Plantation Camp One, and the Weli shelter.	Encircling Wahiawa Bay	Kikuchi 1963, Kikuchi Sites 15-20 and 22 reassigned SIHP No. 50-30-09-3046-3052

### **Site 63: Huhu‘akai Heiau**

Thrum described Huhu‘akai Heiau as “a medium size heiau; portion of its walls may yet to be seen. Class unknown” (Thrum 1907:37). Bennett noted that the *heiau* was mostly destroyed and that nothing that would identify it as a *heiau* remains (Bennett 1931:115).

## **4.2 Modern Archaeological Investigations**

The following is a review of archaeological investigations conducted in the second half of the twentieth century and

William Kikuchi conducted an archaeological reconnaissance survey of the Kona District of Kaua‘i (Kikuchi 1963). In the vicinity of ‘Ele‘ele, Kikuchi recorded Site 1 (SIHP No. 50-30-09-3037) north of the project area within Hanapēpē Valley. Site 1 is described as burial caves. Kikuchi notes that the caves appear to have been vandalized (Kikuchi 1963:3). Southeast of the project area Kikuchi documented eight sites encircling Wahiawa Bay. Kikuchi Sites 15–19 are described as including a cave shelter, a rock pile, calcified midden, and an adze grinding stone. Site 20 was “Camp One” an ‘Ele‘ele Plantation camp that was destroyed by the tidal wave of 1946. Site 22 is described as the Weli shelter site that was excavated by the Bishop Museum in the summer of 1959. Kikuchi notes that the area is “now considered hopelessly destroyed [by vandals] even though small areas are untouched” (Kikuchi 1963:22). These seven sites have been assigned SIHP No. 50-30-09-3046–3052. Kikuchi describes Site 21 as the potential remains of Huhu‘akai Heiau (SIHP No. 50-30-09-063) previously documented by Thrum (1907) and Bennett (1931). Kikuchi makes the following observation of Huhu‘akai Heiau:

Along the eastern slope of the mouth of Wahiawa valley, on the slopes facing Ahulua [Wahiawa] Bay, a peculiar wall was seen about 30 feet above the road leading to shore...Upon closer examination the wall proved quite thick, 4-5 feet, and about 5 feet high. No other structures were seen back of the wall. The wall may prove to be just another wall constructed during recent times but it may also be the portion of Huhu‘akai heiau which Bennett described. (Kikuchi 1963:22)

### **4.2.1 Recent Archaeological Studies Near ‘Ele‘ele**

In 1990, Cultural Surveys Hawai‘i Inc., conducted an archaeological reconnaissance survey of 72 acres situated adjacent to the southeaster boundary of the ‘Ele‘ele Subdivision and current project area (Hammatt 1990). No historic properties were identified within the project area. It was concluded that the intense cultivation of sugarcane in the area "would have destroyed all traces of former cultural features which may have once been present" (Hammatt 1990:10).

In 1992, the State Historic Preservation Division was notified of the exposure and inadvertent impact of human skeletal remains located adjacent to the Kauai Aggregates Quarry along the Wahiawa Stream bank. (Log No. 5330, Doc. No. 1925w). Hammatt (1992) made an inspection of the exposed remains and identified a minimum of six individuals situated in flex positions indicating that they were probable pre-Contact burials. A number of *ahu* (cairns) and stone paving were observed in the vicinity suggesting the area was a probable burial ground. The site was assigned SIHP No. 50-30-09-1893. Recommended burial mitigation treatment included the restoration of the stream bank with soil and rock fill.

Kikuchi and Remoaldo (1992) conducted an inventory survey of the cemeteries of Kauaʻi. Within a two km radius of the of the current study area six cemeteries were documented. These include the Hanapēpē First United Church of Christ (SIHP No. 50-30-09-0497, B012), the Catholic/Chinese Cemetery (SIHP No. 50-30-09-0603, B004), the Veteran's Cemetery (SIHP No. 50-30-09-0604, B005), the Hanapēpē Heights Japanese Cemetery (SIHP No. 50-30-09-0607, B008), the Filipino Cemetery, (SIHP No. 50-30-09-0608, B003), and the Hanapēpē Cemetery (SIHP No. 50-30-09-0651).

Scientific Consultant Services, Inc., conducted an archaeological inventory survey with subsurface testing at the Hanapēpē First United Church of Christ (Spear 1992). Survey of the church grounds identified three marked burial plots. Subsurface testing resulted in the identification of pre-Contact deposit (SIHP No. 50-30-09-497). The cultural deposit consisted of charcoal and midden including marine shell, pig teeth, and mammal bone. A hammer stone and a basalt flake were also recovered from the deposit. A radiocarbon assay of the cultural deposit produced a date range of AD 1360 to 1590.

Nancy McMahan investigated the inadvertent discovery of human remains located 90 cm below the road surface of old Puolo Road (McMahan 1993). McMahan identified a long bone and a portion of a mandible. The burial was determined to be associated with SIHP No. 50-30-09-053 previously documented by Bennett (1931). The following year McMahan investigated a second inadvertent burial discovery near the Hanapēpē Japanese Cemetery (SIHP No. 50-30-09-0651) (McMahan 1994). She identified a humerus at the corner of the cemetery in a pile of driftwood that appeared to have been exposed for some time. McMahan expressed concerns that additional skeletal remains may become exposed in the area.

Cultural Surveys Hawaiʻi Inc., conducted an archaeological inventory survey with subsurface testing of a house lot situated on the western bank of the Hanapēpē River (Creed et al. 1994). Two human burials were discovered during subsurface testing. These burial were assigned SIHP Nos. 50-30-09-0704 and 50-30-09-0705. No analysis of the human remains was performed and the burials were preserved in place. A subsurface cultural deposit was also documented and assigned SIHP No. 50-30-09-0706. A radiocarbon assay of the cultural deposit produced a date range of AD 1811–1927.

In 1995, Cultural Surveys Hawaiʻi Inc., conducted an archaeological inventory survey with subsurface testing of a 3.2-acre parcel for the development of the Self-Help Housing project (Creed and Hammatt 1995). No historic properties were identified.

Archaeological Consultants of the Pacific, Inc., responded to the inadvertent discovery of human remains during the construction and revetment repair of Puolo Road (Kennedy and Latinis 1996). They initially assumed the burial may have been a component of the burial ground (SIHP No. 50-30-09-053) previously documented by Bennett 1931, however, the close proximity of the Japanese cemetery made this determination inconclusive. Dr. Pietrusewsky (1996) conducted an analysis of the skeletal remains and determined that the majority of metric and non-metric data observed were consistent with Polynesian ancestry.

Cultural Surveys Hawaiʻi Inc., conducted archaeological monitoring for the Hanapēpē Drainage Improvement project (Winieski et al. 1996). While no pre-Contact cultural deposits were

encountered during monitoring, one historic coffin burial was discovered. The Coffin Burial was assigned SIHP No. 50-30-09-1987. The burial was later reinterred at the Hanapēpē Hawaiian Cemetery by the Kaua‘i Burial Council.

In 2002, Scientific Consultant Services, Inc., conducted a burial treatment and recovery of human skeletal remains discovered at the Old Hanapēpē Pool Hall (Powell and Dega 2002). The skeletal remains were recovered and assigned SIHP No. 50-30-09-1710.

Cultural Surveys Hawai‘i Inc., conducted an archaeological inventory survey of a 9-acre parcel for the proposed construction of a waste disposal facility at the Kauai Aggregates Quarry (Tulchin and Hammatt 2004). The survey resulted in the identification of two terraces determined to be probable pre-Contact temporary habitation structures. These terraces were assigned SIHP No. 50-30-09-0393 and recommended to be preserved through avoidance. A single human burial was also observed within an overhanging ledge. It was determined that human burial was a component of SIHP No. 50-30-09-1893 previously documented by Hammatt (1992).

In 2006, Cultural Surveys Hawai‘i Inc., conducted an archaeological literature review and field check of eight Department of Education schools on the island of Kaua‘i, including ‘Ele‘ele Elementary School, for the Inter-Island Department of Education Cesspool project (Hammatt and Shideler 2006). ‘Ele‘ele Elementary School is located on the northwestern boundary of the current project area. The background and field check at ‘Ele‘ele Elementary School gave no indications for archaeological concern and no further work was recommended.

Scientific Consultant Services, Inc., conducted archaeological monitoring in support of sewage improvements at Port Allen Harbor (Viguie and Cordle 2008). Archaeological monitoring resulted in the identification of a single historic property, plantation-era railroad tracks. The site was assigned SIHP No. 50-30-09-0583.

In 2014, Scientific Consultant Services, Inc., conducted an archeological inventory survey of 75 undeveloped acres (Powell and Dega 2014). The boundary of the project area borders the northeastern boundary of the current study area. The inventory survey documented a single plantation-era feature assigned SIHP No. 50-30-09-2219.

Cultural Surveys Hawai‘i Inc., conducted an archaeological inventory survey in support of the Hanapēpē River Bridge Replacement project (Belluomini et al. 2016). The inventory survey identified four historic properties including, the Hanapēpē Bridge (SIHP No. 50-30-09-2280), two retaining walls (SIHP Nos. 50-30-09-2281 and 50-30-09-2282), and an earth and basalt berm (SIHP No. 50-30-09-2283).

## **5.0 ARCHAEOLOGICAL EXPECTATIONS**

Expectations for subsurface historic properties within the undertaking APE fall into three basic categories, each associated with a major period of regional land-use: 1) traditional Hawaiian occupation, ranching, and sugar cane cultivation.

The earliest and most temporally extensive period is that of traditional (including early historic period) Hawaiian occupation. The precise beginning of this period is unclear from an

archaeological standpoint, but is not really necessary to know. Land-use in the region consisted of habitation and subsistence activities centered along the coastline and the banks of the Hanapēpē River. ‘Ele‘ele ‘Ili, including the project APE, is in close proximity to both the coastline and the river and it is quite likely that Hawaiians utilized this land in some manner during the many centuries prior to Western contact. Importantly, however, the project APE is situated on a topological shelf, standing well above the coast and river in relative elevation. It seems unlikely, therefore, that it was ever a significant hub of occupation. Early historic accounts note the high level of productivity in the general region, but do not remark on any settlements or dry-land agricultural activities in the project area. Importantly, there were no *kuleana* LCA claims within the project area and the whole of ‘Ele‘ele was awarded as a single LCA to Mataio Kekuanao‘a, the Governor of O‘ahu and Kaua‘i. This stands in stark contrast to the 66 *kuleana* claims awarded in adjacent Hanapēpē. Those claims demonstrate the high importance of wetland taro cultivation, dryland agriculture (to a far lesser degree), and residential habitation generally. So although the area was regionally active and well populated, the ‘Ele‘ele area specifically appears to have been somewhat peripheral. Archaeological investigations in the region, although spotty in their coverage, have likewise turned up very little in the way of subsurface cultural deposits, although this may be attributable to post-depositional land use, as discussed below.

The next major land-use in the APE was ranching, which coincided closely with the new ownership established under the Māhele. Cattle operations at Wailua Ranch, and then later McBryde Ranch, persisted into the late 1800s, but sugarcane production soon displaced grazing on the parcel—possibly as early as the 1870s. Cattle grazing is a low-impact activity, from an archaeological standpoint, and likely left very little trace. The subsequent plantation activities, however, were highly disruptive to local soils, resulting in the complete mixing of up to 24 inches or more of sediment. This is expected to have had a devastating impact on any traditional Hawaiian deposits that may have been present. As noted, these are expected to have been sparse, given the information contained in early historic documents and modern archaeological findings. The plantation period did, however, produce a range of historic properties associated with: 1) the housing of an ethnically diverse labor force, 2) early commercial enterprises such as J. I. Silva’s Homestead Store, and 3) the water and rail infrastructure features necessary to irrigate and transport crops. Although some of these feature may still be found in the region, particularly on undeveloped lands, none have survived within the undertaking APE. Wholesale development of the APE as a modern residential subdivision by the early 1960s has erased any surficial historic properties associated with plantation activities.

Given the low intensity of pre-Contact and early Historic Period Hawaiian activities within the APE, and the high intensity of subsequent Plantation Era disturbance, it is unlikely that undisturbed traditional Hawaiian subsurface historic properties are present. Early historic features associated with the Planation Era are more likely, although still probably quite sparse on the modern residential landscape. Major infrastructure and engineering features (e.g., ranch roads, irrigation works), if present, were apparently removed to make way for the present subdivision. Buried isolated artifacts and features associated with the plantation may yet be present. However, the historical significance and information value of such deposits is highly questionable.

## 6.0 ASSESSMENT SUMMARY AND CONCLUSIONS

Historic documents, maps, photos, and previous archaeological research indicate an upward progression in land-use intensity that mitigates against the survival of significant historic properties within the 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project's APE. This process peaked in the late 1800s with utilization of the landscape for commercial agriculture, an activity that involved large-scale sediment disturbance within the APE. This was followed in the mid-twentieth century by a final phase of high intensity land modification—the development of the current 'Ele'ele residential subdivision with its constituent houses, transportation infrastructure, and supporting utilities. This archaeological assessment therefore concludes that the likelihood for significant intact traditional Hawaiian deposits within the APE is very low. Furthermore, the likelihood of historic properties associated with Historic Period land-use, including commercial ranching and sugar cane cultivation, is also very low. Expected historic materials include only isolated artifacts of questionable information value.

The 'Ele'ele Subdivision Sewer Collection System Rehabilitation Project, which will involve the excavation of 460 linear meters of new 8-inch sewer line and six short laterals to existing residences, as well as localized point-access excavation along existing sewer lines, is unlikely to affect significant historic properties. The latter point-access excavations, which involve excavation of previously disturbed sediments, are especially unlikely to encounter intact subsurface historic properties.

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