Final
Burial Treatment Plan for
SIHP #50-10-28-13387, -26831 & -26836,
Ane Keohokālole Highway Project,
Keahuolū Ahupua‘a,
North Kona District, Island of Hawai‘i
TMK [3] 7-4-020: 010 por.; [3] 7-4-020: 022 por.

Prepared for
Belt Collins Hawai‘i Ltd.

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Kailua, Hawai‘i
(Job Code: KEALAKEHE 2)

November 2009

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Management Summary

Reference	Burial Treatment Plan for SIHP # 50-10-28-13387, -26831 & -26836, Ane Keohokālole Highway Project, Keahuolū Ahupua‘a, North Kona District, Island of Hawai‘i, TMK [3] 7-4-020: 010 por.; [3] 7-4-020: 022 por. (McDermott & Tulchin 2009)
Date	November 2009
Project Number (s)	Hawaii State Department of Transportation #: ARR - 1880 Cultural Surveys Hawai‘i Inc. (CSH) Job Code: KEALAKEHE 2
Agencies	State of Hawai‘i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD); County of Hawaii; Hawaii State Department of Transportation; Hawaii Island Burial Council (HIBC); Federal Highways Administration (FHWA)
Area of Potential Effect (APE) and Survey Acreage	The Ane Keohokālole Highway Project's area of potential effect (APE) is approximately defined as a 150- to 400-ft wide corridor oriented in a roughly north-south direction extending about 3.0 miles from Hina Lani Street toward Palani Road, with an approximately 100-ft wide corridor oriented in a roughly east-west direction about 1,700 feet between the intersection of Palani Road/Henry Street to the intersection of Palani Road/Queen Ka‘ahumanu Highway (Figures 1-3). The additional area to the west of the proposed road corridor, a former quarry, may be used as a contractor staging area. In addition, two burial sites (SIHP -13387 & SIHP -26836) were identified along the highway corridor (outside of the construction APE boundary) and included in the overall undertaking APE in consideration of any indirect alterations to the character or use of the sites that may result from the undertaking. The burial sites addressed in this plan were encountered in a 72-acre survey area consisting primarily of an approximately 2.3-km (1.4-mi.) long by 120-m (400-ft.) wide corridor located approximately 1.3 km *mauka* (inland) of the Queen Ka‘ahumanu Highway (Figures 1-3). The survey area corridor is oriented roughly north-south, parallel to the Queen Ka‘ahumanu Highway, extending south from Puohulihuli Street to a point approximately 300 m (1000 ft.) north of Palani Road.
Current Land Jurisdiction	Private: Queen Lili‘uokalani Trust (SIHP # 50-10-28-13387 and -26836). Government: County of Hawai‘i and State of Hawai‘i, Hawai‘i Housing Finance and Development Corporation (SIHP #50-10-28-26831).
Project Proponent	Hawai‘i County Department of Public Works

Project Description and Related Ground Disturbance	The proposed Ane Keohokālole Highway Project involves construction of a mid-level highway that will connect Henry Street to Hina Lani Road, *mauka* (inland) of the Queen Ka‘ahumanu Highway. Minimally, land disturbing activities would include grubbing, grading, paving, and excavations for subsurface utilities.
Background to the Plan	CSH conducted an archaeological inventory survey for a proposed Ane Keohokālole survey corridor between 5 and 14 May 2009 identifying four sets of human skeletal remains (*iwi kūpuna*) at three archaeological sites (see below). The inventory survey report was approved by SHPD on 20 August 2009 (SHPD correspondence LOG NO: 2009.3247 DOC NO: 0908TD11). The inventory survey report’s effect recommendation was “affect, with agreed upon mitigation measures.” The recommended mitigation measures included an archaeological monitoring program during Ane Keohokālole Hwy. construction and the preparation of this burial treatment plan (a requirement of Hawai‘i Administrative Rules [HAR] Chapter 13-300).
Historic Properties Addressed in this Plan	State Inventory of Historic Properties (SIHP) # 50-10-28-13387, lava tube with a burial and a temporary habitation function (single known burial); SIHP # 50-10-28-26831, burial cave, (single known burial); SIHP # 50-10-28-26836, lava tube with 2 known burials and a temporary habitation function. The burials were found during an archaeological inventory survey investigation and are therefore "previously identified" burials under Hawai‘i state burial law. SHPD has made an ethnicity determination of “native Hawaiian” for all four burials.
Historic Preservation Regulatory Context	Prepared in consultation with SHPD, Queen Lili‘uokalani Trust, Belt Collins Hawai‘i Ltd., the County of Hawai‘i, the HIBC, and recognized cultural descendents, this burial treatment plan is designed to fulfill the State requirements for burial treatment plans per HAR Chapter 13-300-33. The plan was prepared to provide SHPD and the HIBC with the appropriate information to support the HIBC’s determination of appropriate treatment for the survey area’s previously identified burial remains. It was also prepared to support the Ane Keohokālole Highway project’s historic preservation review under HRS Chapter 6E-8 and HAR Chapter 13-275. The plan describes the methods and procedures that will be used to protect the four previously identified burials during project construction and to preserve them in place in perpetuity.

Results of Lineal / Cultural Descendent Search	Ms. Nicole K. Lui was recognized by the HIBC as a cultural descendent of the project's previously identified burials (SIHP # 50-10-28-13387, -26831 & -26836) at the HIBC's 20 August 2009 meeting. At the HIBC's 17 September 2009 meeting additional cultural descendents of the project's burials were recognized by the HIBC, including Mr. Aka Mahi, Ms. Ruby McDonald, and Ms. Hannah Reeves. Additionally, at the 15 October 2009 HIBC meeting, the Keohokālole Family was recognized as cultural descendents to the project's burials. A list of all recognized cultural and/or lineal descendents of the project's burials will be included with the project's final SHPD-approved burial treatment plan.
Proposed Burial Treatment	The affected landowners, the project proponents, and the recognized cultural descendents propose to preserve all burials in place, inside the lava tubes where they were discovered, within four discrete burial preserve areas (one each for SIHP -26831 and -13387 and two separate preserves for the two burials at SIHP -26836). Lava tube entrances that provide access to the burials will be sealed with locally available lava rock and concrete. For each burial site, the collapsed lava tube blisters, or lava sinks, that provide access to the burial lava tubes will be filled with locally available lava rock boulders. These boulders will completely fill in the lava tube blisters to the level of the surrounding land surface, providing additional protection for the burials. The lava rock fill material will be dry-stone, without mortar. Permanent burial preserve areas for each burial will be established within an area 30 feet in radius measured out from the perimeter of the lava tube chamber in which each burial is located. To avoid disturbance, these permanent burial preserve boundaries will be marked with large boulders. Additionally, the boundaries will be recorded with the Bureau of Conveyances so that the burial areas will be preserved undisturbed in perpetuity. At SIHP -26831, the burial preserve nearest to the highway, the permanent burial preserve area will be cleared of introduced vegetation and landscaped with drought-tolerant Native Hawaiian vegetation, in particular *alahe`e* (*Psydrax odorata*) and *noni* (*Morinda citrifolia*), which naturally flourish in the vicinity. Also, at SIHP -26831 a single large boulder bearing a bronze plaque will be installed to inform passerby's to keep out, with a reference to the penalties for disturbing burial sites under Hawai‘i Revised Statutes (HRS) Chapter 6E-11. For SIHP #s -13387 and -26836 similar large boulders will be installed to mark the preserve area boundaries, four for each burial preserve area and located approximately at the cardinal directions (N, S, E, W) around the perimeter of the three 30 ft-radius burial preserve areas (two preserve areas for SIHP # -26836 and one for -13387). At the two preserve areas for SIHP #-26836 and one for -13387, one of the large boulders will have the same bronze plaque and text as SIHP # -26831. The placement of these thirteen large boulders (one for SIHP #- 26831, four for -13387, and eight for the two preserve areas of -26836) will be adjusted to the natural topography to be ascetically pleasing as well as effective visible

	markers of the burial preserve boundaries. No vegetation or landscaping will be undertaken at SIHP #-26836 and -13387.
Burial Preserve Recordation	In order to provide perpetual protection for the burial preserve areas, the project proponents (Hawai‘i County Department of Public Works) and the affected land owners (Queen Lili‘uokalani Trust and the County of Hawai`i), pursuant to HAR 13-300-38(g), will record the burial preserve area locations with the State of Hawai‘i Bureau of Conveyances. This recordation would create an encumbrance on the property (TMK [3] 7-4-020: 010 por.; [3] 7-4-020: 022 por.) to run with the land in perpetuity. The burial preserve area recordation with the Bureau of Conveyances will be done once this burial treatment plan is accepted by SHPD. Copies of the recorded document shall be submitted to SHPD, HIBC, the affected landowners, and interested parties that participated in the burial treatment consultation process.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

At the request of Belt Collins Hawai‘i Ltd., representative of the project proponent, and the project proponent, the Hawai‘i County Department of Public Works (contact: Mr. Warren Lee, Director, County of Hawai‘i Department of Public Works, 101 Pauahi Street, Suite 7, Hilo, Hawai‘i, 96720; tel. 808 961-8321; fax 808 961-8630) Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this burial treatment plan to address treatment of four sets of human skeletal remains (*iwi kūpuna*) discovered on lands owned by the Queen Lili‘uokalani Trust in Keahuolū Ahupua‘a, North Kona District, Island of Hawai‘i [TMK [3] 7-4-020: 010 por.; [3] 7-4-020: 022) por.]. The *iwi kūpuna* were discovered during archaeological inventory survey related to the proposed Ane Keohokālole Highway Project. This proposed project involves construction of a mid-level highway that will connect Henry Street to Hina Lani Road, *mauka* (inland) of the Queen Ka‘ahumanu Highway, within the *ahupua‘a* of Keahuolū, Kealakehe, Honokohau 1 and 2, and Kaloko). This area is depicted on the U.S. Geological Survey 7.5-Minute Series Topographic Map, Kailua Quadrangle (1996) (Figure 1).

The Ane Keohokālole Highway Project’s area of potential effect (APE) is approximately defined as a 150- to 400-ft wide corridor oriented in a roughly north-south direction extending about 3.0 miles from Hina Lani Street south to Palani Road, with an approximately 100-ft wide corridor oriented in a roughly east-west direction extending about 1,700 feet between the intersection of Palani Road/Henry Street to the intersection of Palani Road/Queen Ka‘ahumanu Highway. The additional area to the west of the proposed road corridor, a former quarry (refer to Figure 1, where this area is labeled “quarry” on the USGS), may be used as a contractor staging area. Figures 1-3 show the Ane Keohokālole Highway Project’s APE.

Five archaeological inventory surveys (located within the *ahupua‘a* of Keahuolū, Kealakehe, Honokohau 1 and 2, and Kaloko) were conducted to investigate the entirety of the proposed Ane Keohokālole Highway Project’s APE. Four sets of *iwi kūpuna* were identified during these five archaeological inventory survey investigations. All four sets of *iwi kūpuna* were identified in the same archaeological inventory survey conducted in the Keahuolū *Ahupua‘a* described below.

The *iwi kūpuna* that are the subject of this plan were discovered in the course of an archaeological inventory survey of an approximately 2.3-km (1.4-mi.) long by 120-m (400-ft.) wide corridor located approximately 1.3 km *mauka* (inland) of the Queen Ka‘ahumanu Highway. The archaeological inventory survey of portion of the overall proposed Ane Keohokālole Highway Project’s APE, termed the survey area for this document, is oriented roughly north-south, parallel to the Queen Ka‘ahumanu Highway, extending south from Puohulihuli Street to a point approximately 300 m (1000 ft.) north of Palani Road (refer to Figures 1-3). The survey area acreage is approximately 72-acres. As can be seen on Figures 1-3, the survey area is wider than the proposed Ane Keohokālole Highway Project’s APE. This wider survey area allowed for some leeway in the alignment of the project’s APE. The locations of the three burial sites (including four previously identified burials) addressed in this plan are shown in Figure 4 (also a U.S. Geological Survey map) and Figure 5 (an aerial photograph).

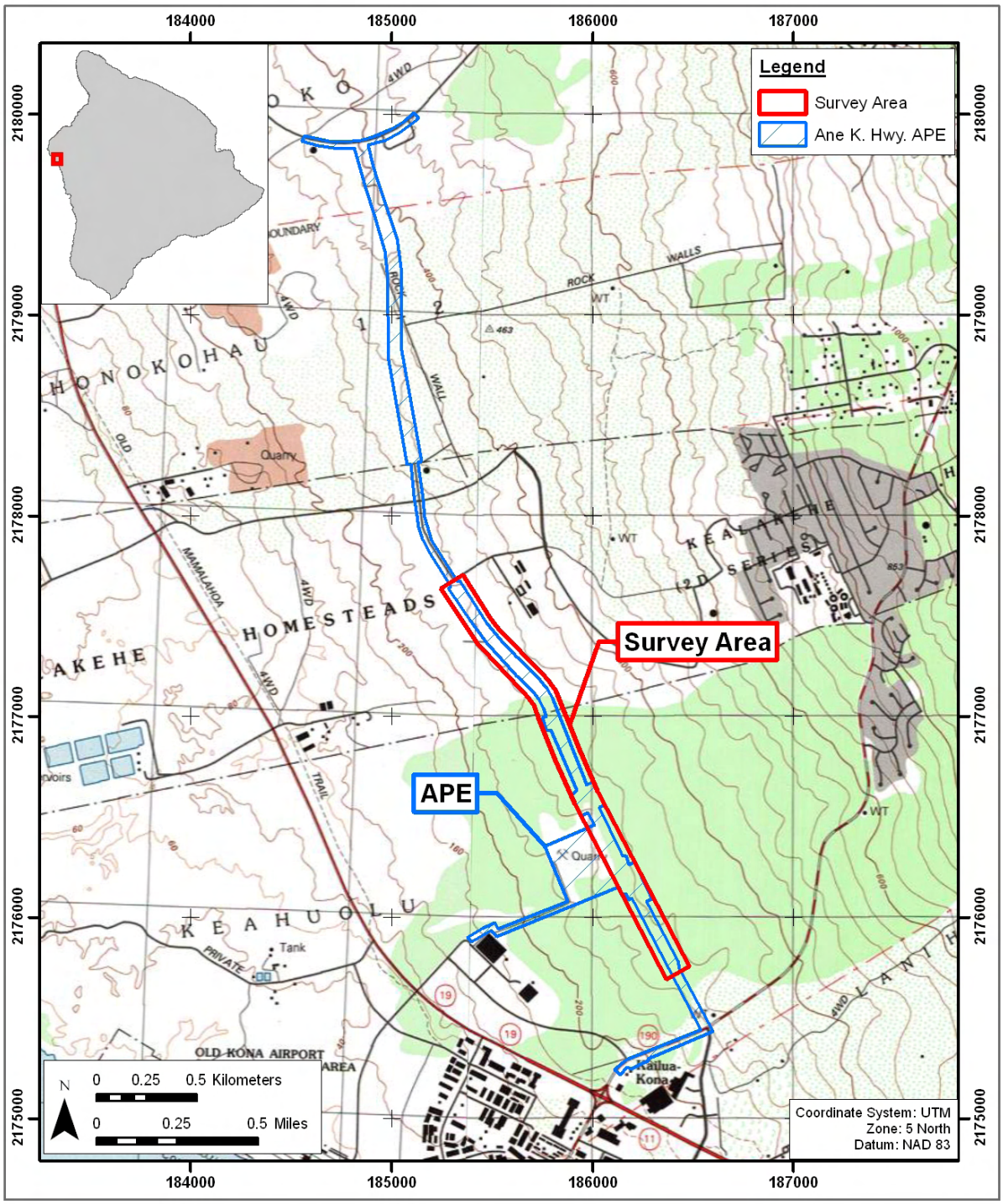

Figure 1. U.S. Geological Survey 7.5-Minute Series Topographic Map, Kailua and Keāhole Point Quadrangles (1996), showing the location of the survey area and the overall undertaking area of potential effect (APE)

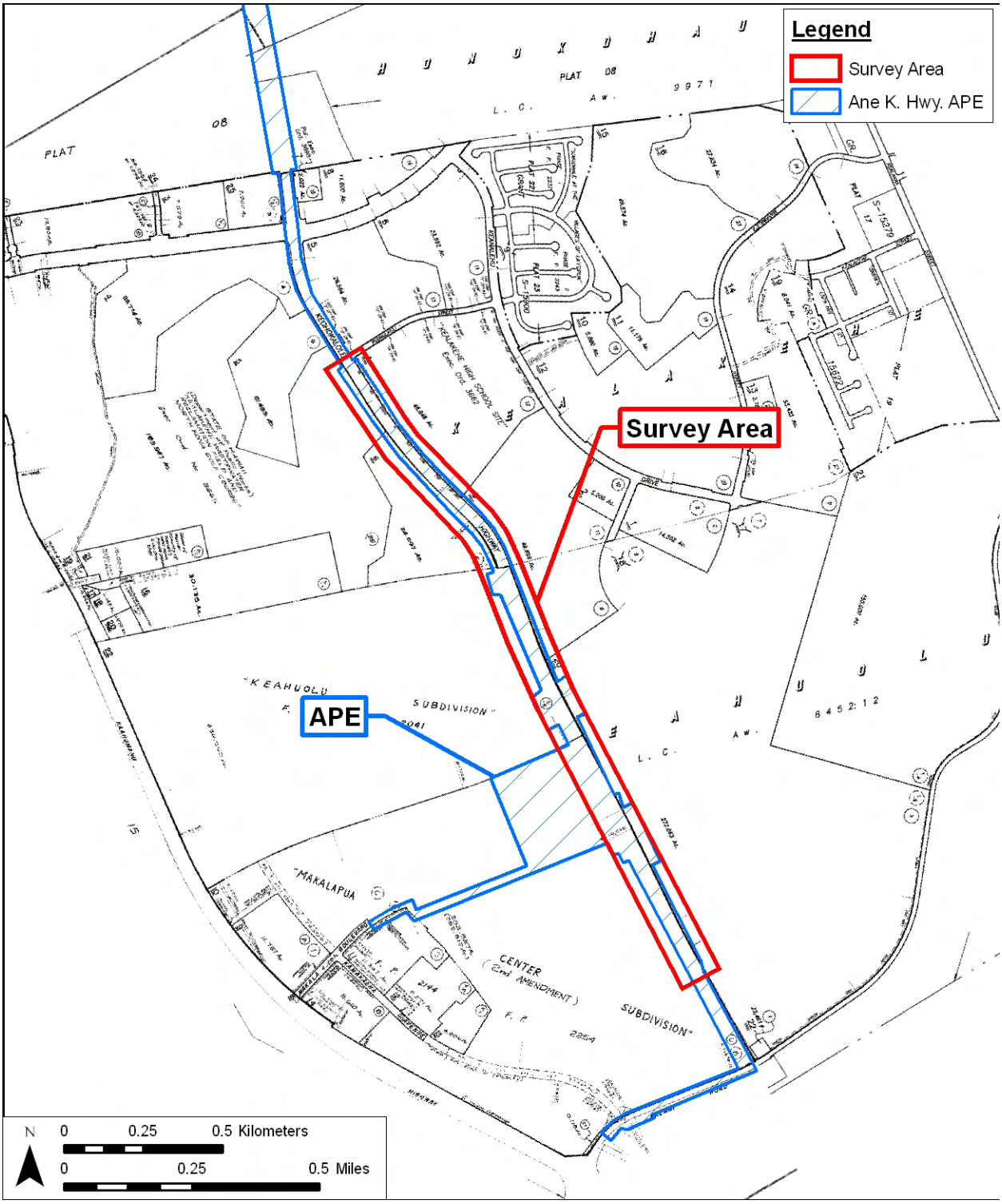

Figure 2. Tax Map Key [1] 4-2-38, showing the location of the survey area and the overall undertaking area of potential effect (APE)

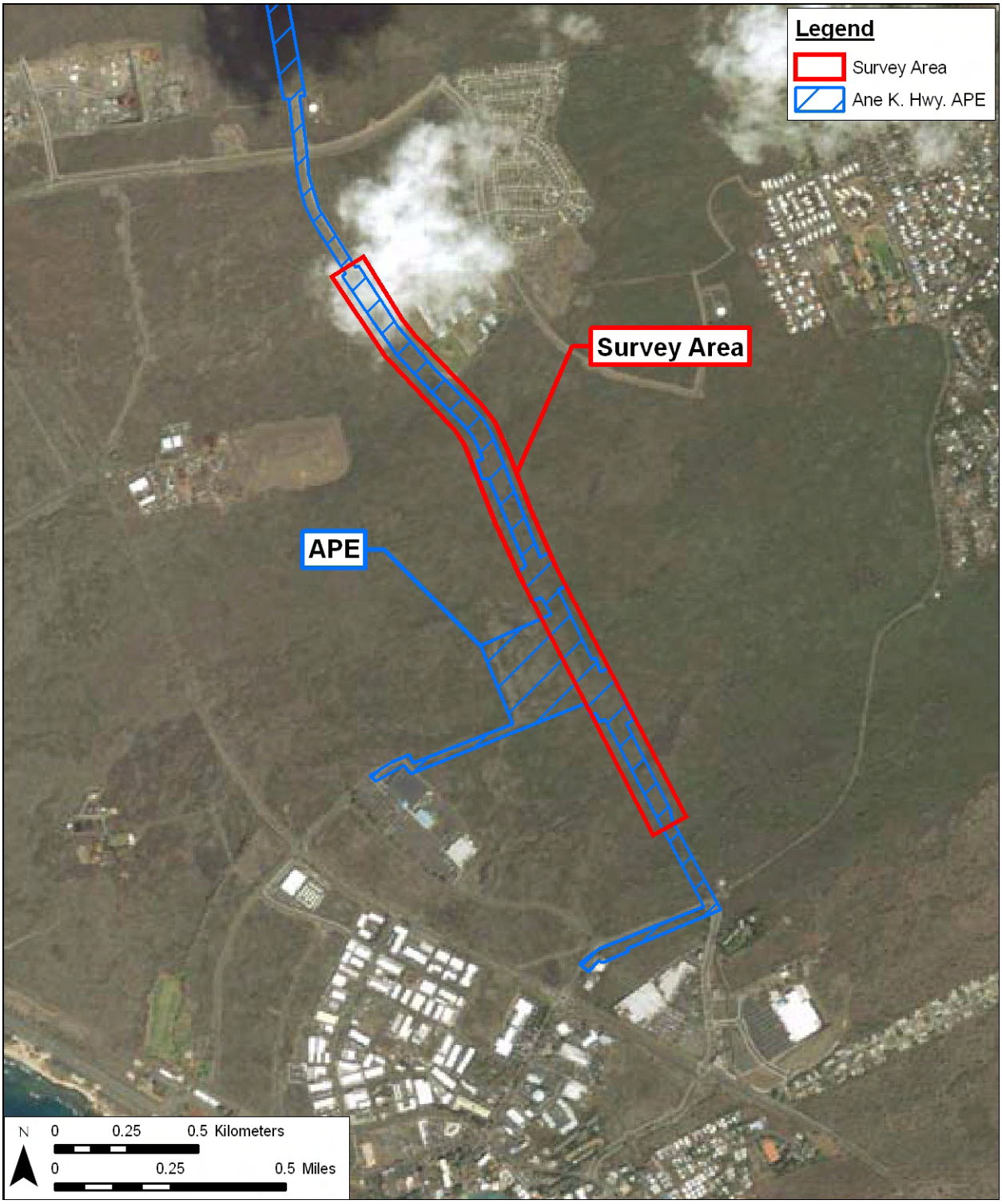

Figure 3. Aerial photograph (source: Google Earth 2009), showing the location of the survey area and the overall undertaking area of potential effect (APE)

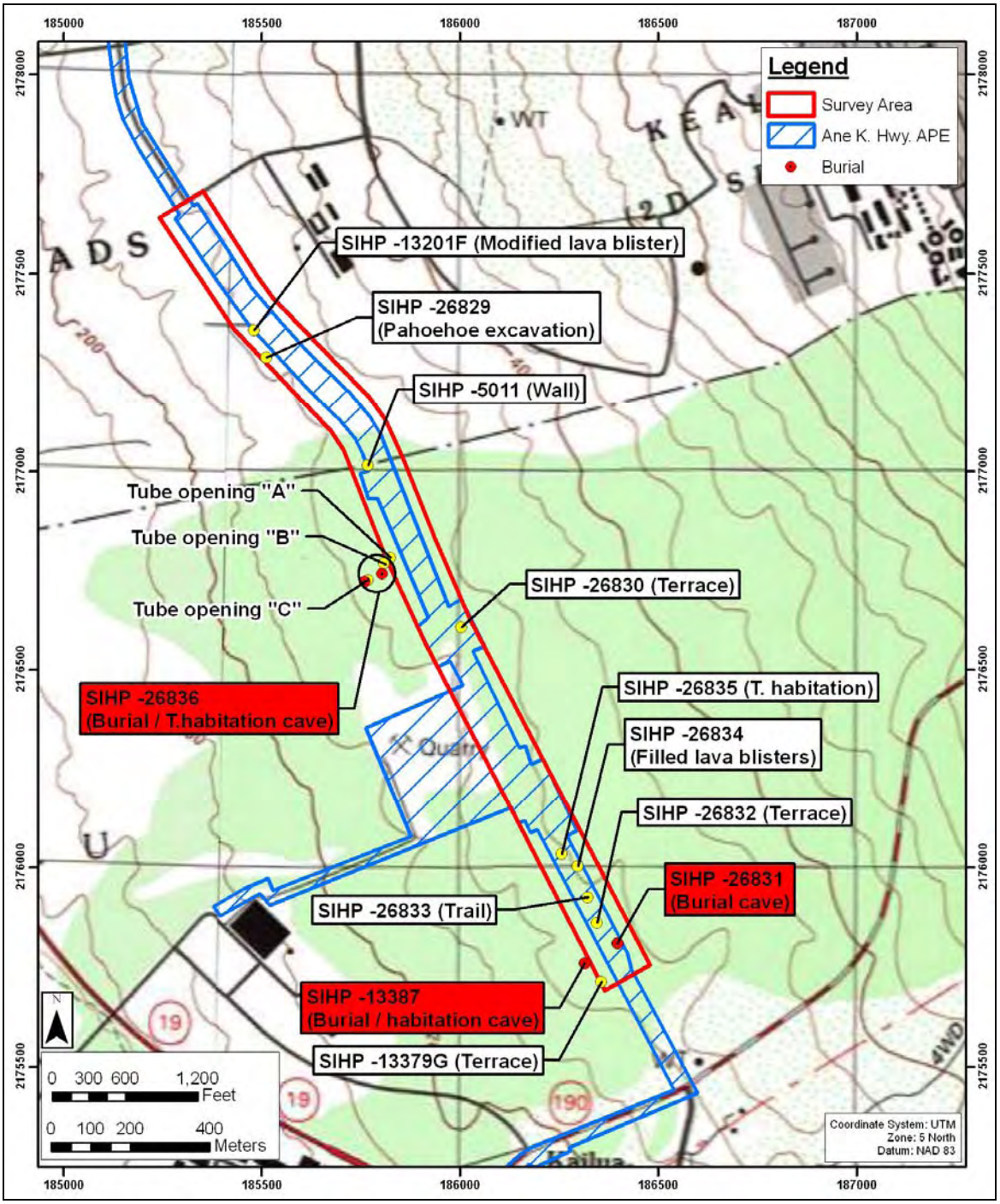

Figure 4 U.S. Geological Survey 7.5-Minute Series Topographic Map, Kailua Quadrangle (1996), showing the locations of cultural resources within and in the immediate vicinity of the survey area and the proposed project's APE. (*Note: SHPD has determined that SIHP -13387 & SIHP -26836 are within the project's APE.)

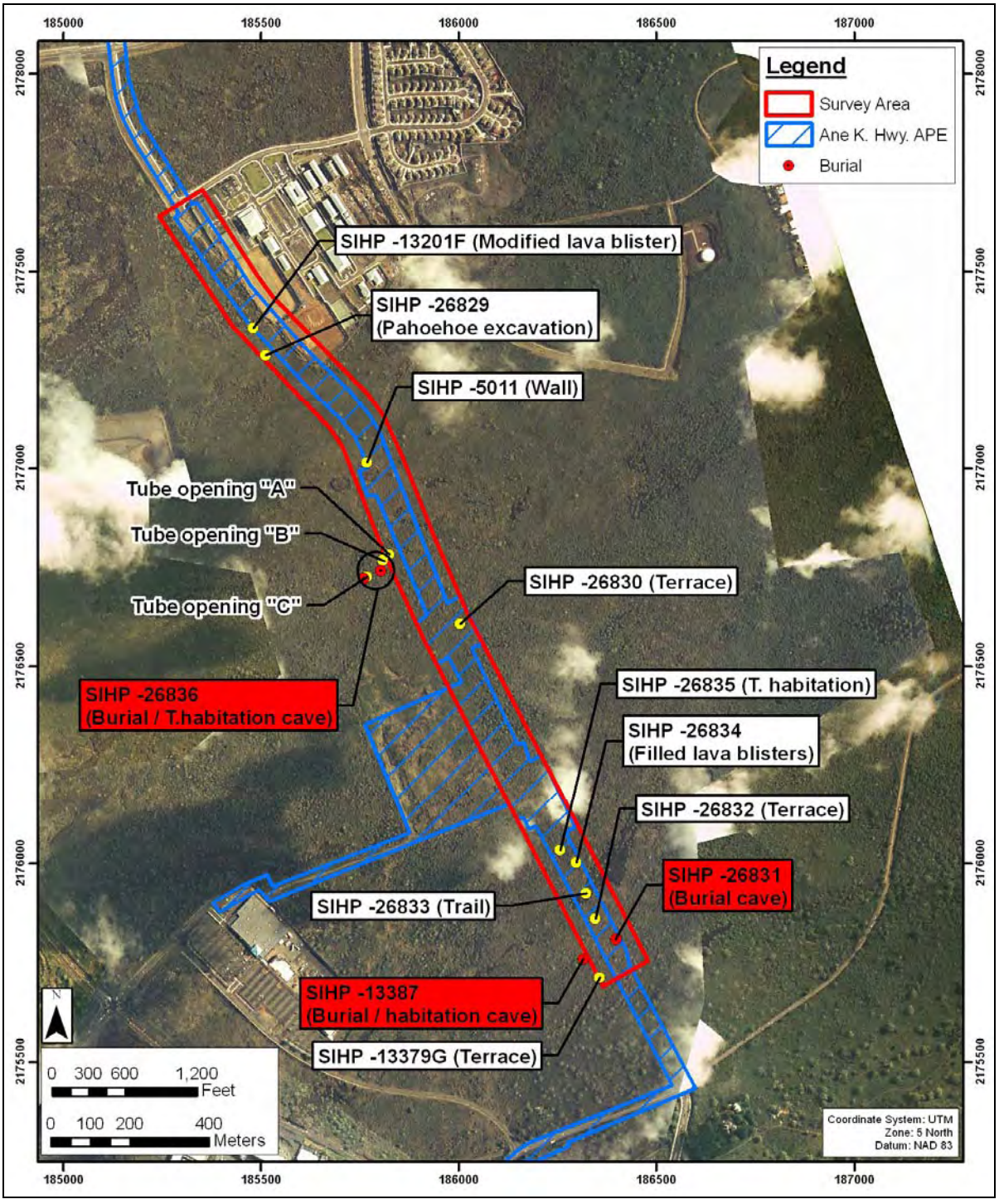

Figure 5 Aerial photograph (source: Google Maps 2009) showing the locations of cultural resources within and in the immediate vicinity of the survey area and the proposed project's APE. (*Note: SHPD has determined that SIHP -13387 & SIHP -26836 are within the project's APE.)

Two of the previously identified burial sites (State Inventory of Historic Properties [SIHP] #s 50-10-28-13387 & 50-10-28-26836—refer to Figures 4 and 5) were identified along the highway corridor, but outside of the construction APE boundary. Following a determination from the State Historic Preservation Division (SHPD), these two burial sites are included in the overall undertaking APE in consideration of any indirect alterations to the character or use of the sites that may result from the undertaking.

Portions of the survey area (including the location of the three sites with a total of four previously identified burials) are privately owned by the Queen Lili‘uokalani Trust. The remaining survey area lands are government-owned by the State of Hawai‘i. Although all three burial sites are currently located on privately-owned Queen Lili‘uokalani Trust land, eventually one burial site, SIHP #50-10-28-26831 (refer to Figures 4 and 5), will become part of lands owned by the County of Hawai‘i.

1.1 Project Background and Archaeological Inventory Survey

Because of federal funding, with Federal Highways Administration (FHWA) as the lead federal agency, the proposed project is an undertaking requiring historic preservation and environmental review compliance under Section 106 of the National Historic Preservation Act, Section 4(f) of the Department of Transportation Act, and the National Environmental Policy Act. As an at least partially Hawaii State-funded venture on private and state lands, the proposed project is subject to Hawai‘i State historic preservation (Hawai‘i Revised Statutes [HRS] Chapter 6E-8/42 and Hawai‘i Administrative Rules [HAR] Chapter 13-275/284) and environmental (HRS Chapter 343) review legislation.

CSH conducted an archaeological inventory survey for the proposed project between 5 and 14 May 2009. The inventory survey investigation was designed to fulfill the State requirements for archaeological inventory surveys per HAR Chapter 13-276. The inventory survey fieldwork involved a complete pedestrian inspection of a project survey corridor, as well as limited subsurface testing to aid in determining the function of located surface features, as well as to possibly obtain datable materials for later radiocarbon dating.

The survey area’s archaeological inventory survey report (Tulchin and Hammatt 2009) was reviewed and approved by SHPD on 20 August 2009 (refer to Appendix D of this document for a copy of this acceptance letter). The inventory survey documented 12 cultural resources (Figure 4 and Figure 5). All of the identified cultural resources are of traditional Hawaiian (probably pre-contact) origin, with the exception of SIHP #50-80-10-28-5011, a post-contact boundary wall. Observed site types consisted of caves and lava tubes, terraces, a trail, modified lava blisters, a *pāhoehoe* excavation, and a wall. Interpreted site functions included the following: burial, temporary habitation, agriculture, transportation, livestock/land division boundary, and marker.

Three of the twelve identified historic properties contained human burials (SIHP -13387, -26831, & -26836), totaling four identified sets of human remains (two sets of *iwi kūpuna* were identified at SIHP # -26836). All four previously identified burials were found in caves and/or lava tubes and lacked associated grave goods (including historic artifacts). Following the procedures of HRS Chapter 6E-43, and HAR Chapter 13-300, the remains were determined by SHPD to be over 50 years old and most likely Native Hawaiian. As previously identified Native Hawaiian burials on Hawai‘i Island, their treatment falls under the jurisdiction of the Hawai‘i

Island Burial Council (HIBC). SIHP #50-10-28-13387, SIHP # -26831, and SIHP -26836 were recommended eligible to the Hawai‘i Register of Historic Places under Criteria D (for information content) and E (for traditional cultural significance to an ethnic group).

Under Hawaii State historic preservation legislation, the inventory survey report's effect recommendation was "affect, with agreed upon mitigation measures." The recommended mitigation measures were two-fold. First, project development should proceed under an archaeological monitoring program to facilitate the identification and treatment of any additional burials that might be discovered during project construction and to alleviate the project's effect on non-burial archaeological deposits. Second, in order to alleviate the project's effect on human burials, the report recommended the preparation of a project specific burial treatment plan (a requirement of HAR Chapter 13-300).

Prepared in consultation with SHPD, Queen Lili‘uokalani Trust, County of Hawai‘i, Belt Collins Hawai‘i Ltd., and the HIBC, this burial treatment plan is designed to fulfill the State requirements for burial treatment plans per HAR Chapter 13-300-33. The plan was prepared to provide SHPD, recognized lineal and/or cultural descendents to the project's previously identified burials, and the HIBC with the appropriate information to support the HIBC's determination of appropriate treatment for the project area's previously identified burial remains. It was also prepared to support the project's historic preservation review under HRS Chapter 6E-8 and HAR Chapter 13-275. The plan describes the methods and procedures that will be used to protect the four previously identified burials during project construction and to preserve them in place in perpetuity.

1.2 Survey Area Environmental Setting

1.2.1 Survey Area Natural Environment

The survey area is located approximately 1.4 km (0.9 mi.) mauka (inland) of Kailua Bay. The land surface slopes gently to the southwest. Elevations within the survey area range from 79 to 85 m (260 to 280 ft.) above mean sea level. Soils in the survey area are reported as Lava Flows, AA (rLV) and Lava Flows, Pahoehoe (rLW) (Figure 6). Sato et al. (1973) provides the following descriptions for each of the lava flow types:

> Lava flows, Aa (rLV) - This lava has practically no soil covering and is bare of vegetation, except for mosses, lichens, ferns, and a few small ohia trees. This lava is rough and broken. It is a mass of clinkery, hard, glassy, sharp pieces piled in tumbled heaps. In areas of high rainfall, it contributes substantially to the underground water supply and is used for watershed.
>
> Lava flows, pahoehoe (rLW) - This lava has a billowy, glassy surface that is relatively smooth. In some areas, however, the surface is rough and broken, and there are hummocks and pressure domes. Pahoehoe lava has no soil covering and
>
> is typically bare of vegetation except for mosses and lichens. In areas of higher rainfall, this lava contributes to the ground-water supply.

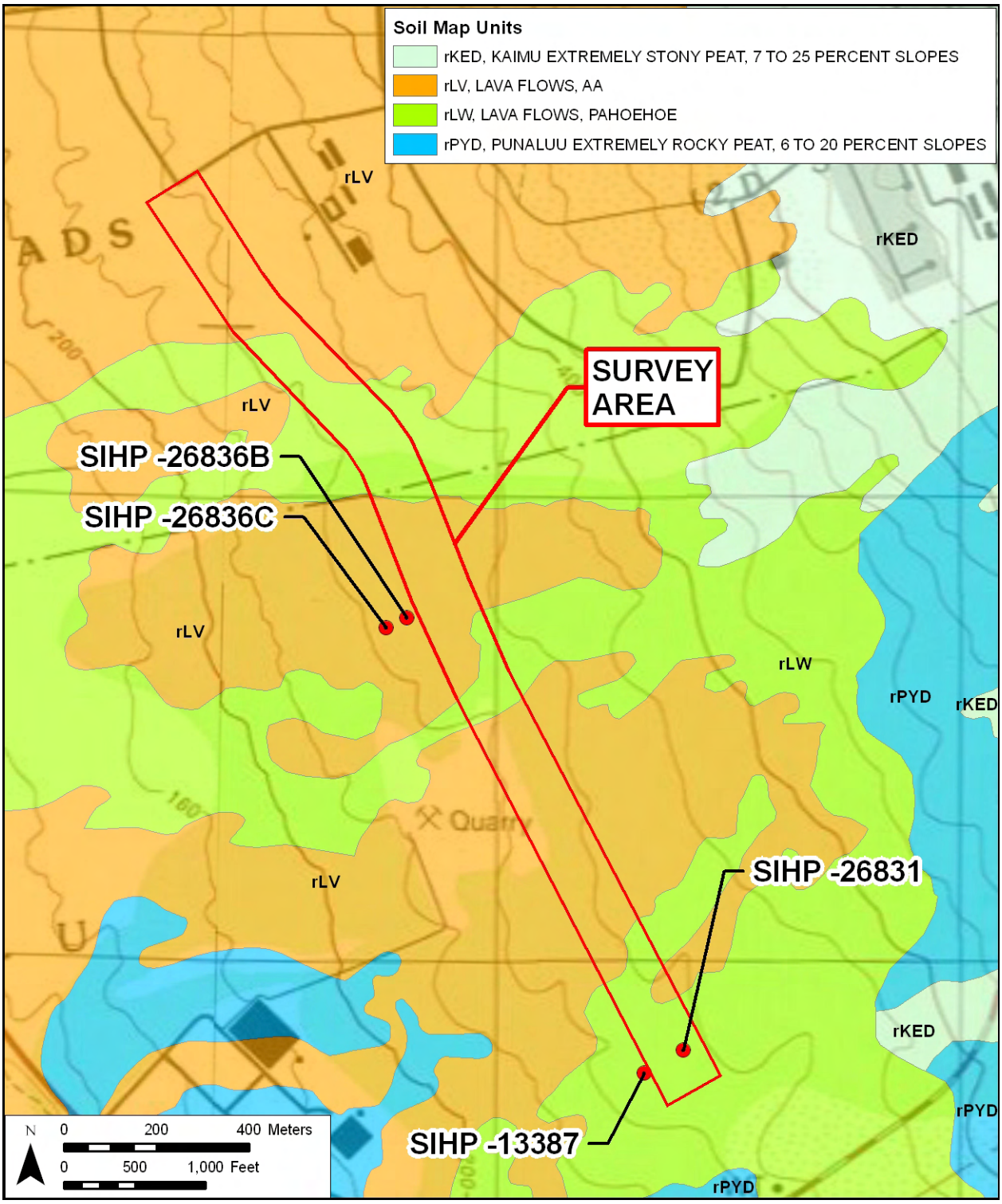

Figure 6. Overlay of Soil Survey of the State of Hawai‘i (Sato et al. 1973), indicating sediment types within the survey area (indicated in red)

The survey area receives approximately 750 mm (30 in.) of annual rainfall (Giambelluca et al. 1986). Vegetation within the survey area primarily consists of *koa haole* (*Leucaena leucocephala*), *kiawe* (*Prosopis pallida*), Christmas berry (*Lycium carolinanum*), and exotic grasses.

1.2.2 Survey Area Built Environment

At present, the survey area is undeveloped. No modern structures are located in the survey area. In general, lands surrounding the entire survey area are undeveloped, with the exception of an abandoned quarry extending into the west side of the southwestern survey area boundary and Kealakehe High School abutting the east side of the northeastern survey area boundary.

Section 2 Background Research

2.1 Oral History and Documentary Background

2.1.1 Oral History and Pre-Western Contact

The survey area is located within the *ahupua‘a* (traditional land units) of Keahuolū and Kealakehe. Keahuolū and Kealakehe Ahupua‘a are located within a transitional area between two distinct ecological zones. Lands to the south, known as *Kona kai ‘opua* (Kona of the distant horizon clouds above the ocean), between Kailua Bay and Keauhou Bay, are generally recognized as the fertile agricultural district and population center of North Kona (Kirch 1985:166; Kelly 1983). The relatively dry *Kekaha-wai-‘ole* area of North Kona to the northeast is characterized by coastal fishponds and relatively barren lava hinterlands. During HIBC meeting conversation regarding earlier drafts of this burial treatment plan, there was discussion of the appropriate English translation of the place name *Kekaha-wai-‘ole*. Ms. Nicole K. Lui was kind enough to ask her *tutu wahine,* Ms. Anita Kauaiauau Keohokālole Solomon, for her translation. Ms. Solomon replied that the name referred to “a land that did not have a lot of rainfall.” Discussion among the HIBC members suggested that this translation, although not wrong, perhaps did not grasp the place name’s true meaning and significance. HIBC members suggested “no evidence of erosion” was a more fitting translation—indicating that in this area there is no evidence of stream channels caused by the surface flow of water. This lack of evidence of surface stream flow—the absence of “*kahawai”*—is an important environmental characteristic of *Kekaha-wai-‘ole,* and Native Hawaiians may have included this environmental clue in the place name as an inference to indicate water flowing, not on the ground surface, but below the ground surface. Perhaps residents had noticed this subsurface water flow, for example at the coast, where fresh ground water could have been collected from springs. HIBC council members pointed this out as another example of the poetic euphemism often found in the Hawaiian language.

The name of the *ahupua‘a*, Ke-ahu-o-lū, has been translated in two ways. The first is as “the *ahu* [cairn or altar] of Lū” (Pukui et al. 1974:101). There are no oral history accounts of a Hawaiian named Lū, but an *ahu* is a mound, often used as an altar, so the name could refer to “the altar of Lū.” The name of the land has also been written as Ke‘ohu‘olu, which means “the refreshing mists” (Maly 1994:A-3).

There is a mound-hill at Keahuolū and Kealakehe, the *ahupua‘a* to the north, that is also associated with mists. According to the oral history of Ka-Miki, which include a series of stories about a supernatural hero who traveled around the Hawaiian Islands in the 13th century:

> Ka-noenoe (The mist, fogginess). The mound-hill called Pu‘u-o-Kaloa sits upon the plain of Kanoenoe which is associated with both Keahuolu and Kealakehe. The settling of mists upon Pu‘u-o-Kaloa was a sign of pending rains; thus the traditional farmers of this area would prepare their fields. This plain was referenced by Pili when he described to Ka-Miki the extent of the lands which Ka-Miki would over see upon marrying the sacred chiefess Paehala of Honokōhau. The inheritance lands included everything from the uplands of

> Hikuhia above Nāpu‘u and the lands of the waterless Kekaha, which spanned from the rocky plain of Kanikū (Keahualono) to the plain of Kanoenoe at Pu‘ukaloa. [*Ka Hōkū o Hawai‘i* 10/25/1917, as translated by Maly 1994:A-4]

Another legendary account discusses the hill called Pu‘u-o-kaloa:

> Pu‘u-o-kaloa is a mound-hill site in the lands of Keahuolu-Kealakehe, not far from the shore of Kaiwi and Hi-iakanoholae. During periods of dry weather (*Ka lā malo‘o*) when planted crops, from the grassy plains to the ‘ama‘uma‘u (fern forest zone), and even the ponds (*ki‘o wai*) were dry, people would watch this hill for signs of coming rains. When the *līhau* (light dew mists) sat atop the hill of Pu‘u-o-kaloa, rains were on the way. Planters of the districts agricultural fields watched for omens at Pu‘uokaloa, and it was from keen observation and diligent work that people prospered on the land. If a native of the land was hungry and came asking for food, the person would be asked:
>
> *Ua ka ua i Pu‘ukaloa, ihea ‘oe*?
>
> When rains fell at Pu‘ukaloa, where were you?
>
> If the answer was…
>
> *I Kona nei no*!
>
> In Kona!
>
> There would be no sweet potatoes for this person. If the answer was…
>
> *I Kohala nei no*!
>
> In Kohala! (The person would be given food to eat for they had been away, thus unable to accomplish the planting.) [*Ka Hōkū o Hawai‘i* 3/19/1914, as translated by Maly 1994:A-5]

These legendary accounts emphasize the importance of rainfall in this relatively dry region for farmers, who were cultivating sweet potatoes and other crops on the plains of Keahuolū and Kealakehe.

2.1.2 Early Post-Western Contact

Early missionary residents made the first estimates of the population of the North Kona District. Asa Thurston estimated a population of not less than 20,000 people along a 30-mile stretch of the Kona Coast. These residents were clustered on the coast, but some families also lived in a habitation belt about 2 miles inland (Kelly 1983:14). A formal census was conducted in 1832, and 12,432 people were recorded for the district of Kona. By 1835, this number had declined to 5,957. By 1853, the number had dropped to 2,210 (Schmitt 1973:21, 29, 31). The missionary, William Ellis (1976:32), visited the Kona area in 1822 and noted deserted villages and abandoned fields “everywhere to be met with.”

William Ellis also described Kailua Bay, the coastal area to the south of the survey area as follows:

> The houses which are neat, are generally erected on the sea-shore, shaded with cocoa-nut and kou trees, which greatly enliven the scene. The environs were

> cultivated to a considerable extent: small gardens were seen among the barren rocks on which the houses were built, wherever soil could be found sufficient to nourish the sweet potato, the watermelon, or even a few plants of tobacco, and in many places they seemed to be growing literally in the fragments of lava, collected in small heaps around their roots. [Ellis 1976:31]

Few historical records can be found about the early history of Keahuolū and Kealakehe. In 1869, Keahuolū was described thus by David Kalākaua:

> This land is situated in the District of North Kona, bounded by the *ahupua‘a* of Lanihau (in Kailua) belonging to Prince Lunalilo on the Ka‘u side, and on the Kohala side, by Kealakehe, a government land and Honokohaniki belonging to Keelikolani. Keahuolu runs clear up to the mountains and includes a portion of nearly one half of Hualalai mountains. On the mountains the *koa*, *kukui* and *ohia* abounds in vast quantities. The upper land or inland is arable, and suitable for growing coffee, oranges, taro, potatoes bananas &c. Breadfruit trees grow wild as well as the *Koli* [kolī, castor-oil plant] oil seed. The lower land is adopted for grazing cattle, sheep, goats, &c. The fishery is very extensive and a fine grove of cocoanut trees of about 200 to 300 grows on the beach. The flat land near the sea beach is composed chiefly of lava, but herbs and shrubbery grows on it and [it is] suitable for feed of sheep and goats. It is estimated at 15,000 to 20,000 acres or more. [cited in Donham 1990a: B-5]

2.1.3 Mid- to late-1800s

In 1848, Kamehameha III authorized the Māhele (*lit*. division), which defined the land interests of the king, the high-ranking chiefs, and the *konohiki* (landlords for the chiefs). The lands awarded to the chiefs and their *konohiki* were known as “Konohiki Lands”. In 1848, four resolutions were passed to protect the rights of the *kama‘āina*, the native tenants. The resolutions authorized the Land Commission to award fee simple title to native tenants for habitation and agricultural lands that were part of Crown Lands (lands reserved for the royal family), Government Lands (lands held by the government), or Konohiki Lands. The lands for the common people became known as *kuleana* (tenant) awards (Chinen 1958; Chinen 1961).

Through the Māhele of 1848, the entire *ahupua‘a* of Keahuolū was awarded to Ane Keohokālole, who had held two walled houselots “from very ancient times” along the shore. Keohokālole was the granddaughter of Ali‘i Aimoku Kame‘eiamoku, the paramount chief that supported Kamehameha I, and the wife of High Chief Caesar Kapa‘akea, who was the son of High Chief Kamanawa ‘Elua (SHPD correspondence 6 August 2009 LOG NO:2009.2478 DOC NO:0908AJ04). She was also the mother of the future King David Kalākaua, the future Queen Kamaka‘eha Lydia Lili‘uokalani, William Pitt Leleiōhoku, and Miriam Likelike. Ane Keohokālole later sold portions of her 15,000-20,000-acre grant to the government and other parties, with the remainder being passed on to her heir, Lili‘uokalani. Kealakehe Ahupua‘a was held as Government Lands.

Emerson, a 19th century government surveyor, described the inland portion of Keahuolū and Kealakehe as “rough pahoehoe, little vegetation,” similar to descriptions of the dry and barren lands of Kekaha (Reg. Map 1280, Figure 7). David Kalākaua further described these *kula* (plains

used for dry land agriculture) lands as suitable for livestock grazing (Donham 1990a). No *kuleana* claims were awarded in the inland portion (lower *kula* zone) of Keahuolū and Kealakehe, and there is little historic information concerning traditional Hawaiian land use in the area. However, the archaeological record suggests that dry land agriculture in areas designated grazing land was once relatively intensive.

The upper *kula* zone was historically the primary agricultural zone of the two *ahupua‘a*. Many *kuleana* claims were awarded for this area, with documentation indicating that dry land crops were grown here. The most common crop described in the claims was taro, with coffee and potatoes also mentioned. During the Māhele, few of these *kuleana* awards were granted; instead, these lands were generally awarded to the *konohiki* (lower chiefs), who used the lands for livestock grazing (Kelly 1983:67).

Emerson described the boundary between the inland and upland forested areas in this transitional region as “lava covered with scattering forest and dense masses of *ki* [ti; *Cordyline terminalis*] root” (Kelly 1983:58). Lands below the forest edge were described as “rocks covered with grass” (Kelly 1983:58). Emerson estimated the forest edge boundary to be at 200-230-m (650-750-ft.) elevation in Keahuolū well upslope of the survey area.

2.1.4 1900s to Present

The population of the North Kona region continued to decline until around A.D. 1890, when it was 1,754 people. By 1900, the population had increased to 3,189 and continued to increase as people moved into the urban and suburban lands around Kailua-Kona.

A sisal (*Agave sisilana*) mill was constructed in Keahuolū sometime during the late 1890s. Sisal was grown to make ropes and other fibers. The mill was located along the southern portion of the old Palani Road corridor at an elevation of approximately 130 m (430 ft.). Operating until 1924, the mill was surrounded by sisal fields that covered an area of up to 1000 acres in Keahuolū and Kealakehe *ahupua‘a* (Jensen 1990). An area of concentrated sisal growth was located along a section of the old Palani Road at an elevation of approximately 180 m (600 ft.), which was believed to be at too high an elevation to be associated with the mill itself, though it may have been related to sisal transport operations (Donham 1990b).

In 1909, the Lili‘uokalani Trust was established to provide for children, particularly orphans, of Hawaiian descent. Income is derived from real estate owned by Queen Lili‘uokalani. As a result of the trust deed of Queen Lili‘uokalani, the lands of Keahuolū were placed in a trust. Until recent years, the Keahuolū lands were primarily used for grazing livestock. In the last thirty years, the Queen Lili‘uokalani Trust has begun to develop the Keahuolū lands to generate revenue for their programs. The area around Palani Road is now occupied with retail centers, offices, and residential subdivisions.

As government lands, portions of Kealakehe Ahupua‘a were subdivided as the Kealakehe Homesteads for purchase by homesteaders for residential development. Following the passage of the Hawaiian Homes Commission Act in 1921, portions of Kealakehe were designated Hawaiian Homelands, “…for the benefit and use of native Hawaiians, upon which they may live, farm, ranch, and otherwise engage in commercial or industrial or any other activities.”

Kealakehe lands were acquired by the Department of Hawaiian Home Lands (DHHL) in lieu of monies owed to the department (SHPD correspondence 6 August 2009 LOG NO:2009.2478 DOC NO:0908AJ04).

The 1959 U. S. Geological Survey map () and 1978 U.S. Geological Survey orthophotograph (Figure 9) show a general lack of development in the vicinity of the survey area. Development is indicated to be concentrated around the coastal area of Kailua Bay, as well as in the upland areas. Development on the Kealakehe Hawaiian Homelands has commenced in recent years with the construction of residential subdivisions.

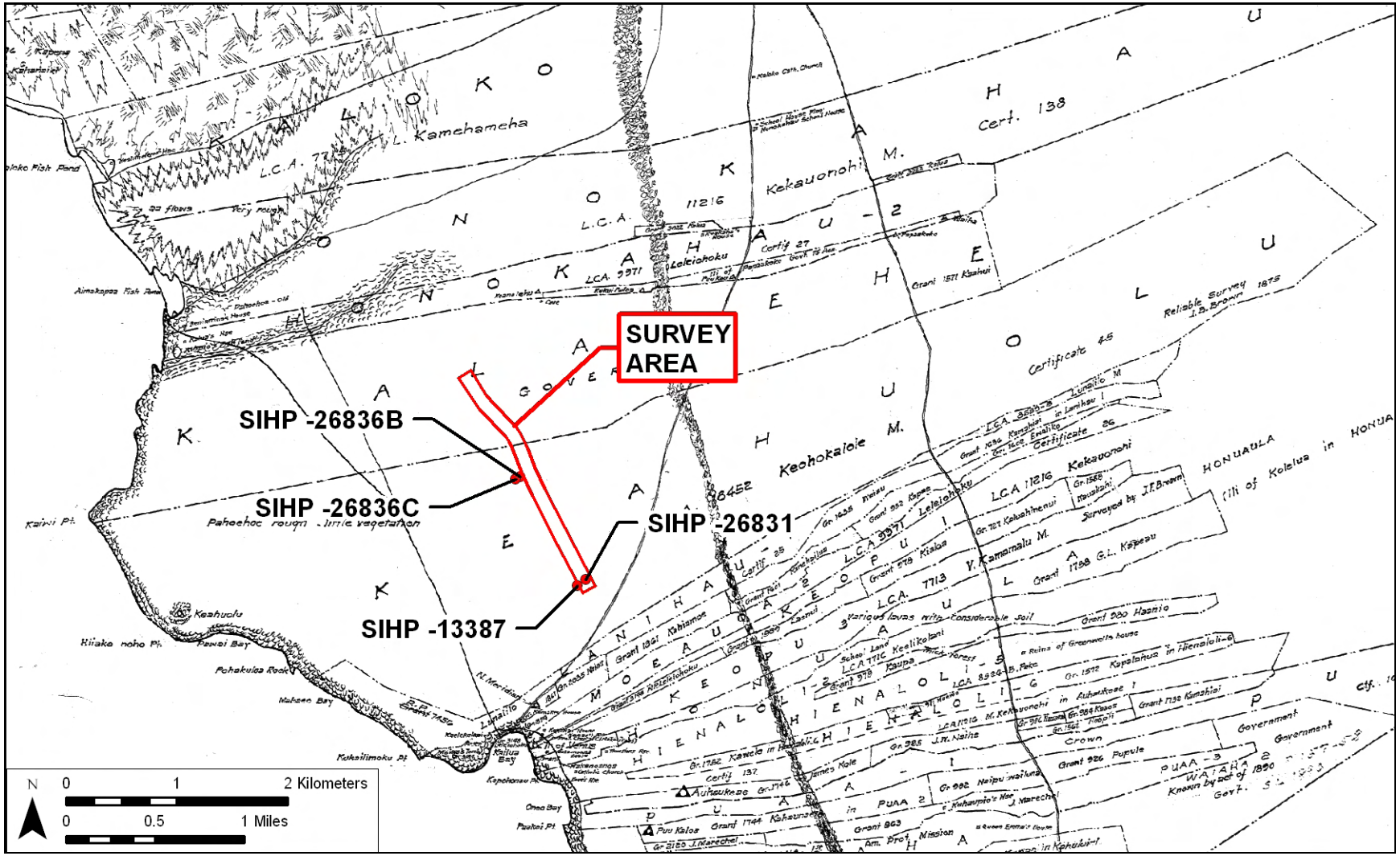

Figure 7. 1891 Emerson map of the Kailua Section of North Kona (RM 1280), showing the location of the survey area

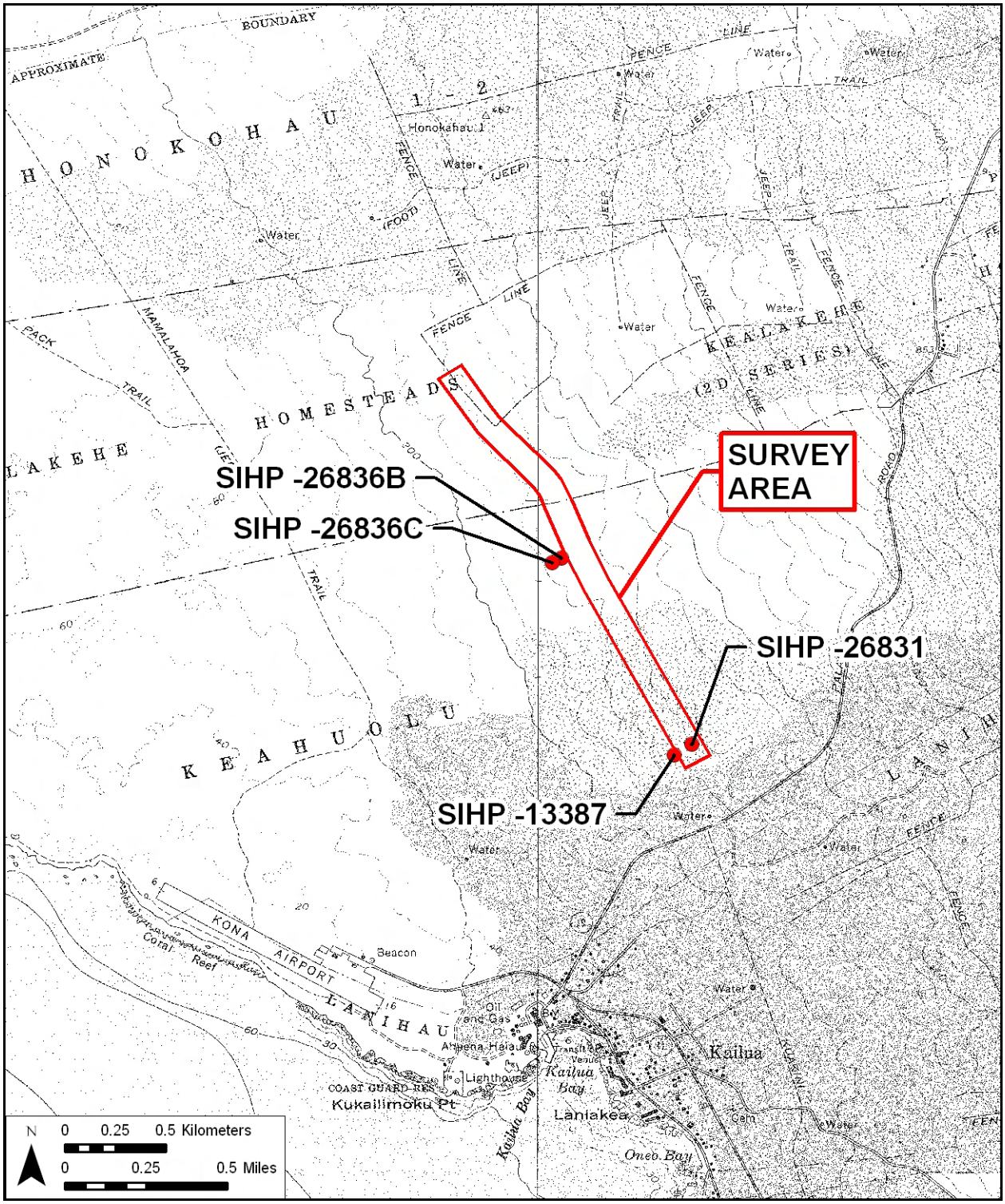

Figure 8. 1959 U.S. Geological Survey Topographic Map, Kailua and Keāhole Point Quadrangles, showing the location of the survey area

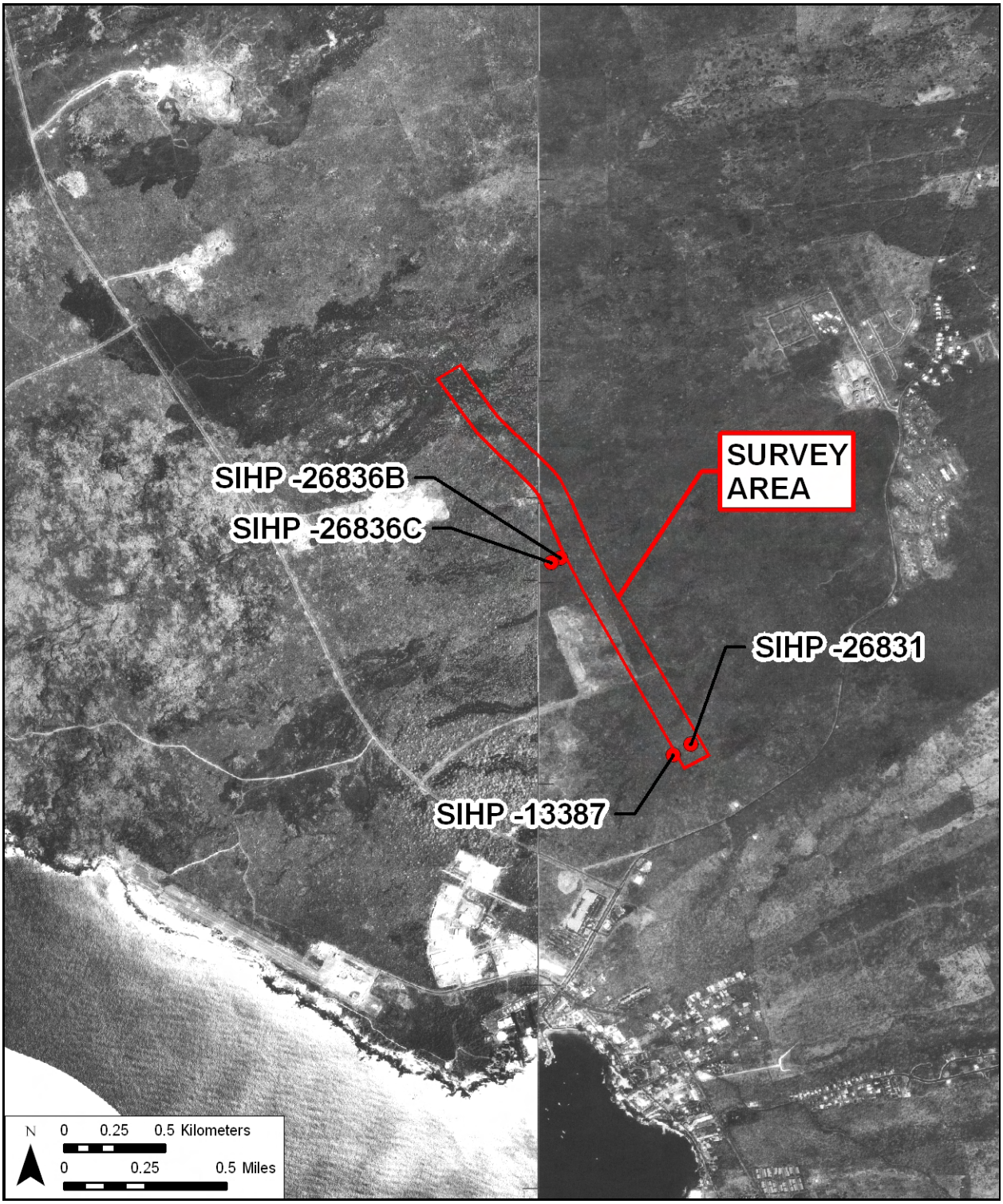

Figure 9. 1978 U.S. Geological Survey Orthophoto quad, Kailua and Keāhole Point Quadrangles, showing the location of the survey area

2.2 Previous Archaeological Research

Early archaeological investigations (Table 1) in the *ahupua‘a* of Keahuolū and Kealakehe were generally focused on coastal ceremonial and habitation sites. In 1906, Stokes (Stokes and Dye 1991) documented three *heiau* (places of worship), Luapauwila Heiau, Kawaluna Heiau, and Palihiolo Heiau, and one *ko‘a* (fishing shrine), Halepa‘u Ko‘a and, along the coast of Kealakehe and Keahuolū. In 1930, John Reinecke conducted a survey of Hawaiian sites along the Kona coast. Reinecke noted the presence of numerous habitation platforms and petroglyphs (Reinecke 1930). Kenneth Emory (1970:37) indicated Reinecke's sites 10 to 24 are located in Keahuolū, consisting of "15 platforms, three house sites, four pens, three brackish water pools, two shelters, one enclosure, a *papamū* [stone on which the checker-like game, *kōnane*, was played], and several petroglyphs…" Emory (1970:37) also indicated Reinecke's sites 25 to 31 are located in Kealakehe, including the Kealakehe settlement ruins, consisting of "13 house platforms, 11 burials, two corrals, one pen, and two *heiau*, Heiau-o-Kāne and Heiau Maka‘opio."

In 1990, Paul H. Rosendahl, Ph.D., Inc. (PHRI) completed an archaeological inventory survey for the Queen Lili‘uokalani Trust Property in Keahuolū (Donham 1990a) (Figure 10, Table 2 & Figure 11). The approximately 1,100-acre study area consisted of lands both *mauka* and *makai* of the Queen Ka‘ahumanu Highway, including the Keahuolū portion of the survey area (Figure 10). A total of 239 historic properties, including 1,810 features, were located within the study area. The most common features types consisted of rock mounds, modified lava blisters and outcrops, and *pāhoehoe* excavation features. Other common features included small terraces, low platforms, enclosures, and rubble walls. Agricultural features accounted for 90% of identified sites. The archaeological features were generally found within four clusters:

> At the northwestern end of the project area between nine and 20 ft AMSL; along the east side of Queen Kaahumanu Highway, between 50 and 150 ft AMSL; along the north side of Palani Road, between 200 and 400 ft AMSL; and at the eastern end of the project area, between 450 and 600 ft AMSL. The patterning of these clusters is such that they are in non-overlapping elevation ranges which encompass the overall elevation range of the project area. [Donham 1990a:15]

In the vicinity of the Cultural Surveys survey area, Donham (1990a) identified *pāhoehoe* excavations, cairns, burial caves, enclosures, and terraces (Table 2).

In 1990, PHRI completed an archaeological inventory survey for the Kealakehe Planned Community in Kealakehe (Donham 1990b) (Figure 10, Table 2 and Figure 12). The approximately 950-acre study area consisted of lands *mauka* of the Queen Ka‘ahumanu Highway, including the Kealakehe portion of the Cultural Surveys survey area (Figure 10). A total of 82 historic properties, including 840 features, were located within the study area. The most common features types consisted of rock mounds and *pāhoehoe* excavation features. Other common features included modified outcrops, terraces, enclosures, and low mounded walls. The author noted the predominance of such features indicates "relatively intensive use of the area for agricultural purposes" (Donham 1990b:ii). In the vicinity of the Cultural Surveys survey area, Donham (1990b) identified *pāhoehoe* excavations, modified outcrops, rock mounds, cairns, trails, terraces, a paved area, and a ranch wall (Table 2).

Table 1. Previous Archaeological Studies in Kealakehe and Keahuolū Ahupua‘a

Reference	Project Location	Report Type And Results
(Stokes 1906); Stokes & Dye 1991	Island of Hawai‘i	Survey: Identified two *heiau*, Kawaluna Heiau and Palihiolo Heiau, and two *ko‘a*, Halepa‘u Ko‘a and Maka‘eo Ko‘a.
Reinecke 1930	West Hawai‘i	Survey: Identified 7 sites: Sites 8 through 14, including house platforms, small complexes encompassing enclosures and platforms, petroglyphs, and a possible fishing *heiau*.
Sekido 1968	A Shelter Cave Kealakehe D11-1a	Archaeological Excavation Report (Anthropology 371 UH Hilo paper)
Emory 1970	Ka‘ū, Kona Districts and ‘Anaeho‘omalu	Inventory of Sites: Named 4 sites in the old Kona Airport vicinity, two *heiau*, one *ko‘a* and a cluster of petroglyphs
Newman 1970	*Makai* portion of Kona Airport	Field Inspection: observed several sites, assigning 3 sites State numbers
Bevaqua 1972	a portion of Keahuolū	Archaeological Reconnaissance Survey
Neighbor Island Consultants 1973	Old Kona Airport	Reconnaissance Survey: Identified 19 sites including planting pits, house sites, burials, and petroglyphs
Sinoto 1975a	a proposed access road corridor at Keahuolū	Archaeological Reconnaissance Survey identifying 7 sites (walls and enclosures)
Sinoto 1975b	Honokōhau Small-Boat Harbor Kealakehe	Archaeological Reconnaissance Survey documenting no new sites but discussing 3 previously identified sites
Ching 1978	987-acre parcel from the shore to Ka‘ahumanu Hwy	Reconnaissance Survey: 50 sites identified consisting of: salt pans along the coast, cave shelters, platforms, enclosures, *ahu* (cairn), pavements, petroglyphs, wells, and planting areas.
Rosendahl 1979	Three parcels adjacent to Queen Ka‘ahumanu Hwy and/or Palani Rd., Keahuolū Ahupua‘a	Reconnaissance Survey: Thirteen features or feature complexes were recorded in the three parcels. Parcel 1 was later surveyed as the QLT 100-Acre KIS parcel (O'Hare & Rosendahl 1993); Parcel 2 is a section of the 1,100 acre QLT inventory survey parcel (Donham 1990b and others), and Parcel 3 covers the area between Palani Road and the Henry St. Extension area (Rosendahl 1993b and others)

Reference	Project Location	Report Type And Results
Estioko-Griffin & Lovelace 1980	Old Kona Airport	Reconnaissance Survey: 35 archaeological sites were identified. Identified sites varied in age (pre-contact, post-contact, and modern) and in form (enclosures, burials, lava shelter caves, bait mortars, walls, *ahu*, and petroglyphs).
Folk 1980	Lili‘uokalani Trust Lands, coastal Keahuolū	Archaeological Survey and Selective Subsurface Testing work at 21 sites
Neller 1980	Old Kona Airport Beach Park, Keahuolū and Lanihau	Archeological Reconnaissance documents an isolated burial find
Soehren 1980	Proposed Kailua Wastewater Treatment Site Kealakehe, makai of Queen Ka‘ahumanu Hwy. TMK 7-4-08:por. 3	Letter Report on An Archaeological Reconnaissance Survey documenting trail 50-10-27-7704
Soehren 1983	Ten-acre parcel near the Queen Lili‘uokalani Village, Lanihau and Keahuolū Ahupua‘a	Reconnaissance Survey of parcel; no sites were recorded in a 10-acre parcel at elevations of 240-300 m (800-1000 ft).
Schilt 1984	Kuakini Highway Realignment Project - 26 *ahupua‘a* in Kona	Archaeological Study: 134 sites were found in the road corridor; two sites, a cairn and a modified outcrop, were recorded in Keahuolū.
Bonk 1987	Lower Kealakehe	An Archaeological Walk-Through Survey noted sites in a 1,000ft - wide coastal strip and between 620’ and 730’ elevation
Hammatt 1987	15-Acre Parcel Kealakehe, (TMK 7-4-17:30) at 700’ elevation	Archaeological Reconnaissance describing 18 sites including mounds, terraces, overhang shelters, agricultural complexes and cattle walls
Rosendahl 1988	Kaahumanu Plaza II Development Site Keahuolū, (TMK 3-7-4-08: Por. 2)	Archaeological Field Inspection documenting a stone walled enclosure understood as a cattle corral

Reference	Project Location	Report Type And Results
Donham 1990a	QLT Lands 1,100 acre parcel	Inventory Survey: 239 sites, comprising 1,810 features were recorded. The most common features types consisted of rock mounds, modified lava blisters and outcrops, and *pāhoehoe* excavation features. Other common features included small terraces, low platforms, enclosures, and rubble walls. Agricultural features accounted for 90% of all identified sites.
Donham 1990b	QLT Lands 1,100 acre parcel, Keahuolū Ahupua‘a	Inventory Survey: 239 sites, comprising 1,810 features were recorded. Distributional patterns similar to those found at the Kealakehe Planned Community area were noted.
Jensen 1990	Palani Road Improvement Project, Keahuolū Ahupua‘a	Inventory Survey: 32 sites were recorded and four radiocarbon dates ranging from A.D. 1400-1640 to the present were determined
Smith & Yent 1990	Old Kona Airport	Data Recovery: Identified 4 new sites within the Old Kona Airport area, including walls, paving and filled crevices
Borthwick and Hammatt 1992a	A Proposed Kealakehe Sewer Force Main and Waste Water Pumping Station, Kealakehe & Keahuolū TMK 7-5-04:67, 7-5-05:07, 7-4-08:02,	Archaeological Assessment discussing ten previously identified sites and 4 new sites
Borthwick and Hammatt 1992b	Proposed Kealakehe Golf Center, Kealakehe, North Kona, Hawai‘i Island, (TMK 7-1-8: por. 17),	Archaeological Field Inspection and Interim Preservation Plan identifies 2 additional sites (15,537, a cave and 15,538, a terrace)
Burgett and Rosendahl 1992	Kealakehe *mauka* of Queen Ka‘ahumanu Hwy.	44 additional historic properties, comprised of 225 features, were identified within the study area previously surveyed by Donham (1990b). An additional 103 features were also identified at sites previously identified by Donham (1990b). The most common feature types consisted of modified outcrops, rock mounds, terraces, and *‘a‘ā* excavations.

Reference	Project Location	Report Type And Results
Yent 1992 (Nagata 1992)	Canoe Hālau Project, Old Kona Airport State Recreation Area, TMK 7-7-05: por. 5	Field Inspection: Identified 1 new sites, a petroglyph, within the old Kona Airport area
Goodfellow and Walker 1993	QLT Lands Palani Road Turning Lane, Keahuolū Ahupua‘a	Field Inspection: Seventeen sites were recorded. Data Recovery: Two sites, which were in danger of damage during construction of the Palani Turning Lane were tested. A human burial was found in one feature. Two radiocarbon dates, both ranging from about A.D. 1410-1955, were determined for an agricultural terrace.
O’Hare & Rosendahl 1993	QLT 100-acre parcel from Old Kona Airport to Queen Ka‘ahumanu Hwy.	Inventory Survey: Eighteen historic properties were identified, including a section of the Māmalahoa Trail, one burial, modified outcrops, mounds, terraces, walls, *ahu*, filled depressions, *pāhoehoe* excavations, an enclosure, and a cave shelter.
Rosendahl 1993a	Keahuolū Reservoir Site, Keahuolū Ahupua‘a	Field Inspection Five sites with 31 component features were recorded in two parcels in elevations from 509-524 m AMSL. The majority of the sites were determined to be agricultural features associated with the Kona Field System (see also Walker 1994 and Jensen & Head 1995).
Rosendahl 1993b	Henry Street Extension, Keahuolū and Lanihau Ahupua‘a	Field Inspection, conducted along a proposed road corridor. Seven sites were identified; four were connected and were related to cattle ranching in the historic period. One tested temporary habitation platform at Site 50-10-28-19486 was dated to A.D. 1650-1955 (see also Wulzen et al. 1996 and Wulzen & Wolforth 1997).
O’Hare & Franklin 1994	QLT Lands Palani Road Turning Lane	Inventory Survey: Two historic properties were identified: SIHP # 50-10-27-19762, an agricultural complex containing modified outcrops, terraces, and a mound; and SIHP #50-10-27-19763, a burial mound.
Walker 1994	Keahuolū Reservoir Site, Keahuolū Ahupua‘a	Field Inspection: Five sites with 31 component features were recorded in two parcels in elevations from 509-524 m AMSL. The majority of the sites were determined to be agricultural features associated with the Kona Field System (see also Rosendahl 1993a and Jensen & Head 1995).

Reference	Project Location	Report Type And Results
Carpenter 1995	Old Kona Airport State Recreation Area, Lanihau and Keahuolū	State Parks Burial Recovery Report describing an estimated 24 burials revealed by high surf
Jensen & Head 1995	Keahuolū Reservoir Site, Keahuolū Ahupua‘a	Inventory Survey: Five sites with 31 component features were recorded in two parcels in elevations from 509-524 m AMSL. The majority of the sites were determined to be agricultural features associated with the Kona Field System (see also Rosendahl 1993a and Walker 1994).
Walsh & Hammatt 1995	New Queen Ka‘ahumanu Right-of-Way	Inventory Survey: Seventeen historic properties were located, with one, the Māmalahoa Trail (Site 00002), recorded in Keahuolū Ahupua‘a.
Wulzen et al. 1996	Henry Street Extension, Keahuolū and Lanihau Ahupua‘a	Archaeological Inventory Survey conducted along a proposed road corridor. Seven sites were identified; four were connected and were related to cattle ranching in the historic period. One tested temporary habitation platform at Site 50-10-28-19486 was dated to A.D. 1650-1955 (see also Rosendahl 1993b and Wulzen & Wolforth 1997).
Wulzen & Wolforth 1997	Henry Street Extension, Keahuolū and Lanihau Ahupua‘a	Additional Subsurface Testing conducted along a proposed road corridor. Seven sites were identified; four were connected and were related to cattle ranching in the historic period. One tested temporary habitation platform at Site 50-10-28-19486 was dated to A.D. 1650-1955 (see also Rosendahl 1993b and Wulzen et al. 1996)..
Henry et al. 1998	Palani Road Corridor, Keahuolū Ahupua‘a	Inventory Survey: Thirty-five sites were relocated or newly identified. Radiocarbon dates for five features were determined, which suggested an initial use of the area for agriculture in A.D. 1410 to 1665.
Corbin 2001	QLT Lands Block C, Keahuolū Ahupua‘a	Data Recovery at two sites first identified by Donham (1990a): 188 features were identified at the two sites and 16 test units were excavated. Three radiocarbon dates of A.D. 1400-1640, A.D. 1490-1900, and A.D. 1660-1950 were determined for the sites.

Reference	Project Location	Report Type And Results
Tulchin & Hammatt 2002	Kealaka‘a Street Realignment Project, Keahuolū Ahupua‘a	Archaeological Assessment confirmed the location of three previously identified sites within the 100 ft. - wide grubbing limits of the proposed road corridor. These were Site 50-10-27-13244 (kerbstone trail), Site 50-10-27-13246 Feature A (roadbed), and Site 50-10-27-13248 (wall).
Madeus et al. 2004	3-Acre Parcel, Keahuolū (Kona Fire Station) TMK (3) 7-4-008:027	Archaeological Assessment identified no new sites but describes SIHP 50-10-28-23,798
Perzinski et al. 2004	Verizon Office Subdivision Project (TMK 3-7-4-8:20)	Archaeological Inventory Survey: One habitation site (SIHP # 50-10-28-23,798) with three features a platform with an adjoining terrace and two modified outcrops
Cleghorn 2007	Māmalahoa Trail (Site 50-10-27-02) in the vicinity of Makala Blvd. and the Queen Ka‘ahumanu Highway	Damage Assessment Report assessing modest damage to Māmalahoa Trail
Hammatt and Shideler 2007	Māmalahoa Trail (SIHP #50-10-27-002) in the Vicinity of Makala Boulevard and the Queen Ka‘ahumanu Highway, Keahuolū	Documentation of Damage Report assessing modest damage to Māmalahoa Trail
Hammatt et al. 2008	Māmalahoa Trail (SIHP #50-10-27-002) in the Vicinity of Makala Boulevard and the Queen Ka‘ahumanu Highway, Keahuolū	Mitigation Implementation Report documenting modest re-construction efforts at Māmalahoa Trail