

Appendix A
U.S. Army Corps of Engineers' Preliminary
Jurisdictional Determination and Delineation of
Wetlands and Other Waters of the U.S. for the
Halona Street Bridge Replacement Project
(March 2015)



DEPARTMENT OF THE ARMY
HONOLULU DISTRICT, U.S. ARMY CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

December 2, 2015

SUBJECT: Preliminary Jurisdictional Determination for Central Federal Lands Highways Division (CFLHD) Halona Street Bridge Project, Honolulu (Kalihi), Oahu Island, Hawaii. DA File No. POH-2015-00225.

Mr. Mike Will
U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highways Division
12300 West Dakota Avenue, Suite 380A
Lakewood, CO 80228-2583

Dear Mr. Will:

The U.S. Army Corps of Engineers, Honolulu District (Corps) has received your letter, dated October 28, 2015, requesting a preliminary jurisdictional determination for the above-subject project. Department of the Army (DA) file number POH-2015-00225 has been assigned this project. Please reference this number in all future correspondence with our office concerning this project.

We have completed review of your submittal pursuant to our authorities at Section 404 of the Clean Water Act (33 U.S.C. 1344)(Section 404) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)(Section 10). Section 404 requires authorization prior to the discharge and/or placement of dredged or fill material into waters of the U.S., including adjacent wetlands. Section 10 requires authorization prior to installing structures or conducting work in, over, under, and affecting navigable waters.

Based on our review of the information submitted and available resources, we have preliminarily determined that the Kapalama Drainage Canal at the Halona Bridge crossing may be a navigable water of the U.S. subject to the Corps' regulatory jurisdiction (Enclosure 1). Accordingly, a Section 404 DA permit will be required for any activity resulting in the discharge and/or placement of dredged or fill material into the canal below the surveyed high tide line (HTL) in tidal waters, and the surveyed ordinary high water mark (OHWM) in non-tidal waters. A Section 10 DA permit will be required for any for any structures or activities occurring in, over, under, and affecting navigable waters of the U.S. that are NOT related to improvements to the bridge (e.g., maintenance repair of canal walls).

Please be advised, work activities related to the structural components of the Halona Street Bridge that would occur in, over, under, and affecting navigable (i.e.,

tidal) waters should be coordinated with the U.S. Coast Guard pursuant to Section 9 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401)(Section 9).

This preliminary jurisdictional determination identifies the presence of aquatic resources that may be waters of the U.S. subject to the Corps' regulatory jurisdiction, but it does not finalize the Corps' jurisdictional limits for the Kapalama Drainage Canal. The surveyed HTL and/or OHWM must be included on your project plans and may be subject to field verification by the Corps. The surveyed HTL and/or OHWM shall be used to determine whether a DA permit is required and the type of DA permit will be processed for your project.

We recommend that you identify and survey the Kapalama Drainage Canal's HTL and/or OHWM, as applicable, for portions of the stream that may be impacted by the proposed bridge project, including any area within the canal that may be cleared for maintenance purposes as part of the project scope. The HTL and/or OHWM shall be defined based on physical indicators present in the field (Enclosure 2). If there are circumstances that prevent the physical survey of the HTL and/or mean high water (MHW) mark in the field for tidally-influenced waters, then the HTL and MHW elevations must be established by survey with reference to available tidal datum (i.e., NOAA tidal station 1612340, Honolulu Harbor, 1983-2001 epoch) (Enclosure 3, or web link at: <http://tidesandcurrents.noaa.gov/datums.html?id=1612340>). The mean higher high water (MHHW) datum may be substituted for the HTL datum, but the HTL/MHHW and MHW elevations must be adjusted and in reference to mean sea level (MSL) (or MSL = 0) for this project location.

The enclosed preliminary jurisdictional determination (JD) is a written indication that wetlands and waterways within your project area may be waters of the U.S. (Enclosure 4). For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected by the permitted activity as if they are jurisdictional waters of the U.S. If you concur with the findings of this preliminary JD, please sign it and return it to the following address within two weeks. If you believe the preliminary JD is inaccurate, you may request an approved JD, which is an official determination regarding the presence or absence of waters of the U.S.

Honolulu District
U.S. Army Corps of Engineers
Regulatory Office, Building 230
Fort Shafter, Hawaii 96858-5440

Thank you for your cooperation with the Honolulu District Regulatory Program. Should you have any questions related to this preliminary determination, please contact Ms. Joy Anamizu at (808) 835-4308 or via e-mail at joy.n.anamizu@usace.army.mil.

You are encouraged to provide comments on your experience with the Honolulu District Regulatory Office by accessing our web-based customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

Sincerely,

A handwritten signature in black ink that reads "Michelle Lynch". The signature is fluid and cursive, with the first name "Michelle" written in a larger, more prominent script than the last name "Lynch".

Michelle R. Lynch
Chief, Regulatory Office

Enclosures:

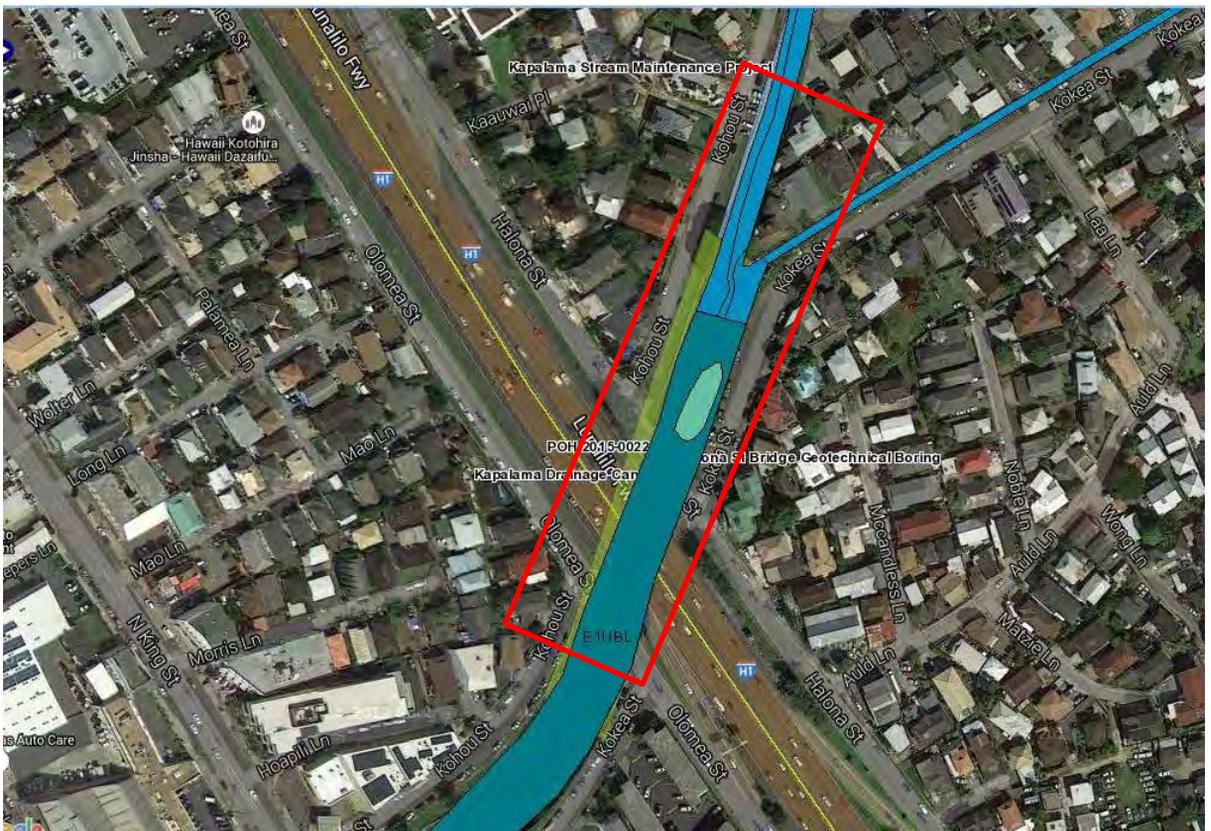
Cc via email w/encls:

T. Parker, CFLHD

T. Bovino Agostini, SWCA



Above: Source – Google Earth, Aerial Imagery (29 Jan 2013) (project site in red);
 Below: Source – ORM2, Aerial Imagery w/ USFWS NWI layer (project site in red)



(b) General Tributary Characteristics (check all that apply):

- Tributary** is: Natural
 Artificial (man-made). Explain:
 Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **Pick List**.

Primary tributary substrate composition (check all that apply):

- | | | |
|--|--|-----------------------------------|
| <input type="checkbox"/> Silts | <input type="checkbox"/> Sands | <input type="checkbox"/> Concrete |
| <input type="checkbox"/> Cobbles | <input type="checkbox"/> Gravel | <input type="checkbox"/> Muck |
| <input type="checkbox"/> Bedrock | <input type="checkbox"/> Vegetation. Type/% cover: | |
| <input type="checkbox"/> Other. Explain: | | |

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: **Pick List**

Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**

Estimate average number of flow events in review area/year: **Pick List**

Describe flow regime:

Other information on duration and volume:

Surface flow is: **Pick List**. Characteristics:

Subsurface flow: **Pick List**. Explain findings:

- Dye (or other) test performed:

Tributary has (check all that apply):

- | | |
|---|---|
| <input type="checkbox"/> Bed and banks | |
| <input type="checkbox"/> OHWM ⁶ (check all indicators that apply): | |
| <input type="checkbox"/> clear, natural line impressed on the bank | <input type="checkbox"/> the presence of litter and debris |
| <input type="checkbox"/> changes in the character of soil | <input type="checkbox"/> destruction of terrestrial vegetation |
| <input type="checkbox"/> shelving | <input type="checkbox"/> the presence of wrack line |
| <input type="checkbox"/> vegetation matted down, bent, or absent | <input type="checkbox"/> sediment sorting |
| <input type="checkbox"/> leaf litter disturbed or washed away | <input type="checkbox"/> scour |
| <input type="checkbox"/> sediment deposition | <input type="checkbox"/> multiple observed or predicted flow events |
| <input type="checkbox"/> water staining | <input type="checkbox"/> abrupt change in plant community |
| <input type="checkbox"/> other (list): | |
| <input type="checkbox"/> Discontinuous OHWM. ⁷ Explain: | |

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> High Tide Line indicated by: | <input type="checkbox"/> Mean High Water Mark indicated by: |
| <input type="checkbox"/> oil or scum line along shore objects | <input type="checkbox"/> survey to available datum; |
| <input type="checkbox"/> fine shell or debris deposits (foreshore) | <input type="checkbox"/> physical markings; |
| <input type="checkbox"/> physical markings/characteristics | <input type="checkbox"/> vegetation lines/changes in vegetation types. |
| <input type="checkbox"/> tidal gauges | |
| <input type="checkbox"/> other (list): | |

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

PRODUCTS

(/products.html) Data, Analyses, and Publications

PROGRAMS

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(/education.html) Tides, Currents, and Predictions

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(/about.html) Info and how to reach us

Home (/) / Products (products.html) / Datums (stations.html?type=Datums) / 1612340 Honolulu, HI

There is a scheduled power outage which will affect CO-OPS' Tides and Currents web site (<http://tidesandcurrents.noaa.gov/>) beginning on Friday, December 4th, at 2:00 P.M, EST. During this time, the Tides and Currents website will have limited capability. Click here for more information (/coop_notice.html).

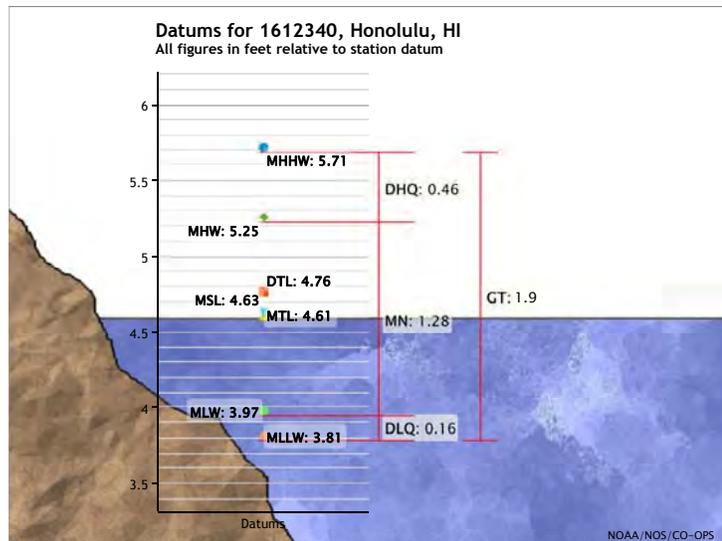
Station Info Tides/Water Levels Meteorological Obs. (/met.html?id=1612340) Phys. Oceanography (/physocean.html?id=1612340)

Datums for 1612340, Honolulu HI

Elevations on Station Datum

Station: 1612340, Honolulu, HI T.M.: 150
 Status: Accepted (Apr 17 2003) Epoch: (/datum_options.html#NTDE) 1983-2001
 Units: Feet Datum: STND

Datum	Value	Description
MHHW (/datum_options.html#MHHW)	5.71	Mean Higher-High Water
MHW (/datum_options.html#MHW)	5.25	Mean High Water
MTL (/datum_options.html#MTL)	4.61	Mean Tide Level
MSL (/datum_options.html#MSL)	4.63	Mean Sea Level
DTL (/datum_options.html#DTL)	4.76	Mean Diurnal Tide Level
MLW (/datum_options.html#MLW)	3.97	Mean Low Water
MLLW (/datum_options.html#MLLW)	3.81	Mean Lower-Low Water
Ortho (/datum_options.html)		
STND (/datum_options.html#STND)	0.00	Station Datum
GT (/datum_options.html#GT)	1.90	Great Diurnal Range
MN (/datum_options.html#MN)	1.28	Mean Range of Tide
DHQ (/datum_options.html#DHQ)	0.46	Mean Diurnal High Water Inequality
DLQ (/datum_options.html#DLQ)	0.16	Mean Diurnal Low Water Inequality
HWI (/datum_options.html#HWI)	2.09	Greenwich High Water Interval (in hours)
LWI (/datum_options.html#LWI)	8.34	Greenwich Low Water Interval (in hours)
Maximum	7.20	Highest Observed Water Level
Max Date & Time	02/14/1967 06:54	Highest Observed Water Level Date and Time
Minimum	2.40	Lowest Observed Water Level
Min Date & Time	04/30/1911 10:00	Lowest Observed Water Level Date and Time
HAT (/datum_options.html#HAT)	6.59	Highest Astronomical Tide
HAT Date & Time	12/02/1990 14:06	HAT Date and Time
LAT (/datum_options.html#LAT)	3.30	Lowest Astronomical Tide



Showing datums for

1612340 Honolulu, HI

Data Units Feet Meters

Epoch Present (1983-2001) Superseded (1960-1978)

Submit

Datum	Value	Description
LAT Date & Time	05/24/1990 18:54	LAT Date and Time

Tidal Datum Analysis Periods

01/01/1983 - 12/31/2001

To refer water level heights to NAVD88 (North American Vertical Datum of 1988), apply the values located at National Geodetic Survey (http://www.ngs.noaa.gov/Tidal_Elevation/diagram.jsp?PID=TU0286&EPOCH=1983-2001).

Show nearby stations

Products available at 1612340 Honolulu, HI

TIDES/WATER LEVELS

Water Levels (</waterlevels.html?id=1612340>)

NOAA Tide Predictions
(</noaatidepredictions/NOAATidesFacade.jsp?Stationid=1612340>)

Harmonic Constituents (</harcon.html?id=1612340>)

Sea Level Trends (/sltrends/sltrends_station.shtml?stnid=1612340)

Datums (</datums.html?id=1612340>)

Bench Mark Sheets (</benchmarks.html?id=1612340>)

Extreme Water Levels (/est/est_station.shtml?stnid=1612340)

Reports (</reports.html?id=1612340>)

METEOROLOGICAL/OTHER

Meteorological Observations (</met.html?id=1612340>)

Water Temp/Conductivity

PORTS®

This station is not a member of PORTS®

OPERATIONAL FORECAST SYSTEMS

This station is not a member of OFS

INFORMATION

Station Home Page (</stationhome.html?id=1612340>)

Data Inventory (</inventory.html?id=1612340>)

Measurement Specifications (</measure.html>)

Information

About CO-OPS

(</about.html>)

Disclaimers

(</disclaimers.html>)

Contact Us (</contact.html>)

Privacy Policy

(</privacy.html>)

Products

PORTS (</ports.html>)

OFS (</models.html>)

Tide Predictions

(/tide_predictions.html)

Currents

(</cdata/StationList?type=Current+Data&filter=active>)

More about products...

(</products.html>)

Programs

Mapping and Charting

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Maritime Services

(</maritime.html>)

COASTAL (</coastal.html>)

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Partners

Hydrographic Survey

Support (</hydro.html>)

Marsh Restoration

(</marsh.html>)

GoMOOS (</gomoos.html>)

TCOON (</tcoon.html>)

Revised: 10/15/2013

NOAA (<http://www.noaa.gov>) / National Ocean Service

(<http://oceanservice.noaa.gov>)

Web site owner: Center for Operational Oceanographic Products and Services



US Army Corps of Engineers, Honolulu District
PRELIMINARY JURISDICTIONAL DETERMINATION FORM

File Number: POH-2015-00225
Project Title: Central Federal Lands Highways Division (CFLHD) Halona Street Bridge Project, Honolulu (Kalihi) Oahu Island, Hawaii
Subject: PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary jurisdictional determination (JD) finds that there “*may be*” waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

A. REPORT COMPLETION DATE FOR PRELIMINARY JURSDICTIONAL DETERMINATION: 2 Dec 2015

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Mr. Mike Will
U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highways Division
12300 West Dakota Avenue, Suite 380A
Lakewood, CO 80228-2583

C. DISTRICT OFFICE: Honolulu District, CEPOH-RO

FILE NAME: Central Federal Lands Highways Division (CFLHD) Halona Street Bridge Project, Honolulu (Kalihi) Oahu Island, Hawaii
FILE NUMBER: POH-2015-00225

D. PROJECT LOCATION(S), BACKGROUND INFORMATION, AND WATERS:

State or Territory: Hawaii

City: Honolulu

County: Honolulu

Center Coordinates of Site:

Latitude: 21.326906°

Longitude: -157.867339°

Name of nearest waterbody: Kapalama Drainage Canal

Identify the amount of waters in the review area:

- Non-wetland waters: ~ 560 linear feet; ~ 95 width (ft); 0.97 acres
Cowardin Classification: Estuarine/Riverine
- Wetlands: acres
Cowardin Classification:
- Other:

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal: Kapalama Drainage Canal

Non-Tidal: Kapalama Drainage Canal

E. REVIEW PERFORMED FOR SITE EVALUATION:

Office (Desk) Determination. Date: 1 Dec 2015

Field Determination. Date(s):

F. EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD

will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

G. SUPPORTING DATA:

Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: CFLHD project letter, dated 28 Oct 2015, and SWCA WOUS report, dated Mar 2015.
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite quad name: Honolulu Quad, 7.5 min series
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name: USFWS NWI e-mapper
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): Aerial imagery, 29 Jan 2013
or Other (Name & Date): 11 Sep 2014 photos in SWCA WOUS report, dated Mar 2015
- Previous determination(s). File no. and date of response letter:
- Other information (please specify): Waolani Stream HUC 200600000304 / 12606.462772 sq ac

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

//s// Joy Anamizu, 2 Dec 2015
Signature and date of
Regulatory Project Manager
(REQUIRED)

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining the
signature is impracticable)

Determination and Delineation of Wetlands and Other Waters of the U.S. for the Hālonā Bridge Project

Kalihi, O‘ahu Island, Hawai‘i

Prepared for
CH2M HILL

Prepared by
SWCA Environmental Consultants

March 2015



**DETERMINATION AND DELINEATION OF WETLANDS AND
OTHER WATERS OF THE U.S. FOR THE HĀLONA BRIDGE
PROJECT**

KALIHI, O‘AHU ISLAND, HAWAI‘I

Prepared for

CH2M HILL

1132 Bishop Street, Suite 1100
Honolulu, Hawai‘i 96813
(808) 943-1133

Prepared by

SWCA Environmental Consultants

Bishop Square ASB Tower
1001 Bishop Street, Suite 2800
Honolulu, Hawai‘i
(808) 548-7899
www.swca.com

SWCA Project No. 27166

Submitted November 11, 2014
Revised March 20, 2015

WATERS OF THE U.S. DETERMINATION/DELINEATION SUMMARY

PROJECT NAME: Hālonā Bridge

SITE LOCATION: Kalihi, O‘āhu Island, Hawai‘i
21°19'36.81"N, 157°52'2.41"W

OWNER: Hawai‘i Department of Transportation

SURVEY DATES: September 11, 2014

PROJECT STAFF: Tiffany Bovino Agostini, Botanist/Project Manager
Bryson Luke, Field Technician

SUMMARY

SWCA Environmental Consultants (SWCA) was tasked by CH2M HILL to conduct a determination and delineation of wetlands and other potential Waters of the U.S. governed by the Clean Water Act and the Rivers and Harbors Act at nine bridge projects throughout the state of Hawai‘i. This report summarizes the findings of the potential Waters of the U.S. delineation conducted at the Hālonā Bridge site located in Kalihi, O‘āhu, on September 11, 2014.

The purpose of the project is to address the existing Hālonā Bridge (#003000H10202075) to amend structurally deficient conditions and meet current design standards for roadway width, load capacity, pedestrian/bicycle traffic, bridge railing and transitions, and bridge approaches. The survey was conducted in support of the environmental compliance efforts for the project.

The survey area encompasses approximately 5.37 acres (2.17 hectares). Elevations at the site range from approximately 2 to 24 feet (0.6 to 7.3 meters) above mean sea level. The National Wetlands Inventory program identifies five types of wetlands or waterways in the survey area (E2EM1N, E1UBL, R2USC_x, R2USC, and R4SBC_x). An additional riverine feature—R2UBH_x—is identified immediately adjacent to the survey area. Geospatial data from the State of Hawai‘i and the U.S. Geological Survey identify perennial Kapālama Stream within the survey area.

No wetland sampling points were evaluated in the survey area because of the lack of hydrophytic plants (or vegetation in general). However, SWCA delineated approximately 0.97 acre (0.39 hectare) of non-wetland Waters of the U.S., a drainage channel channelized with vertical concrete walls. The channel bed is concrete-lined near the northern portion of the survey area, and according to project engineers, the bed comprises natural material closer to the bridge. The stream appears to carry a relatively permanent flow of water to the Pacific Ocean. This conclusion is subject to confirmation by the U.S. Army Corps of Engineers.

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ABBREVIATIONS

CFR	Code of Federal Regulations
CWA	Clean Water Act
ha	hectare(s)
m	meter(s)
MHW	Mean High Water
MHHW	Mean Higher High Water
mm	millimeter(s)
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
RHA	Rivers and Harbors Act
SWCA	SWCA Environmental Consultants
USACE	U.S. Army Corps of Engineers
WoUS	Waters of the U.S.

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE) derives its regulatory authority over wetlands and other Waters of the U.S. (WoUS) from two federal laws: 1) Section 10 of the Rivers and Harbors Act (RHA) of 1899 and 2) Section 404 of the Clean Water Act (CWA) of 1972. The RHA of 1899 prevents unauthorized obstruction or alteration of navigable WoUS. Navigable waters are defined as “subject to the ebb and flow of the tide and/or presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce” (33 Code of Federal Regulations [CFR] 325.5(c)(2)). A Section 10 permit is required for non-fill discharging activities proposed within, over, or under WoUS. The limits of jurisdiction for tidally influenced navigable waters extend to the Mean High Water (MHW) line or High Tide Line. A more conservative approach than the MHW, the Mean Higher High Water (MHHW) line, is often used.

Under Section 404 of the CWA, dredged and fill material may not be discharged into jurisdictional WoUS (including wetlands) without a permit. According to 40 CFR 230.3, WoUS subject to agency jurisdiction under Section 404 include navigable waters and their tributaries, interstate waters and their tributaries, wetlands adjacent to these waters, and impoundments of these waters. In addition, waters are protected by the CWA if determined to have a “significant nexus” with a traditional navigable water or interstate water (Environmental Protection Agency and USACE 2011). The U.S. Supreme Court’s decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (126 S. Ct. 2208) provides further information regarding whether a wetland or tributary is a WoUS. A Section 404 permit is required for all fill or discharge activities below (seaward or makai) of the MHW/MHHW line or High Tide Line in tidal waters or ordinary high water mark (OHWM) for non-tidal, non-wetland waters.

The USACE (33 CFR 230.3) and U.S. Environmental Protection Agency (40 CFR 230.3) define *wetlands* as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (40 CFR 232.3). The 1987 *Corps of Engineers Wetlands Delineation Manual* (USACE 1987 Manual; USACE 1987), as amended, outlines the technical guidelines and methods for identifying and delineating wetlands potentially subject to Section 404. This manual is supplemented by the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai‘i and Pacific Islands Region* (Hawai‘i and Pacific Island Regional Supplement; USACE 2012).

CH2M HILL is reviewing the proposed Hālonā Bridge project (hereafter *project*) pursuant to Section 10 of the RHA and Section 404 of the CWA. The purpose of the project is to address the existing Hālonā Bridge (#003000H10202075) to amend structurally deficient conditions and meet current design standards for roadway width, load capacity, pedestrian/bicycle traffic, bridge railing and transitions, and bridge approaches. The survey was conducted in support of the environmental compliance efforts for the project.

2.0 DESCRIPTION OF THE SURVEY AREA

2.1 Location and Vicinity

The Hālonā Bridge site is in the Kalihi area on the Island of O‘ahu. The survey area encompasses Hālonā Street from Kaauwai Place to Palama Street, a segment of the Interstate Route H-1 (Lunalilo Freeway), and portions of Kokea Street and Kohou Street (Figure 1). It covers approximately 5.37 acres (2.17 hectares [ha]). The surrounding area is predominantly residential.

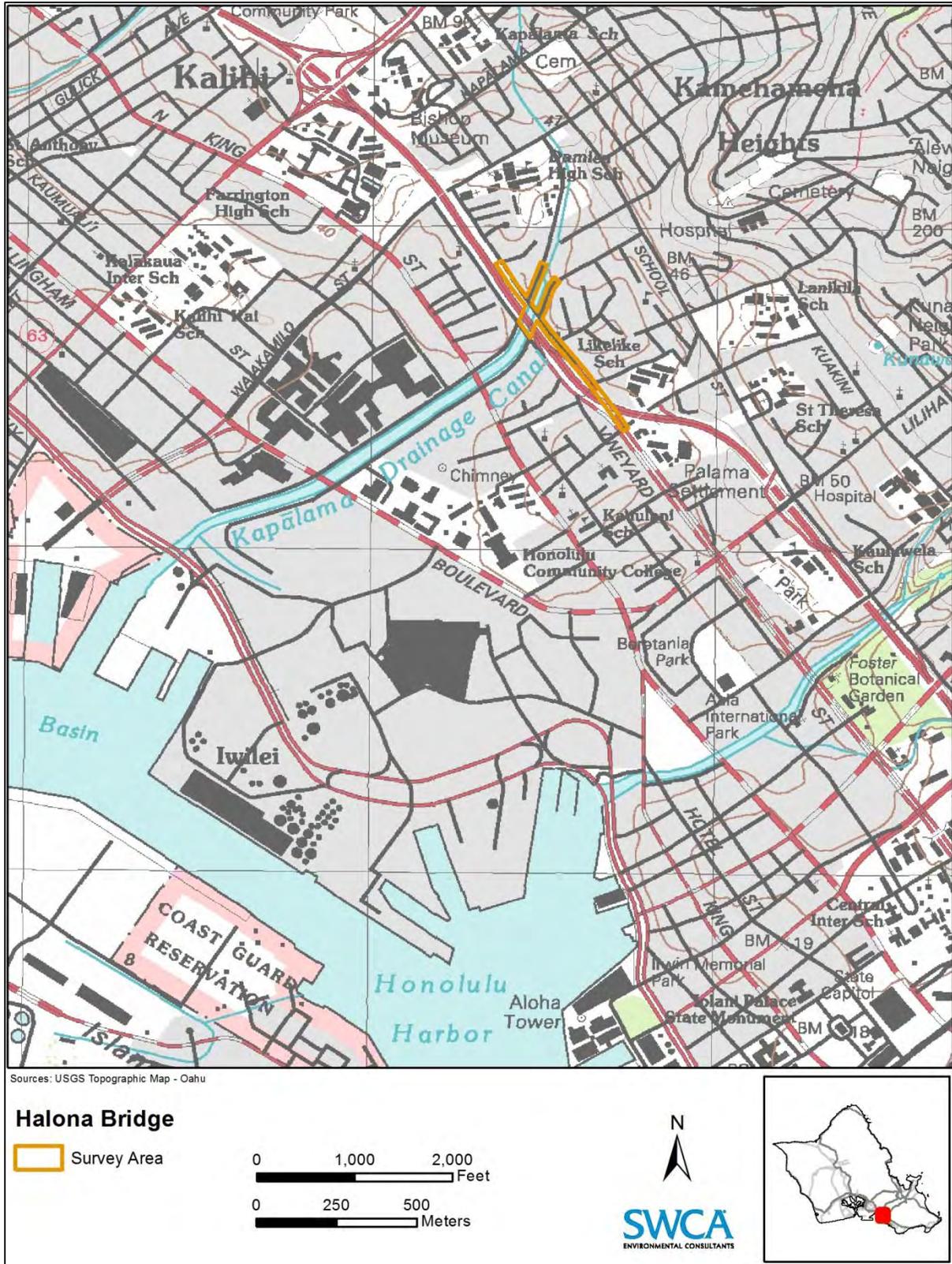


Figure 1. Location of the survey area.

2.2 Topography and Soils

Most of the survey area is relatively flat. Elevations at the site range from roughly 2 to 24 feet (0.6 to 7.3 meters [m]) above sea level. The Natural Resources Conservation Service (NRCS) identifies the following four soil types within the survey area: Kawaihapai stony clay loam, 2%–6% slopes (KlaB); Hanalei silty clay, 0%–2% slopes (HnA); Ewa silty clay loam, moderately shallow, 0%–2% slopes (EmA); and Water > 40 acres (W) (Foote et al. 1972; NRCS 2013) (Figure 2). The Hanalei silty clay, 0%–2% slopes soil type is listed as a hydric soil (NRCS 2012). Most of the survey area is covered in asphalt concrete-paved roadways.

2.3 Hydrology

Mean annual rainfall for this area is approximately 37 inches (940 millimeters [mm]). Rainfall is typically highest in November–December and lowest in June–August (Giambelluca et al. 2013). The closest rainfall gage to the site has experienced slightly above-average rainfall for 2014 through the end of September (National Oceanic and Atmospheric Administration/National Weather Service, Weather Forecast Office Honolulu 2014).

The National Wetlands Inventory (NWI) program identifies five wetlands or waterways in the survey area (Figure 3). These comprise E2EM1N (Estuarine, Intertidal, Emergent, Persistent, Regularly Flooded), E1UBL (Estuarine, Subtidal, Unconsolidated bottom), R2USC_x (Riverine, Lower Perennial, Unconsolidated Shore, Seasonally Flooded, Excavated), R2USC (Riverine, Lower Perennial, Unconsolidated Shore, Seasonally Flooded), and R4SBC_x (Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated). An additional Riverine feature—R2UBH_x (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated)—is identified by the NWI program immediately adjacent to the survey area (Figure 3).

The State of Hawai‘i and the U.S. Geological Survey identify Kapālāma Stream (or Kapālāma Drainage Canal) transversing the survey area (see Figure 1). The total length of this perennial stream is approximately 5.6 miles (9 kilometers) according to the *Atlas of Hawaiian Watersheds & Their Aquatic Resources* (Parham et al. 2008).

Kapālāma Stream is listed as a 303(d) Impaired Waterbody. The following are listed as the causes of impairment: total nitrogen, total phosphorus, nitrate/nitrite, trash, and turbidity (Hawai‘i State Department of Health 2014).

2.4 Flora and Fauna

Flora and fauna surveys of the survey area were conducted by SWCA on the same date as the WoUS survey. Vegetation types identified during that survey include weedy vegetation and ornamental landscaping. The site is dominated by non-native plants, and no listed plant species were seen (SWCA 2014).

One state-listed animal species, the threatened white tern (*Gygis alba*), was observed transiting above the survey area. White terns are listed under Hawai‘i Revised Statutes (HRS) 195D as threatened on O‘ahu Island only. The endangered Hawaiian hoary bat or ‘ōpe‘ape‘a (*Lasiurus cinereus semotus*) may pass through the site or may use adjacent trees as roosting sites, but impacts to this species are not expected to occur so long as trees are not removed as a result of the project (SWCA 2014).

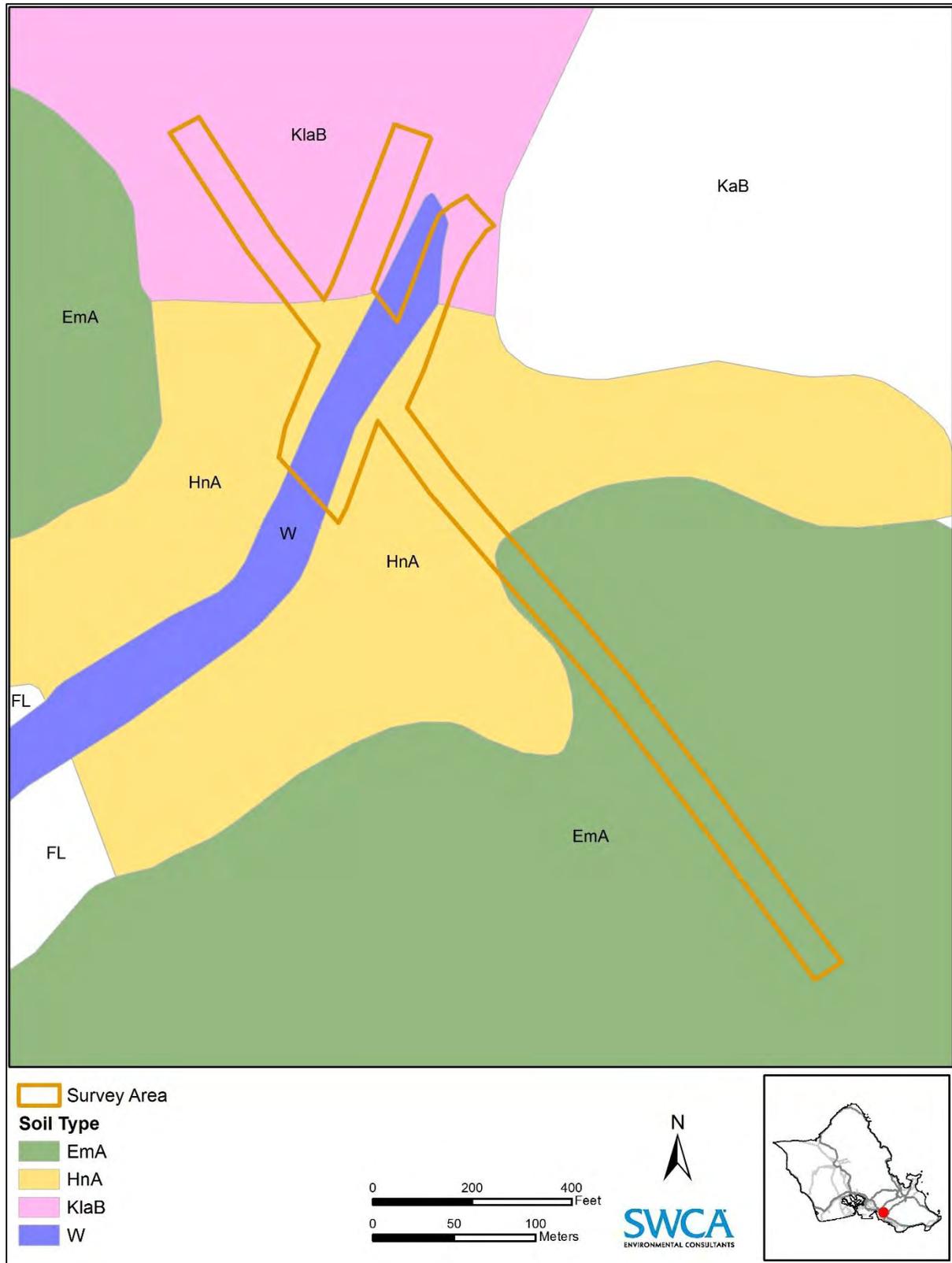


Figure 2. Soil types within the survey area.

Note: EmA = Ewa silty clay loam, moderately shallow, 0%–2% slopes; HnA = Hanalei silty clay, 0%–2% slopes; KlaB = Kawaihapai stony clay loam, 2%–6% slopes; W = Water > 40 acres.

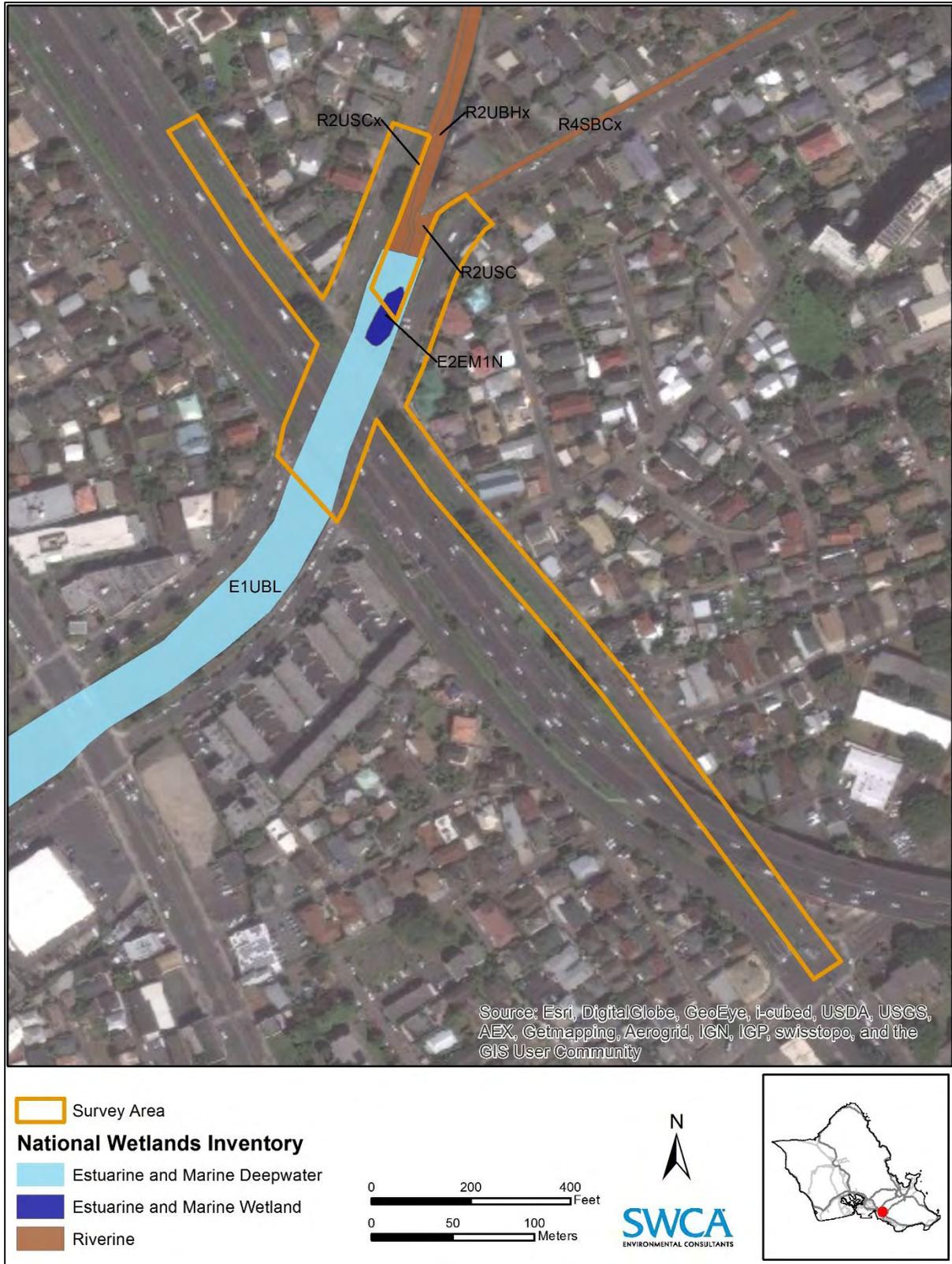


Figure 3. National Wetland Inventory classifications near the survey area.

3.0 METHODOLOGY

Before visiting the survey area, aerial photographs and topographic maps were examined to identify potential wetlands or WoUS in or near the survey area. Information was also gleaned from the NWI program, NRCS hydric soil data, as well as previous water resource reports and environmental assessments/environmental impact statements.

SWCA biologists conducted WoUS determination and delineation fieldwork on September 11, 2014. As stated above, the jurisdiction of tidal, non-wetland WoUS extends to the High Tide Line or MHW line. The High Tide Line is defined as the intersection of the land with the water's surface at the maximum height reached by a rising tide (33 CFR Part 328). MHW is defined as the average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch. The MHW line is 0.62 feet (0.19 m) above mean sea level, and the MHHW is 1.08 feet (0.33 m) above mean sea level. However, because the stream contains vertical concrete walls and the wall height exceeds the MHW and MHHW, SWCA determined the jurisdictional boundary of the potential WoUS by mapping the top of the vertical concrete wall. The boundaries of the stream under the freeway were estimated by connecting the known boundaries of the stream at the existing bridge with the boundaries of the stream just north of Olomea Street.

The geographic coordinates were collected in the field with Trimble GeoExplorer 2008 Series global positioning system (GPS) unit and data were post-processed in ArcGIS using GPS Correct to sub-meter accuracy. The linear length and acreage of the feature were calculated by projecting these point and line data files in a geographic information system.

4.0 FINDINGS

4.1 Non-Wetland Waters

A single perennial stream (known as Kapālāma Stream or Canal) was identified in the survey area (Figure 4). Approximately 0.97 acre (0.39 ha) of non-wetland WoUS were delineated within the survey area.

The stream is channelized and entirely surrounded by urban development; thus, the original drainage course has been extensively modified. In the northern portion of the survey area, approximately 300 feet (91 m) upstream of the existing bridge, the channelized stream forks. The channel bed is concrete-lined in the immediate vicinity of the fork; however, according to project engineers, the channel bed comprises natural material closer to the bridge.

Standing water was observed in the stream during the survey (Figures 5 and 6). Most of Kapālāma Stream within the survey area was determined to be tidally influenced due to the presence of marine/estuarine fish (striped mullet [*Mugil cephalus*] and great barracuda [*Sphyraena barracuda*]) near the bridge and observed changes in water levels throughout the day. It is unknown how often water within the channelized forks is tidally influenced.

According to NWI data, the unnamed right fork terminates before the intersection with North School Street (outside of the survey area). The left fork (named Kapālāma Stream) continues mauka toward the Ko'olau Mountain Range. Downstream of the survey area, Kapālāma Stream flows southwest between Kokea and Kohou Street and eventually empties into Honolulu Harbor roughly 0.8 mile (1.3 kilometers) from the survey area.



Figure 4. Delineated non-wetland Waters of the U.S.



Figure 5. Kapālāma Stream looking upstream from the bridge.



Figure 6. Kapālāma Stream looking downstream toward the bridge.

4.2 Wetlands

No wetlands were identified within the survey area. Most of the survey area is composed of pavement and concrete. Vegetated areas are mowed grasses and ornamental trees, interspersed with various weeds. The only hydrophytic plants seen occur within the concrete-lined portion of the channel where sediment has accumulated along the edges of the concrete walls.

5.0 CONCLUSIONS

SWCA surveyed and delineated a single perennial non-wetland WoUS (known as Kapālama Stream or Canal) within the survey area. The stream was noted to be tidal in the immediate vicinity of the bridge during the survey, connecting to the Honolulu Harbor.

Because the bridge project involves non-fill discharging activities over a WoUS, a Section 10 permit will likely be required. If the proposed project intends to place dredged or fill material within the delineated feature (such as a bridge pillar), it could be subject to either a Section 10 or Section 404 Nationwide Permit (NWP). These conclusions are subject to confirmation by the USACE Honolulu District.

The general rule regarding the State Section 401 water quality certification is, if the USACE identifies that a permit (NWP/LOP/SIP) under Section 404 is required, the applicant will likely need a Section 401 water quality certification from the State Department of Health Clean Water Branch (CWB). Often a 401 water quality certification is not required for Section 10 permits. If the CWB responds and requires a 401 water quality certification, it can take several months to a year to process. In addition, a Stream Channel Alteration Permit (SCAP) may be required from the Commission on Water Resource Management (CWRM), depending on the activities proposed. SWCA recommends submitting a Request for Determination (RFD) from CWRM. If a SCAP is required, the permit timeframe is 90 days.

6.0 LITERATURE CITED

- Environmental Protection Agency and U.S. Army Corps of Engineers (USACE). 2011. Draft Guidance on Identifying Waters Protected by the Clean Water Act. Available at: http://water.epa.gov/lawsregs/guidance/wetlands/upload/wous_guidance_4-2011.pdf. Accessed July 3, 2013.
- Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens. 1972. *Soil Survey of the Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lana'i, State of Hawai'i*. U.S. Department of Agriculture, Soil Conservation Service.
- Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.L. Chen, P.S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. Online Rainfall Atlas of Hawai'i. Bull. Amer. Meteor. Soc. 94, 313–316, doi: 10.1175/BAMS-D-11-00228.1. Available at: <http://rainfall.geography.hawaii.edu>. Accessed on September 12, 2014.
- Hawai'i State Department of Health. 2014. *2014 State of Hawaii Water Quality Monitoring and Assessment Report*. Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections 303(D) and 305(B), Clean Water Act (Public Law 97-117).
- Lichvar, R.W. 2012. *The National Wetland Plant List*. ERDC/CRREL TR-12-11. Hanover, New Hampshire: U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory. Available at: [http://acwc.sdp.sirsi.net/client/search/asset:asset?t:ac=\\$N/1012381](http://acwc.sdp.sirsi.net/client/search/asset:asset?t:ac=$N/1012381). Accessed December 10, 2012.
- . 2013. The National Wetland Plant List: 2013 wetland ratings. *Phytoneuron* 2013(49):1–241.
- Lichvar, R., N. Melvin, M. Butterwick, and W. Kirchner. 2012. National Wetland Plant List indicator rating definitions. ERDC/CRREL TN-12-1. Hanover, New Hampshire: U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory. Available at: <http://www.fws.gov/wetlands/documents/National-Wetland-Plant-List-Indicator-Rating-Definitions.pdf>. Accessed December 10, 2012.
- National Oceanic and Atmospheric Administration/National Weather Service, Weather Forecast Office Honolulu. 2014. Hydrology in Hawai'i. Available at: <http://www.prh.noaa.gov/hnl/hydro/pages/sep14sum.php>. Accessed on October 15, 2014.
- Natural Resources Conservation Service (NRCS). 2012. Hydric Soils State Lists, Hydric Soils of Hawai'i. Available at: ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/Lists/hydric_soils.xlsx. Accessed December 7, 2012.
- . 2013. Web Soil Survey. Available at: <http://websoilsurvey.nrcs.usda.gov/>. Accessed October 16, 2014.
- Parham, J.E., G.R. Higashi, E.K. Lapp, D.G. K. Kuamoo, R.T. Nishimoto, S. Hau, J.M. Fitzsimons, D.A. Polhemus, and W.S. Devick. 2008. *Atlas of Hawaiian Watersheds & Their Aquatic Resources*. Copyrighted website published by the Hawaii Division of Aquatic Resources, Department of Land and Natural Resources. Available at: www.hawaiiwatershedatlas.com. Accessed April 9, 2013.

SWCA. 2014. Biological Resource Assessment for the Hālonā Bridge Project. Draft Submitted to CH2M HILL October 20, 2014.

U.S. Army Corps of Engineers (USACE). 1987. *Corps of Engineers Wetlands Delineation Manual*. Wetlands Research Program Technical Report Y-87-1 (online edition). Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station. Available at: <http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf>. Accessed December 10, 2012.

———. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai‘i and Pacific Islands Region Version 2.0*, edited by J.F. Berkowitz, J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-12-5. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

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Appendix B
Summary of EDR Radius Map Report™ with
GeoCheck®, May 13, 2015



Halona Bridge

Lunalilo Freeway/Kohou Street
Honolulu, HI 96817

Inquiry Number: 4293163.2s
May 13, 2015

EDR Summary Radius Map Report

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Thank you for your business.
 Please contact EDR at 1-800-352-0050
 with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

LUNALILO FREEWAY/KOHOU STREET
HONOLULU, HI 96817

COORDINATES

Latitude (North): 21.3266000 - 21° 19' 35.76"
Longitude (West): 157.8675000 - 157° 52' 3.00"
Universal Transverse Mercator: Zone 4
UTM X (Meters): 617448.9
UTM Y (Meters): 2358577.2
Elevation: 3 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property: TP
Source: USGS 7.5 min quad index

Target Property: W
Source: USGS 7.5 min quad index

MAPPED SITES SUMMARY

Target Property Address:
LUNALILO FREEWAY/KOHOU STREET
HONOLULU, HI 96817

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
Reg	SAND ISLAND MILITARY		DOD	Same	3993, 0.756, SSW
Reg	FORT SHAFTER		DOD	Same	4935, 0.935, NW
1		1435 AULD LN	EDR US Hist Auto Stat	Higher	578, 0.109, East
A2	7-11 KAPALAMA	1136 N KING ST.	HI LUST, HI UST, HI Financial Assurance	Higher	622, 0.118, SW
A3	UNOCAL 76 SS L 0471	1136 N KING ST	RCRA-CESQG	Higher	622, 0.118, SW
4	QUEEN LILIOKALANI HO	1300 HALONA ST	RCRA-CESQG, FINDS	Higher	646, 0.122, NNW
A5	BOBS AUTO REPAIR	1138-A N KING ST	RCRA NonGen / NLR	Higher	704, 0.133, WSW
A6	GTE-HAWAIIAN TEL EMP	1138 N KING ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	704, 0.133, WSW
7		1160 N KING ST	EDR US Hist Auto Stat	Higher	727, 0.138, WSW
8	KING'S SERVICE	1070 N KING ST	HI LUST, HI UST	Higher	835, 0.158, SSW
B9	OAHU PLUMBING & SHEE	1217 N KING ST	HI LUST, HI UST	Higher	839, 0.159, West
B10		1222 N KING ST	EDR US Hist Cleaners	Higher	862, 0.163, West
B11	PACIFIC AUTO SERVICE	1229 N KING ST	HI UST	Higher	866, 0.164, West
B12		1229 N KING ST	EDR US Hist Auto Stat	Higher	866, 0.164, West
13	KANO TRUCKING SERVIC	1412 IAO LANE	RCRA NonGen / NLR, FINDS, HI UST	Higher	893, 0.169, SE
C14		1240 MOOKAULA BAY 5	EDR US Hist Auto Stat	Higher	963, 0.182, WSW
D15	U.S. POSTAL SERVICE	1271 N KING ST	HI LUST, HI UST, HI Financial Assurance	Higher	991, 0.188, West
E16	OAHU AIR CONDITIONIN	938 KOHOU ST	RCRA-CESQG, FINDS, CA HAZNET	Higher	1005, 0.190, SW
D17		1270 N KING ST	EDR US Hist Cleaners	Higher	1015, 0.192, WNW
C18	ACCENT WALL DESIGN I	1240 MOOKAULA ST	RCRA-CESQG, FINDS, CA HAZNET	Higher	1037, 0.196, WSW
C19	JOHIRO BROTHERS, INC	1240 MOOKAULA ST	HI LUST, HI UST	Higher	1037, 0.196, WSW
C20		1240 MOOKAULA ST	EDR US Hist Auto Stat	Higher	1037, 0.196, WSW
F21		1010 N KING ST	EDR US Hist Auto Stat	Higher	1040, 0.197, SSW
F22	MAHALO NORTH KING AU	1010 N KING ST	HI LUST, HI UST, HI Financial Assurance	Higher	1040, 0.197, SSW
F23	YAMASAKI SERVICE INC	1010 KING ST	RCRA-CESQG	Higher	1040, 0.197, SSW
C24		1249 MOOKAULA ST	EDR US Hist Auto Stat	Higher	1053, 0.199, WSW
C25		1255 MOOKAULA ST	EDR US Hist Auto Stat	Higher	1058, 0.200, WSW
E26	OAHU PLUMBING & SHEE	926 KOHOU ST	HI LUST, HI UST, HI Financial Assurance	Higher	1093, 0.207, SW
27	OAHU AIR CONDITIONIN	904 KOHOU ST	RCRA NonGen / NLR, FINDS	Higher	1179, 0.223, SW
G28	GERMAN CAR SERVICE	1310 MOOKAULA ST	RCRA-CESQG, FINDS	Higher	1207, 0.229, West
G29		1310 MOOKAULA ST	EDR US Hist Auto Stat	Higher	1207, 0.229, West
G30		1311 MOOKAULA ST	EDR US Hist Auto Stat	Higher	1210, 0.229, West
H31	HAWAII HOCHI LTD	917 KOKEA ST	RCRA-CESQG, FINDS, CA HAZNET	Higher	1231, 0.233, SW
H32	JBL HAWAII LTD	905 KOKEA ST	HI LUST, HI UST	Higher	1291, 0.245, SW
H33	JBL HAWAII, LTD	905 KOKEA ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	1291, 0.245, SW
I34	TAKAMIYA PROPERTY	850 MOOWAA ST	HI SHWS, HI SPILLS	Higher	1371, 0.260, West
I35	I. STEVEN SUNADA	850 MOOWAA ST	HI LUST, HI UST	Higher	1371, 0.260, West
I36	TAKAMIYA PROPERTY	850 MOOWAA ST.	CERCLIS	Higher	1371, 0.260, West
J37	FUTURE HONOLULU FORD	CORNER OF HOUGHTAILI	HI LUST, HI UST	Higher	1424, 0.270, WNW

MAPPED SITES SUMMARY

Target Property Address:
LUNALILO FREEWAY/KOHOU STREET
HONOLULU, HI 96817

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
38	HAWAII HOUSING AUTHO	1002 N SCHOOL ST	HI LUST, HI UST	Higher	1429, 0.271, ENE
39	SAWAI BROTHERS PAINT	1135 N SCHOOL ST	HI LUST, HI UST	Higher	1440, 0.273, NE
40	TESORO 2GO #61022	1311 PALAMA ST	HI LUST, HI UST, HI Financial Assurance	Higher	1476, 0.280, SSE
J41	MARSHALL'S SHELL SS	1029 HOUGHTAILING ST	HI LUST, HI UST, HI Financial Assurance	Higher	1483, 0.281, WNW
42	ISLAND PAINTING	1353 MOOKAULA ST	HI LUST, HI UST, HI Financial Assurance	Higher	1492, 0.283, West
K43	ROSS TRUSTS	819 MOOWAA ST	HI SHWS, HI VCP	Higher	1561, 0.296, WSW
K44	SEN PLEX CORPORATION	819 MOOWAA ST	HI LUST, HI UST	Higher	1561, 0.296, WSW
K45	OKADA TRUCKING CO.,	818 MOOWAA ST	HI LUST, HI UST, HI Financial Assurance	Higher	1564, 0.296, WSW
46	PALAMA ELDERLY HOUSI	851 N SCHOOL ST	HI LUST, HI UST	Higher	1658, 0.314, East
47	CLASSIC RUSTPROOFING	1437 N KING ST	HI LUST, HI UST	Higher	1777, 0.337, WNW
48	FORMER T J AUTO REPA	1314 N. SCHOOL STREE	HI LUST, HI UST	Higher	1785, 0.338, NNE
49	SHIMAYA SHOTEN, LTD.	710 KOHOU ST	HI LUST, HI UST	Higher	1931, 0.366, SW
50	MALUHIA ELDERLY HOUS	1111 HALA DR	HI LUST, HI UST	Higher	1987, 0.376, ENE
51	HONOLULU COMMUNITY C	DILLINGHAM BLVD	HI LUST, HI UST	Higher	2061, 0.390, SSW
L52	AIM SCHOOL ST.	1403 N SCHOOL ST	HI LUST, HI UST, HI Financial Assurance	Higher	2062, 0.391, North
L53	KAPALAMA CHEVRON	1402 N SCHOOL ST	HI LUST, HI UST, HI Financial Assurance	Higher	2069, 0.392, North
54	KAPALAMA INCINERATOR	757 KOKEA STREET	CERCLIS	Higher	2071, 0.392, SW
55	MID PAC PETROLEUM 25	1342 N SCHOOL ST	HI LUST, HI Financial Assurance	Higher	2105, 0.399, NNE
56	ALPAC CORPORATION	815 WAIAKAMILO RD	HI LUST, HI UST	Higher	2111, 0.400, West
57	SNAPPY SERVICE	719 N SCHOOL ST	HI LUST, HI UST, HI SPILLS	Higher	2186, 0.414, ESE
58	RICHARD TOM	963 ROBELLO LN	HI LUST, HI UST, HI Financial Assurance	Higher	2308, 0.437, South
M59	HONOLULU COMMUNITY C	874 DILLINGHAM BLVD	HI SHWS	Higher	2436, 0.461, SSW
M60	OWNED BY CCI, LEASED	925 DILLINGHAM BLVD	FINDS, HI SHWS, HI ENG CONTROLS, HI INST CONTROL,...	Higher	2454, 0.465, SSW
M61	SPRINT LOT	925 DILLINGHAM BLVD	HI LUST, HI UST	Higher	2454, 0.465, SSW
M62	THEO DAVIES CATERPIL	935 DILLINGHAM BLVD	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	2457, 0.465, SSW
63	MALUHIA HOSPITAL	1027 HALA DR	HI LUST, HI UST, HI SPILLS	Higher	2461, 0.466, ENE
64	KING SHELL FOODMART	666 N KING ST	HI LUST, HI UST, HI Financial Assurance	Higher	2474, 0.469, SSE
65	CLASSIC BOWL	1190 DILLINGHAM BLVD	HI SHWS	Higher	2547, 0.482, SW
66	HAWAIIAN CANDIES & N	707 WAIAKAMILO RD	HI LUST, HI UST	Higher	2566, 0.486, WSW
67	FARRINGTON HIGH SCHO	1564 N KING ST	FTTS, HIST FTTS, HI SHWS, HI SPILLS	Higher	2644, 0.501, WNW
68	DOLE IWILEI	801 DILLINGHAM BLVD	HI SHWS, HI SPILLS, HI INST CONTROL	Higher	2646, 0.501, South
69	KAMEHAMEHA SCHOOLS -	1336 DILLINGHAM BLVD	HI SHWS, HI SPILLS	Higher	2785, 0.527, WSW
70	HALL MARK DRY CLEANE	1470 LILIHA ST	HI SHWS	Higher	3042, 0.576, SE
71	LANCE GOYA CHEVRON	504 N SCHOOL ST	HI SHWS, HI LUST, HI UST, HI ENG CONTROLS, HI INST...	Higher	3105, 0.588, SE
N72	COSTCO WAREHOUSE	525 ALAKAWA ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI VCP	Higher	3215, 0.609, SSW
N73	COSTCO GAS STATION	520 ALAKAWA ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI VCP	Higher	3234, 0.613, SSW
O74	VON HAMM TEXTILES	546 KAAHI ST	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	3243, 0.614, South
P75	1385 COLBURN STREET	1385 COLBURN ST	HI SHWS, HI SPILLS	Higher	3250, 0.616, WSW
O76	NUUANU AUTO COMPANY	545 KAAHI ST	HI SHWS	Higher	3252, 0.616, South

MAPPED SITES SUMMARY

Target Property Address:
LUNALILO FREEWAY/KOHOU STREET
HONOLULU, HI 96817

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
77	HAWAIIAN GAS PRODUCT	516-520 KUWILI ST	EDR MGP	Higher	3280, 0.621, South
P78	GENERAL TIRE	505 WAIAKAMILO RD	HI SHWS, HI SPILLS	Higher	3329, 0.630, WSW
79	IWILEI BUSINESS CENT	501 SUMNER ST	HI SHWS, HI SPILLS, HI INST CONTROL	Higher	3409, 0.646, SSW
80	TRAVEL PLAZA TRANSP	818 PINE ST	HI SHWS, HI LUST, HI UST, HI Financial Assurance	Higher	3438, 0.651, South
81	HOME DEPOT	421 ALAKAWA ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	3681, 0.697, SSW
82	BEST BUY	ALAKAWA ST & NIMITZ	HI SHWS, HI SPILLS	Higher	3829, 0.725, SW
83	BHP GASCO BENZENE SI	616 IWILEI RD	HI SHWS, HI SPILLS, HI INST CONTROL, HI AIRS	Higher	3928, 0.744, SSW
Q84	MCCABE, HAMILTON, &	1130 N NIMITZ HWY	HI SHWS, HI SPILLS	Higher	4028, 0.763, SW
85	1305 HART STREET	1305 HART ST	HI SHWS, HI SPILLS, HI INST CONTROL	Higher	4049, 0.767, WSW
86	DOMESTIC COMMERCIAL	1133 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	4099, 0.776, SW
87	373 NORTH NIMITZ HIG	373 N NIMITZ HWY	HI SHWS, HI SPILLS	Higher	4104, 0.777, South
88	SENIOR RESIDENCES AT	888 IWILEI RD	HI SHWS, HI INST CONTROL	Higher	4132, 0.783, South
R89	BHP GASCO	432 PACIFIC STREET	EDR MGP	Higher	4148, 0.786, SSW
90	LILIHA CIVIC CENTER	337 N KING ST	HI SHWS	Higher	4153, 0.787, SSE
Q91	CHEVRON KAPALAMA TER	1105 N NIMITZ HWY	HI SHWS, HI SPILLS, HI INST CONTROL	Higher	4156, 0.787, SW
R92	UNOCAL 76 HONOLULU L	411 PACIFIC ST	RCRA NonGen / NLR, FINDS, HI SHWS, HI UST, HI...	Higher	4217, 0.799, SSW
93	IWILEI FRUIT AND VEG	920 IWILEI ROAD	HI SHWS, HI LUST, HI UST	Higher	4235, 0.802, SSE
94	HART STREET WWPS	1031 N NIMITZ HWY	HI SHWS, HI UIC	Higher	4273, 0.809, SW
95	KUAKINI MEDICAL CENT	347 N KUAKINI ST	RCRA-SQG, FINDS, HI SHWS, HI LUST, HI UST, HI...	Higher	4274, 0.809, ESE
96	420-470 NORTH NIMITZ	420-470 N NIMITZ HWY	HI SHWS, HI ENG CONTROLS	Higher	4337, 0.821, South
97	FACTORY STREET LEAD	2003 N KING ST	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	4339, 0.822, WNW
S98	356 PACIFIC STREET B	356 PACIFIC ST	HI SHWS, HI SPILLS	Higher	4346, 0.823, SSW
99	YOUNG BROTHERS REFRI	1331 N NIMITZ HWY	HI SHWS, HI SPILLS	Higher	4351, 0.824, WSW
100	GTE HAWAIIAN TEL - C	ALAKAWA ST & NIMITZ	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	4369, 0.827, SW
S101	BREWER ENVIRONMENTAL	311 PACIFIC ST	HI SHWS, HI SPILLS, HI VCP	Higher	4373, 0.828, SSW
102	IWILEI PROJECT SITE	IWILEI RD & N KING S	HI SHWS	Higher	4380, 0.830, SSE
S103	POLYNESIAN HOSPITALI	330 PACIFIC ST	RCRA-CESQG, FINDS, HI SHWS, HI LUST, HI UST, HI...	Higher	4393, 0.832, SSW
104	MID PAC PETROLEUM LL	540 N NIMITZ HWY	HI SHWS, HI LUST, HI UST, HI Financial Assurance	Higher	4522, 0.856, South
T105	HAWAII STEVEDORES	965 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS	Higher	4528, 0.858, SW
106	215 NORTH KING STREE	215 N KING ST	HI SHWS	Higher	4574, 0.866, SSE
T107	CHEVRON HONOLULU TRA	933 N NIMITZ HWY	HI SHWS, HI ENG CONTROLS, HI Financial Assurance	Higher	4582, 0.868, SSW
108	TOWN INN	248-258 N BERETANIA	HI SHWS, HI INST CONTROL, HI VCP	Higher	4598, 0.871, SSE
109	KAMEHAMEHA SCHOOLS	1887 MAKUAKANE ST	RCRA-CESQG, FINDS, HI SHWS, HI SPILLS, HI ENG...	Higher	4650, 0.881, North
U110	580 NORTH NIMITZ HIG	580 N NIMITZ HWY	HI SHWS, HI ENG CONTROLS	Higher	4654, 0.881, South
U111	CITY MILL	660 N NIMITZ HWY	HI SHWS, HI LUST, HI UST, HI INST CONTROL	Higher	4689, 0.888, South
112	DILLINGHAM BOULEVARD	DILLINGHAM BLVD & MO	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	4698, 0.890, West
V113	WEYERHAEUSER	900 N NIMITZ HWY	HI SHWS, HI SPILLS	Higher	4711, 0.892, SSW
114	ZIPPY'S 634 N NIMITZ	634 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	4746, 0.899, South
115	KAPALAMA INCINERATOR	757 KOKEA ST	RCRA-SQG, HI SHWS, HI SPILLS, HI INST CONTROL	Higher	4765, 0.902, WNW

MAPPED SITES SUMMARY

Target Property Address:
LUNALILO FREEWAY/KOHOU STREET
HONOLULU, HI 96817

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
116	AWA WASTEWATER PUMP	190 N NIMITZ HWY	HI SHWS, HI SPILLS	Lower	4775, 0.904, South
V117	861-869 NORTH NIMITZ	861-869 N NIMITZ HWY	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	4819, 0.913, SSW
V118	HAWAIIAN ELECTRIC CO	855 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	4847, 0.918, SSW
119	700 N NIMITZ IDPP RE	700 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	4879, 0.924, SSW
W120	HAWAIIAN GRAIN CORPO	701 N NIMITZ HWY	HI SHWS, HI LUST, HI UST	Higher	5057, 0.958, SSW
X121	PAULEY PETROLEUM	795 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	5082, 0.962, SSW
W122	HAWAIIAN FLOUR MILL	703 N NIMITZ HWY	HI SHWS	Higher	5085, 0.963, SSW
W123	MOANA PAA KAI	705 N NIMITZ HWY	RCRA-CESQG, HI SHWS, HI SPILLS	Higher	5087, 0.963, SSW
X124	EQUILON ENTERPRISES	789 N NIMITZ HWY	HI SHWS	Higher	5098, 0.966, SSW
125	CHANG-CHOW PROPERTY,	2161 N SCHOOL ST	HI SHWS	Higher	5099, 0.966, NNW
Y126	BHP PIER 29	739 N NIMITZ HWY	HI SHWS	Higher	5112, 0.968, SSW
127	KEKAULIKE DIAMOND HE	163 N HOTEL ST	HI SHWS, HI SPILLS	Higher	5116, 0.969, SSE
128	775 NORTH NIMITZ HIG	775 N NIMITZ HWY	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	5120, 0.970, SSW
Y129	755 N NIMITZ HWY	755 N NIMITZ HWY	HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST...	Higher	5122, 0.970, SSW
130	PACIFIC POULTRY	1804 KANAKANUI ST	HI SHWS, HI SPILLS	Higher	5228, 0.990, West
131	KUHIO PARK TERRACE T	LINAPUNI ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	5239, 0.992, NW
132	SAUSE BROTHERS	ALAKEA ST	HI SHWS, HI SPILLS	Higher	5249, 0.994, South

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

CERCLIS: A review of the CERCLIS list, as provided by EDR, and dated 10/25/2013 has revealed that there are 2 CERCLIS sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
TAKAMIYA PROPERTY	850 MOOWAA ST.	W 1/4 - 1/2 (0.260 mi.)	I36	16
KAPALAMA INCINERATOR	757 KOKEA STREET	SW 1/4 - 1/2 (0.392 mi.)	54	23

Federal RCRA generators list

RCRA-CESQG: A review of the RCRA-CESQG list, as provided by EDR, and dated 12/09/2014 has revealed that there are 7 RCRA-CESQG sites within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
UNOCAL 76 SS L 0471	1136 N KING ST	SW 0 - 1/8 (0.118 mi.)	A3	8
<i>QUEEN LILIOKALANI HO</i>	<i>1300 HALONA ST</i>	<i>NNW 0 - 1/8 (0.122 mi.)</i>	<i>4</i>	<i>8</i>
<i>OAHU AIR CONDITIONIN</i>	<i>938 KOHOU ST</i>	<i>SW 1/8 - 1/4 (0.190 mi.)</i>	<i>E16</i>	<i>11</i>
<i>ACCENT WALL DESIGN I</i>	<i>1240 MOOKAULA ST</i>	<i>WSW 1/8 - 1/4 (0.196 mi.)</i>	<i>C18</i>	<i>11</i>
YAMASAKI SERVICE INC	1010 KING ST	SSW 1/8 - 1/4 (0.197 mi.)	F23	13
<i>GERMAN CAR SERVICE</i>	<i>1310 MOOKAULA ST</i>	<i>W 1/8 - 1/4 (0.229 mi.)</i>	<i>G28</i>	<i>14</i>
<i>HAWAII HOCHI LTD</i>	<i>917 KOKEA ST</i>	<i>SW 1/8 - 1/4 (0.233 mi.)</i>	<i>H31</i>	<i>15</i>

EXECUTIVE SUMMARY

State- and tribal - equivalent CERCLIS

HI SHWS: A review of the HI SHWS list, as provided by EDR, and dated 12/02/2014 has revealed that there are 72 HI SHWS sites within approximately 1 mile of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
GTE-HAWAIIAN TEL EMP	1138 N KING ST	WSW 1/8 - 1/4 (0.133 mi.)	A6	8
JBL HAWAII, LTD	905 KOKEA ST	SW 1/8 - 1/4 (0.245 mi.)	H33	15
TAKAMIYA PROPERTY	850 MOOWAA ST	W 1/4 - 1/2 (0.260 mi.)	I34	15
ROSS TRUSTS	819 MOOWAA ST	WSW 1/4 - 1/2 (0.296 mi.)	K43	19
HONOLULU COMMUNITY C	874 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.461 mi.)	M59	24
OWNED BY CCI, LEASED	925 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M60	25
THEO DAVIES CATERPIL	935 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M62	25
CLASSIC BOWL	1190 DILLINGHAM BLVD	SW 1/4 - 1/2 (0.482 mi.)	65	26
FARRINGTON HIGH SCHO	1564 N KING ST	WNW 1/2 - 1 (0.501 mi.)	67	27
DOLE IWILEI	801 DILLINGHAM BLVD	S 1/2 - 1 (0.501 mi.)	68	27
KAMEHAMEHA SCHOOLS -	1336 DILLINGHAM BLVD	WSW 1/2 - 1 (0.527 mi.)	69	27
HALL MARK DRY CLEANE	1470 LILIHA ST	SE 1/2 - 1 (0.576 mi.)	70	27
LANCE GOYA CHEVRON	504 N SCHOOL ST	SE 1/2 - 1 (0.588 mi.)	71	27
COSTCO WAREHOUSE	525 ALAKAWA ST	SSW 1/2 - 1 (0.609 mi.)	N72	28
COSTCO GAS STATION	520 ALAKAWA ST	SSW 1/2 - 1 (0.613 mi.)	N73	28
VON HAMM TEXTILES	546 KAAAAHI ST	S 1/2 - 1 (0.614 mi.)	O74	28
1385 COLBURN STREET	1385 COLBURN ST	WSW 1/2 - 1 (0.616 mi.)	P75	28
NUUANU AUTO COMPANY	545 KAAAAHI ST	S 1/2 - 1 (0.616 mi.)	O76	29
GENERAL TIRE	505 WAIAKAMILO RD	WSW 1/2 - 1 (0.630 mi.)	P78	29
IWILEI BUSINESS CENT	501 SUMNER ST	SSW 1/2 - 1 (0.646 mi.)	79	29
TRAVEL PLAZA TRANSPO	818 PINE ST	S 1/2 - 1 (0.651 mi.)	80	29
HOME DEPOT	421 ALAKAWA ST	SSW 1/2 - 1 (0.697 mi.)	81	30
BEST BUY	ALAKAWA ST & NIMITZ	SW 1/2 - 1 (0.725 mi.)	82	30
BHP GASCO BENZENE SI	616 IWILEI RD	SSW 1/2 - 1 (0.744 mi.)	83	30
MCCABE, HAMILTON, &	1130 N NIMITZ HWY	SW 1/2 - 1 (0.763 mi.)	Q84	30
1305 HART STREET	1305 HART ST	WSW 1/2 - 1 (0.767 mi.)	85	30
DOMESTIC COMMERCIAL	1133 N NIMITZ HWY	SW 1/2 - 1 (0.776 mi.)	86	31
373 NORTH NIMITZ HIG	373 N NIMITZ HWY	S 1/2 - 1 (0.777 mi.)	87	31
SENIOR RESIDENCES AT	888 IWILEI RD	S 1/2 - 1 (0.783 mi.)	88	31
LILIHA CIVIC CENTER	337 N KING ST	SSE 1/2 - 1 (0.787 mi.)	90	31
CHEVRON KAPALAMA TER	1105 N NIMITZ HWY	SW 1/2 - 1 (0.787 mi.)	Q91	31
UNOCAL 76 HONOLULU L	411 PACIFIC ST	SSW 1/2 - 1 (0.799 mi.)	R92	32
IWILEI FRUIT AND VEG	920 IWILEI ROAD	SSE 1/2 - 1 (0.802 mi.)	93	32
HART STREET WWPS	1031 N NIMITZ HWY	SW 1/2 - 1 (0.809 mi.)	94	32
KUAKINI MEDICAL CENT	347 N KUAKINI ST	ESE 1/2 - 1 (0.809 mi.)	95	33
420-470 NORTH NIMITZ	420-470 N NIMITZ HWY	S 1/2 - 1 (0.821 mi.)	96	33
FACTORY STREET LEAD	2003 N KING ST	WNW 1/2 - 1 (0.822 mi.)	97	33
356 PACIFIC STREET B	356 PACIFIC ST	SSW 1/2 - 1 (0.823 mi.)	S98	34
YOUNG BROTHERS REFRI	1331 N NIMITZ HWY	WSW 1/2 - 1 (0.824 mi.)	99	34
GTE HAWAIIAN TEL - C	ALAKAWA ST & NIMITZ	SW 1/2 - 1 (0.827 mi.)	100	34
BREWER ENVIRONMENTAL	311 PACIFIC ST	SSW 1/2 - 1 (0.828 mi.)	S101	34
IWILEI PROJECT SITE	IWILEI RD & N KING S	SSE 1/2 - 1 (0.830 mi.)	102	34
POLYNESIAN HOSPITALI	330 PACIFIC ST	SSW 1/2 - 1 (0.832 mi.)	S103	34
MID PAC PETROLEUM LL	540 N NIMITZ HWY	S 1/2 - 1 (0.856 mi.)	104	35
HAWAII STEVEDORES	965 N NIMITZ HWY	SW 1/2 - 1 (0.858 mi.)	T105	36
215 NORTH KING STREE	215 N KING ST	SSE 1/2 - 1 (0.866 mi.)	106	36
CHEVRON HONOLULU TRA	933 N NIMITZ HWY	SSW 1/2 - 1 (0.868 mi.)	T107	36
TOWN INN	248-258 N BERETANIA	SSE 1/2 - 1 (0.871 mi.)	108	36
KAMEHAMEHA SCHOOLS	1887 MAKUAKANE ST	N 1/2 - 1 (0.881 mi.)	109	36
580 NORTH NIMITZ HIG	580 N NIMITZ HWY	S 1/2 - 1 (0.881 mi.)	U110	37

EXECUTIVE SUMMARY

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
CITY MILL	660 N NIMITZ HWY	S 1/2 - 1 (0.888 mi.)	U111	37
DILLINGHAM BOULEVARD	DILLINGHAM BLVD & MO	W 1/2 - 1 (0.890 mi.)	112	37
WEYERHAEUSER	900 N NIMITZ HWY	SSW 1/2 - 1 (0.892 mi.)	V113	37
ZIPPY'S 634 N NIMITZ	634 N NIMITZ HWY	S 1/2 - 1 (0.899 mi.)	114	38
KAPALAMA INCINERATOR	757 KOKEA ST	WNW 1/2 - 1 (0.902 mi.)	115	38
861-869 NORTH NIMITZ	861-869 N NIMITZ HWY	SSW 1/2 - 1 (0.913 mi.)	V117	38
HAWAIIAN ELECTRIC CO	855 N NIMITZ HWY	SSW 1/2 - 1 (0.918 mi.)	V118	38
700 N NIMITZ IDPP RE	700 N NIMITZ HWY	SSW 1/2 - 1 (0.924 mi.)	119	38
HAWAIIAN GRAIN CORPO	701 N NIMITZ HWY	SSW 1/2 - 1 (0.958 mi.)	W120	39
PAULEY PETROLEUM	795 N NIMITZ HWY	SSW 1/2 - 1 (0.962 mi.)	X121	39
HAWAIIAN FLOUR MILL	703 N NIMITZ HWY	SSW 1/2 - 1 (0.963 mi.)	W122	39
MOANA PAA KAI	705 N NIMITZ HWY	SSW 1/2 - 1 (0.963 mi.)	W123	39
EQUILON ENTERPRISES	789 N NIMITZ HWY	SSW 1/2 - 1 (0.966 mi.)	X124	39
CHANG-CHOW PROPERTY,	2161 N SCHOOL ST	NNW 1/2 - 1 (0.966 mi.)	125	40
BHP PIER 29	739 N NIMITZ HWY	SSW 1/2 - 1 (0.968 mi.)	Y126	40
KEKAULIKE DIAMOND HE	163 N HOTEL ST	SSE 1/2 - 1 (0.969 mi.)	127	40
775 NORTH NIMITZ HIG	775 N NIMITZ HWY	SSW 1/2 - 1 (0.970 mi.)	128	40
755 N NIMITZ HWY	755 N NIMITZ HWY	SSW 1/2 - 1 (0.970 mi.)	Y129	40
PACIFIC POULTRY	1804 KANAKANUI ST	W 1/2 - 1 (0.990 mi.)	130	40
KUHIO PARK TERRACE T	LINAPUNI ST	NW 1/2 - 1 (0.992 mi.)	131	41
SAUSE BROTHERS	ALAKEA ST	S 1/2 - 1 (0.994 mi.)	132	41
Lower Elevation	Address	Direction / Distance	Map ID	Page
AWA WASTEWATER PUMP	190 N NIMITZ HWY	S 1/2 - 1 (0.904 mi.)	116	38

State and tribal leaking storage tank lists

HI LUST: A review of the HI LUST list, as provided by EDR, and dated 03/02/2015 has revealed that there are 33 HI LUST sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
7-11 KAPALAMA Facility Id: 9-100028 Release ID: 930033 Facility Status: Site Cleanup Completed (NFA)	1136 N KING ST.	SW 0 - 1/8 (0.118 mi.)	A2	7
KING'S SERVICE Facility Id: 9-101111 Release ID: 870007 Facility Status: Site Cleanup Completed (NFA)	1070 N KING ST	SSW 1/8 - 1/4 (0.158 mi.)	8	9
OAHU PLUMBING & SHEE Facility Id: 9-103346 Release ID: 980032 Facility Status: Site Cleanup Completed (NFA)	1217 N KING ST	W 1/8 - 1/4 (0.159 mi.)	B9	9
U.S. POSTAL SERVICE Facility Id: 9-101773 Release ID: 900116 Facility Status: Site Cleanup Completed (NFA)	1271 N KING ST	W 1/8 - 1/4 (0.188 mi.)	D15	10
JOHIRO BROTHERS, INC Facility Id: 9-100258 Release ID: 930050 Facility Status: Site Cleanup Completed (NFA)	1240 MOOKAULA ST	WSW 1/8 - 1/4 (0.196 mi.)	C19	12

EXECUTIVE SUMMARY

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
MAHALO NORTH KING AU Facility Id: 9-100339 Release ID: 080009 Release ID: 980145 Facility Status: Site Cleanup Completed with EHMP Facility Status: Site Cleanup Completed (NFA)	1010 N KING ST	SSW 1/8 - 1/4 (0.197 mi.)	F22	12
OAHU PLUMBING & SHEE Facility Id: 9-101367 Release ID: 990119 Facility Status: Site Cleanup Completed (NFA)	926 KOHOU ST	SW 1/8 - 1/4 (0.207 mi.)	E26	13
JBL HAWAII LTD Facility Id: 9-102462 Release ID: 920012 Facility Status: Site Cleanup Completed (NFA)	905 KOKEA ST	SW 1/8 - 1/4 (0.245 mi.)	H32	15
I. STEVEN SUNADA Facility Id: 9-100251 Release ID: 910015 Facility Status: Site Cleanup Completed (NFA)	850 MOOWAA ST	W 1/4 - 1/2 (0.260 mi.)	I35	16
FUTURE HONOLULU FORD Facility Id: 9-103785 Release ID: 040065 Facility Status: Site Cleanup Completed (NFA)	CORNER OF HOUGHTAILI	WNW 1/4 - 1/2 (0.270 mi.)	J37	16
HAWAII HOUSING AUTHO Facility Id: 9-101036 Release ID: 940197 Facility Status: Site Cleanup Completed (NFA)	1002 N SCHOOL ST	ENE 1/4 - 1/2 (0.271 mi.)	38	16
SAWAI BROTHERS PAINT Facility Id: 9-101808 Release ID: 980024 Facility Status: Site Cleanup Completed (NFA)	1135 N SCHOOL ST	NE 1/4 - 1/2 (0.273 mi.)	39	17
TESORO 2GO #61022 Facility Id: 9-100348 Release ID: 980039 Facility Status: Site Cleanup Completed (NFA)	1311 PALAMA ST	SSE 1/4 - 1/2 (0.280 mi.)	40	17
MARSHALL'S SHELL SS Facility Id: 9-100783 Release ID: 920145 Release ID: 060022 Release ID: 080032 Release ID: 150008 Facility Status: Site Cleanup Completed (NFA) Facility Status: Confirmed Release	1029 HOUGHTAILING ST	WNW 1/4 - 1/2 (0.281 mi.)	J41	18
ISLAND PAINTING Facility Id: 9-102161 Release ID: 910079 Facility Status: Site Cleanup Completed (NFA)	1353 MOOKAULA ST	W 1/4 - 1/2 (0.283 mi.)	42	18
SEN PLEX CORPORATION Facility Id: 9-103359 Release ID: 980053 Facility Status: Site Cleanup Completed (NFA)	819 MOOWAA ST	WSW 1/4 - 1/2 (0.296 mi.)	K44	19
OKADA TRUCKING CO., Facility Id: 9-100285 Release ID: 900028 Facility Status: Site Cleanup Completed (NFA)	818 MOOWAA ST	WSW 1/4 - 1/2 (0.296 mi.)	K45	19

EXECUTIVE SUMMARY

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
PALAMA ELDERLY HOUSI Facility Id: 9-102887 Release ID: 950012 Facility Status: Site Cleanup Completed (NFA)	851 N SCHOOL ST	E 1/4 - 1/2 (0.314 mi.)	46	20
CLASSIC RUSTPROOFING Facility Id: 9-103539 Release ID: 000043 Facility Status: Site Cleanup Completed (NFA)	1437 N KING ST	WNW 1/4 - 1/2 (0.337 mi.)	47	20
FORMER T J AUTO REPA Facility Id: 9-103862 Release ID: 080039 Facility Status: Site Cleanup Completed (NFA)	1314 N. SCHOOL STREE	NNE 1/4 - 1/2 (0.338 mi.)	48	20
SHIMAYA SHOTEN, LTD. Facility Id: 9-101425 Release ID: 900044 Facility Status: Site Cleanup Completed (NFA)	710 KOHOU ST	SW 1/4 - 1/2 (0.366 mi.)	49	21
MALUHIA ELDERLY HOUS Facility Id: 9-103082 Release ID: 950084 Facility Status: Site Cleanup Completed (NFA)	1111 HALA DR	ENE 1/4 - 1/2 (0.376 mi.)	50	21
HONOLULU COMMUNITY C Facility Id: 9-103285 Release ID: 970108 Facility Status: Site Cleanup Completed (NFA)	DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.390 mi.)	51	21
AIM SCHOOL ST. Facility Id: 9-101198 Release ID: 990010 Facility Status: Active Remediation	1403 N SCHOOL ST	N 1/4 - 1/2 (0.391 mi.)	L52	22
KAPALAMA CHEVRON Facility Id: 9-101237 Release ID: 910023 Facility Status: Site Cleanup Completed with EHE/EHMP	1402 N SCHOOL ST	N 1/4 - 1/2 (0.392 mi.)	L53	22
MID PAC PETROLEUM 25 Facility Id: 9-100032 Release ID: 980023 Release ID: 090002 Release ID: 040006 Facility Status: Site Cleanup Completed with EHE	1342 N SCHOOL ST	NNE 1/4 - 1/2 (0.399 mi.)	55	23
ALPAC CORPORATION Facility Id: 9-102546 Release ID: 920077 Facility Status: Site Cleanup Completed (NFA)	815 WAIKAMILO RD	W 1/4 - 1/2 (0.400 mi.)	56	23
SNAPPY SERVICE Facility Id: 9-100858 Release ID: 900093 Facility Status: Site Cleanup Completed with EHE/EHMP	719 N SCHOOL ST	ESE 1/4 - 1/2 (0.414 mi.)	57	24
RICHARD TOM Facility Id: 9-101574 Release ID: 990055 Facility Status: Site Cleanup Completed (NFA)	963 ROBELLO LN	S 1/4 - 1/2 (0.437 mi.)	58	24
SPRINT LOT Facility Id: 9-103769 Release ID: 030041 Facility Status: Site Cleanup Completed (NFA)	925 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M61	25

EXECUTIVE SUMMARY

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
MALUHIA HOSPITAL Facility Id: 9-103044 Release ID: 950073 Facility Status: Site Cleanup Completed (NFA)	1027 HALA DR	ENE 1/4 - 1/2 (0.466 mi.)	63	25
KING SHELL FOODMART Facility Id: 9-101026 Release ID: 020033 Release ID: 080030 Release ID: 030030 Facility Status: Site Cleanup Completed (NFA)	666 N KING ST	SSE 1/4 - 1/2 (0.469 mi.)	64	26
HAWAIIAN CANDIES & N Facility Id: 9-101980 Release ID: 910024 Facility Status: Site Cleanup Completed (NFA)	707 WAIAKAMILO RD	WSW 1/4 - 1/2 (0.486 mi.)	66	26

State and tribal registered storage tank lists

HI UST: A review of the HI UST list, as provided by EDR, and dated 03/02/2015 has revealed that there are 10 HI UST sites within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
7-11 KAPALAMA Facility Id: 9-100028 Date Closed: 12/15/1992 Date Closed: 12/11/1992 Tank Status: Permanently Out of Use Tank Status: Currently In Use	1136 N KING ST.	SW 0 - 1/8 (0.118 mi.)	A2	7
KING'S SERVICE Facility Id: 9-101111 Date Closed: 07/01/1993 Date Closed: 09/29/1986 Tank Status: Permanently Out of Use	1070 N KING ST	SSW 1/8 - 1/4 (0.158 mi.)	8	9
OAHU PLUMBING & SHEE Facility Id: 9-103346 Date Closed: 01/06/1998 Tank Status: Permanently Out of Use	1217 N KING ST	W 1/8 - 1/4 (0.159 mi.)	B9	9
PACIFIC AUTO SERVICE Facility Id: 9-100930 Date Closed: 04/01/1988 Tank Status: Permanently Out of Use	1229 N KING ST	W 1/8 - 1/4 (0.164 mi.)	B11	9
KANO TRUCKING SERVIC Facility Id: 9-101372 Date Closed: 07/11/1997 Tank Status: Permanently Out of Use	1412 IAO LANE	SE 1/8 - 1/4 (0.169 mi.)	13	10
U.S. POSTAL SERVICE Facility Id: 9-101773 Date Closed: 05/14/2001 Date Closed: 07/30/1990 Tank Status: Permanently Out of Use	1271 N KING ST	W 1/8 - 1/4 (0.188 mi.)	D15	10

EXECUTIVE SUMMARY

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
JOHIRO BROTHERS, INC Facility Id: 9-100258 Date Closed: 01/26/1993 Tank Status: Permanently Out of Use	1240 MOOKAULA ST	WSW 1/8 - 1/4 (0.196 mi.)	C19	12
MAHALO NORTH KING AU Facility Id: 9-100339 Date Closed: 11/30/1987 Date Closed: 12/03/2007 Date Closed: 11/07/2005 Tank Status: Permanently Out of Use Tank Status: Permanently out of Use	1010 N KING ST	SSW 1/8 - 1/4 (0.197 mi.)	F22	12
OAHU PLUMBING & SHEE Facility Id: 9-101367 Date Closed: 01/07/1999 Tank Status: Permanently Out of Use	926 KOHOU ST	SW 1/8 - 1/4 (0.207 mi.)	E26	13
JBL HAWAII LTD Facility Id: 9-102462 Date Closed: 10/19/1991 Tank Status: Permanently Out of Use	905 KOKEA ST	SW 1/8 - 1/4 (0.245 mi.)	H32	15

State and tribal institutional control / engineering control registries

HI ENG CONTROLS: A review of the HI ENG CONTROLS list, as provided by EDR, and dated 12/02/2014 has revealed that there are 4 HI ENG CONTROLS sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
GTE-HAWAIIAN TEL EMP	1138 N KING ST	WSW 1/8 - 1/4 (0.133 mi.)	A6	8
JBL HAWAII, LTD	905 KOKEA ST	SW 1/8 - 1/4 (0.245 mi.)	H33	15
OWNED BY CCI, LEASED	925 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M60	25
THEO DAVIES CATERPIL	935 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M62	25

HI INST CONTROL: A review of the HI INST CONTROL list, as provided by EDR, and dated 12/02/2014 has revealed that there are 4 HI INST CONTROL sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
GTE-HAWAIIAN TEL EMP	1138 N KING ST	WSW 1/8 - 1/4 (0.133 mi.)	A6	8
JBL HAWAII, LTD	905 KOKEA ST	SW 1/8 - 1/4 (0.245 mi.)	H33	15
OWNED BY CCI, LEASED	925 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M60	25
THEO DAVIES CATERPIL	935 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M62	25

EXECUTIVE SUMMARY

State and tribal voluntary cleanup sites

HI VCP: A review of the HI VCP list, as provided by EDR, and dated 12/02/2014 has revealed that there are 2 HI VCP sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
ROSS TRUSTS	819 MOOWAA ST	WSW 1/4 - 1/2 (0.296 mi.)	K43	19
OWNED BY CCI, LEASED	925 DILLINGHAM BLVD	SSW 1/4 - 1/2 (0.465 mi.)	M60	25

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

RCRA NonGen / NLR: A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/09/2014 has revealed that there are 3 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
BOBS AUTO REPAIR	1138-A N KING ST	WSW 1/8 - 1/4 (0.133 mi.)	A5	8
KANO TRUCKING SERVIC	1412 IAO LANE	SE 1/8 - 1/4 (0.169 mi.)	13	10
OAHU AIR CONDITIONIN	904 KOHOU ST	SW 1/8 - 1/4 (0.223 mi.)	27	14

DOD: A review of the DOD list, as provided by EDR, and dated 12/31/2005 has revealed that there are 2 DOD sites within approximately 1 mile of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
SAND ISLAND MILITARY		SSW 1/2 - 1 (0.756 mi.)	0	7
FORT SHAFTER		NW 1/2 - 1 (0.935 mi.)	0	7

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: A review of the EDR MGP list, as provided by EDR, has revealed that there are 2 EDR MGP sites within approximately 1 mile of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
HAWAIIAN GAS PRODUCT	516-520 KUWILI ST	S 1/2 - 1 (0.621 mi.)	77	29
BHP GASCO	432 PACIFIC STREET	SSW 1/2 - 1 (0.786 mi.)	R89	31

EXECUTIVE SUMMARY

EDR US Hist Auto Stat: A review of the EDR US Hist Auto Stat list, as provided by EDR, has revealed that there are 10 EDR US Hist Auto Stat sites within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
Not reported	1435 AULD LN	E 0 - 1/8 (0.109 mi.)	1	7
Not reported	1160 N KING ST	WSW 1/8 - 1/4 (0.138 mi.)	7	8
Not reported	1229 N KING ST	W 1/8 - 1/4 (0.164 mi.)	B12	10
Not reported	1240 MOOKAULA BAY 5	WSW 1/8 - 1/4 (0.182 mi.)	C14	10
Not reported	1240 MOOKAULA ST	WSW 1/8 - 1/4 (0.196 mi.)	C20	12
Not reported	1010 N KING ST	SSW 1/8 - 1/4 (0.197 mi.)	F21	12
Not reported	1249 MOOKAULA ST	WSW 1/8 - 1/4 (0.199 mi.)	C24	13
Not reported	1255 MOOKAULA ST	WSW 1/8 - 1/4 (0.200 mi.)	C25	13
Not reported	1310 MOOKAULA ST	W 1/8 - 1/4 (0.229 mi.)	G29	14
Not reported	1311 MOOKAULA ST	W 1/8 - 1/4 (0.229 mi.)	G30	14

EDR US Hist Cleaners: A review of the EDR US Hist Cleaners list, as provided by EDR, has revealed that there are 2 EDR US Hist Cleaners sites within approximately 0.25 miles of the target property.

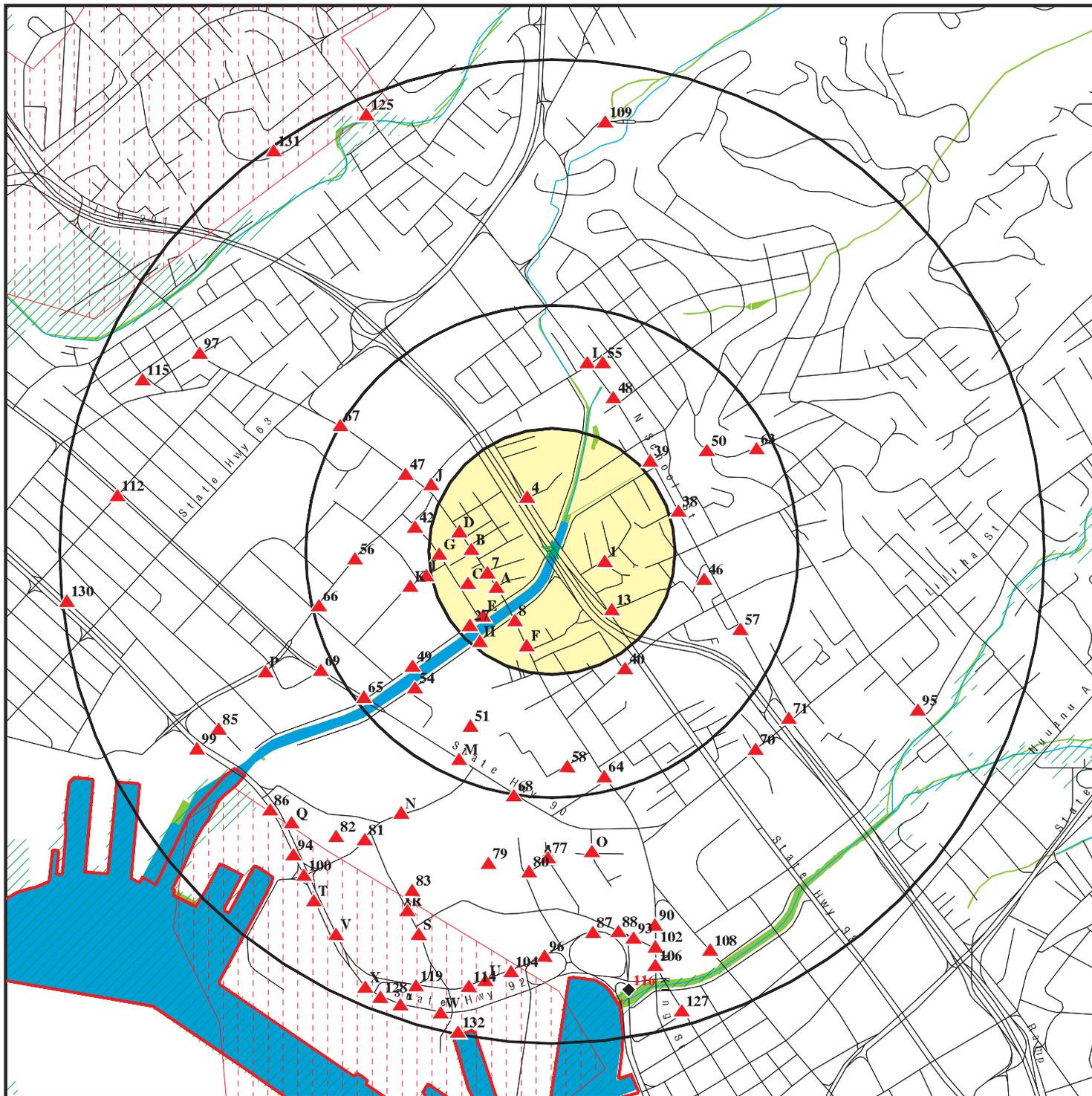
<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
Not reported	1222 N KING ST	W 1/8 - 1/4 (0.163 mi.)	B10	9
Not reported	1270 N KING ST	WNW 1/8 - 1/4 (0.192 mi.)	D17	11

Count: 8 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HONOLULU	S117391417	1339 SCHOOL STREET	1339, 1341, 1343 N SCHOOL ST		HI SHWS, HI ENG CONTROLS, HI INST CONTROL
HONOLULU	S108008549	KALANI, HART, MOKUAEA STREET, HONO	HART ST & KALANI ST & MOKUAEA		HI SHWS
HONOLULU	S115488703	KALIHI AND KALAEPA INTERSECTION	KALAEPA DR AND KALIHI ST		HI SHWS, HI SPILLS
HONOLULU	1006820337	ABC DISPOSAL COMPANY	2760 KAMEHAMEHA HWY	96819	HI SHWS
HONOLULU	S111704706	FORMER KAPALAMA MILITARY RESERVATI	N NIMITZ HWY		HI SHWS
HONOLULU	S108008765	CITIZENS ENERGY SERVICES PIER 38	NIMITZ HWY		HI SHWS, HI SPILLS, HI ENG CONTROLS, HI INST CONTROL
HONOLULU	S106819311	NIMITZ HIGHWAY WATER IMPROVEMENT P	N NIMITZ HWY	96817	HI SHWS
HONOLULU	S108859926	KOKUA KALIHI VALLEY ACTIVE LIVING	UPPER KALIHI ST		HI SHWS, HI BROWNFIELDS

OVERVIEW MAP - 4293163.2S



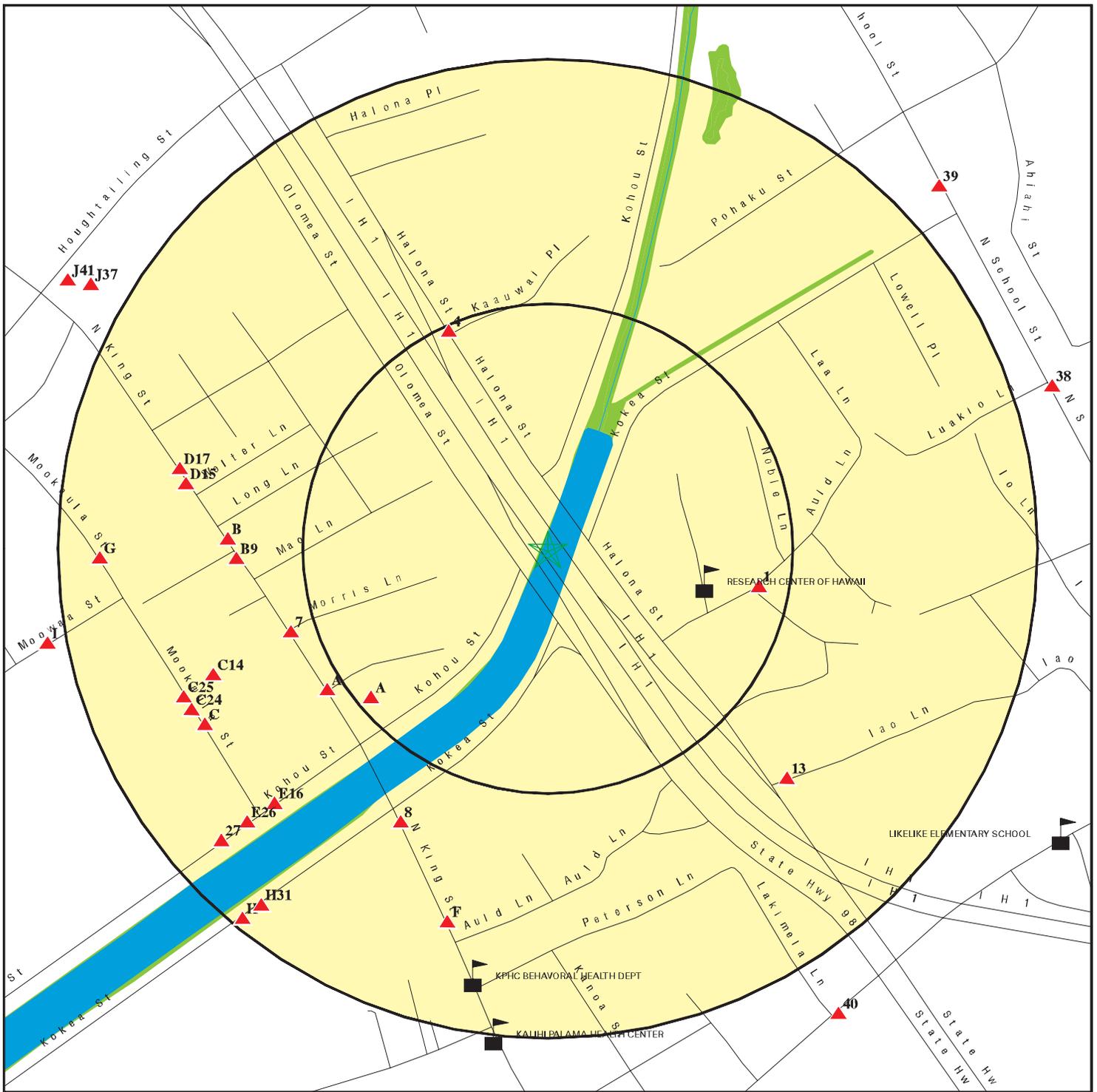
- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ⚡ Manufactured Gas Plants
- 🏠 National Priority List Sites
- 🏠 Dept. Defense Sites
- 🏠 Indian Reservations BIA
- 📏 County Boundary
- 📏 Oil & Gas pipelines from USGS
- 🌊 100-year flood zone
- 🌊 500-year flood zone
- 🌿 National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Halona Bridge
 ADDRESS: Lunalilo Freeway/Kohou Street
 Honolulu HI 96817
 LAT/LONG: 21.3266 / 157.8675

CLIENT: CH2M Hill Corporation
 CONTACT: Lyna Black
 INQUIRY #: 4293163.2s
 DATE: May 13, 2015 5:14 pm

DETAIL MAP - 4293163.2S



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

- Indian Reservations BIA
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Halona Bridge
 ADDRESS: Lunalilo Freeway/Kohou Street
 Honolulu HI 96817
 LAT/LONG: 21.3266 / 157.8675

CLIENT: CH2M Hill Corporation
 CONTACT: Lyna Black
 INQUIRY #: 4293163.2s
 DATE: May 13, 2015 5:17 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
<i>Federal NPL site list</i>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
<i>Federal Delisted NPL site list</i>								
Delisted NPL	1.000		0	0	0	0	NR	0
<i>Federal CERCLIS list</i>								
CERCLIS	0.500		0	0	2	NR	NR	2
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
<i>Federal CERCLIS NFRAP site List</i>								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
<i>Federal RCRA CORRACTS facilities list</i>								
CORRACTS	1.000		0	0	0	0	NR	0
<i>Federal RCRA non-CORRACTS TSD facilities list</i>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<i>Federal RCRA generators list</i>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		2	5	NR	NR	NR	7
<i>Federal institutional controls / engineering controls registries</i>								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
<i>Federal ERNS list</i>								
ERNS	TP		NR	NR	NR	NR	NR	0
<i>State- and tribal - equivalent CERCLIS</i>								
HI SHWS	1.000		0	2	6	64	NR	72
<i>State and tribal landfill and/or solid waste disposal site lists</i>								
HI SWF/LF	0.500		0	0	0	NR	NR	0
<i>State and tribal leaking storage tank lists</i>								
HI LUST	0.500		1	7	25	NR	NR	33
INDIAN LUST	0.500		0	0	0	NR	NR	0
<i>State and tribal registered storage tank lists</i>								
HI UST	0.250		1	9	NR	NR	NR	10

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
HI ENG CONTROLS	0.500		0	2	2	NR	NR	4
HI INST CONTROL	0.500		0	2	2	NR	NR	4
State and tribal voluntary cleanup sites								
HI VCP	0.500		0	0	2	NR	NR	2
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
HI BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
HI CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
HI SPILLS	TP		NR	NR	NR	NR	NR	0
HI SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	3	NR	NR	NR	3
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	2	NR	2
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
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DOD Region SSW 1/2-1 3993 ft.	SAND ISLAND MILITARY RESERVATION SAND ISLAND MILITARY RESE (County), HI Click here for full text details	DOD	CUSA147757 N/A
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DOD Region NW 1/2-1 4935 ft.	FORT SHAFTER FORT SHAFTER (County), HI Click here for full text details	DOD	CUSA147753 N/A
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1 East < 1/8 0.109 mi. 578 ft.	1435 AULD LN HONOLULU, HI 96817 Click here for full text details	EDR US Hist Auto Stat	1015227916 N/A
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Relative:
Higher

A2 SW < 1/8 0.118 mi. 622 ft.	7-11 KAPALAMA 1136 N KING ST. HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST HI Financial Assurance	U003154444 N/A
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Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 930033
 Facility Id: 9-100028

HI UST
 Tank Status: Permanently Out of Use
 Tank Status: Currently In Use
 Date Closed: 12/15/1992
 Date Closed: 12/11/1992
 Facility Id: 9-100028

HI Financial Assurance
 Alt Facility ID: 9-100028
 Tank Status: Permanently Out of Use
 Tank Status: Currently In Use

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
A3 SW < 1/8 0.118 mi. 622 ft.	UNOCAL 76 SS L 0471 1136 N KING ST HONOLULU, HI 96817 Click here for full text details	RCRA-CESQG	1004688898 HID984468702
Relative: Higher	RCRA-CESQG EPA Id: HID984468702		
4 NNW < 1/8 0.122 mi. 646 ft.	QUEEN LILIOKALANI HOSPITAL 1300 HALONA ST HONOLULU, HI 96817 Click here for full text details	RCRA-CESQG FINDS	1004688933 HIR000000018
Relative: Higher	RCRA-CESQG EPA Id: HIR000000018		
	FINDS Registry ID:: 110005729104		
A5 WSW 1/8-1/4 0.133 mi. 704 ft.	BOBS AUTO REPAIR 1138-A N KING ST HONOLULU, HI 96817 Click here for full text details	RCRA NonGen / NLR	1000373883 HID981660905
Relative: Higher	RCRA NonGen / NLR EPA Id: HID981660905		
A6 WSW 1/8-1/4 0.133 mi. 704 ft.	GTE-HAWAIIAN TEL EMPLOYEES FEDERAL CREDIT UNION (HTEFCU) 1138 N KING ST HONOLULU, HI 96817 Click here for full text details	HI SHWS HI ENG CONTROLS HI INST CONTROL	1006820922 N/A
Relative: Higher			
7 WSW 1/8-1/4 0.138 mi. 727 ft.	1160 N KING ST HONOLULU, HI 96817 Click here for full text details	EDR US Hist Auto Stat	1015170839 N/A
Relative: Higher			

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
8 SSW 1/8-1/4 0.158 mi. 835 ft.	KING'S SERVICE 1070 N KING ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U003541723 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 870007 Facility Id: 9-101111 HI UST Tank Status: Permanently Out of Use Date Closed: 07/01/1993 Date Closed: 09/29/1986 Facility Id: 9-101111		
B9 West 1/8-1/4 0.159 mi. 839 ft.	OAHU PLUMBING & SHEETMETAL 1217 N KING ST HONOLULU, HI 96819 Click here for full text details	HI LUST HI UST	U003221928 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 980032 Facility Id: 9-103346 HI UST Tank Status: Permanently Out of Use Date Closed: 01/06/1998 Facility Id: 9-103346		
B10 West 1/8-1/4 0.163 mi. 862 ft.	1222 N KING ST HONOLULU, HI 96817 Click here for full text details	EDR US Hist Cleaners	1014983189 N/A
Relative: Higher			
B11 West 1/8-1/4 0.164 mi. 866 ft.	PACIFIC AUTO SERVICE 1229 N KING ST HONOLULU, HI 96817 Click here for full text details	HI UST	U003541719 N/A
Relative: Higher	HI UST Tank Status: Permanently Out of Use Date Closed: 04/01/1988 Facility Id: 9-100930		

MAP FINDINGS

Map ID			EDR ID Number
Direction			EPA ID Number
Distance		Database(s)	
Elevation	Site		

B12 West 1/8-1/4 0.164 mi. 866 ft. Relative: Higher	1229 N KING ST HONOLULU, HI 96817 Click here for full text details	EDR US Hist Auto Stat 1015188110 N/A
--	--	--

13 SE 1/8-1/4 0.169 mi. 893 ft. Relative: Higher	KANO TRUCKING SERVICE LTD 1412 IAO LANE HONOLULU, HI 96817 Click here for full text details RCRA NonGen / NLR EPA Id: HID982497968	RCRA NonGen / NLR FINDS HI UST 1000327197 HID982497968
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FINDS
Registry ID:: 110005727062

HI UST
 Tank Status: Permanently Out of Use
 Date Closed: 07/11/1997
 Facility Id: 9-101372

C14 WSW 1/8-1/4 0.182 mi. 963 ft. Relative: Higher	1240 MOOKAULA BAY 5 HONOLULU, HI 96813 Click here for full text details	EDR US Hist Auto Stat 1015191011 N/A
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D15 West 1/8-1/4 0.188 mi. 991 ft. Relative: Higher	U.S. POSTAL SERVICE - KAPALAMA 1271 N KING ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST HI Financial Assurance U001235585 N/A
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HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 900116
 Facility Id: 9-101773

HI UST
 Tank Status: Permanently Out of Use
 Date Closed: 05/14/2001
 Date Closed: 07/30/1990
 Facility Id: 9-101773

HI Financial Assurance

MAP FINDINGS

Map ID
Direction
Distance
Elevation

Site

Database(s)

EDR ID Number
EPA ID Number

U.S. POSTAL SERVICE - KAPALAMA (Continued)

U001235585

Alt Facility ID: 9-101773
Tank Status: Permanently Out of Use

E16
SW
1/8-1/4
0.190 mi.
1005 ft.

OAHU AIR CONDITIONING SERVICE INC
938 KOHOU ST
HONOLULU, HI 96817

RCRA-CESQG
FINDS
CA HAZNET

1000423869
HID982525347

Relative:
Higher

[Click here for full text details](#)

RCRA-CESQG
EPA Id: HID982525347

FINDS

Registry ID:: 110005727197

CA HAZNET

GEPAID: HID982525347

D17
WNW
1/8-1/4
0.192 mi.
1015 ft.

1270 N KING ST
HONOLULU, HI 96817

EDR US Hist Cleaners

1014985672
N/A

Relative:
Higher

[Click here for full text details](#)

C18
WSW
1/8-1/4
0.196 mi.
1037 ft.

ACCENT WALL DESIGN INC
1240 MOOKAULA ST
HONOLULU, HI 96819

RCRA-CESQG
FINDS
CA HAZNET

1004688987
HIR000054296

Relative:
Higher

[Click here for full text details](#)

RCRA-CESQG
EPA Id: HIR000054296

FINDS

Registry ID:: 110005730478

CA HAZNET

GEPAID: HIR000054296

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
C19 WSW 1/8-1/4 0.196 mi. 1037 ft.	JOHIRO BROTHERS, INC. 1240 MOOKAULA ST HONOLULU, HI 96817 Click here for full text details Relative: Higher	HI LUST HI UST	U003154457 N/A
	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 930050 Facility Id: 9-100258 HI UST Tank Status: Permanently Out of Use Date Closed: 01/26/1993 Facility Id: 9-100258		
C20 WSW 1/8-1/4 0.196 mi. 1037 ft.	1240 MOOKAULA ST HONOLULU, HI 96817 Click here for full text details Relative: Higher	EDR US Hist Auto Stat	1015191012 N/A
F21 SSW 1/8-1/4 0.197 mi. 1040 ft.	1010 N KING ST HONOLULU, HI 96817 Click here for full text details Relative: Higher	EDR US Hist Auto Stat	1015126277 N/A
F22 SSW 1/8-1/4 0.197 mi. 1040 ft.	MAHALO NORTH KING AUTO 1010 N KING ST HONOLULU, HI 96817 Click here for full text details Relative: Higher	HI LUST HI UST HI Financial Assurance	U001235167 N/A
	HI LUST Facility Status: Site Cleanup Completed with EHMP Facility Status: Site Cleanup Completed (NFA) Release ID: 080009 Release ID: 980145 Facility Id: 9-100339 HI UST Tank Status: Permanently Out of Use Tank Status: Permanently out of Use Date Closed: 11/30/1987 Date Closed: 12/03/2007 Date Closed: 11/07/2005		

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

MAHALO NORTH KING AUTO (Continued)

U001235167

Facility Id: 9-100339

HI Financial Assurance

Alt Facility ID: 9-100339

Tank Status: Permanently Out of Use

Tank Status: Permanently out of Use

F23
SSW
1/8-1/4
0.197 mi.
1040 ft.

YAMASAKI SERVICE INC
1010 KING ST
HONOLULU, HI 96817

RCRA-CESQG

1000157880
HID981629132

[Click here for full text details](#)

Relative:
Higher

RCRA-CESQG

EPA Id: HID981629132

C24
WSW
1/8-1/4
0.199 mi.
1053 ft.

1249 MOOKAULA ST
HONOLULU, HI 96817

EDR US Hist Auto Stat

1015192260
N/A

[Click here for full text details](#)

Relative:
Higher

C25
WSW
1/8-1/4
0.200 mi.
1058 ft.

1255 MOOKAULA ST
HONOLULU, HI 96817

EDR US Hist Auto Stat

1015193953
N/A

[Click here for full text details](#)

Relative:
Higher

E26
SW
1/8-1/4
0.207 mi.
1093 ft.

OAHU PLUMBING & SHEET METAL, LTD
926 KOHOU ST
HONOLULU, HI 96817

HI LUST
HI UST
HI Financial Assurance

U001235455
N/A

[Click here for full text details](#)

Relative:
Higher

HI LUST

Facility Status: Site Cleanup Completed (NFA)

Release ID: 990119

Facility Id: 9-101367

HI UST

Tank Status: Permanently Out of Use

Date Closed: 01/07/1999

Facility Id: 9-101367

HI Financial Assurance

MAP FINDINGS

Map ID					
Direction					
Distance					
Elevation	Site		Database(s)	EDR ID Number	EPA ID Number

OAHU PLUMBING & SHEET METAL, LTD (Continued)

U001235455

Alt Facility ID: 9-101367
 Tank Status: Permanently Out of Use

27	OAHU AIR CONDITIONING SVC INC	RCRA NonGen / NLR	1001218487
SW	904 KOHOU ST	FINDS	HIR000000679
1/8-1/4	HONOLULU, HI 96817		
0.223 mi.			
1179 ft.			

[Click here for full text details](#)

Relative:
Higher
RCRA NonGen / NLR
 EPA Id: HIR000000679

FINDS

Registry ID:: 110005729541

G28	GERMAN CAR SERVICE	RCRA-CESQG	1004688801
West	1310 MOOKAULA ST	FINDS	HID981655228
1/8-1/4	HONOLULU, HI 96817		
0.229 mi.			
1207 ft.			

[Click here for full text details](#)

Relative:
Higher
RCRA-CESQG
 EPA Id: HID981655228

FINDS

Registry ID:: 110005724877

G29		EDR US Hist Auto Stat	1015204739
West	1310 MOOKAULA ST		N/A
1/8-1/4	HONOLULU, HI 96817		
0.229 mi.			
1207 ft.			

[Click here for full text details](#)

Relative:
Higher

G30		EDR US Hist Auto Stat	1015205064
West	1311 MOOKAULA ST		N/A
1/8-1/4	HONOLULU, HI 96817		
0.229 mi.			
1210 ft.			

[Click here for full text details](#)

Relative:
Higher

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
H31 SW 1/8-1/4 0.233 mi. 1231 ft.	HAWAII HOCHI LTD 917 KOKEA ST HONOLULU, HI 96817 Click here for full text details	RCRA-CESQG FINDS CA HAZNET	1000688449 HID984468314
Relative: Higher	RCRA-CESQG EPA Id: HID984468314 FINDS Registry ID:: 110046191189 Registry ID:: 110005727927 CA HAZNET GEPaid: HID984468314		
H32 SW 1/8-1/4 0.245 mi. 1291 ft.	JBL HAWAII LTD 905 KOKEA ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U001235921 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 920012 Facility Id: 9-102462 HI UST Tank Status: Permanently Out of Use Date Closed: 10/19/1991 Facility Id: 9-102462		
H33 SW 1/8-1/4 0.245 mi. 1291 ft.	JBL HAWAII, LTD 905 KOKEA ST HONOLULU, HI 96817 Click here for full text details	HI SHWS HI ENG CONTROLS HI INST CONTROL	1006820832 N/A
Relative: Higher			
I34 West 1/4-1/2 0.260 mi. 1371 ft.	TAKAMIYA PROPERTY 850 MOOWAA ST HONOLULU, HI 96817 Click here for full text details	HI SHWS HI SPILLS	S106820561 N/A
Relative: Higher			

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
I35 West 1/4-1/2 0.260 mi. 1371 ft.	I. STEVEN SUNADA 850 MOOWAA ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U001235118 N/A
Relative: Higher	<p>HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 910015 Facility Id: 9-100251</p> <p>HI UST Tank Status: Permanently Out of Use Date Closed: 04/01/1986 Facility Id: 9-100251</p>		
I36 West 1/4-1/2 0.260 mi. 1371 ft.	TAKAMIYA PROPERTY 850 MOOWAA ST. HONOLULU, HI 96817 Click here for full text details	CERCLIS	1000707614 HID984468371
Relative: Higher	<p>CERCLIS Site ID: 0904486 EPA Id: HID984468371</p>		
J37 WNW 1/4-1/2 0.270 mi. 1424 ft.	FUTURE HONOLULU FORD PROPERTY CORNER OF HOUGHTAILING AND KING ST HONOLULU, HI 96819 Click here for full text details	HI LUST HI UST	U003986422 N/A
Relative: Higher	<p>HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 040065 Facility Id: 9-103785</p> <p>HI UST Tank Status: Permanently Out of Use Date Closed: 08/10/2004 Facility Id: 9-103785</p>		
38 ENE 1/4-1/2 0.271 mi. 1429 ft.	HAWAII HOUSING AUTHORITY 1002 N SCHOOL ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U001235353 N/A
Relative: Higher	<p>HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 940197</p>		

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

HAWAII HOUSING AUTHORITY (Continued)

U001235353

Facility Id: 9-101036

HI UST

Tank Status: Permanently Out of Use
Date Closed: 06/13/1994
Facility Id: 9-101036

39
NE
1/4-1/2
0.273 mi.
1440 ft.

SAWAI BROTHERS PAINTING CO. LTD.
1135 N SCHOOL ST
HONOLULU, HI 96817

HI LUST U001235597
HI UST N/A

[Click here for full text details](#)

Relative:
Higher

HI LUST

Facility Status: Site Cleanup Completed (NFA)
Release ID: 980024
Facility Id: 9-101808

HI UST

Tank Status: Permanently Out of Use
Date Closed: 12/16/1997
Facility Id: 9-101808

40
SSE
1/4-1/2
0.280 mi.
1476 ft.

TESORO 2GO #61022
1311 PALAMA ST
HONOLULU, HI 96817

HI LUST U003221598
HI UST N/A
HI Financial Assurance

[Click here for full text details](#)

Relative:
Higher

HI LUST

Facility Status: Site Cleanup Completed (NFA)
Release ID: 980039
Facility Id: 9-100348

HI UST

Tank Status: Permanently Out of Use
Tank Status: Currently In Use
Date Closed: 12/03/1997
Date Closed: 02/21/1990
Facility Id: 9-100348

HI Financial Assurance

Alt Facility ID: 9-100348
Tank Status: Permanently Out of Use
Tank Status: Currently In Use

MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Site

Database(s)

EDR ID Number
 EPA ID Number

J41
 WNW
 1/4-1/2
 0.281 mi.
 1483 ft.

MARSHALL'S SHELL SS
1029 HOUGHTAILING ST
HONOLULU, HI 96817

HI LUST U003402806
HI UST N/A
HI Financial Assurance

[Click here for full text details](#)

Relative:
 Higher

HI LUST

Facility Status: Site Cleanup Completed (NFA)
 Facility Status: Confirmed Release
 Release ID: 920145
 Release ID: 060022
 Release ID: 080032
 Release ID: 150008
 Facility Id: 9-100783

HI UST

Tank Status: Permanently Out of Use
 Tank Status: Permanently out of Use
 Date Closed: 09/30/1991
 Date Closed: 12/03/2014
 Date Closed: 12/03/2004
 Facility Id: 9-100783

HI Financial Assurance

Alt Facility ID: 9-100783
 Tank Status: Permanently Out of Use
 Tank Status: Permanently out of Use

42
 West
 1/4-1/2
 0.283 mi.
 1492 ft.

ISLAND PAINTING
1353 MOOKAULA ST
HONOLULU, HI 96817

HI LUST U001235756
HI UST N/A
HI Financial Assurance

[Click here for full text details](#)

Relative:
 Higher

HI LUST

Facility Status: Site Cleanup Completed (NFA)
 Release ID: 910079
 Facility Id: 9-102161

HI UST

Tank Status: Permanently Out of Use
 Facility Id: 9-102161

HI Financial Assurance

Alt Facility ID: 9-102161
 Tank Status: Permanently Out of Use

MAP FINDINGS

Map ID			EDR ID Number
Direction			
Distance			
Elevation	Site	Database(s)	EPA ID Number

K43 WSW 1/4-1/2 0.296 mi. 1561 ft. Relative: Higher	ROSS TRUSTS 819 MOOWAA ST HONOLULU, HI 96817 Click here for full text details	HI SHWS HI VCP	S103290154 N/A
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K44 WSW 1/4-1/2 0.296 mi. 1561 ft. Relative: Higher	SEN PLEX CORPORATION 819 MOOWAA ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U003346385 N/A
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HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 980053
 Facility Id: 9-103359

HI UST
 Tank Status: Permanently Out of Use
 Date Closed: 01/01/1988
 Facility Id: 9-103359

K45 WSW 1/4-1/2 0.296 mi. 1564 ft. Relative: Higher	OKADA TRUCKING CO., LTD. 818 MOOWAA ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U001235137 N/A
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HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 900028
 Facility Id: 9-100285

HI UST
 Tank Status: Permanently Out of Use
 Tank Status: Currently in Use
 Date Closed: 11/01/1989
 Facility Id: 9-100285

HI Financial Assurance
 Alt Facility ID: 9-100285
 Tank Status: Permanently Out of Use
 Tank Status: Currently in Use

MAP FINDINGS

Map ID Direction Distance Elevation		Database(s)	EDR ID Number EPA ID Number
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46 East 1/4-1/2 0.314 mi. 1658 ft.	PALAMA ELDERLY HOUSING 851 N SCHOOL ST HONOLULU, HI 96814 Click here for full text details	HI LUST HI UST	U003154703 N/A
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Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 950012
 Facility Id: 9-102887

HI UST
 Tank Status: Permanently Out of Use
 Date Closed: 12/02/1994
 Facility Id: 9-102887

47 WNW 1/4-1/2 0.337 mi. 1777 ft.	CLASSIC RUSTPROOFING 1437 N KING ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U003732579 N/A
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Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 000043
 Facility Id: 9-103539

HI UST
 Tank Status: Permanently Out of Use
 Date Closed: 11/17/1999
 Facility Id: 9-103539

48 NNE 1/4-1/2 0.338 mi. 1785 ft.	FORMER T J AUTO REPAIR 1314 N. SCHOOL STREET HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U004120866 N/A
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Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 080039
 Facility Id: 9-103862

HI UST
 Tank Status: Permanently out of Use
 Date Closed: 04/29/2008
 Facility Id: 9-103862

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
49 SW 1/4-1/2 0.366 mi. 1931 ft.	SHIMAYA SHOTEN, LTD. 710 KOHOU ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U001235478 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 900044 Facility Id: 9-101425 HI UST Tank Status: Permanently Out of Use Date Closed: 01/30/1990 Facility Id: 9-101425		
50 ENE 1/4-1/2 0.376 mi. 1987 ft.	MALUHIA ELDERLY HOUSING 1111 HALA DR HONOLULU, HI 96813 Click here for full text details	HI LUST HI UST	U003221877 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 950084 Facility Id: 9-103082 HI UST Tank Status: Permanently Out of Use Date Closed: 05/05/1995 Date Closed: 04/28/1995 Facility Id: 9-103082		
51 SSW 1/4-1/2 0.390 mi. 2061 ft.	HONOLULU COMMUNITY COLLEGE DILLINGHAM BLVD HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U004109517 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 970108 Facility Id: 9-103285 HI UST Tank Status: Permanently Out of Use Date Closed: 12/01/1982 Facility Id: 9-103285		

MAP FINDINGS

Map ID			EDR ID Number
Direction			EPA ID Number
Distance			
Elevation	Site	Database(s)	

L52 North 1/4-1/2 0.391 mi. 2062 ft.	AIM SCHOOL ST. 1403 N SCHOOL ST HONOLULU, HI 96817	HI LUST HI UST HI Financial Assurance	U003154504 N/A
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[Click here for full text details](#)

Relative:
Higher

HI LUST
 Facility Status: Active Remediation
 Release ID: 990010
 Facility Id: 9-101198

HI UST
 Tank Status: Currently In Use
 Tank Status: Permanently Out of Use
 Date Closed: 10/21/1998
 Facility Id: 9-101198

HI Financial Assurance
 Alt Facility ID: 9-101198
 Tank Status: Permanently Out of Use
 Tank Status: Currently In Use

L53 North 1/4-1/2 0.392 mi. 2069 ft.	KAPALAMA CHEVRON 1402 N SCHOOL ST HONOLULU, HI 96817	HI LUST HI UST HI Financial Assurance	U004221609 N/A
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[Click here for full text details](#)

Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed with EHE/EHMP
 Release ID: 910023
 Facility Id: 9-101237

HI UST
 Tank Status: Currently In Use
 Tank Status: Permanently Out of Use
 Date Closed: 09/18/1989
 Facility Id: 9-101237

HI Financial Assurance
 Alt Facility ID: 9-101237
 Tank Status: Permanently Out of Use
 Tank Status: Currently In Use

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
54 SW 1/4-1/2 0.392 mi. 2071 ft.	KAPALAMA INCINERATOR 757 KOKEA STREET HONOLULU, HI 96817 Click here for full text details	CERCLIS	1001475694 HISFN0905436
Relative: Higher	CERCLIS Site ID: 0905436 EPA Id: HISFN0905436		
55 NNE 1/4-1/2 0.399 mi. 2105 ft.	MID PAC PETROLEUM 254539 (PREV: BURT'S UNOCAL SERVICE) 1342 N SCHOOL ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI Financial Assurance	U001235009 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed with EHE Release ID: 980023 Release ID: 090002 Release ID: 040006 Facility Id: 9-100032 HI Financial Assurance Alt Facility ID: 9-100032 Tank Status: Permanently Out of Use Tank Status: Permanently out of Use Tank Status: Currently in Use		
56 West 1/4-1/2 0.400 mi. 2111 ft.	ALPAC CORPORATION 815 WAIKAMILO RD HONOLULU, HI 96800 Click here for full text details	HI LUST HI UST	U003221749 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 920077 Facility Id: 9-102546 HI UST Tank Status: Permanently Out of Use Date Closed: 02/25/1992 Facility Id: 9-102546		

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
57 ESE 1/4-1/2 0.414 mi. 2186 ft.	SNAPPY SERVICE 719 N SCHOOL ST HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST HI SPILLS	U001235264 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed with EHE/EHMP Release ID: 900093 Facility Id: 9-100858 HI UST Tank Status: Permanently Out of Use Date Closed: 10/25/1993 Date Closed: 01/25/1993 Date Closed: 07/29/1991 Facility Id: 9-100858		
58 South 1/4-1/2 0.437 mi. 2308 ft.	RICHARD TOM 963 ROBELLO LN HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST HI Financial Assurance	U003221678 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 990055 Facility Id: 9-101574 HI UST Tank Status: Permanently Out of Use Date Closed: 06/01/1998 Date Closed: 05/21/1998 Facility Id: 9-101574 HI Financial Assurance Alt Facility ID: 9-101574 Tank Status: Permanently Out of Use		
M59 SSW 1/4-1/2 0.461 mi. 2436 ft.	HONOLULU COMMUNITY COLLEGE GAS STATION 874 DILLINGHAM BLVD HONOLULU, HI 96817 Click here for full text details	HI SHWS	1006820629 N/A
Relative: Higher			

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
M60 SSW 1/4-1/2 0.465 mi. 2454 ft.	OWNED BY CCI, LEASED SPRINT 925 DILLINGHAM BLVD HONOLULU, HI 96817 Click here for full text details	FINDS HI SHWS HI ENG CONTROLS HI INST CONTROL HI VCP	1006819934 N/A
Relative: Higher	FINDS Registry ID:: 110013778055		
M61 SSW 1/4-1/2 0.465 mi. 2454 ft.	SPRINT LOT 925 DILLINGHAM BLVD HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST	U003914036 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 030041 Facility Id: 9-103769 HI UST Tank Status: Permanently Out of Use Date Closed: 01/01/1984 Facility Id: 9-103769		
M62 SSW 1/4-1/2 0.465 mi. 2457 ft.	THEO DAVIES CATERPILLAR REPAIR SITE 935 DILLINGHAM BLVD HONOLULU, HI 96817 Click here for full text details	HI SHWS HI ENG CONTROLS HI INST CONTROL	S109096031 N/A
Relative: Higher			
63 ENE 1/4-1/2 0.466 mi. 2461 ft.	MALUHIA HOSPITAL 1027 HALA DR HONOLULU, HI 96817 Click here for full text details	HI LUST HI UST HI SPILLS	U003154786 N/A
Relative: Higher	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 950073 Facility Id: 9-103044 HI UST Tank Status: Permanently Out of Use Date Closed: 03/16/1995 Facility Id: 9-103044		

MAP FINDINGS

Map ID Direction Distance Elevation		Database(s)	EDR ID Number EPA ID Number
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64 SSE 1/4-1/2 0.469 mi. 2474 ft.	KING SHELL FOODMART 666 N KING ST HONOLULU, HI 96817	HI LUST HI UST HI Financial Assurance	U001235340 N/A
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[Click here for full text details](#)

Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 020033
 Release ID: 080030
 Release ID: 030030
 Facility Id: 9-101026

HI UST
 Tank Status: Currently In Use
 Facility Id: 9-101026

HI Financial Assurance
 Alt Facility ID: 9-101026
 Tank Status: Currently In Use

65 SW 1/4-1/2 0.482 mi. 2547 ft.	CLASSIC BOWL 1190 DILLINGHAM BLVD HONOLULU, HI	HI SHWS	S117391422 N/A
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[Click here for full text details](#)

Relative:
Higher

66 WSW 1/4-1/2 0.486 mi. 2566 ft.	HAWAIIAN CANDIES & NUTS. LTD 707 WAIAKAMILO RD HONOLULU, HI 96817	HI LUST HI UST	U001235654 N/A
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[Click here for full text details](#)

Relative:
Higher

HI LUST
 Facility Status: Site Cleanup Completed (NFA)
 Release ID: 910024
 Facility Id: 9-101980

HI UST
 Tank Status: Permanently Out of Use
 Date Closed: 06/09/1990
 Facility Id: 9-101980

MAP FINDINGS

Map ID	Direction	Distance	Elevation	Site	Database(s)	EDR ID Number	EPA ID Number
67	WNW	1/2-1	0.501 mi. 2644 ft.	FARRINGTON HIGH SCHOOL 1564 N KING ST HONOLULU, HI 96817	FTTS HIST FTTS HI SHWS HI SPILLS	1007277849	N/A
Click here for full text details							
Relative: Higher							
68	South	1/2-1	0.501 mi. 2646 ft.	DOLE IWILEI 801 DILLINGHAM BLVD HONOLULU, HI 96817	HI SHWS HI SPILLS HI INST CONTROL	S106816902	N/A
Click here for full text details							
Relative: Higher							
69	WSW	1/2-1	0.527 mi. 2785 ft.	KAMEHAMEHA SCHOOLS - 1336 DILLINGHAM BOULEVARD 1336 DILLINGHAM BLVD HONOLULU, HI 96813	HI SHWS HI SPILLS	S110061575	N/A
Click here for full text details							
Relative: Higher							
70	SE	1/2-1	0.576 mi. 3042 ft.	HALL MARK DRY CLEANERS 1470 LILIHA ST HONOLULU, HI 96814	HI SHWS	S104534167	N/A
Click here for full text details							
Relative: Higher							
71	SE	1/2-1	0.588 mi. 3105 ft.	LANCE GOYA CHEVRON 504 N SCHOOL ST HONOLULU, HI 96817	HI SHWS HI LUST HI UST HI ENG CONTROLS HI INST CONTROL HI Financial Assurance	U003402822	N/A
Click here for full text details							
Relative: Higher							
HI LUST Facility Status: Site Cleanup Completed (NFA) Facility Status: Site Cleanup Completed with EHMP Release ID: 980240 Release ID: 030004 Release ID: 030003 Facility Id: 9-101259							
HI UST Tank Status: Permanently Out of Use Date Closed: 10/06/2002							

MAP FINDINGS

Map ID				EDR ID Number
Direction				EPA ID Number
Distance				
Elevation	Site	Database(s)		

LANCE GOYA CHEVRON (Continued)

U003402822

Date Closed: 01/01/1982
 Date Closed: 07/01/1997
 Facility Id: 9-101259

HI Financial Assurance

Alt Facility ID: 9-101259
 Tank Status: Permanently Out of Use

N72	COSTCO WAREHOUSE	HI SHWS	S108008497
SSW	525 ALAKAWA ST	HI ENG CONTROLS	N/A
1/2-1	HONOLULU, HI 96817	HI INST CONTROL	
0.609 mi.		HI VCP	
3215 ft.			
Relative:	Click here for full text details		
Higher			

N73	COSTCO GAS STATION	HI SHWS	S108859910
SSW	520 ALAKAWA ST	HI ENG CONTROLS	N/A
1/2-1	HONOLULU, HI 96817	HI INST CONTROL	
0.613 mi.		HI VCP	
3234 ft.			
Relative:	Click here for full text details		
Higher			

O74	VON HAMM TEXTILES	HI SHWS	S106820929
South	546 KAAHI ST	HI SPILLS	N/A
1/2-1	HONOLULU, HI 96817	HI ENG CONTROLS	
0.614 mi.		HI INST CONTROL	
3243 ft.			
Relative:	Click here for full text details		
Higher			

P75	1385 COLBURN STREET	HI SHWS	S115488666
WSW	1385 COLBURN ST	HI SPILLS	N/A
1/2-1	KAPALAMA, HI 96817		
0.616 mi.			
3250 ft.			
Relative:	Click here for full text details		
Higher			

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
O76 South 1/2-1 0.616 mi. 3252 ft. Relative: Higher	NUUANU AUTO COMPANY LTD 545 KAAAHU ST HONOLULU, HI 96817 Click here for full text details	HI SHWS	S111704825 N/A
77 South 1/2-1 0.621 mi. 3280 ft. Relative: Higher	HAWAIIAN GAS PRODUCTS LTD 516-520 KUWILI ST HONOLULU, HI 96817 Click here for full text details	EDR MGP	1008409006 N/A
P78 WSW 1/2-1 0.630 mi. 3329 ft. Relative: Higher	GENERAL TIRE 505 WAIKAMIKO RD HONOLULU, HI 96817 Click here for full text details	HI SHWS HI SPILLS	S106817180 N/A
79 SSW 1/2-1 0.646 mi. 3409 ft. Relative: Higher	IWILEI BUSINESS CENTER 501 SUMNER ST HONOLULU, HI 96814 Click here for full text details	HI SHWS HI SPILLS HI INST CONTROL	S106817968 N/A
80 South 1/2-1 0.651 mi. 3438 ft. Relative: Higher	TRAVEL PLAZA TRANSPORTATION, LLC 818 PINE ST HONOLULU, HI 96817 Click here for full text details HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 960094 Release ID: 950040 Facility Id: 9-102991 HI UST Tank Status: Currently In Use Tank Status: Permanently Out of Use Date Closed: 09/02/1996 Date Closed: 12/27/1994 Facility Id: 9-102991	HI SHWS HI LUST HI UST HI Financial Assurance	U003154753 N/A

MAP FINDINGS

Map ID			EDR ID Number
Direction			EPA ID Number
Distance			
Elevation	Site	Database(s)	

TRAVEL PLAZA TRANSPORTATION, LLC (Continued)

U003154753

HI Financial Assurance

Alt Facility ID: 9-102991
 Tank Status: Currently In Use
 Tank Status: Permanently Out of Use

<p>81 SSW 1/2-1 0.697 mi. 3681 ft.</p> <p>Relative: Higher</p>	<p>HOME DEPOT 421 ALAKAWA ST HONOLULU, HI 96817</p> <p>Click here for full text details</p>	<p>HI SHWS HI ENG CONTROLS HI INST CONTROL</p>	<p>S105887731 N/A</p>
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<p>82 SW 1/2-1 0.725 mi. 3829 ft.</p> <p>Relative: Higher</p>	<p>BEST BUY ALAKAWA ST & NIMITZ HWY HONOLULU, HI 96817</p> <p>Click here for full text details</p>	<p>HI SHWS HI SPILLS</p>	<p>S108008729 N/A</p>
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<p>83 SSW 1/2-1 0.744 mi. 3928 ft.</p> <p>Relative: Higher</p>	<p>BHP GASCO BENZENE SITE 616 IWILEI RD HONOLULU, HI 96817</p> <p>Click here for full text details</p> <p>HI AIRS Facility Id: 0551-01-N</p>	<p>HI SHWS HI SPILLS HI INST CONTROL HI AIRS</p>	<p>S110277531 N/A</p>
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<p>Q84 SW 1/2-1 0.763 mi. 4028 ft.</p> <p>Relative: Higher</p>	<p>MCCABE, HAMILTON, & RENNY COMPANY, LTD 1130 N NIMITZ HWY HONOLULU, HI 96817</p> <p>Click here for full text details</p>	<p>HI SHWS HI SPILLS</p>	<p>1006818946 N/A</p>
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<p>85 WSW 1/2-1 0.767 mi. 4049 ft.</p> <p>Relative: Higher</p>	<p>1305 HART STREET 1305 HART ST HONOLULU, HI 96814</p> <p>Click here for full text details</p>	<p>HI SHWS HI SPILLS HI INST CONTROL</p>	<p>S106815169 N/A</p>
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MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
86 SW 1/2-1 0.776 mi. 4099 ft.	DOMESTIC COMMERCIAL FISHING VILLAGE 1133 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	S111677154 N/A
Relative: Higher	Click here for full text details		
87 South 1/2-1 0.777 mi. 4104 ft.	373 NORTH NIMITZ HIGHWAY 373 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS	S106815507 N/A
Relative: Higher	Click here for full text details		
88 South 1/2-1 0.783 mi. 4132 ft.	SENIOR RESIDENCES AT IWILEI 888 IWILEI RD HONOLULU, HI 96813	HI SHWS HI INST CONTROL	S111704855 N/A
Relative: Higher	Click here for full text details		
R89 SSW 1/2-1 0.786 mi. 4148 ft.	BHP GASCO 432 PACIFIC STREET HONOLULU, HI 96817	EDR MGP	1008409005 N/A
Relative: Higher	Click here for full text details		
90 SSE 1/2-1 0.787 mi. 4153 ft.	LILIHA CIVIC CENTER 337 N KING ST HONOLULU, HI 96817	HI SHWS	1006819345 N/A
Relative: Higher	Click here for full text details		
Q91 SW 1/2-1 0.787 mi. 4156 ft.	CHEVRON KAPALAMA TERMINAL 1105 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS HI INST CONTROL	S108008763 N/A
Relative: Higher	Click here for full text details		

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
R92 SSW 1/2-1 0.799 mi. 4217 ft. Relative: Higher	UNOCAL 76 HONOLULU LRNG CTR 411 PACIFIC ST HONOLULU, HI 96817 Click here for full text details	RCRA NonGen / NLR FINDS HI SHWS HI UST HI SPILLS HI VCP HI Financial Assurance	1000167494 HID981652696
	RCRA NonGen / NLR EPA Id: HID981652696		
	FINDS Registry ID:: 110009359826 Registry ID:: 110000495848		
	HI UST Tank Status: Permanently Out of Use Date Closed: 03/07/1997 Facility Id: 9-100108		
	HI Financial Assurance Alt Facility ID: 9-100108 Tank Status: Permanently Out of Use		
93 SSE 1/2-1 0.802 mi. 4235 ft. Relative: Higher	IWILEI FRUIT AND VEGETABLE WAREHOUSE 920 IWILEI ROAD HONOLULU, HI 96813 Click here for full text details	HI SHWS HI LUST HI UST	U003858603 N/A
	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 020031 Facility Id: 9-103747		
	HI UST Tank Status: Permanently Out of Use Date Closed: 05/20/2002 Facility Id: 9-103747		
94 SW 1/2-1 0.809 mi. 4273 ft. Relative: Higher	HART STREET WWPS 1031 N NIMITZ HWY HONOLULU, HI 96817 Click here for full text details	HI SHWS HI UIC	U003154453 N/A
	HI UIC UIC Permit Number: UO-2174 Facility Id/Lat Long Min Coord: 3-1952.05.1-2		

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
95 ESE 1/2-1 0.809 mi. 4274 ft. Relative: Higher	KUAKINI MEDICAL CENTER# 347 N KUAKINI ST HONOLULU, HI 96817 Click here for full text details	RCRA-SQG FINDS HI SHWS HI LUST HI UST HI SPILLS HI Financial Assurance	1000270690 HID077701613
	RCRA-SQG EPA Id: HID077701613 FINDS Registry ID:: 110046154790 HI LUST Facility Status: Site Cleanup Completed with EHE/EHMP Facility Status: Site Cleanup Completed (NFA) Release ID: 100019 Release ID: 910061 Release ID: 980098 Facility Id: 9-100264 HI UST Tank Status: Permanently Out of Use Tank Status: Currently In Use Date Closed: 04/15/1998 Date Closed: 03/07/1991 Facility Id: 9-100264 HI Financial Assurance Alt Facility ID: 9-100264 Tank Status: Currently In Use Tank Status: Permanently Out of Use		
96 South 1/2-1 0.821 mi. 4337 ft. Relative: Higher	420-470 NORTH NIMITZ HIGHWAY 420-470 N NIMITZ HWY HONOLULU, HI 96817 Click here for full text details	HI SHWS HI ENG CONTROLS	S106815536 N/A
97 WNW 1/2-1 0.822 mi. 4339 ft. Relative: Higher	FACTORY STREET LEAD 2003 N KING ST HONOLULU, HI 96819 Click here for full text details	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	1006820199 N/A

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
S98 SSW 1/2-1 0.823 mi. 4346 ft.	356 PACIFIC STREET BWS TRENCHING SHEEN 356 PACIFIC ST HONOLULU, HI	HI SHWS HI SPILLS	S110169069 N/A
Relative: Higher	Click here for full text details		
99 WSW 1/2-1 0.824 mi. 4351 ft.	YOUNG BROTHERS REFRIGERATE RELEASE 1331 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS	S108009312 N/A
Relative: Higher	Click here for full text details		
100 SW 1/2-1 0.827 mi. 4369 ft.	GTE HAWAIIAN TEL - CONTAMINATED SOIL ALAKAWA ST & NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	S106817210 N/A
Relative: Higher	Click here for full text details		
S101 SSW 1/2-1 0.828 mi. 4373 ft.	BREWER ENVIRONMENTAL INDUSTRIES-PACIFIC STREET 311 PACIFIC ST HONOLULU, HI 96817	HI SHWS HI SPILLS HI VCP	1000436248 N/A
Relative: Higher	Click here for full text details		
102 SSE 1/2-1 0.830 mi. 4380 ft.	IWILEI PROJECT SITE (IWILEI BROWNFIELDS) IWILEI RD & N KING ST HONOLULU, HI 96817	HI SHWS	S107022564 N/A
Relative: Higher	Click here for full text details		
S103 SSW 1/2-1 0.832 mi. 4393 ft.	POLYNESIAN HOSPITALITY 330 PACIFIC ST HONOLULU, HI 96817	RCRA-CESQG FINDS HI SHWS HI LUST HI UST HI SPILLS HI Financial Assurance	1000906758 HI0000589812
Relative: Higher	Click here for full text details		

RCRA-CESQG

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

POLYNESIAN HOSPITALITY (Continued)

1000906758

EPA Id: HI0000589812

FINDS

Registry ID:: 110005722316

HI LUST

Facility Status: Monitored Natural Attenuation
Release ID: 910046
Facility Id: 9-101379

HI UST

Tank Status: Currently in Use
Tank Status: Permanently Out of Use
Date Closed: 08/03/1994
Date Closed: 03/19/1991
Facility Id: 9-101379

HI Financial Assurance

Alt Facility ID: 9-101379
Tank Status: Permanently Out of Use
Tank Status: Currently in Use
Tank Status: Temporarily out of Use

104
South
1/2-1
0.856 mi.
4522 ft.

MID PAC PETROLEUM LLC 2705958
540 N NIMITZ HWY
HONOLULU, HI 96817

HI SHWS U001235004
HI LUST N/A
HI UST
HI Financial Assurance

[Click here for full text details](#)

Relative:
Higher

HI LUST

Facility Status: Site Cleanup Completed (NFA)
Release ID: 970015
Release ID: 920166
Release ID: 080018
Release ID: 070010
Facility Id: 9-100017

HI UST

Tank Status: Permanently out of Use
Tank Status: Permanently Out of Use
Date Closed: 01/29/2007
Date Closed: 04/07/2008
Date Closed: 04/08/2008
Date Closed: 06/18/2001
Date Closed: 10/01/1996
Date Closed: 06/01/1990
Facility Id: 9-100017

HI Financial Assurance

Alt Facility ID: 9-100017

MAP FINDINGS

Map ID				EDR ID Number
Direction				EPA ID Number
Distance				
Elevation	Site		Database(s)	

MID PAC PETROLEUM LLC 2705958 (Continued)

U001235004

Tank Status: Permanently out of Use
 Tank Status: Permanently Out of Use

T105
SW
 1/2-1
 0.858 mi.
 4528 ft.

HAWAII STEVEDORES
 965 N NIMITZ HWY
 HONOLULU, HI 96817

HI SHWS
HI SPILLS
HI ENG CONTROLS

S106817380
N/A

[Click here for full text details](#)

Relative:
 Higher

106
SSE
 1/2-1
 0.866 mi.
 4574 ft.

215 NORTH KING STREET CONSTRUCTION SITE, TANKS 1 & 2
 215 N KING ST
 HONOLULU, HI 96814

HI SHWS

S106815334
N/A

[Click here for full text details](#)

Relative:
 Higher

T107
SSW
 1/2-1
 0.868 mi.
 4582 ft.

CHEVRON HONOLULU TRANSPORTATION TERMINAL
 933 N NIMITZ HWY
 HONOLULU, HI 96817

HI SHWS
HI ENG CONTROLS
HI Financial Assurance

U003154454
N/A

[Click here for full text details](#)

Relative:
 Higher

HI Financial Assurance
 Alt Facility ID: 9-100242
 Tank Status: Permanently Out of Use

108
SSE
 1/2-1
 0.871 mi.
 4598 ft.

TOWN INN
 248-258 N BERETANIA ST
 HONOLULU, HI 96817

HI SHWS
HI INST CONTROL
HI VCP

1006819555
N/A

[Click here for full text details](#)

Relative:
 Higher

109
North
 1/2-1
 0.881 mi.
 4650 ft.

KAMEHAMEHA SCHOOLS
 1887 MAKUAKANE ST
 HONOLULU, HI 96817

RCRA-CESQG
FINDS
HI SHWS
HI SPILLS
HI ENG CONTROLS
HI INST CONTROL

1000202706
HID981616469

[Click here for full text details](#)

Relative:
 Higher

RCRA-CESQG
 EPA Id: HID981616469

FINDS

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
	KAMEHAMEHA SCOOLS (Continued)		1000202706
	Registry ID:: 110055125877 Registry ID:: 110055117715 Registry ID:: 110000789406		
U110 South 1/2-1 0.881 mi. 4654 ft.	580 NORTH NIMITZ HIGHWAY 580 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI ENG CONTROLS	S109096040 N/A
Relative: Higher	Click here for full text details		
U111 South 1/2-1 0.888 mi. 4689 ft.	CITY MILL 660 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI LUST HI UST HI INST CONTROL	U001235472 N/A
Relative: Higher	Click here for full text details		
	HI LUST Facility Status: Site Cleanup Completed (NFA) Release ID: 930073 Facility Id: 9-101398		
	HI UST Tank Status: Permanently Out of Use Date Closed: 03/08/1993 Facility Id: 9-101398		
112 West 1/2-1 0.890 mi. 4698 ft.	DILLINGHAM BOULEVARD & MOKAUEA STREET DILLINGHAM BLVD & MOKAUEA ST HONOLULU, HI 96819	HI SHWS HI ENG CONTROLS HI INST CONTROL	S106816881 N/A
Relative: Higher	Click here for full text details		
V113 SSW 1/2-1 0.892 mi. 4711 ft.	WEYERHAEUSER 900 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS	S106821137 N/A
Relative: Higher	Click here for full text details		

MAP FINDINGS

Map ID	Direction	Distance	Elevation	Site	Database(s)	EDR ID Number	EPA ID Number
114	South	1/2-1	0.899 mi. 4746 ft.	ZIPPY'S 634 N NIMITZ HIGHWAY 634 N NIMITZ HWY HONOLULU, HI 96781	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	S110061866	N/A
				Click here for full text details			
Relative: Higher							
115	WNW	1/2-1	0.902 mi. 4765 ft.	KAPALAMA INCINERATOR 757 KOKEA ST HONOLULU, HI 96817	RCRA-SQG HI SHWS HI SPILLS HI INST CONTROL	1001116173	HIR000001008
				Click here for full text details			
Relative: Higher				RCRA-SQG EPA Id: HIR000001008			
116	South	1/2-1	0.904 mi. 4775 ft.	AWA WASTEWATER PUMP STATION 190 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI SPILLS	S105262868	N/A
				Click here for full text details			
Relative: Lower							
V117	SSW	1/2-1	0.913 mi. 4819 ft.	861-869 NORTH NIMITZ HIGHWAY 861-869 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS HI ENG CONTROLS HI INST CONTROL	S108859941	N/A
				Click here for full text details			
Relative: Higher							
V118	SSW	1/2-1	0.918 mi. 4847 ft.	HAWAIIAN ELECTRIC COMPANY (HECO) - IWILEI TANK YARD 855 N NIMITZ HWY HONOLULU, HI 96818	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	U001235311	N/A
				Click here for full text details			
Relative: Higher							
119	SSW	1/2-1	0.924 mi. 4879 ft.	700 N NIMITZ IDPP RELEASE 700 N NIMITZ HWY HONOLULU, HI	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	S110061245	N/A
				Click here for full text details			
Relative: Higher							

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
W120 SSW 1/2-1 0.958 mi. 5057 ft.	HAWAIIAN GRAIN CORPORATION 701 N NIMITZ HWY HONOLULU, HI 96817 Click here for full text details	HI SHWS HI LUST HI UST	U003402808 N/A
Relative: Higher	<p>HI LUST Facility Status: Case Transferred to HEER (regulated) Release ID: 920157 Facility Id: 9-100852</p> <p>HI UST Tank Status: Permanently Out of Use Date Closed: 10/06/1993 Facility Id: 9-100852</p>		
X121 SSW 1/2-1 0.962 mi. 5082 ft.	PAULEY PETROLEUM 795 N NIMITZ HWY HONOLULU, HI 96817 Click here for full text details	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	S108009116 N/A
Relative: Higher			
W122 SSW 1/2-1 0.963 mi. 5085 ft.	HAWAIIAN FLOUR MILL 703 N NIMITZ HWY HONOLULU, HI 96808 Click here for full text details	HI SHWS	S106817404 N/A
Relative: Higher			
W123 SSW 1/2-1 0.963 mi. 5087 ft.	MOANA PAA KAI 705 N NIMITZ HWY HONOLULU, HI 96817 Click here for full text details	RCRA-CESQG HI SHWS HI SPILLS	1000146699 HID982411357
Relative: Higher	RCRA-CESQG EPA Id: HID982411357		
X124 SSW 1/2-1 0.966 mi. 5098 ft.	EQUILON ENTERPRISES LLC HONOLULU TERMINAL 789 N NIMITZ HWY HONOLULU, HI 96817 Click here for full text details	HI SHWS	S115488694 N/A
Relative: Higher			

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
125 NNW 1/2-1 0.966 mi. 5099 ft.	CHANG-CHOW PROPERTY, NORTH SCHOOL STREET 2161 N SCHOOL ST HONOLULU, HI 96817	HI SHWS	1006820024 N/A
Relative: Higher	Click here for full text details		
Y126 SSW 1/2-1 0.968 mi. 5112 ft.	BHP PIER 29 739 N NIMITZ HWY HONOLULU, HI 96817	HI SHWS	S106816192 N/A
Relative: Higher	Click here for full text details		
127 SSE 1/2-1 0.969 mi. 5116 ft.	KEKAULIKE DIAMOND HEAD BLOCK REVITALIZATION 163 N HOTEL ST HONOLULU, HI 96817	HI SHWS HI SPILLS	1006819184 N/A
Relative: Higher	Click here for full text details		
128 SSW 1/2-1 0.970 mi. 5120 ft.	775 NORTH NIMITZ HIGHWAY 775 N NIMITZ HWY HONOLULU, HI	HI SHWS HI ENG CONTROLS HI INST CONTROL	S110061247 N/A
Relative: Higher	Click here for full text details		
Y129 SSW 1/2-1 0.970 mi. 5122 ft.	755 N NIMITZ HWY 755 N NIMITZ HWY HONOLULU, HI	HI SHWS HI SPILLS HI ENG CONTROLS HI INST CONTROL	S110061246 N/A
Relative: Higher	Click here for full text details		
130 West 1/2-1 0.990 mi. 5228 ft.	PACIFIC POULTRY 1804 KANAKANUI ST HONOLULU, HI 96819	HI SHWS HI SPILLS	1006819073 N/A
Relative: Higher	Click here for full text details		

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
131 NW 1/2-1 0.992 mi. 5239 ft.	KUHIO PARK TERRACE TOWERS LINAPUNI ST HONOLULU, HI 96819 Click here for full text details	HI SHWS HI ENG CONTROLS HI INST CONTROL HI BROWNFIELDS	S108008570 N/A
132 South 1/2-1 0.994 mi. 5249 ft.	SAUSE BROTHERS ALAKEA ST HONOLULU, HI 96817 Click here for full text details	HI SHWS HI SPILLS	S107024013 N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
HI	AIRS	List of Permitted Facilities	Department of Health	04/08/2015	04/10/2015	04/30/2015
HI	BROWNFIELDS	Brownfields Sites	Department of Health	12/02/2014	12/22/2014	01/27/2015
HI	CDL	Clandestine Drug Lab Listing	Department of Health	08/04/2010	09/10/2010	10/22/2010
HI	DRYCLEANERS	Permitted Drycleaner Facility Listing	Department of Health	12/31/2014	01/09/2015	02/11/2015
HI	ENG CONTROLS	Engineering Control Sites	Department of Health	12/02/2014	12/22/2014	01/27/2015
HI	Financial Assurance	Financial Assurance Information Listing	Department of Health	03/13/2015	03/17/2015	03/25/2015
HI	INST CONTROL	Sites with Institutional Controls	Department of Health	12/02/2014	12/22/2014	01/27/2015
HI	LUST	Leaking Underground Storage Tank Database	Department of Health	03/02/2015	03/04/2015	03/17/2015
HI	RGA HWS	Recovered Government Archive State Hazardous Waste Facilitie	Department of Health		07/01/2013	01/08/2014
HI	RGA LF	Recovered Government Archive Solid Waste Facilities List	Department of Health		07/01/2013	01/17/2014
HI	RGA LUST	Recovered Government Archive Leaking Underground Storage Tan	Department of Health		07/01/2013	01/03/2014
HI	SHWS	Sites List	Department of Health	12/02/2014	12/22/2014	01/27/2015
HI	SPILLS	Release Notifications	Department of Health	12/02/2014	12/22/2014	01/28/2015
HI	SPILLS 90	SPILLS90 data from FirstSearch	FirstSearch	03/10/2012	01/03/2013	02/11/2013
HI	SWF/LF	Permitted Landfills in the State of Hawaii	Department of Health	09/17/2012	04/03/2013	05/10/2013
HI	UIC	Underground Injection Wells Listing	Department of Health	02/07/2013	02/12/2013	04/09/2013
HI	UST	Underground Storage Tank Database	Department of Health	03/02/2015	03/04/2015	03/17/2015
HI	VCP	Voluntary Response Program Sites	Department of Health	12/02/2014	12/22/2014	01/27/2015
US	2020 COR ACTION	2020 Corrective Action Program List	Environmental Protection Agency	04/22/2013	03/03/2015	03/09/2015
US	BRS	Biennial Reporting System	EPA/NTIS	12/31/2011	02/26/2013	04/19/2013
US	CERCLIS	Comprehensive Environmental Response, Compensation, and Liab	EPA	10/25/2013	11/11/2013	02/13/2014
US	CERCLIS-NFRAP	CERCLIS No Further Remedial Action Planned	EPA	10/25/2013	11/11/2013	02/13/2014
US	COAL ASH DOE	Steam-Electric Plant Operation Data	Department of Energy	12/31/2005	08/07/2009	10/22/2009
US	COAL ASH EPA	Coal Combustion Residues Surface Impoundments List	Environmental Protection Agency	07/01/2014	09/10/2014	10/20/2014
US	CONSENT	Superfund (CERCLA) Consent Decrees	Department of Justice, Consent Decree Library	01/23/2015	02/13/2015	03/09/2015
US	CORRACTS	Corrective Action Report	EPA	12/09/2014	12/29/2014	01/29/2015
US	DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations	EPA, Region 9	01/12/2009	05/07/2009	09/21/2009
US	DELISTED NPL	National Priority List Deletions	EPA	12/16/2014	01/08/2015	02/09/2015
US	DOD	Department of Defense Sites	USGS	12/31/2005	11/10/2006	01/11/2007
US	DOT OPS	Incident and Accident Data	Department of Transportation, Office of Pipeli	07/31/2012	08/07/2012	09/18/2012
US	EDR MGP	EDR Proprietary Manufactured Gas Plants	EDR, Inc.			
US	EDR US Hist Auto Stat	EDR Exclusive Historic Gas Stations	EDR, Inc.			
US	EDR US Hist Cleaners	EDR Exclusive Historic Dry Cleaners	EDR, Inc.			
US	EPA WATCH LIST	EPA WATCH LIST	Environmental Protection Agency	08/30/2013	03/21/2014	06/17/2014
US	ERNS	Emergency Response Notification System	National Response Center, United States Coast	09/29/2014	09/30/2014	11/06/2014
US	FEDERAL FACILITY	Federal Facility Site Information listing	Environmental Protection Agency	07/21/2014	10/07/2014	10/20/2014
US	FEDLAND	Federal and Indian Lands	U.S. Geological Survey	12/31/2005	02/06/2006	01/11/2007
US	FEMA UST	Underground Storage Tank Listing	FEMA	01/01/2010	02/16/2010	04/12/2010
US	FINDS	Facility Index System/Facility Registry System	EPA	01/18/2015	02/27/2015	03/25/2015
US	FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA/Office of Prevention, Pesticides and Toxi	04/09/2009	04/16/2009	05/11/2009
US	FTTS INSP	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA	04/09/2009	04/16/2009	05/11/2009
US	FUDS	Formerly Used Defense Sites	U.S. Army Corps of Engineers	06/06/2014	09/10/2014	09/18/2014
US	HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HIST FTTS INSP	FIFRA/TSCA Tracking System Inspection & Enforcement Case Lis	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HMIRS	Hazardous Materials Information Reporting System	U.S. Department of Transportation	12/29/2014	12/30/2014	03/09/2015
US	ICIS	Integrated Compliance Information System	Environmental Protection Agency	01/23/2015	02/06/2015	03/09/2015
US	INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land	EPA Region 1	02/01/2013	05/01/2013	11/01/2013

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land	EPA Region 10	02/03/2015	02/12/2015	03/13/2015
US	INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land	EPA Region 4	09/30/2014	03/03/2015	03/13/2015
US	INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land	EPA, Region 5	01/30/2015	02/05/2015	03/09/2015
US	INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land	EPA Region 6	01/23/2015	02/10/2015	03/13/2015
US	INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land	EPA Region 7	09/23/2014	11/25/2014	01/29/2015
US	INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land	EPA Region 8	01/28/2015	01/30/2015	03/13/2015
US	INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land	Environmental Protection Agency	01/08/2015	01/08/2015	02/09/2015
US	INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	Environmental Protection Agency	12/31/1998	12/03/2007	01/24/2008
US	INDIAN RESERV	Indian Reservations	USGS	12/31/2005	12/08/2006	01/11/2007
US	INDIAN UST R1	Underground Storage Tanks on Indian Land	EPA, Region 1	02/01/2013	05/01/2013	01/27/2014
US	INDIAN UST R10	Underground Storage Tanks on Indian Land	EPA Region 10	02/03/2015	02/12/2015	03/13/2015
US	INDIAN UST R4	Underground Storage Tanks on Indian Land	EPA Region 4	09/30/2014	03/03/2015	03/13/2015
US	INDIAN UST R5	Underground Storage Tanks on Indian Land	EPA Region 5	01/30/2015	02/05/2015	03/13/2015
US	INDIAN UST R6	Underground Storage Tanks on Indian Land	EPA Region 6	01/23/2015	02/13/2015	03/13/2015
US	INDIAN UST R7	Underground Storage Tanks on Indian Land	EPA Region 7	09/23/2014	11/25/2014	01/29/2015
US	INDIAN UST R8	Underground Storage Tanks on Indian Land	EPA Region 8	01/29/2015	01/30/2015	03/13/2015
US	INDIAN UST R9	Underground Storage Tanks on Indian Land	EPA Region 9	12/14/2014	02/13/2015	03/13/2015
US	INDIAN VCP R1	Voluntary Cleanup Priority Listing	EPA, Region 1	09/29/2014	10/01/2014	11/06/2014
US	INDIAN VCP R7	Voluntary Cleanup Priority Lisitng	EPA, Region 7	03/20/2008	04/22/2008	05/19/2008
US	LEAD SMELTER 1	Lead Smelter Sites	Environmental Protection Agency	11/25/2014	11/26/2014	01/29/2015
US	LEAD SMELTER 2	Lead Smelter Sites	American Journal of Public Health	04/05/2001	10/27/2010	12/02/2010
US	LIENS 2	CERCLA Lien Information	Environmental Protection Agency	02/18/2014	03/18/2014	04/24/2014
US	LUCIS	Land Use Control Information System	Department of the Navy	12/03/2014	12/12/2014	01/29/2015
US	MLTS	Material Licensing Tracking System	Nuclear Regulatory Commission	12/29/2014	01/08/2015	01/29/2015
US	NPL	National Priority List	EPA	12/16/2014	01/08/2015	02/09/2015
US	NPL LIENS	Federal Superfund Liens	EPA	10/15/1991	02/02/1994	03/30/1994
US	ODI	Open Dump Inventory	Environmental Protection Agency	06/30/1985	08/09/2004	09/17/2004
US	PADS	PCB Activity Database System	EPA	07/01/2014	10/15/2014	11/17/2014
US	PCB TRANSFORMER	PCB Transformer Registration Database	Environmental Protection Agency	02/01/2011	10/19/2011	01/10/2012
US	PRP	Potentially Responsible Parties	EPA	10/25/2013	10/17/2014	10/20/2014
US	Proposed NPL	Proposed National Priority List Sites	EPA	12/16/2014	01/08/2015	02/09/2015
US	RAATS	RCRA Administrative Action Tracking System	EPA	04/17/1995	07/03/1995	08/07/1995
US	RADINFO	Radiation Information Database	Environmental Protection Agency	02/27/2015	02/27/2015	03/25/2015
US	RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated	Environmental Protection Agency	12/09/2014	12/29/2014	01/29/2015
US	RCRA-CESQG	RCRA - Conditionally Exempt Small Quantity Generators	Environmental Protection Agency	12/09/2014	12/29/2014	01/29/2015
US	RCRA-LQG	RCRA - Large Quantity Generators	Environmental Protection Agency	12/09/2014	12/29/2014	01/29/2015
US	RCRA-SQG	RCRA - Small Quantity Generators	Environmental Protection Agency	12/09/2014	12/29/2014	01/29/2015
US	RCRA-TSDF	RCRA - Treatment, Storage and Disposal	Environmental Protection Agency	12/09/2014	12/29/2014	01/29/2015
US	RMP	Risk Management Plans	Environmental Protection Agency	02/01/2015	02/13/2015	03/25/2015
US	ROD	Records Of Decision	EPA	11/25/2013	12/12/2013	02/24/2014
US	SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing	Environmental Protection Agency	03/07/2011	03/09/2011	05/02/2011
US	SSTS	Section 7 Tracking Systems	EPA	12/31/2009	12/10/2010	02/25/2011
US	TRIS	Toxic Chemical Release Inventory System	EPA	12/31/2011	07/31/2013	09/13/2013
US	TSCA	Toxic Substances Control Act	EPA	12/31/2012	01/15/2015	01/29/2015
US	UMTRA	Uranium Mill Tailings Sites	Department of Energy	09/14/2010	10/07/2011	03/01/2012
US	US AIRS (AFS)	Aerometric Information Retrieval System Facility Subsystem (EPA	10/16/2014	10/31/2014	11/17/2014
US	US AIRS MINOR	Air Facility System Data	EPA	10/16/2014	10/31/2014	11/17/2014

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	US BROWNFIELDS	A Listing of Brownfields Sites	Environmental Protection Agency	12/22/2014	12/22/2014	01/29/2015
US	US CDL	Clandestine Drug Labs	Drug Enforcement Administration	02/25/2015	03/10/2015	03/25/2015
US	US ENG CONTROLS	Engineering Controls Sites List	Environmental Protection Agency	09/18/2014	09/19/2014	10/20/2014
US	US FIN ASSUR	Financial Assurance Information	Environmental Protection Agency	03/09/2015	03/10/2015	03/25/2015
US	US HIST CDL	National Clandestine Laboratory Register	Drug Enforcement Administration	02/25/2015	03/10/2015	03/25/2015
US	US INST CONTROL	Sites with Institutional Controls	Environmental Protection Agency	09/18/2014	09/19/2014	10/20/2014
US	US MINES	Mines Master Index File	Department of Labor, Mine Safety and Health A	12/30/2014	12/31/2014	01/29/2015
US	Oil/Gas Pipelines	GeoData Digital Line Graphs from 1:100,000-Scale Maps	USGS			
US	AHA Hospitals	Sensitive Receptor: AHA Hospitals	American Hospital Association, Inc.			
US	Medical Centers	Sensitive Receptor: Medical Centers	Centers for Medicare & Medicaid Services			
US	Nursing Homes	Sensitive Receptor: Nursing Homes	National Institutes of Health			
US	Public Schools	Sensitive Receptor: Public Schools	National Center for Education Statistics			
US	Private Schools	Sensitive Receptor: Private Schools	National Center for Education Statistics			
US	Flood Zones	100-year and 500-year flood zones	Emergency Management Agency (FEMA)			
US	NWI	National Wetlands Inventory	U.S. Fish and Wildlife Service			
US	USGS 7.5' Topographic Map	Scanned Digital USGS 7.5' Topographic Map (DRG)	USGS			

STREET AND ADDRESS INFORMATION

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GEOCHECK[®] - PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

HALONA BRIDGE
LUNALILO FREEWAY/KOHOU STREET
HONOLULU, HI 96817

TARGET PROPERTY COORDINATES

Latitude (North):	21.3266 - 21° 19' 35.76"
Longitude (West):	157.8675 - 157° 52' 3.00"
Universal Transverse Mercator:	Zone 4
UTM X (Meters):	617448.9
UTM Y (Meters):	2358577.2
Elevation:	3 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	21157-C7 HONOLULU, HI
Most Recent Revision:	Not reported
West Map:	21157-C8 PEARL HARBOR, HI
Most Recent Revision:	Not reported

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

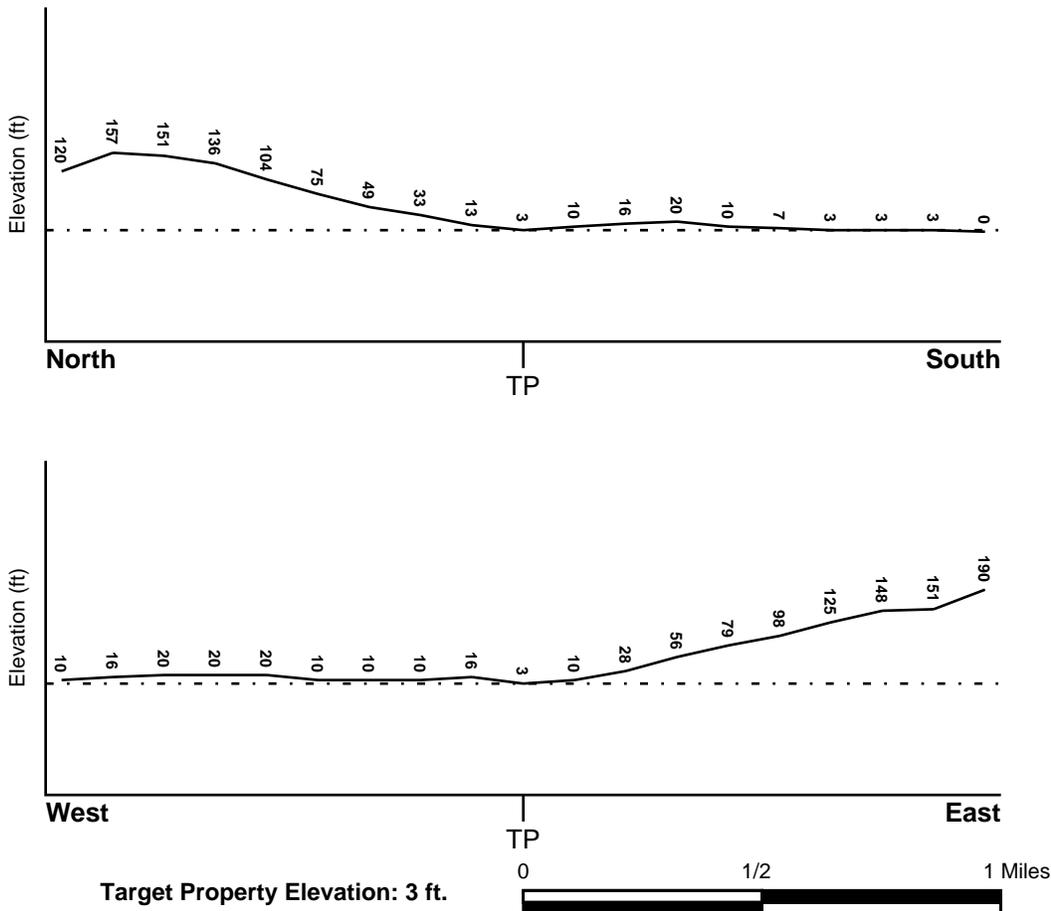
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General WSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

<u>Target Property County</u> HONOLULU, HI	<u>FEMA Flood Electronic Data</u> YES - refer to the Overview Map and Detail Map
Flood Plain Panel at Target Property:	15003C - FEMA DFIRM Flood data
Additional Panels in search area:	Not Reported

NATIONAL WETLAND INVENTORY

<u>NWI Quad at Target Property</u> HONOLULU	<u>NWI Electronic Data Coverage</u> YES - refer to the Overview Map and Detail Map
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HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

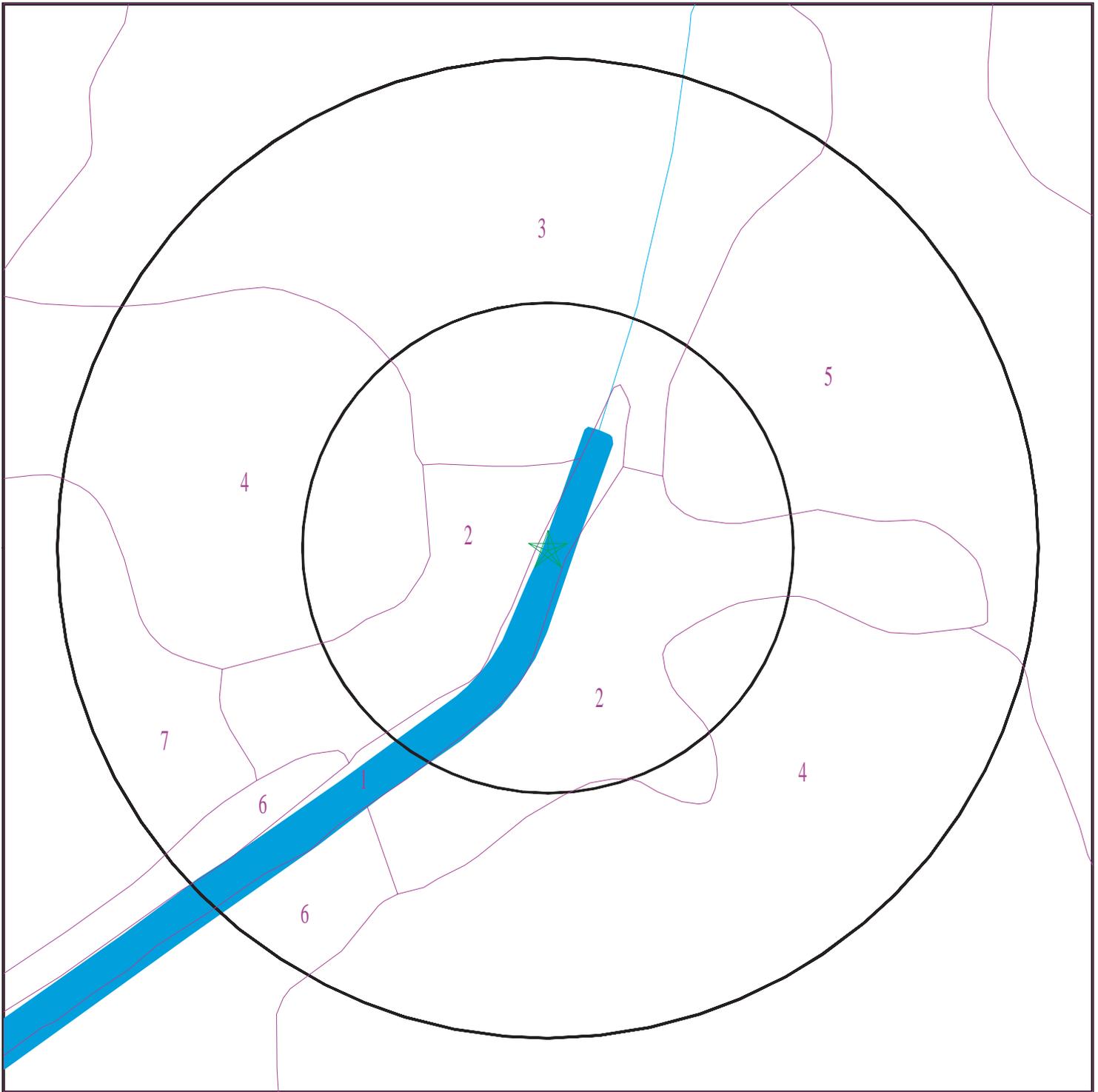
Era: -
System: -
Series: -
Code: N/A (*decoded above as Era, System & Series*)

GEOLOGIC AGE IDENTIFICATION

Category: -

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 4293163.2s



- ★ Target Property
- SSURGO Soil
- Water



SITE NAME: Halona Bridge
ADDRESS: Lunalilo Freeway/Kohou Street
Honolulu HI 96817
LAT/LONG: 21.3266 / 157.8675

CLIENT: CH2M Hill Corporation
CONTACT: Lyna Black
INQUIRY #: 4293163.2s
DATE: May 13, 2015 5:19 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Water > 40 acres

Soil Surface Texture: Not reported
Hydrologic Group: Not reported

Soil Drainage Class: Unknown
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 2

Soil Component Name: Hanalei

Soil Surface Texture: silty clay

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 30 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	12 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Organic Clay or Organic Silt.	Max: 14 Min: 1.41	Max: 6.5 Min: 4.5
2	12 inches	25 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Organic Clay or Organic Silt.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.1
3	25 inches	35 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Organic Clay or Organic Silt.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.1

Soil Map ID: 3

Soil Component Name: Kawaihapai

Soil Surface Texture: stony clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	22 inches	stony clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay Soils.	Max: 42.34 Min: 4.23	Max: 7.3 Min: 6.6
2	22 inches	31 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 14.11	Max: 7.3 Min: 6.6
3	31 inches	53 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 14.11	Max: 7.3 Min: 6.6

Soil Map ID: 4

Soil Component Name: Ewa

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	7 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6
2	7 inches	29 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6
3	29 inches	38 inches	bedrock	Not reported	Not reported	Max: 42 Min: 1	Max: Min:

Soil Map ID: 5

Soil Component Name: Kaena

Soil Surface Texture: clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 107 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	9 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4.23 Min: 0.42	Max: 7.3 Min: 6.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
2	9 inches	37 inches	stony clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.41 Min: 0.01	Max: 7.3 Min: 6.6
3	37 inches	53 inches	stony clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.41 Min: 0.01	Max: 7.3 Min: 6.6

Soil Map ID: 6

Soil Component Name: Fill land, mixed

Soil Surface Texture: gravelly sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 152 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	5 inches	gravelly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 1.41	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
2	5 inches	59 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 1.41	Max: 7.3 Min: 6.1
3	59 inches	70 inches	bedrock	Not reported	Not reported	Max: 0.42 Min: 0.02	Max: Min:

Soil Map ID: 7

Soil Component Name: Pearl Harbor

Soil Surface Texture: clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 30 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	11 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4.23 Min: 0.42	Max: 7.3 Min: 6.6
2	11 inches	31 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.41 Min: 0.01	Max: 8.4 Min: 6.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
3	31 inches	48 inches	muck	A-8	Highly organic soils, Peat.	Max: 0.42 Min: 0.01	Max: 7.8 Min: 7.4

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
A1	USGS40000269854	1/8 - 1/4 Mile ENE
A3	USGS40000269853	1/8 - 1/4 Mile ENE
A4	USGS40000269850	1/8 - 1/4 Mile ENE
A7	USGS40000269863	1/8 - 1/4 Mile ENE
B9	USGS40000269855	1/4 - 1/2 Mile WNW
C10	USGS40000269888	1/4 - 1/2 Mile NNE
B11	USGS40000269864	1/4 - 1/2 Mile WNW
B12	USGS40000269867	1/4 - 1/2 Mile WNW
B13	USGS40000269866	1/4 - 1/2 Mile WNW
B14	USGS40000269865	1/4 - 1/2 Mile WNW
B15	USGS40000269868	1/4 - 1/2 Mile WNW
B16	USGS40000269871	1/4 - 1/2 Mile WNW
B17	USGS40000269870	1/4 - 1/2 Mile WNW
B18	USGS40000269869	1/4 - 1/2 Mile WNW
D29	USGS40000269893	1/4 - 1/2 Mile NNW
E32	USGS40000269822	1/4 - 1/2 Mile SE
F43	USGS40000269816	1/4 - 1/2 Mile SSW
F44	USGS40000269817	1/4 - 1/2 Mile SSW
F45	USGS40000269815	1/4 - 1/2 Mile SSW
C46	USGS40000269899	1/4 - 1/2 Mile NNE
G47	USGS40000269810	1/4 - 1/2 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
H48	USGS40000269894	1/4 - 1/2 Mile NW
F49	USGS40000269813	1/4 - 1/2 Mile SSW
F51	USGS40000269814	1/4 - 1/2 Mile SSW
F52	USGS40000269811	1/4 - 1/2 Mile SSW
F53	USGS40000269812	1/4 - 1/2 Mile SSW
H54	USGS40000269900	1/4 - 1/2 Mile NNW
I55	USGS40000269852	1/4 - 1/2 Mile East
J58	USGS40000269919	1/2 - 1 Mile North
J60	USGS40000269923	1/2 - 1 Mile North
J62	USGS40000269937	1/2 - 1 Mile North
K66	USGS40000269799	1/2 - 1 Mile South
K68	USGS40000269800	1/2 - 1 Mile SSW
K70	USGS40000269801	1/2 - 1 Mile SSW
L71	USGS40000269795	1/2 - 1 Mile South
K72	USGS40000269802	1/2 - 1 Mile SSW
M75	USGS40000269794	1/2 - 1 Mile SSE
K76	USGS40000269796	1/2 - 1 Mile SSW
N80	USGS40000269805	1/2 - 1 Mile SE
K81	USGS40000269790	1/2 - 1 Mile South
O86	USGS40000269778	1/2 - 1 Mile South
O87	USGS40000269779	1/2 - 1 Mile South
O88	USGS40000269780	1/2 - 1 Mile South
P89	USGS40000269788	1/2 - 1 Mile SSW
Q90	USGS40000269880	1/2 - 1 Mile WNW
P94	USGS40000269789	1/2 - 1 Mile SSW
P95	USGS40000269786	1/2 - 1 Mile SSW
P98	USGS40000269781	1/2 - 1 Mile SSW
O99	USGS40000269771	1/2 - 1 Mile SSW
R102	USGS40000269772	1/2 - 1 Mile SSW
O105	USGS40000269768	1/2 - 1 Mile South
S106	USGS40000269819	1/2 - 1 Mile WSW
S107	USGS40000269820	1/2 - 1 Mile WSW
S110	USGS40000269821	1/2 - 1 Mile WSW
P112	USGS40000269773	1/2 - 1 Mile SSW
R113	USGS40000269763	1/2 - 1 Mile SSW
Q114	USGS40000269889	1/2 - 1 Mile WNW
T116	USGS40000269834	1/2 - 1 Mile West
U117	USGS40000269908	1/2 - 1 Mile WNW
119	USGS40000269791	1/2 - 1 Mile SW
W123	USGS40000269751	1/2 - 1 Mile South
X124	USGS40000269910	1/2 - 1 Mile WNW
127	USGS40000269830	1/2 - 1 Mile West
Y128	USGS40000269785	1/2 - 1 Mile SE
129	USGS40000269764	1/2 - 1 Mile SW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B19	HI0000343	1/4 - 1/2 Mile WNW

Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

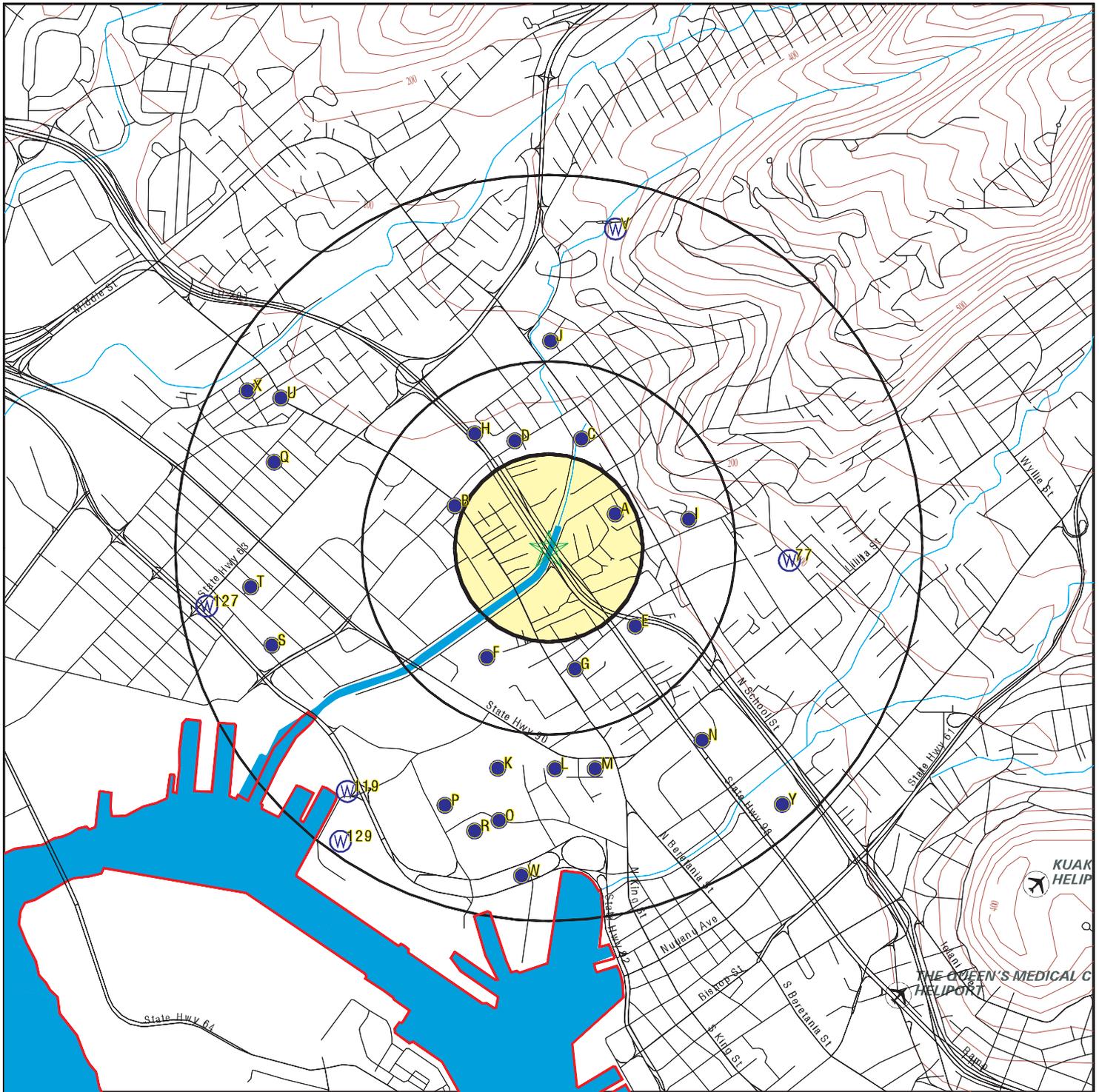
MAP ID	WELL ID	LOCATION FROM TP
A2	HI9000000000928	1/8 - 1/4 Mile ENE
A5	HI9000000000923	1/8 - 1/4 Mile ENE
A6	HI9000000000922	1/8 - 1/4 Mile ENE
A8	HI9000000000927	1/8 - 1/4 Mile ENE
B20	HI9000000000926	1/4 - 1/2 Mile WNW
B21	HI9000000000934	1/4 - 1/2 Mile WNW
B22	HI9000000000924	1/4 - 1/2 Mile WNW
B23	HI9000000000925	1/4 - 1/2 Mile WNW
B24	HI9000000000935	1/4 - 1/2 Mile WNW
B25	HI9000000000940	1/4 - 1/2 Mile WNW
B26	HI9000000000966	1/4 - 1/2 Mile WNW
B27	HI9000000000936	1/4 - 1/2 Mile WNW
B28	HI9000000000937	1/4 - 1/2 Mile WNW
D30	HI9000000001091	1/4 - 1/2 Mile NNW
E31	HI9000000000933	1/4 - 1/2 Mile SE
C33	HI9000000001100	1/4 - 1/2 Mile NNE
F34	HI9000000000959	1/4 - 1/2 Mile SSW
F35	HI9000000000960	1/4 - 1/2 Mile SSW
F36	HI9000000000957	1/4 - 1/2 Mile SSW
F37	HI9000000000958	1/4 - 1/2 Mile SSW
F38	HI9000000000963	1/4 - 1/2 Mile SSW
F39	HI9000000000964	1/4 - 1/2 Mile SSW
F40	HI9000000000961	1/4 - 1/2 Mile SSW
F41	HI9000000000962	1/4 - 1/2 Mile SSW
G42	HI9000000000919	1/4 - 1/2 Mile SSE
H50	HI9000000001092	1/4 - 1/2 Mile NW
H56	HI9000000001094	1/4 - 1/2 Mile NNW
I57	HI9000000000915	1/4 - 1/2 Mile ENE
J59	HI9000000001098	1/2 - 1 Mile North
J61	HI9000000001095	1/2 - 1 Mile North
K63	HI9000000000938	1/2 - 1 Mile South
J64	HI9000000001099	1/2 - 1 Mile North
K65	HI9000000000939	1/2 - 1 Mile SSW
L67	HI9000000000941	1/2 - 1 Mile South
K69	HI9000000000931	1/2 - 1 Mile SSW
M73	HI9000000000921	1/2 - 1 Mile SSE
K74	HI9000000000929	1/2 - 1 Mile SSW
77	HI9000000000918	1/2 - 1 Mile East
N78	HI9000000000916	1/2 - 1 Mile SE
K79	HI9000000000930	1/2 - 1 Mile South
O82	HI9000000000944	1/2 - 1 Mile South
O83	HI9000000000946	1/2 - 1 Mile South
O84	HI9000000000945	1/2 - 1 Mile South
P85	HI9000000000948	1/2 - 1 Mile SSW
Q91	HI9000000000920	1/2 - 1 Mile WNW
P92	HI9000000000932	1/2 - 1 Mile SSW
P93	HI9000000000943	1/2 - 1 Mile SSW
O96	HI9000000000951	1/2 - 1 Mile South
P97	HI9000000000942	1/2 - 1 Mile SSW
R100	HI9000000000947	1/2 - 1 Mile SSW
O101	HI9000000000949	1/2 - 1 Mile South
S103	HI9000000000953	1/2 - 1 Mile WSW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
S104	HI9000000000954	1/2 - 1 Mile WSW
S108	HI9000000000952	1/2 - 1 Mile WSW
T109	HI9000000000956	1/2 - 1 Mile West
O111	HI9000000000950	1/2 - 1 Mile SSW
Q115	HI9000000001089	1/2 - 1 Mile WNW
U118	HI9000000001093	1/2 - 1 Mile WNW
V120	HI9000000001102	1/2 - 1 Mile NNE
W121	HI9000000000955	1/2 - 1 Mile South
V122	HI9000000001101	1/2 - 1 Mile NNE
X125	HI9000000001090	1/2 - 1 Mile WNW
Y126	HI9000000000914	1/2 - 1 Mile SE

PHYSICAL SETTING SOURCE MAP - 4293163.2s



- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location



SITE NAME: Halona Bridge
 ADDRESS: Lunalilo Freeway/Kohou Street
 Honolulu HI 96817
 LAT/LONG: 21.3266 / 157.8675

CLIENT: CH2M Hill Corporation
 CONTACT: Lyna Black
 INQUIRY #: 4293163.2s
 DATE: May 13, 2015 5:19 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
A1 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	FED USGS	USGS40000269854
A2 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	HI WELLS	HI900000000928
A3 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	FED USGS	USGS40000269853
A4 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	FED USGS	USGS40000269850
A5 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	HI WELLS	HI900000000923
A6 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	HI WELLS	HI900000000922
A7 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	FED USGS	USGS40000269863
A8 ENE 1/8 - 1/4 Mile Higher	Click here for full text details	HI WELLS	HI900000000927
B9 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269855

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
C10 NNE 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269888
B11 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269864
B12 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269867
B13 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269866
B14 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269865
B15 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269868
B16 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269871
B17 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269870
B18 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269869

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
B19 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	FRDS PWS	HI0000343
B20 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000926
B21 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000934
B22 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000924
B23 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000925
B24 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000935
B25 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000940
B26 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000966
B27 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000936

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
B28 WNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000937
D29 NNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269893
D30 NNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000001091
E31 SE 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000933
E32 SE 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269822
C33 NNE 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000001100
F34 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000959
F35 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000960
F36 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000957

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
F37 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000958
F38 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000963
F39 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000964
F40 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000961
F41 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000962
G42 SSE 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000919
F43 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269816
F44 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269817
F45 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269815

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
C46 NNE 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269899
G47 SSE 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269810
H48 NW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269894
F49 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269813
H50 NW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000001092
F51 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269814
F52 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269811
F53 SSW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269812
H54 NNW 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269900

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
I55 East 1/4 - 1/2 Mile Higher	Click here for full text details	FED USGS	USGS40000269852
H56 NNW 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000001094
I57 ENE 1/4 - 1/2 Mile Higher	Click here for full text details	HI WELLS	HI9000000000915
J58 North 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269919
J59 North 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001098
J60 North 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269923
J61 North 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001095
J62 North 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269937
K63 South 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000938

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
J64 North 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001099
K65 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000939
K66 South 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269799
L67 South 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000941
K68 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269800
K69 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000931
K70 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269801
L71 South 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269795
K72 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269802

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
M73 SSE 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000921
K74 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000929
M75 SSE 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269794
K76 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269796
77 East 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000918
N78 SE 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000916
K79 South 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000930
N80 SE 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269805
K81 South 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269790

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID	Direction	Distance	Elevation	Database	EDR ID Number
O82	South	1/2 - 1 Mile	Higher	HI WELLS	HI9000000000944
		Click here for full text details			
O83	South	1/2 - 1 Mile	Higher	HI WELLS	HI9000000000946
		Click here for full text details			
O84	South	1/2 - 1 Mile	Higher	HI WELLS	HI9000000000945
		Click here for full text details			
P85	SSW	1/2 - 1 Mile	Higher	HI WELLS	HI9000000000948
		Click here for full text details			
O86	South	1/2 - 1 Mile	Higher	FED USGS	USGS40000269778
		Click here for full text details			
O87	South	1/2 - 1 Mile	Higher	FED USGS	USGS40000269779
		Click here for full text details			
O88	South	1/2 - 1 Mile	Higher	FED USGS	USGS40000269780
		Click here for full text details			
P89	SSW	1/2 - 1 Mile	Higher	FED USGS	USGS40000269788
		Click here for full text details			
Q90	WNW	1/2 - 1 Mile	Higher	FED USGS	USGS40000269880
		Click here for full text details			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
Q91 WNW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000920
P92 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000932
P93 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000943
P94 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269789
P95 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269786
O96 South 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000951
P97 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000942
P98 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269781
O99 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269771

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
R100 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000947
O101 South 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000949
R102 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269772
S103 WSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000953
S104 WSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000954
O105 South 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269768
S106 WSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269819
S107 WSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269820
S108 WSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000952

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
T109 West 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000956
S110 WSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269821
O111 SSW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000950
P112 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269773
R113 SSW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269763
Q114 WNW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269889
Q115 WNW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001089
T116 West 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269834
U117 WNW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269908

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
U118 WNW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001093
119 SW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269791
V120 NNE 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001102
W121 South 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000955
V122 NNE 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001101
W123 South 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269751
X124 WNW 1/2 - 1 Mile Higher	Click here for full text details	FED USGS	USGS40000269910
X125 WNW 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000001090
Y126 SE 1/2 - 1 Mile Higher	Click here for full text details	HI WELLS	HI9000000000914

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID	Direction	Distance	Elevation	Database	EDR ID Number
127	West	1/2 - 1 Mile	Higher	FED USGS	USGS40000269830
		Click here for full text details			
Y128	SE	1/2 - 1 Mile	Higher	FED USGS	USGS40000269785
		Click here for full text details			
129	SW	1/2 - 1 Mile	Higher	FED USGS	USGS40000269764
		Click here for full text details			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for HONOLULU County: 3

- Note: Zone 1 indoor average level > 4 pCi/L.
 : Zone 2 indoor average level \geq 2 pCi/L and \leq 4 pCi/L.
 : Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 96817

Number of sites tested: 10

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.110 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	0.200 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)

Source: United States Geologic Survey

A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^R Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)

Telephone: 800-672-5559

SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

RADON

Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities

Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater

Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

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Appendix C
Endangered Species Act Section 7
Consultation Documentation



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division 12300 West Dakota Avenue

Suite 380

Lakewood, CO 80228

720-963-3647

michael.will@dot.gov

November 21, 2014

In Reply Refer To:
HFPM-16

Ms. Michelle Bogardus
U.S. Department of the Interior
Fish & Wildlife Service
Pacific Islands Fish & Wildlife Office
300 Ala Moana Blvd, Room 3-122
Honolulu, HI 96850

Subject: Notification of Intent to Construct the Hawaii Bridge Program
Request for Species and Critical Habitat List under Section 7, Endangered Species Act

Dear Ms. Michelle Bogardus:

The Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is planning to undertake environmental studies for the Hawaii Bridge Program. The Program includes work on 12 bridges at 10 locations on the islands of Oahu (4 locations total: 4 locations with 1 bridge each), Kauai (4 locations total: 3 locations with 1 bridge each and 1 location with 3 bridges), and Hawaii (2 locations total: 2 locations with 1 bridge each). Attachment 1, Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu, includes location maps, and project descriptions, for each of the 10 locations.

In accordance with Section 7 of the Endangered Species Act, FHWA-CFLHD and HDOT are requesting a list of threatened, endangered, proposed, and candidate plant and animal species, and critical habitats in the vicinity of each of the bridge projects to enable an appropriate determination for these projects.

Furthermore, to assist us with our assessment, we also respectfully ask for input the USFWS may have in relation to specific avoidance and minimization measures that should be considered for each project. Your response within 30 calendar days of receipt of this letter, as outlined in the ESA Consultation Handbook, would be appreciated.

Should you have any questions, please contact Nicole Winterton, Environmental Protection Specialist, at (720) 963-3689 or by e-mail at Nicole.Winterton@dot.gov.

Sincerely,

J. Michael Will, P.E.

Program Engineering Manager

Enclosure:

Attachment 1: Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu

cc: Nicole Winterton/FHWA-CFLHD
Paul Luersen/CH2M HILL
Elizabeth Cutler/CH2M HILL



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
720-963-3647
michael.will@dot.gov

November 21, 2014

In Reply Refer To:
HFPM-16

Mr. Frazer McGilvray
Administrator
Department of Aquatic Resources
1151 Punchbowl St. Room 330
Honolulu, HI 96813

Subject: Notification of Intent to Construct the Hawaii Bridge Program
Request for Information

Dear Mr. Frazer McGilvray:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is planning to undertake environmental studies for the Hawaii Bridge Program. The Program includes work on 12 bridges at 10 locations on the islands of Oahu (4 locations total: 4 locations with 1 bridge each), Kauai (4 locations total: 3 locations with 1 bridge each and 1 location with 3 bridges), and Hawaii (2 locations total: 2 locations with 1 bridge each). Attachment 1, Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu, includes location maps, and project descriptions, for each of the 10 locations.

We are writing to request information you may have regarding known presence of listed species and designated critical habitat in the vicinity of each of the bridge projects to appropriately assess potential impacts for these projects.

Furthermore, to assist us with our assessment, we also respectfully ask for DAR's opinion on the likely impact of each of the bridge projects based on the potential issues of the location considering the proposed construction activities and schedule.

Your response within 30 calendar days of receipt of this letter would be appreciated.

Should you have any questions, please contact Nicole Winterton, Environmental Protection Specialist, at (720) 963-3689 or by e-mail at Nicole.Winterton@dot.gov.

Sincerely,

J. Michael Will, P.E.
Program Engineering Manager

Enclosure:

Attachment 1: Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu

Cc: Glenn Higashi/DAR
Nicole Winterton/FHWA-CFLHD
Paul Luersen/CH2M HILL
Elizabeth Cutler/CH2M HILL



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
720-963-3647
michael.will@dot.gov

November 21, 2014

In Reply Refer To:
HFPM-16

Ms. Lisa Hadway
Administrator
Division of Forestry and Wildlife
Kalanimoku Building
1151 Punchbowl St. Room 325
Honolulu, HI 96813

Subject: Notification of Intent to Construct the Hawaii Bridge Program
Request for Information

Dear Ms. Lisa Hadway:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is planning to undertake environmental studies for the Hawaii Bridge Program. The Program includes work on 12 bridges at 10 locations on the islands of Oahu (4 locations total: 4 locations with 1 bridge each), Kauai (4 locations total: 3 locations with 1 bridge each and 1 location with 3 bridges), and Hawaii (2 locations total: 2 locations with 1 bridge each). Attachment 1, Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu, includes location maps, and project descriptions, for each of the 10 locations.

We are writing to request information you may have regarding known presence of listed species and designated critical habitat in the vicinity of the each of the bridge projects to appropriately assess potential impacts for these projects. Furthermore, to assist us with our assessment, we also respectfully ask for input the DOFAW may have in relation to specific avoidance and minimization measures that should be considered for each project

To assist us with our assessment, we also respectfully ask for DOFAW's opinion on the likely impact of each of the bridge projects based on the potential issues of the location considering the proposed construction activities and schedule.

Your response within 30 calendar days of receipt of this letter would be appreciated.

Should you have any questions, please contact Nicole Winterton, Environmental Protection Specialist, at (720) 963-3689 or by e-mail at Nicole.Winterton@dot.gov.

Sincerely,


J. Michael Will, P.E.
Program Engineering Manager

Enclosure:

Attachment 1: Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu

Cc: Nicole Winterton/FHWA-CFLHD
Paul Luersen/CH2M HILL
Elizabeth Cutler/CH2M HILL



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division 12300 West Dakota Avenue

Suite 380

Lakewood, CO 80228

720-963-3647

michael.will@dot.gov

November 21, 2014

In Reply Refer To:
HFPM-16

Mr. Aaron Nadig
U.S. Department of the Interior
Fish & Wildlife Service
Pacific Islands Fish & Wildlife Office
300 Ala Moana Blvd, Room 3-122
Honolulu, HI 96850

Subject: Notification of Intent to Construct the Hawaii Bridge Program
Request for Species and Critical Habitat List under Section 7, Endangered Species Act

Dear Mr. Aaron Nadig:

The Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is planning to undertake environmental studies for the Hawaii Bridge Program. The Program includes work on 12 bridges at 10 locations on the islands of Oahu (4 locations total: 4 locations with 1 bridge each), Kauai (4 locations total: 3 locations with 1 bridge each and 1 location with 3 bridges), and Hawaii (2 locations total: 2 locations with 1 bridge each).

Attachment 1, Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu, includes location maps, and project descriptions, for each of the 10 locations.

In accordance with Section 7 of the Endangered Species Act, FHWA-CFLHD and HDOT are requesting a list of threatened, endangered, proposed, and candidate plant and animal species, and critical habitats in the vicinity of each of the bridge projects to enable an appropriate determination for these projects.

Furthermore, to assist us with our assessment, we also respectfully ask for input the USFWS may have in relation to specific avoidance and minimization measures that should be considered for each project. Your response within 30 calendar days of receipt of this letter, as outlined in the ESA Consultation Handbook, would be appreciated.

Should you have any questions, please contact Nicole Winterton, Environmental Protection Specialist, at (720) 963-3689 or by e-mail at Nicole.Winterton@dot.gov.

Sincerely,

J. Michael Will, P.E.

Program Engineering Manager

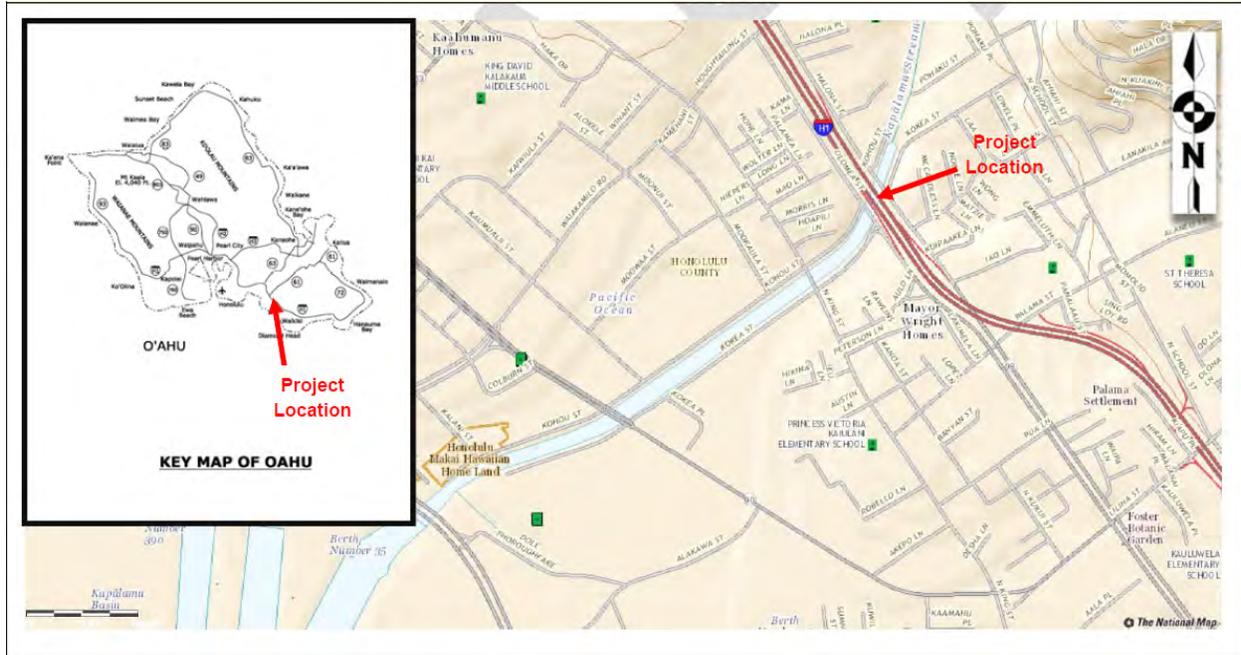
Enclosure:

Attachment 1: Hawaii Bridges Program Summary Map Set - Hawaii, Kauai, and Oahu

cc: Nicole Winterton/FHWA-CFLHD
Paul Luersen/CH2M HILL
Elizabeth Cutler/CH2M HILL

O – Halona

The proposed project is located on Halona Street, MP 20.21, adjacent to the Interstate Route H-1 on-ramp from Vineyard Boulevard. The purpose of the project is to replace the existing bridge to meet current design standards for roadway width, load capacity, pedestrian traffic, bridge railing and transitions, and bridge approaches. HDOT has also requested the project include provisions to discourage people from making temporary shelters under the bridges along Kapalama Canal.





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
2015-SL-0081

J. Michael Will
U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division
12300 West Dakota Avenue, Suite 380
Lakewood, CO 80228

DEC 22 2014

Subject: Species List for Hawaii Bridges Program, Hawaii, Kauai, and Oahu

Dear Mr. J. Michael Will:

The U.S. Fish and Wildlife Service (Service) received your letter, dated November 21, 2014, requesting a list of federally threatened and endangered species, candidate species, plants and animals of special concern, and critical habitats in the vicinity of the proposed bridge projects. The Federal Highways Administration (FHWA), Central Federal Lands Highway Division (CFLHD), in cooperation with the State of Hawaii Department of Transportation (HDOT), is planning to conduct environmental studies for the proposed rehabilitation or replacement of 12 bridges at 10 locations on the islands of Hawaii, Kauai, and Oahu to improve the safety and reliability of the bridges.

On the island of Hawaii, the Ninole Bridge located along Mamalahoa Highway (Route 11) at mile post 56.7 would be rehabilitated or replaced, addressing bridge width, load capacity, railing, transitions, and approaches. The Hilea Bridge located on Mamalahoa Highway (Route 11) at mile post 57.7 would be rehabilitated or replaced, addressing bridge width, load capacity, railing, and transitions.

On the island of Kauai, Bridge 7E located along Kaumualii Highway (Route 50), approximately 800 feet west of Maluhia Road intersection, would be rehabilitated or replaced, addressing bridge width, load capacity, railing, and transitions. Hanapepe Bridge located on Kaumualii Highway (Route 50) in Hanapepe town would be rehabilitated or replaced, addressing bridge width, load capacity, railing, transitions, approaches, and effects of scour. Kapaa Stream Bridge located on Kuhio Highway (Route 56) near mile post 10 would be rehabilitated or replaced, addressing bridge width, load capacity, railing, transitions, and approaches. This project would also involve improvements to the highway intersection at Mailihuna Road, including roadway

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widening, lighting, signing, pavement markings, drainage, and other improvements such as installation of traffic signals. The three Wainiha Stream bridges located on Kuhio Highway (Route 560) at mile post 6.4 and 6.7 would be replaced. Additionally, three load-restricted bridges which cross Waioli, Waipa, and Waikoko streams, located at mile posts 3.4, 3.9, and 4.2, will be studied to determine loads and alternatives such as temporary bridges or supports necessary to provide construction access to the Wainiha Stream bridges.

On the island of Oahu, the Halona Bridge located on Halona Street, which crosses Kapalama Canal, would be rehabilitated or replaced, addressing bridge width, load capacity, railing, transitions, approaches, and pedestrian traffic. The Kawela Bridge located on Kamehameha Highway (Route 83) at mile post 11.4 would be replaced, addressing bridge width, load capacity, railing, transitions, and approaches. The Nanahu Bridge located on Kamehameha Highway (Route 83) at mile post 13.4 would be rehabilitated or replaced, addressing bridge width, load capacity, railing, transitions, and approaches. The Roosevelt Bridge located on Kamehameha Highway (Route 99) at mile post 14.4 would be rehabilitated, addressing bridge load capacity, railing, and transitions.

The Service offers the following comments to assist you in your planning process so that impacts to trust resources can be avoided through site preparation, construction, and operation. Our comments are provided under the authorities of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 *et seq.*).

Our databases, including data compiled by the Hawaii Biodiversity and Mapping Program (HBMP), indicate the following species are known to occur or transit through the vicinity of the proposed project areas at Ninole Bridge and Hilea Bridge on the island of Hawaii: the federally endangered Blackburn's sphinx moth (*Manduca blackburni*, BSM), Hawaiian goose (*Branta sandvicensis*), Hawaiian hawk (*Buteo solitarius*), Hawaiian hoary bat (*Lasiurus cinereus semotus*), and Hawaiian petrel (*Pterodroma sandwichensis*); and the threatened Newell's shearwater (*Puffinus auricularis newelli*). There is no designated critical habitat in the vicinity of the proposed project areas on the island of Hawaii.

Our databases, including data compiled by the HBMP, indicate the following species are known to occur or transit through the proposed project areas at Bridge 7E, Hanapepe Bridge, Kapaa Stream Bridge, and the Wainiha Stream bridges on the island of Kauai: the endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian goose, Hawaiian hoary bat, and Hawaiian petrel; the threatened Newell's shearwater; and a candidate for listing band-rumped storm-petrel (*Oceanodroma castro*). Additionally, our databases indicate the threatened green sea turtle (*Chelonia mydas*) is known to occur in the vicinity of the proposed project areas at the Kapaa Stream Bridge and the Wainiha Stream bridges. There is no designated critical habitat in the vicinity of the proposed project areas on the island of Kauai.

The endangered Hawaiian monk seal (*Monachus schauinslandi*) may use beach habitat in the vicinity of the proposed project at the Kapaa Stream Bridge and the Wainiha Stream bridges. The National Marine Fisheries Service (NMFS) is the Federal agency that consults on potential impacts to monk seals, both in their on-shore and ocean habitats. Therefore, we did not review

the proposed project for potential project impacts to monk seals. We recommend that you contact NMFS regarding the presence of monk seals in the area and potential impacts to the species from the project.

Our databases, including data compiled by the HBMP, indicate the following species are known to occur or transit through the proposed project areas at Kawela Bridge, Nanahu Bridge, and Roosevelt Bridge on the island of Oahu: the endangered Hawaiian black-necked stilt, Hawaiian moorhen, Hawaiian coot, Hawaiian duck, Hawaiian goose, Hawaiian hoary bat, and Hawaiian petrel; and the threatened Newell's shearwater. Hawaiian geese recently arrived on Oahu. A pair was first observed in early January 2014 at the First Wind Kawailoa wind farm facility. They have successfully nested, fledging two goslings at the James Campbell National Wildlife Refuge (NWR) near the town of Kahuku. The pair, originally from Kauai, was translocated to Hilo, Hawaii in February 2012, by the State of Hawaii Division of Forestry and Wildlife, and were apparently attempting to return to Kauai when they arrived on Oahu. As of December 2014 the four birds have been seen at the Mililani Agricultural Park, Mililani golf course, and James Campbell NWR.

Additionally, our databases indicate the endangered Hawaiian hoary bat is known to occur or transit through the proposed project area at Halona Bridge on the island of Oahu. There is no designated critical habitat in the vicinity of the proposed project areas on the island of Oahu.

The Service recommends the following measures to avoid and minimize project impacts to the above listed species.

Island of Hawaii

Blackburn's sphinx moth

Adult Blackburn's sphinx moths feed on nectar from native plants including beach morning glory (*Ipomoea pescaprae*), iliee (*Plumbago zeylanica*), and maiapilo (*Capparis sandwichiana*). BSM larvae feed upon native tree tobacco (*Nicotiana glauca*), which occupies disturbed areas such as open fields and roadway margins, and the native aiea (*Nothocestrum sp.*), which is found in dry to moist forests at elevations ranging from 1,500 to 5,000 feet. We recommend that a qualified biologist survey the project area for the presence of larval host plants. If larval host plants are detected and will be affected during project construction or operation, we recommend that the biologist document 1) general larval plant density; 2) proximity of larval plants to project sites; 3) average height of the larval plants; 4) signs of larval feeding damage on leaves; and 5) presence of BSM larvae on leaves. We recommend that surveys be conducted for BSM and potential host plants approximately four to eight weeks following significant rainfall and during the wettest portion of the year (usually November-April).

Hawaiian Goose

In order to avoid impacts to Hawaiian geese, we recommend a biologist familiar with the nesting behavior of the Hawaiian goose survey the area prior to the initiation of any work, or after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a nest is discovered, work should cease immediately and our office should be contacted for further guidance. Furthermore, all on-site project personnel should be apprised that Hawaiian geese

may be in the vicinity of the project at any time during the year. If a Hawaiian goose (or geese) appears within 100 feet of ongoing work, all activity should be temporarily suspended until the Hawaiian goose (or geese) leaves the area of its own accord.

Hawaiian Hawk

Loud, irregular and unpredictable activities, such as using heavy equipment or building a structure, near an endangered Hawaiian hawk nest may cause nest failure. Harassment of Hawaiian hawk nesting sites can alter feeding and breeding patterns or result in nest or chick abandonment. Nest disturbance can also increase exposure of chicks and juveniles to inclement weather or predators. To avoid impacts to Hawaiian hawks, we recommend avoiding brush and tree clearing during their breeding season (March through September). If you must clear the property during the Hawaiian hawk breeding season, we recommend a nest search of the proposed construction site and surrounding area be conducted by a qualified ornithologist immediately prior to start of construction activities. Surveys should ensure that construction activity will not occur within 1,600 feet of any Hawaiian hawk nest.

Hawaiian Hoary Bat

The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Site clearing should be timed to avoid disturbance to Hawaiian hoary bats in the project area.

Seabirds

Seabirds, including the Newell's shearwater, Hawaiian petrel and band-rumped storm petrel, fly at night and are attracted to artificially-lighted areas resulting in disorientation and subsequent fallout due to exhaustion. Seabirds are also susceptible to collision with objects that protrude above the vegetation layer, such as utility lines, guy-wires, and communication towers. Additionally, once grounded, they are vulnerable to predators and are often struck by vehicles along roadways. To reduce potential impacts to seabirds, we recommend the following minimization measures be incorporated into your project description:

- Construction activities should only occur during daylight hours. Any increase in the use of nighttime lighting, particularly during peak fallout period (September 15 through December 15), could result in additional seabird injury or mortality.
- If lights cannot be eliminated due to safety or security concerns, then they should be positioned low to the ground, be motion-triggered, and be shielded and/or full cut-off. Effective light shields should be completely opaque, sufficiently large, and positioned so that the bulb is only visible from below.

Island of Kauai

Please refer to “Hawaiian goose”, “Hawaiian hoary bat”, and “Seabirds” under the Island of Hawaii (above) for recommended measures to avoid and minimize impacts to the Hawaiian goose, Hawaiian hoary bat, and Hawaiian petrel, Newell’s shearwater, and band-rumped storm petrel.

Hawaiian Waterbirds

The Hawaiian stilt, moorhen, coot, and duck are hereafter collectively referred to as “Hawaiian waterbirds.” Our records indicate there is a high probability that Hawaiian waterbirds may occur in the vicinity of the proposed project. We recommend you incorporate the following measures into your project description to avoid and minimize impacts to Hawaiian waterbirds:

- A biological monitor should conduct Hawaiian waterbird and nest surveys at the proposed project site prior to project initiation.
- Any documented nests or broods within the project vicinity should be reported to the Service within 48 hours.
- A 100-foot buffer should be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
- The Service should be notified immediately prior to project initiation and provided with the results of pre-construction Hawaiian waterbird surveys.
- A biological monitor(s) should be present on the project site during all construction or earth moving activities to ensure that Hawaiian waterbirds and nests are not adversely impacted.
- If a listed Hawaiian waterbird is observed within the project site, or flies into the site while activities are occurring, the biological monitor should halt all activities within 100 feet of the individual(s). Work should not resume until the Hawaiian waterbird(s) leave the area on their own accord.
- A post-construction report should be submitted to the Service with 30 days of the completion of the project. The report should include the results of Hawaiian waterbird surveys, the location and outcome of documented nests, and any other relevant information.

Sea Turtles

Artificial lighting can disorient adult sea turtles and hatchlings by affecting their ability to find the ocean. To minimize potential impacts to sea turtles that may utilize beaches in the project vicinity, no light from the proposed project should be visible from the beach. We recommend installation of shielded lighting at construction sites near beaches and around shoreline developments. Shielded lights reduce the direct and ambient lighting of beach habitats within and adjacent to the project site. Effective light shields should be completely opaque, sufficiently large, and positioned so that light from the shielded source does not reach the beach. Projects should also be designed to minimize adverse impacts to basking or nesting sea turtles from off-leash pets, mammalian predators, and human disturbance.

Island of Oahu

Please refer to “Hawaiian goose”, “Hawaiian hoary bat”, “Seabirds”, and “Hawaiian waterbirds” (above) for recommended measures to avoid and minimize impacts to the Hawaiian goose, Hawaiian hoary bat, Hawaiian petrel, Newell’s shearwater, Hawaiian black-necked stilt, Hawaiian moorhen, Hawaiian coot, and Hawaiian duck.

Because the proposed activities may cause soil erosion and sedimentation in sensitive aquatic habitats, we are attaching the Service’s recommended Best Management Practices regarding sedimentation and erosion in aquatic environments. We encourage you to incorporate the relevant practices into your project design. In addition to the guidance provided in this letter, the Service anticipates responding to the U.S. Army Corps of Engineers inter-agency notification process and providing further recommendations pursuant to the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended (16 U.S.C. 661 *et seq.*; 48 Stat. 401); and the Clean Water Act (CWA), as amended (33 U.S.C. 1251 *et seq.*; 62 Stat. 1155).

If additional information becomes available, or it is determined that the proposed project may affect federally listed species, we recommend you coordinate with our office early in the planning process so that we may further assist you with Endangered Species Act compliance. We appreciate your efforts to conserve endangered species. Please contact Adam Griesemer, Endangered Species Biologist (phone: 808-285-8261, email: adam_griesemer@fws.gov) should you have any questions pertaining to this response.

Sincerely,



Aaron Nadig
Assistant Field Supervisor:
Oahu, Kauai, NWHI, Am.Samoa

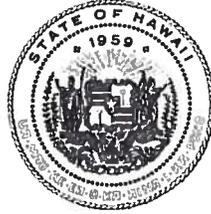
Cc: Paul Luersen, CH2M HILL

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service recommends that the measures below be incorporated into projects to minimize the degradation of water quality and minimize the impacts to fish and wildlife resources.

1. Turbidity and siltation from project-related work shall be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
2. Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.
3. Dredging and filling in the marine/aquatic environment shall be designed to avoid or minimize the loss special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the function of such habitat shall be replaced.
4. All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
5. No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
6. All debris removed from the marine/aquatic environment shall be disposed of at an approved upland or ocean dumping site.
7. No contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities. This shall be accomplished by implementing a litter-control plan and developing a Hazard Analysis and Critical Control Point Plan (HACCP – see <http://www.haccp-nrm.org/Wizard/default.asp>) to prevent attraction and introduction of non-native species.
8. Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases.
9. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
10. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
INTERIM DEPUTY DIRECTOR - WATER

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

January 9, 2015

U. S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division
Attn: J. Michael Will, Program Engineering Manager
12300 West Dakota Avenue, Suite 330
Lakewood, CO 80228

via email: michael.will@dot.gov

Dear Mr. Will,

SUBJECT: Notification of Intent to Construct the Hawaii Bridge Program, Request for Information, HFPM-16

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments sent to you dated December 18, 2014, enclosed are additional comments from the Division of Aquatic Resources on the subject matter. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 2, 2014



DAR # 5037

MEMORANDUM

TO: **DLNR Agency:**

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands

- Land Division – Oahu District
- Land Division – Kauai District
- Land Division – Maui District
- Land Division – Hawaii District
- Historic Preservation

JK ✓
GH ✓

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Notification of Intent to Construct the Hawaii Bridge Program, Request for Information

LOCATION: Various (see cover letter) including all Districts except Maui

APPLICANT: Federal Highway Administration, Central Federal Lands Highway Division, in cooperation with the Hawaii Department of Transportation

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by **December 18, 2014**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: William J. Aila Jr

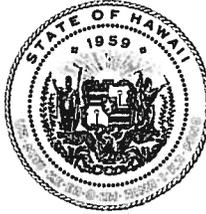
Print Name: William J. Aila Jr

Date: 12/23/14

2015 JAN -7 PM 2:23

RECEIVED
LAND DIVISION

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

Date: 12/17/14
DAR # 5037

MEMORANDUM

TO: William Aila Jr., Chairperson *WJA*
DATE: 12/18/14
FROM: Glenn Higashi, Aquatic Biologist *GKH*
SUBJECT: Notification of Intent to Construct the Hawaii Bridge Program, Request for Information

Comment	Date Request	Receipt	Referral	Due Date
	12/2/14	12/3/14	12/4/12	12/18/14

Requested by: Russell Y. Tsuji, Administrator
Land Division

Summary of Proposed Project

Title: Notification of intent to Construct the Hawaii Bridge Program - Request for information

Project by: Federal Highway Administration, Central Federal Lands Highway Division, in cooperation with the Hawaii Department of Transportation

Location: Hawaii, Kauai, and Oahu

Brief Description:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is planning to undertake environmental studies for the Hawaii Bridge Program. The program includes work on 12 bridges at 10 locations on the islands of Oahu (4 locations with 1 bridge each - Halona, Kawela, Nanahu, and Kipapa (Roosevelt bridge)); Kauai (4 locations with 3 locations with 1 bridge each and 1 location with 3 bridges - Bridge No. 7E, Hanapepe, Kapaa, and Wainiha; respectively); and Hawaii (2 locations with 1 bridge each - Ninole, Hilea).

The FHWA is requesting information regarding the known presence of listed species and designated critical habitat in the vicinity of each of the bridge projects to appropriately assess potential impacts for these projects.

They are also requesting DAR's opinion on the likely impact of each of the bridge projects based on the potential issues of the location considering the proposed construction activities and schedule.

All the bridge projects would improve the safety and reliability of the existing bridges, through rehabilitation or replacement, addressing bridge width, load capacity, bridge railing and transitions, bridge approaches. Hanapepe bridge project would also include mitigation to the effects of scour. The project for Wainiha would involve the replacement of the 3 existing temporary bridges.

Comments:

For the aquatic biological resources there are no listed aquatic species and no known designated critical habitat in the vicinity of each of the bridge projects that may impose potential impacts for these projects.

The proposed replacement bridges are not expected to have any significant impact on the aquatic resource values in these areas. However, the stream channel should be maintained to provide a continuous connection to the ocean during stream flows resulting from heavy rains to accommodate the upstream migration of postlarval native Hawaiian stream animals and allow the downstream passage of larval drift to the ocean should recruitment or spawning occur.

Mitigative measures should be implemented during the rehabilitation or construction of the replacement bridges and to minimize the potential for erosion, siltation and pollution of the aquatic environment.

- 1) lands denuded of vegetation should be planted or covered as quickly as possible to prevent erosion and the vegetation cleared along stream banks should be removed and prevented from falling into the stream/estuary environment;
- 2) scheduling site work (particularly the excavation and demolition of existing bridge abutments, piers, footings and supports, the construction of bridge foundations structures, and stream bank hardening) during periods of minimal rainfall;
- 3) prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment during the rehabilitation /replacement of the bridges and their associated improvements.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plans, DAR requests the opportunity to review and comment on those changes.



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

February 2, 2016

In Reply Refer To:
HFPM-16

Mary Abrams, Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850

Re: Section 7 Consultation for Proposed Halona Street Bridge Replacement Project,
Interstate Route H-1 (Adjacent), Island of Oahu, Hawaii

Dear Ms. Abrams:

The Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), in cooperation with the State of Hawaii Department of Transportation (HDOT), is proposing to replace the Halona Street Bridge, adjacent to Interstate Route H-1, in the Kalihi District on the island of Oahu, Hawaii. The purpose of the project is to improve the Halona Street Bridge and its approaches to maintain the Kapalama Canal crossing on Halona Street as a safe and functional component of the regional transportation system for highway users. FHWA is the lead federal agency for this consultation.

The enclosed biological assessment (BA) addresses potential project impacts on the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*). The action area contains habitat that could support roosting and foraging for the Hawaiian hoary bat; however, the timing of construction and minimal construction footprint will preclude any major or long-term effects to the species. As such, the BA concludes that the proposed action *may affect, but is not likely to adversely affect* the Hawaiian hoary bat. To comply with Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA), FHWA is requesting informal consultation on the Hawaiian hoary bat.

If you require further information or have questions, please contact Nicole Winterton, Environmental Protection Specialist, by email at Nicole.winterton@dot.gov or by phone at (720) 963-3689. We appreciate your assistance with this project.

Sincerely,

Michael Will
Project Manager

Enclosure:

Biological Assessment for the Proposed Halona Bridge Project in Kalihi, Oahu Island, Hawaii

cc:

Michael Tosatto, National Marine Fisheries Service

Lisa Hadway, State of Hawaii Division of Forestry and Wildlife

Frazer McGilvray, State of Hawaii Department of Aquatic Resources



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

February 2, 2016

In Reply Refer To:
HFPM-16

Michael Tosatto, Administrator
National Marine Fisheries Service
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Re: Section 7 Consultation for Proposed Halona Street Bridge Replacement Project,
Interstate Route H-1 (Adjacent), Island of Oahu, Hawaii

Dear Mr. Tosatto:

The Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), in cooperation with the State of Hawaii Department of Transportation (HDOT), is proposing to replace the Halona Street Bridge, adjacent to Interstate Route H-1, in the Kalihi District on the island of Oahu, Hawaii. The purpose of the project is to improve the Halona Street Bridge and its approaches to maintain the Kapalama Canal crossing on Halona Street as a safe and functional component of the regional transportation system for highway users. FHWA is the lead federal agency for this consultation.

The enclosed biological assessment (BA) addresses potential project impacts on the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*). The BA concludes that the proposed action *may affect, but is not likely to adversely affect* the Hawaiian hoary bat, and as such, FHWA is requesting informal consultation with the U.S. Fish and Wildlife Service regarding this species.

Federally listed marine species — the endangered Hawaiian monk seal (*Neomonachus schauinslandi*), threatened green sea turtle (*Chelonia mydas*), and endangered Hawksbill sea turtle (*Eretmochelys imbricate*) — are unlikely to occur in the action area. Therefore, it is concluded that the project would have *No Effect* on these species, and they are not evaluated in the BA. Based on your involvement in project-related discussions to date, we are sending you a copy of the BA for your records.

If you require further information or have questions, please contact Nicole Winterton, Environmental Protection Specialist, by email at Nicole.winterton@dot.gov or by phone at (720) 963-3689. We appreciate your assistance with this project.

Sincerely,

Michael Will
Project Manager

Enclosure:

Biological Assessment for the Proposed Halona Bridge Project in Kalihi, Oahu Island, Hawaii

cc:

Joel Moribe, National Marine Fisheries Service

Mary Abrams, U.S. Fish and Wildlife Service

Lisa Hadway, State of Hawaii Division of Forestry and Wildlife

Frazer McGilvray, State of Hawaii Department of Aquatic Resources

2100

2168

Biological Assessment for the Proposed Hālonā Bridge Project in Kalihi, O‘ahu Island, Hawai‘i

Prepared for

**Federal Highway Administration,
Central Federal Lands Highway Administration**

and

CH2M HILL

Prepared by

SWCA Environmental Consultants

2127

2158

January 2016



**BIOLOGICAL ASSESSMENT FOR THE PROPOSED
HĀLONA BRIDGE PROJECT IN
KALIHI, O‘AHU ISLAND, HAWAI‘I**

Prepared for

Federal Highway Administration, Central Federal Lands Highway Division

12300 West Dakota Avenue, Suite 280
Lakewood, Colorado 80228
(720) 963-3689

and

CH2M HILL

1132 Bishop Street, Suite 1100
Honolulu, Hawai‘i 96813
(808) 943-1133

Prepared by

SWCA Environmental Consultants

Bishop Square ASB Tower
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Honolulu, Hawai‘i 96813
(808) 548-7922
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SWCA Project No. 27166

Revised January 27, 2016

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1. INTRODUCTION

The Federal Highway Administration, Central Federal Lands Highway Division (FHWA), in partnership with the Hawai'i Department of Transportation (HDOT), is proposing to improve the Hālonā Bridge (project) to meet current design standards for roadway width, load capacity, pedestrian and bicycle traffic, bridge railing and transitions, and bridge approaches. CH2M HILL contracted SWCA Environmental Consultants (SWCA) on behalf of FHWA to complete a biological assessment (BA) for the project. Hālonā Street is located between the Vineyard Boulevard H-1 (northbound) on-ramp and the Houghtailing Street H-1 (southbound) off-ramp (Figure 1). Hālonā Bridge was built in 1938.

The purpose of this BA is to evaluate the proposed project in sufficient detail to determine its potential effects on federally listed threatened and endangered species. No proposed or candidate species potentially occur in the project action area, and no proposed or designated critical habitat is present within the project action area.

Section 7(a)(1) of the Endangered Species Act (ESA) of 1973 (as amended) directs all Federal agencies to participate in the conservation and recovery of threatened and endangered species. Section 7(a)(2) of the ESA states that each Federal agency shall consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. This project will be federally funded and FHWA is the lead agency for the Section 7 consultation.

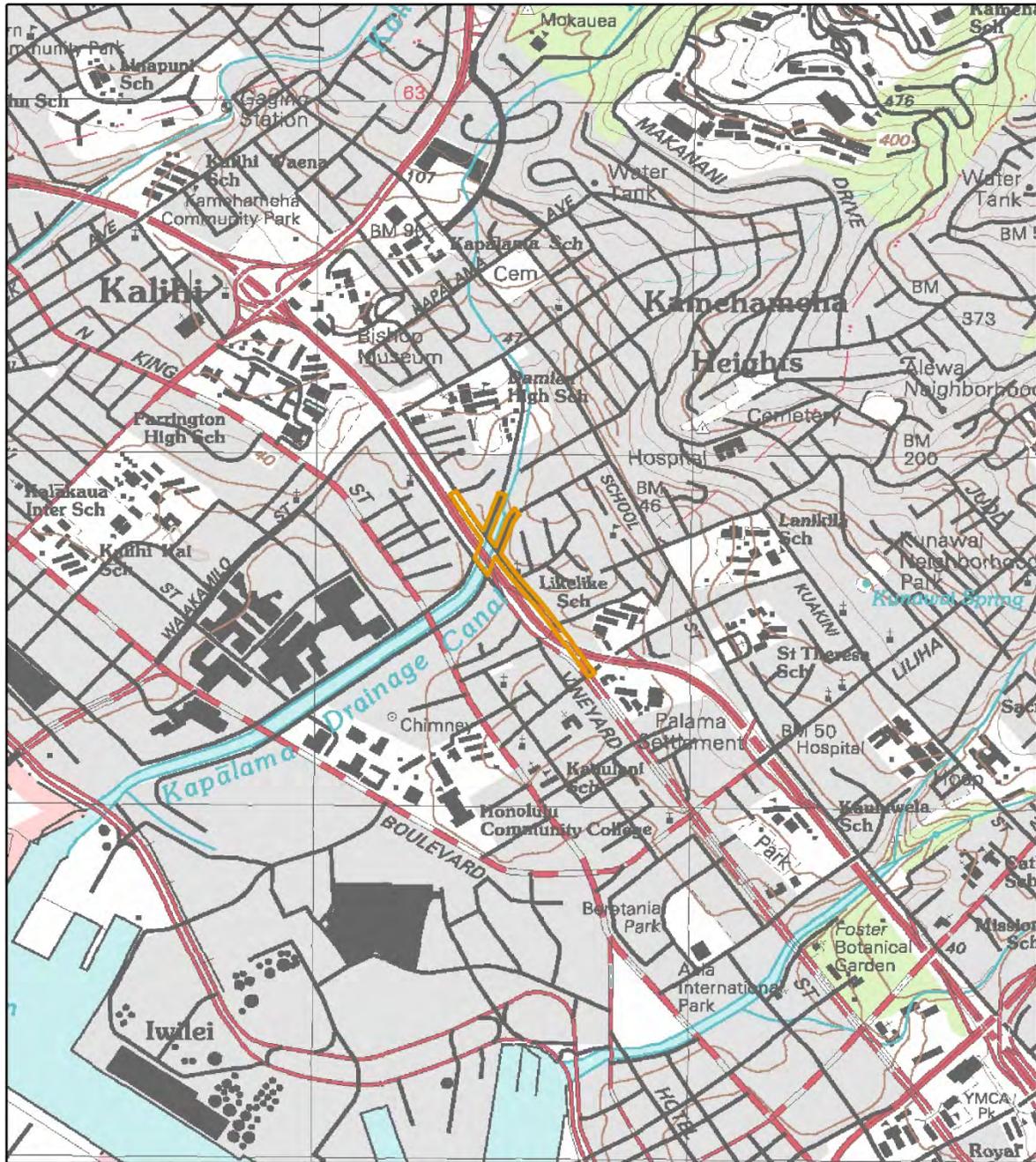
1.1. Consultation to Date

Michael Will, Project Manager from the U.S. Department of Transportation, FHWA-Central Federal Lands Highway Division sent a letter to the USFWS on November 21, 2014, requesting a list of federally threatened and endangered species, candidate species, plants and animals of special concern, and critical habitats near the proposed action. USFWS replied to the letter on December 22, 2014, listing the species that may occur on Kaua'i along with recommended measures that USFWS believes will reduce impacts on each species (USFWS 2014a). Conservation measures that will be incorporated into the proposed project are listed in section 2.3.

CH2M HILL hosted a meeting in their Honolulu Office on March 13, 2015, to discuss the Hawai'i Bridges Program with the FHWA-Central Federal Lands Highway Division, USFWS, CH2M HILL, State of Hawai'i Division of Aquatic Resources, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency, and SWCA. On December 11, 2014, CH2M HILL and SWCA also met with the U.S. Army Corps of Engineers at their Honolulu District Office. The purpose of these meetings was to introduce the project locations, and generally discuss potential biological and regulatory issues associated with the Hawai'i Bridges Program. As recommended by the USFWS, two Fish and Wildlife Coordination Act (FWCA) meetings were held on December 8 and December 15, 2015, to discuss avoidance and minimization measures for fish and wildlife resources and water quality.

2. PROPOSED ACTION AND PROJECT DESCRIPTION

The proposed action in this BA consists of replacing the existing Hālonā Bridge with a new precast bridge. The replacement bridge would be a three-span bridge with a total length of approximately 131 feet, a deck width of 39 feet, and a superstructure depth of 2.5 feet. The new bridge would be narrower than the existing bridge because of the removal of the landscaped buffer that sits atop the existing bridge deck. The bridge would be lengthened to match the span of the H-1 Freeway.



Sources: USGS Topographic Map - Oahu

Hālonā Bridge

 Survey Area

0 1,050 2,100 Feet

0 250 500 Meters



SWCA
ENVIRONMENTAL CONSULTANTS

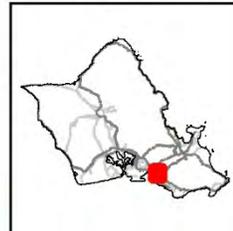


Figure 1. Hālonā Bridge survey area.

The four existing piers would be removed and replaced with two piers that align with the two existing and adjacent H-1 Bridge piers. The proposed new bridge abutments would be set back from and behind the existing abutments.

Construction would last approximately 13 months. No temporary bridge is planned, and the entire bridge will likely be temporarily closed to expedite construction. Detours through the local county streets will be coordinated. No blasting or dredging is anticipated for the proposed action. To minimize impacts to the surrounding residential areas, night work is not anticipated.

2.1. Survey Area

The survey area is the area within which field observations were made during a September 2014 site visit by SWCA biologists. The survey area consists of Hālonā Street from Kaauwai Place to Palama Street, a segment of the Interstate Route H-1 (Lunalilo Freeway), and portions of Kokea Street and Kohou Street (Figure 1). It is 5.37 acres (2.17 hectares) of predominantly residential and developed habitat. Ornamental trees are present on Kohou and Hālonā Streets. Elevations in the survey area range from roughly 2 to 24 feet (0.6 to 7.3 meters [m]) above sea level.

2.2. Action Area

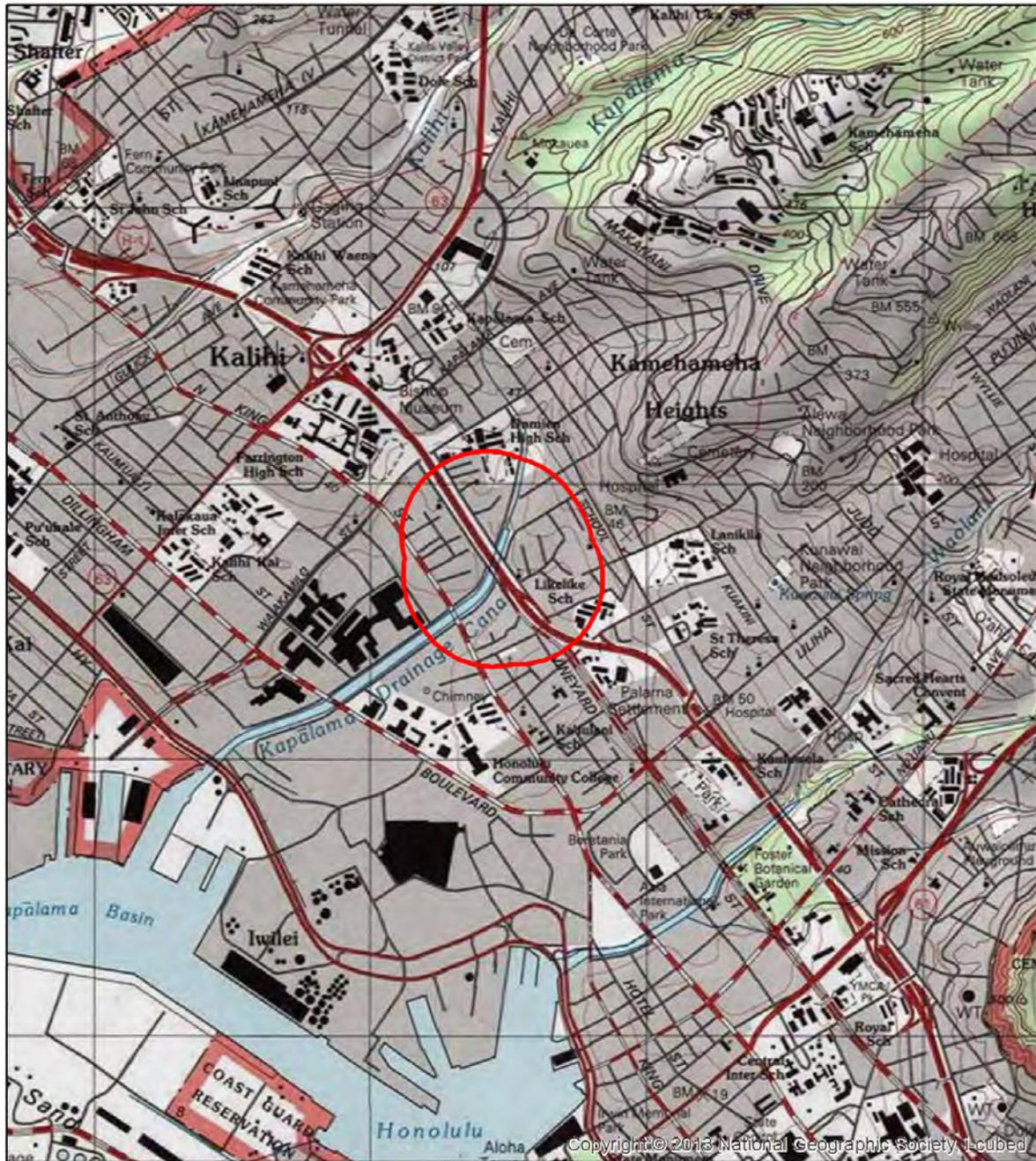
The ESA defines an *action area* as the area within which all of the **direct and indirect impacts** of the project would occur (50 Code of Federal Regulations 402.02). In other words, it is the geographic area that would be affected by construction and maintenance of the project. The Halonā Bridge action area was determined based on potential for construction noise to travel through the surrounding areas. This is because noise would be the most far-reaching impact resulting from the proposed action. The Halonā Bridge action area (see Figure 2) extends 1,000 feet (305 m) from the project footprint, covering a total of 111.5 acres. The 1,000-foot (305-m) buffer defines the action area based on the distance a 100-A-weighted-decibel (dBA) noise (such as a rock drill, paver, or impact pile driver) would attenuate to background levels (approximately 50 dBA) over flat terrain with little to no vegetation. This area is conservatively defined and likely encompasses an area larger than the area within which all impacts would occur. The actual distance that noise effects would occur is likely smaller than the action area because quieter equipment would be used and local topography and vegetation would shield the produced noise.

2.3. Conservation Measures

Implementation of the proposed action will include a variety of conservation measures to reduce or eliminate proposed action-related impacts and avoid adverse effects to listed species. Conservation measures for the Hālonā Bridge proposed action will consist of the following:

Hawaiian Hoary Bat

- Any fences that may be erected as part of the proposed action will have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) on barbed wire.
- In general, no trees taller than 15 feet (4.6 m) would be trimmed or removed as a result of this project between June 1 and September 15, when juvenile bats that are not yet capable of flying may be roosting in the trees; however, if a limited number of trees would need to be cleared during that time period, a qualified biologist would use appropriate protocols to surveys for bats prior to trimming or cutting.



Sources: USGS Topographic Map - Oahu

Hālonā Bridge

 Action Area

0 1,300 2,600 Feet

0 250 500 1,000 Meters



SWCA
ENVIRONMENTAL CONSULTANTS

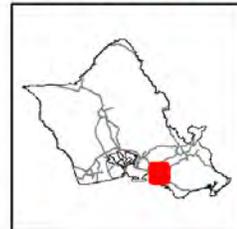


Figure 2. Hālonā Bridge action area.

Monk Seal and Sea Turtles

- Although not expected to occur within the action area, construction activities will not begin if a monk seal (*Neomonachus schauinslandi*) or listed sea turtle is in the construction area or within 150 feet (46 m) of the construction area. Construction will only begin after the animal voluntarily leaves the area.
- Workers will not attempt to feed, touch, ride, or otherwise intentionally interact with any monk seals or sea turtles.

White Tern

- Tree removal and trimming will be conducted in the fall and early winter (roughly November to January), when white tern (*Gygis alba*) breeding rate is lowest (Vanderwerf 2003).
- Trees will be inspected for white tern eggs or chicks before tree removal.

In addition to the conservation measures, the following best management practices (BMPs) would be implemented to protect water quality, as recommended by the NMFS Protected Resources Division (NOAA NMFS 2015a) and USFWS (USFWS 2014a). The applicability of these measures to the proposed project will depend on the site-specific construction means and methods chosen. The project would also adhere to the requirements of all applicable permits.

- Erosion and sediment control measures would be in place before initiating earth-moving activities. Functionality would be maintained throughout the construction period.
- A contingency plan to control toxic materials will be developed.
- Appropriate materials to contain and clean potential spills will be stored at the work site and be readily available.
- All project-related materials and equipment placed in the water will be free of pollutants.
- The project manager and heavy equipment operators will perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations will be postponed or halted if a leak is detected, and they will not proceed until the leak is repaired and the equipment is cleaned.
- Fueling of land-based vehicles and equipment will take place at least 50 feet (15.24 m) away from the water, preferably over an impervious surface. Fueling of vessels will be done at approved fueling facilities.
- Turbidity and siltation from project-related work will be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and flow conditions.
- No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
- No contamination (trash or debris disposal, invasive species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities.
- Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

3. METHODOLOGY AND SPECIES COVERED IN THE EVALUATION OF POTENTIAL IMPACTS

The USFWS maintains lists of endangered, threatened, proposed, and candidate species known or thought to occur in Hawai'i. The USFWS also designates critical habitat in the state for some listed species. Endangered and threatened species are protected under the ESA (16 United States Code [USC] 1531 et seq.). The ESA specifically prohibits *take*, which means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct” of a listed species. *Harm* includes “significant habitat modification or degradation that kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”

The species evaluated in this report are all federally protected (endangered and threatened) species, proposed species, and candidates for federal listing.

All information on the vegetation and wildlife in the survey area was derived from biological surveys conducted by SWCA in September 2014 (see Figure 1). In addition to recording wildlife and plants encountered during the surveys, SWCA evaluated habitat for the possible occurrence of federally listed species. As part of that habitat evaluation effort, the presence of any water, wetlands, and special soils was documented.

The determination of potential for local species occurrence (as reported in section 5.1 of this BA) is based on 1) existing information on distribution and 2) qualitative comparisons of the habitat requirements of each species with vegetation communities, landscape features, and/or water quality conditions in the action area. Possible impacts to these species were evaluated based on reasonably foreseeable proposed action-related activities and the local loss of habitat.

The federally listed species in the action area were evaluated for potential to occur in the action area using the following categories:

- *Unlikely to occur*: The action area is within the species' currently known range, but vegetation communities, soils, water quality conditions, etc., do not resemble those known to be used by the species, or the action area is clearly outside the species' currently known range.
- *May occur*: The action area is within the species' currently known range, and vegetation communities, soils, water quality conditions, etc., resemble those known to be used by the species.
- *Known to occur*: The species was documented in the action area either during or before the field surveys by a reliable observer.

Species with the potential to occur in the action area were then further evaluated for possible impacts from the proposed action. Federally protected (i.e., threatened or endangered) species were assigned to one of three categories of possible effect, following USFWS guidelines:

- *No effect*: A determination of no effect means there are absolutely no effects to the species and its critical habitat, either positive or negative. It does not include small effects or effects that are unlikely to occur.
- *May affect, is not likely to adversely affect*: Under this effect determination, all effects to the species and its critical habitat are beneficial, or discountable. Beneficial effects have contemporaneous positive effects without adverse effects to the species (for example, there cannot be “balancing,” so that the benefits of the action will outweigh the adverse effects). Insignificant effects relate to the magnitude of the impact and should not reach the scale where

take occurs. Discountable effects are considered extremely unlikely to occur. Based on best judgment, a person will not 1) be able to meaningfully measure, detect, or evaluate discountable effects or 2) expect discountable effects to occur. Determinations of “not likely to adversely affect, due to beneficial, or discountable effects” require written concurrence from the USFWS.

- *May affect, is likely to adversely affect:* This effect determination means that the proposed action will have an adverse effect on the species or its critical habitat. Any action that will result in “take” of an endangered or threatened species is considered an adverse effect. A combination of beneficial and adverse effects is still considered “likely to adversely affect,” even if the net effect is neutral or positive. The effect on the species and/or critical habitat must be extremely small to qualify as a discountable effect. Likewise, an effect that can be detected in any way or that can be meaningfully articulated in a discussion of the results of the analysis is not discountable; it is an adverse effect.

As directed by the USFWS, species proposed or candidates for listing are evaluated using the following effect determination categories. *Jeopardy* is defined under the ESA as occurring when “an action is reasonably expected, directly or indirectly, to diminish a species’ numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.”

- No effect.
- Not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat.
- Likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat.

4. AFFECTED ENVIRONMENT

SWCA conducted a review of available scientific and technical literature regarding natural resources in and near the survey area and action area. This literature review encompassed a thorough search of refereed scientific journals, technical journals and reports, environmental assessments and environmental impact statements, relevant government documents, and unpublished data that provide insight into the natural history and ecology of the area. SWCA also reviewed available geospatial data, aerial photographs, and topographic maps of the survey area.

A field reconnaissance of the survey area was conducted by two SWCA biologists on September 11, 2014. Representative portions of the area were driven or walked to describe vegetation types, fauna, and wetlands or streams, as well as known or suspected threatened, endangered, proposed, or candidate wildlife or plant species.

4.1. General Characteristics

The survey area and action area is on a low-lying coastal plain within the Kapālama Watershed. Alluvial material was deposited in the area by the eroding Ko‘olau Mountain Range and by changes in sea level (Sherrod et al. 2007). Mean annual rainfall for this area is approximately 37 inches (940 millimeters [mm]). Rainfall is typically highest in November–December and lowest in June–August (Giambelluca et al. 2013). Most of the action area is relatively flat. Elevations at the site range from roughly 2 to 24 feet (0.6 to 7.3 m) above sea level. Most of the action area is covered in asphalt and concrete-paved roadways. It is predominately characterized by urban residential development. Several schools, small parks, and businesses occur in the vicinity.

4.2. Soils

The Natural Resources Conservation Service (NRCS) identifies the following four soil types in the survey area: Kawaihapai stony clay loam, 2%–6% slopes (KlaB); Hanalei silty clay, 0%–2% slopes (HnA); Ewa silty clay loam, moderately shallow, 0%–2% slopes (EmA); and Water > 40 acres (W) (Foote et al. 1972; NRCS 2013) (Figure 3). The Hanalei silty clay, 0%–2% slopes soil type is listed as a hydric soil (NRCS 2012).

4.3. Hydrology and Waters of the U.S.

A single perennial stream, Kapālama Stream, traverses the survey area. Kapālama Stream is approximately 5.6 miles (9 kilometers) (Parham et al. 2008) long, and approximately 0.97 acre (0.39 ha) of non-wetland waters of the U.S. (i.e., open water) was delineated in the survey area (Figure 4).

The stream is channelized and entirely surrounded by urban development; therefore, the original drainage course has been extensively modified. The channelized stream forks in the north portion of the survey area, approximately 300 feet (91 m) upstream of the existing bridge. The channel bed is concrete-lined in the immediate vicinity of the fork; however, according to project engineers, the channel bed comprises natural material closer to the bridge.

According to National Wetlands Inventory (NWI) data, the unnamed right fork terminates before the intersection with North School Street (outside of the action area). The left fork (formally named Kapālama Stream) continues mauka toward the Ko‘olau Mountain Range. Downstream of the action area, Kapālama Stream flows southwest between Kokea and Kohou Streets and eventually empties into Honolulu Harbor roughly 0.8 mile (1.3 kilometers) from the survey area.

Standing water was observed in the stream during the survey (Appendix A, Figures A3 and A4). Most of Kapālama Stream in the survey area is tidally influenced from the presence of marine/estuarine fish (striped mullet and great barracuda) near the bridge and observed changes in water levels throughout the day. It is unknown how often water within the channelized forks is tidally influenced.

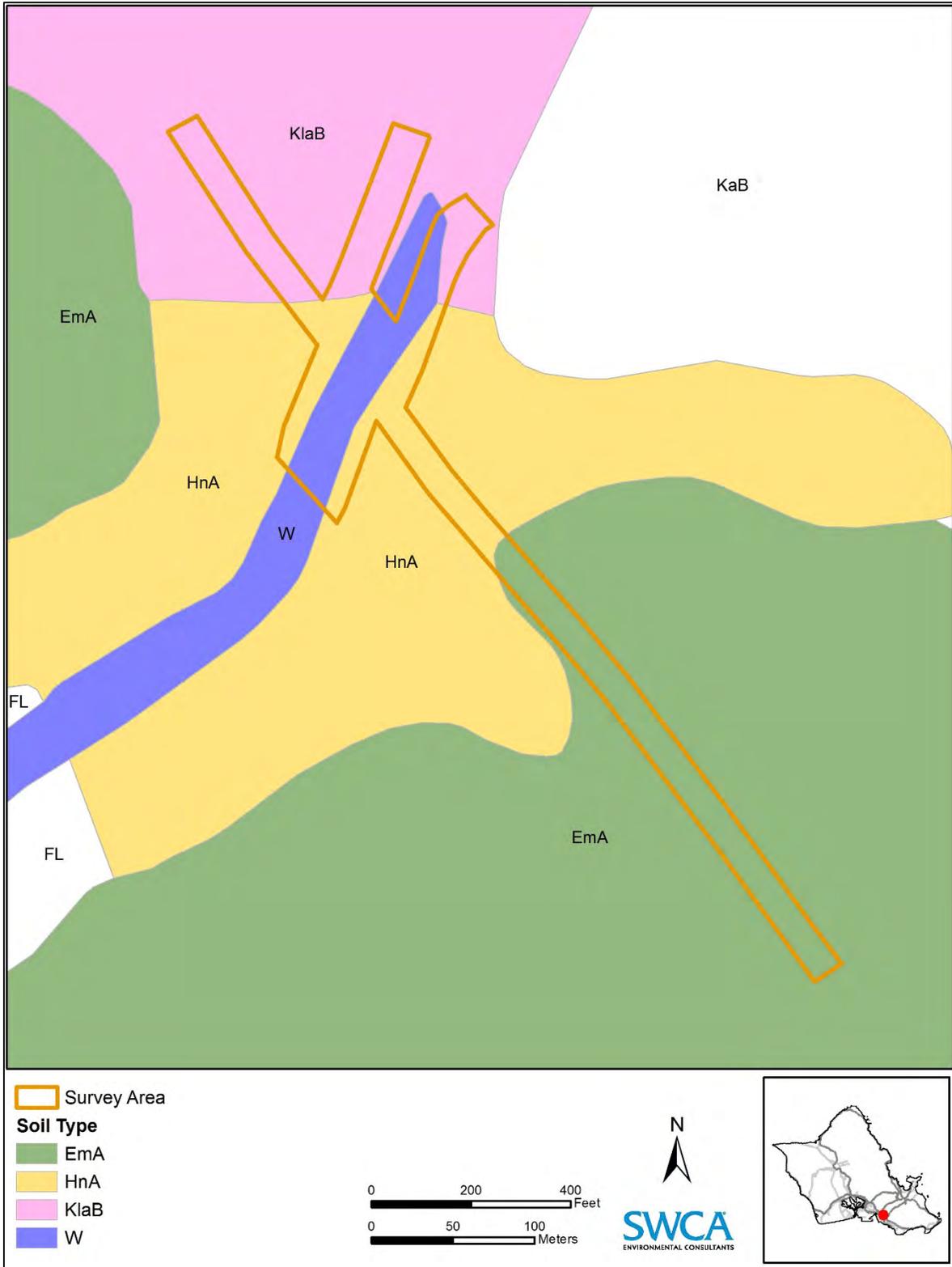


Figure 3. Soil types in and near the survey area.



-  Survey Area
-  WoUS (Riverine)

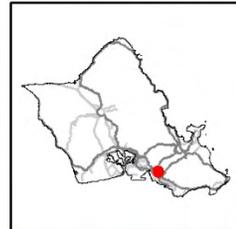
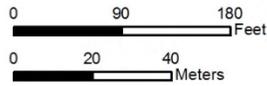


Figure 4. Delineated non-wetland waters of the U.S. in the survey area.

The NWI program identifies five wetlands or waterways in the survey area (Figure 5). These comprise E2EM1N (Estuarine, Intertidal, Emergent, Persistent, Regularly Flooded), E1UBL (Estuarine, Subtidal, Unconsolidated bottom), R2USC_x (Riverine, Lower Perennial, Unconsolidated Shore, Seasonally Flooded, Excavated), R2USC (Riverine, Lower Perennial, Unconsolidated Shore, Seasonally Flooded), and R4SBC_x (Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated). The NWI program identifies an additional Riverine feature — R2UBH_x (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated) — immediately adjacent to the survey area (Figure 5).

4.4. Vegetation

No state or federally listed threatened, endangered, proposed, or candidate plant species were recorded in the survey area and none are expected to occur within the larger action area. Two native Hawaiian plants — ‘ae‘ae (*Bacopa monnieri*) and *Cyperus polystachyos* — were seen during the survey.¹ These species are indigenous, or found in Hawai‘i and elsewhere.

The vegetation in the action area is composed of mowed grasses, interspersed with weedy non-native grasses and herbaceous plants, as well as scattered ornamental trees and shrubs. Mowed lawns adjacent to houses and the Kapālama Canal (or Kapālama Stream) consist mainly of swollen fingergrass (*Chloris barbata*), Bermuda grass (*Cynodon dactylon*), wire grass (*Eleusine indica*), and Panama paspalum (*Paspalum fimbriatum*). Non-native herbaceous weeds common in the grassy areas include creeping indigo (*Indigofera spicata*), morning glory (*Ipomoea obscura*), pitted beardgrass (*Bothriochloa pertusa*), Guinea grass (*Urochloa maxima*), buffel grass (*Cenchrus ciliaris*), khaki weed (*Alternanthera pungens*), and spiny amaranth (*Amaranthus spinosus*).

A few large monkey pod trees (*Samanea saman*) and rainbow shower trees (*Cassia x nealiae*) are planted along Kohou Street and Hālonā Street (Appendix A, Figures A1 and A2). Other ornamental plantings in the survey area include kou haole (*Cordia sebestena*), manila palm (*Veitchia merrillii*), lantana (*Lantana camara*), wedelia (*Sphagneticola trilobata*), and mock orange (*Murraya paniculata*). Sesban tree (*Sesbania grandiflora*) and sweet potato (*Ipomoea batatas*) are planted in a garden in the northern portion of Kokea Street in the survey area. Similar ornamental plants are expected to occur in the larger action area.

Within the canal, hydrophytic plants are present near the northern portion of the action area. These include umbrella sedge (*Cyperus involucratus*), California grass (*Urochloa mutica*), *Cyperus polystachyos*, (*Ludwigia octovalvis*), and ‘ae‘ae.

¹ The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999), Wagner and Herbst (2003), and Staples and Herbst (2005). Recent name changes are those recorded in Wagner et al. (2012). Common/Hawaiian names are provided first, followed by scientific names in parenthesis. If no common or Hawaiian name is known, only the scientific name is provided.

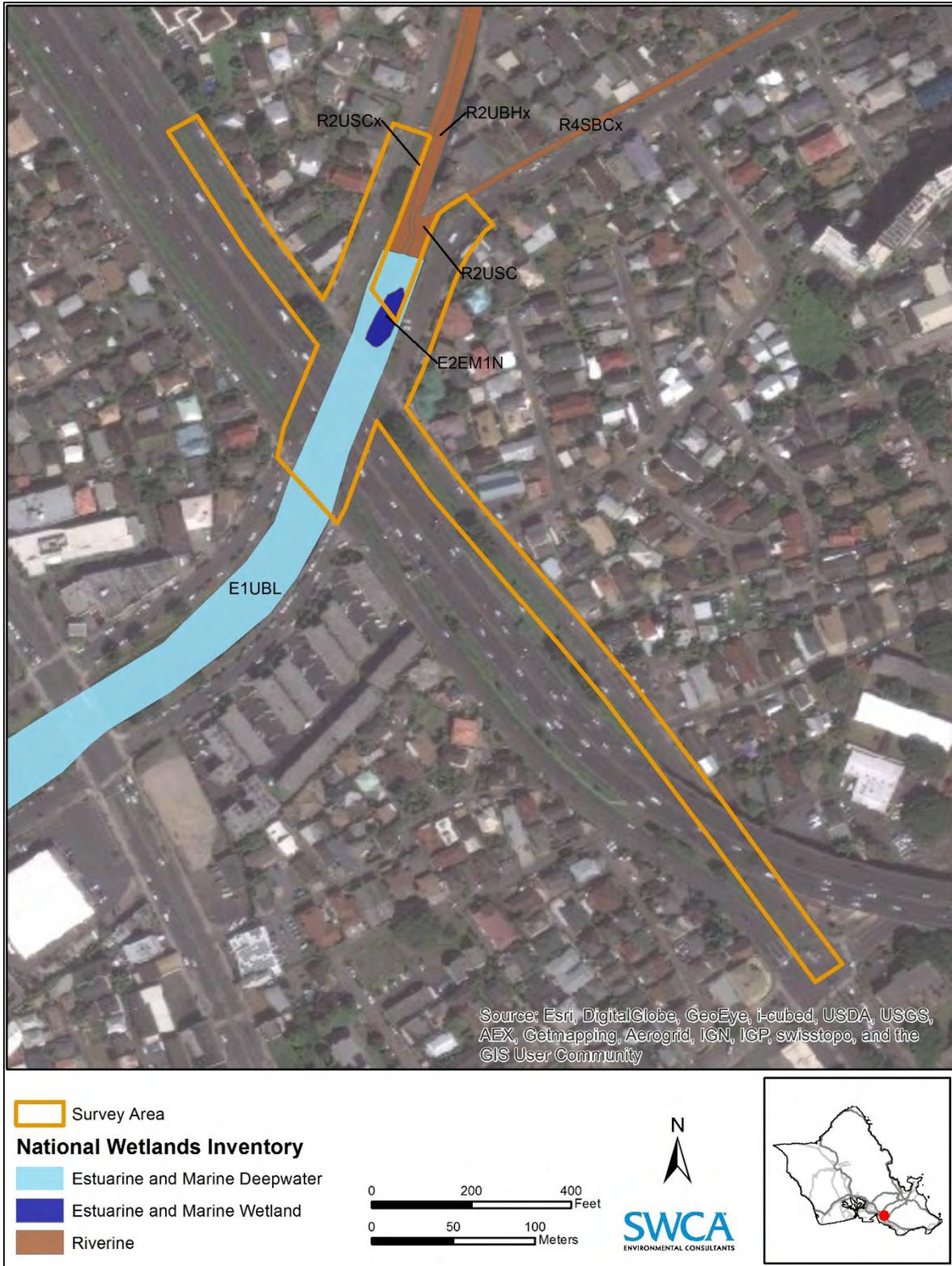


Figure 5. National Wetlands Inventory classification in and near the survey area.

4.5. Wildlife

No state or federally listed threatened, endangered, proposed or candidate wildlife species were observed in the survey area. The following sections describe common wildlife species observed during the site visit.

4.5.1. Birds

All bird species observed in the survey area are commonly found in Hawai‘i’s urban areas, gardens, and waterways. In all, 17 species were documented (Table 1). Four white terns (*Gygis alba*) were observed in-flight, transiting to areas beyond the stream. The white tern is listed under Hawaii Revised Statutes 195D as threatened.

Table 1. Birds Observed by SWCA in and near the Survey Area

Common Name	Scientific Name	Status*
Black-crown night-heron	<i>Nycticorax nycticorax</i>	I
Cattle egret	<i>Bubulcus ibis</i>	NN
Common myna	<i>Acridotheres tristis</i>	NN
Garganey	<i>Anas querquedula</i>	M
Hawaiian duck-mallard hybrids†	<i>Anas</i> sp.	NN
House sparrow	<i>Passer domesticus</i>	NN
Japanese white-eye	<i>Zosterops japonicus</i>	NN
Java sparrow	<i>Padda oryzivora</i>	NN
Pacific golden-plover	<i>Pluvialis fulva</i>	M
Red-crested cardinal	<i>Paroaria coronata</i>	NN
Red-vented bulbul	<i>Pycnonotus cafer</i>	NN
Red junglefowl (chicken)	<i>Gallus</i>	NN
Rock pigeon	<i>Columbia livia</i>	NN
Spotted dove	<i>Streptopelia chinensis</i>	NN
Wandering tattler	<i>Tringa incana</i>	M
White tern (fairy tern)	<i>Gygis alba</i>	I
Zebra dove	<i>Geopelia striata</i>	NN
Total species		17

Notes:

* Status: I = Indigenous, NN = non-native permanent resident, M = migrant.

† These were observations of ducks that are likely hybrids of the native Hawaiian duck (*Anas wyvilliana*) and the introduced mallard (*Anas platyrhynchos*).

Two species of migrant shorebirds, the wandering tattler (*Tringa incana*) and Pacific golden-plover (*Pluvialis fulva*), were observed near the Hālonā Bridge. Pacific golden-plovers were seen foraging along the canal, and wandering tattlers were observed roosting on nearby rooftops. Three species of waterbird were observed during this survey: the black-crowned night-heron (*Nycticorax nycticorax*); Hawaiian

duck-like ducks (*Anas* sp.), which are likely to be mallard-Hawaiian duck hybrids; and a pair of garganey (*Anas querquedula*) ducks. One adult and one juvenile black-crowned night-heron were observed foraging along the northern edge of the canal. Eleven duck hybrids were observed foraging and swimming near the vegetated areas of the canal, and the pair of garganey was observed in water near the bridge. All other bird species observed are introduced species common to developed areas.

Suitable nesting habitat for native Hawaiian waterbirds is not present in the action area. The action area does not provide suitable nesting or foraging habitat for listed seabirds.

4.5.2. Mammals

The Hālonā Bridge and Kapālama Canal are bordered by residential areas, where it is common to find people walking dogs (*Canis familiaris*). No other mammals were observed during the pedestrian surveys. Mammals that could be expected in the action area include cats (*Felis catus*), mongoose (*Herpestes auro punctatus*), rats (*Rattus* spp.), and mice (*Mus musculus*).

An evaluation of the action area as habitat for the Hawaiian hoary bat, a federally listed mammal, is presented in section 6.

4.5.3. Reptiles and Amphibians

The brown anole (*Anolis sagrei*) was frequently observed during the pedestrian survey; individuals were foraging or basking in the sun along the cement sidewalk in the residential area around the canal. A mature red-eared slider turtle (*Trachemys scripta elegans*) was observed swimming in the canal between Olomea Street and Lunalilo Freeway. No other reptiles or amphibians were seen during the survey. None of the observed reptiles are native to the Hawaiian Islands. No threatened green sea turtles (*Chelonia mydas*) were observed during the survey and no records of green sea turtles were found in the survey area; however, these animals have been observed inland in stream as far as approximately 1.8 miles (3 km) on O‘ahu (Clark et al. 2011).

4.5.4. Terrestrial Invertebrates

Rambur’s forktail (*Ischnura ramburii*), a non-native damselfly, as well as the introduced Chinese dragonfly (*Crocothemis servilia*), were observed during the survey. A Sonoran carpenter bee (*Xylocopa sonorina*) was also observed. No native invertebrate species were recorded during the survey.

4.5.5. Fish

In the north portion of the survey area, freshwater from mauka areas of Kapālama Stream mixes into the brackish-water estuarine system. Although the water is turbid, several fish species were observed. Indigenous species observed include striped mullet (*Mugil cephalus*) and great barracuda (*Sphyraena barracuda*) juveniles, both of which occur in estuarine and marine waters. Non-native Poeciliids (*Gambusia affinis* or *Poecilia mexicana*) and tilapia (*Oreochromis* sp. or *Sarotherodon* sp.) were also seen.

5. SPECIES AND CRITICAL HABITAT CONSIDERED

5.1. Species

The species evaluated in this BA consist of all federally protected (i.e., endangered and threatened) species with potential to occur in this portion of O‘ahu.

Federally-listed species that may occur in the action area were identified in a letter from USFWS dated December 22, 2014 and from agency meetings on March 13, 2015, and December 15, 2015 (Section 1.1). Based on current distribution and habitat requirements, one federally-listed species—the Hawaiian hoary bat—may occur in the action area and has potential to use the habitat of the action area. Three marine species — the endangered Hawaiian monk seal, threatened green sea turtle, and endangered Hawksbill sea turtle — are unlikely to occur in the action area and are therefore not evaluated in this BA.

5.2. Critical Habitat

No designated or proposed critical habitat for threatened or endangered species occurs in the action area; therefore, critical habitat is not discussed further in this BA.

Table 2. Species Federally Listed as Endangered or Threatened with Potential to Occur near the Action Area.

Common Name (scientific name)	Status*	Range or Habitat Requirements†	Potential for Occurrence in Action Area	Determination of Effect
Mammals				
Hawaiian monk seal (<i>Neomonachus schauinslandi</i>)	Endangered	Endemic to the Hawaiian archipelago and found mostly in the Northwestern Hawaiian Islands. Increasing sightings reported from main Hawaiian Islands. Hawaiian monk seals spend most of their time in the ocean but like to rest on sandy beaches. There are accounts of seals traveling up some rivers and streams.	Unlikely to occur; have not been recorded in the action area.	No effect.
Hawaiian hoary bat (<i>Lasiurus cinereus semotus</i>)	Endangered	This species is found primarily from sea level to 7,500 feet, although it has also been observed above 13,000 feet. Most of the available documentation suggests that this elusive bat roosts among trees in forested areas. It has been observed on the islands of Hawai‘i, Maui, Moloka‘i, O‘ahu, and Kaua‘i.	May occur in the action area. Bat roosting could occur in the ornamental landscaping of the action area, and foraging could occur in the stream corridor.	May affect, but is not likely to adversely affect.
Reptiles				
Green sea turtle (<i>Chelonia mydas</i>)	Threatened	The green sea turtle is found worldwide in warm seas. They occupy three habitat types: open beaches, open sea, and feeding grounds in shallow, protected waters. Nesting occurs throughout the Hawaiian archipelago. They have been documented transiting some Hawai‘i rivers up to 2 miles (3 km) inland.	Unlikely to occur; have not been recorded in the action area.	No effect.

Table 2. Species Federally Listed as Endangered or Threatened with Potential to Occur near the Action Area.

Common Name (scientific name)	Status*	Range or Habitat Requirements†	Potential for Occurrence in Action Area	Determination of Effect
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	Endangered	The hawksbill sea turtle is found in warm tropical waters worldwide. The hawksbill turtle is a shy tropical reef dwelling species that feeds on jellyfish, sea urchins, and sea sponges. It may also eat algae that grows on the reef. In Hawai‘i, nesting occurs on the islands of Hawai‘i, Maui, Moloka‘i, and O‘ahu.	Unlikely to occur; have not been recorded in the action area.	No effect.

Notes:

* Federal (USFWS) status definitions:

Endangered: Any species considered by the USFWS as being in danger of extinction throughout all or a significant portion of its range. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to engage in any such conduct.

Threatened: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The ESA specifically prohibits the take (see definition above) of a species listed as threatened.

† Unless otherwise noted, data are from USFWS (2014b).

Suitable nesting habitat for native Hawaiian waterbirds is not present in the action area. The action area does not provide suitable nesting or foraging habitat for listed seabirds

6. EFFECTS ANALYSIS

Federally protected species that may be affected by the proposed action are discussed in detail in this section².

6.1. Hawaiian Hoary Bat

The Hawaiian hoary bat was listed as an endangered species on October 13, 1970, under the ESA and the State of Hawai‘i’s Endangered Species List. Hawaiian hoary bats are found on Hawai‘i, Maui, Moloka‘i, O‘ahu, and Kaua‘i and has been observed from sea level to approximately 13,000 feet (3,963 m) (USFWS 2014b).

The Hawaiian hoary bat is the only native terrestrial mammal that is still extant within the Hawaiian Islands (USFWS 1998). Hawaiian hoary bats use both closed habitats near vegetation such as tunneled roadways, and open habitats adjacent to forests, above tree canopies, and over open oceans (Jacobs 1996). Hawaiian hoary bats are insectivores and are regularly observed foraging over streams, reservoirs, and wetlands up to 300 feet (100 m) offshore (U.S. Department of Agriculture 2009). Hawaiian hoary bats forage in open, wooded, and linear habitats with a wide range of vegetation types (USFWS 2014b).

Acoustic surveys for Hawaiian hoary bats were not conducted for the proposed action, but areas of suitable habitat for roosting and foraging were noted during the biological survey. Several of the tree species in the action area—monkey pod, rainbow shower, kou haole, and Manila palms—could be used

² Species that become federally listed as endangered or threatened also become listed under the same classification (endangered or threatened) in the State of Hawai‘i (Hawaii Revised Statutes 195D-4).

by Hawaiian hoary bats for roosting. The stream corridor in the action area is suitable bat foraging habitat.

Hawaiian hoary bats are believed to be threatened by habitat loss, pesticides, predation, and roost disturbance. Reduction of tree cover and indirect impacts from the use of pesticides may be the primary causes of recent declines (USFWS 2014b).

6.1.1. Effects Analysis and Determination

Acoustic surveys for Hawaiian hoary bats were not conducted, but Hawaiian hoary bats are known to occur on O‘ahu in various habitats (U.S. Department of Agriculture 2009; USFWS 1998). They have been documented roosting in kukui (*Aleurites moluccana*) and mango (*Mangifera* sp.) trees, and they may roost in other trees in the action area (e.g., monkey pod) based on their foliage structure. The stream corridor in the action area is also suitable bat foraging habitat.

Direct impacts on bats could occur during vegetation removal if a juvenile bat that is too small to fly but too large to be carried by a parent is present in a tree or branch that is cut down. However, because of the conservation measure that trees would not be cut during the breeding season (June 1 through September 15), direct impacts are unlikely to occur. If a limited number of trees would need to be cleared during that time period, a qualified biologist would use appropriate protocols to surveys for bats prior to trimming or cutting. The potential for direct impacts would also be reduced by ensuring the top wire strand of surrounding fences (if present) is barbless, as listed in the conservation measures in section 2.3.

In the short term, the human noise and disturbance associated with construction activities could temporarily displace bats from roosting and/or foraging habitats. This displacement could alter an individual’s typical foraging and roosting patterns, forcing it to expend energy to search for new foraging and roosting locations. Displacement from roosting habitat could lead to increased predation on individual bats, especially if a bat is forced to leave its roost during daylight hours, making it more visible to potential predators. The potential for these impacts is low considering the project would occur on and immediately adjacent to a heavily traveled highway, and therefore the bats present would already be accustomed to high levels of background noise. Furthermore, roosting and foraging areas occur in the action area, into which bats could be displaced.

Because all impacts on the Hawaiian hoary bat would be discountable or insignificant, the proposed action *may affect, but is not likely to adversely affect*, individuals or populations of the species.

7. CONCLUSION

One federally listed species has the potential to occur in the action area: Hawaiian hoary bat. Potential impacts from the proposed action to this species are expected to be temporary, discountable, and insignificant. As detailed above, the timing of tree trimming and the minimal construction footprint would ensure that there are no significant or long-term effects to this federally listed species. In general, no major or long-term effects are anticipated from the implementation of the proposed action.

In conclusion, the proposed project *may affect, but is not likely to adversely affect* the federally listed Hawaiian hoary bat.

8. LITERATURE CITED

- Clark, D.L. G. Balazs, and S. Hargrove. 2011. Hawaiian Green Turtles Up and Down the Anahulu River. Proceedings of the Thirty-First Annual Symposium on Sea Turtle Biology and Conservation. San Diego, California.
- Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens. 1972. *Soil Survey of the Islands of Kaua‘i, O‘ahu, Maui, Moloka‘i, and Lana‘i, State of Hawai‘i*. U.S. Department of Agriculture.
- Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.L. Chen, P.S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. Online Rainfall Atlas of Hawai‘i. Bull. Amer. Meteor. Soc. 94, 313–316, doi: 10.1175/BAMS-D-11-00228.1. Available at: <http://rainfall.geography.hawaii.edu>. Accessed on September 12, 2014.
- Hawai‘i State Department of Health. 2014. *2014 State of Hawaii Water Quality Monitoring and Assessment Report*. Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections 303(D) and 305(B), Clean Water Act (Public Law 97-117).
- Jacobs, D.S. 1996. Morphological divergence in an insular bat, *Lasiurus cinereus semotus*. *Functional Ecology* 10:622–630.
- Natural Resources Conservation Service (NRCS). 2012. Hydric Soils State Lists, Hydric Soils of Hawai‘i. Available at: ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/Lists/hydric_soils.xlsx. Accessed December 7, 2012.
- . 2013. Web Soil Survey. Available at: <http://websoilsurvey.nrcs.usda.gov/>. Accessed October 16, 2014.
- Parham, J.E., G.R. Higashi, E.K. Lapp, D.G.K. Kuamoo, R.T. Nishimoto, S. Hau, J.M. Fitzsimons, D.A. Polhemus, and W.S. Devick. 2008. Atlas of Hawaiian Watersheds & Their Aquatic Resources. Copyrighted website published by the Hawai‘i Division of Aquatic Resources. Available at: <http://hawaiiwatershedatlas.com/>. Accessed June 20, 2015.
- Sherrod, D.R., J.M. Sinton, S.E. Watkins, and K.M. Brunt. 2007. *Geologic Map of the State of Hawai‘i*. U.S. Geological Survey Open-File Report 2007-1089, 83 p., 8 plates, scales 1:100,000 and 1:250,000, with GIS database.
- Staples, G.W., and D.R. Herbst. 2005. *A Tropical Garden Flora: Plants Cultivated in the Hawaiian Islands and Other Tropical Places*. Honolulu, Hawai‘i: Bishop Museum Press.
- U.S. Department of Agriculture. 2009. Bats of the U.S. Pacific Islands. Biology Technical Note No. 20. Natural Resources Conservation Service, Pacific Islands Area.
- U.S. Fish and Wildlife Service (USFWS). 1998. *Recovery Plan for the Hawaiian Hoary Bat (Lasiurus cinereus semotus)*. Portland, Oregon: USFWS, Region 1.
- . 2014a. Species List for Hawaii Bridges Program, Hawai‘i, Kaua‘i, and O‘ahu. Pacific Islands USFWS, Honolulu, Hawai‘i. Letter from Aaron Nadig, USFWS. December 22, 2015.
- . 2014b. Endangered Species in the Pacific Islands. Available at: <http://www.fws.gov/pacificislands/teslist.html>. Accessed July 2015.

- Vanderwerf, E. 2003. Distribution, Abundance, and Breeding Biology of White Terns on Oahu, Hawaii. *The Wilson Bulletin* 115(3):258–262.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999. *Manual of the Flowering Plants of Hawai'i*. Volumes I and II. Revised edition. Honolulu: University of Hawai'i Press.
- Wagner, W.L., and D.R. Herbst. 2003. *Supplement to the Manual of the Flowering Plants of Hawai'i*. Version 3.1 (12 Dec 2003).
- Wagner, W.L., D.R. Herbst, N. Khan, and T. Flynn. 2012. *Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai'i and Hawai'i's Ferns and Fern Allies*. Version 1.3.

Appendix A

Photographs of the Survey Area



Figure A1. Typical vegetation in the survey area, showing monkey pod trees planted in a mowed grassy area on Kohou Street and some hydrophytic plants within sections of the canal.



Figure A2. View of rainbow shower trees and weedy herbs along Hālonā Street.



Figure A3. Kapālāma Stream looking upstream from the bridge.



Figure A4. Kapālāma Stream looking downstream toward the bridge.

Appendix D
National Historic Preservation Act Section 106
and Hawaii Revised Statutes Chapter 6E
Consultation Documentation

AFFIDAVIT OF PUBLICATION

IN THE MATTER OF
NOTICE OF CONSULTATION

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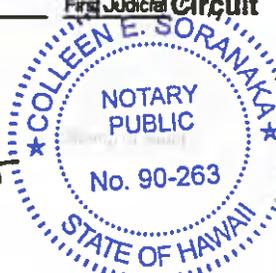
STATE OF HAWAII)
) SS.
City and County of Honolulu)

Doc. Date: 07/24/15 # Pages: 1

Notary Name: COLLEEN E. SORANAKA First Judicial Circuit

Doc. Description: Affidavit of
Publication

[Signature] 07/24/15
Notary Signature Date



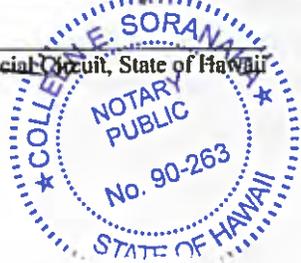
Julie Clark being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of Oahu Publications, Inc. publisher of The Honolulu Star-Advertiser, MidWeek, The Garden Island, West Hawaii Today, and Hawaii Tribune-Herald, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the aforementioned newspapers as follows:

- Honolulu Star-Advertiser 1 times on:
07/24/2015
- MidWeek 0 times on:
- The Garden Island 0 times on:
- Hawaii Tribune-Herald 0 times on:
- West Hawaii Today 0 times on:
- Other Publications: 0 times on:

And that affiant is not a party to or in any way interested in the above entitled matter.

[Signature]
Julie Clark
Subscribed to and sworn before me this 24th day of July A.D. 2015

[Signature]
Colleen E. Soranaka, Notary Public of the First Judicial Circuit, State of Hawaii
My commission expires: Jan 06 2016



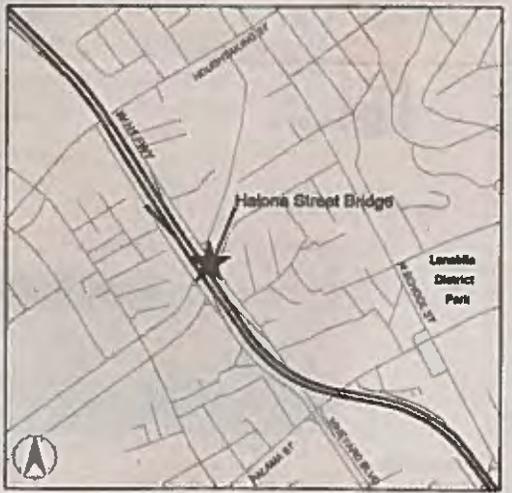
Ad # 0000779087

NOTICE OF CONSULTATION
SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT
OF 1966 AS AMENDED (2006)
AND CHAPTER 6E OF THE HAWAII REVISED STATUTES
HALONA BRIDGE REPLACEMENT PROJECT
HONOLULU DISTRICT, OAHU ISLAND, KAPALAMA AHUPUAA
FEDERAL-AID PROJECT NUMBER: HI STP H1 (1)
TAX MAP KEYS: (1)1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, and Kapalama Canal) and (1)1-6-006 (Halona Street, Kokea Street, Kohou Street and H-1 Interstate Highway Rights-of-Way, and Kapalama Canal)

Notice is hereby given that the Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD) and State of Hawaii Department of Transportation, Highways Division propose to replace the Halona Bridge, which spans Kapalama Canal, on Hawaii State Highway 98 (H-98), also known as Halona Street, at Mile Post 20.21 in Kapalama Ahupuaa in Honolulu District on Oahu. The proposed project would replace the existing Halona Bridge and its approaches to maintain the Kapalama Canal crossing on Halona Street as a safe and functional component of the regional transportation system for highway users. The project would also address safety concerns related to public access to the canal below the adjacent H-1 and Olomea Street bridges. The existing Halona Bridge would be demolished and removed. The replacement bridge would be a three-span bridge with a total length of approximately 131 feet. The bridge would have a deck width of 39 feet and a depth of 2.5 feet. The potential area of disturbance, including temporary construction areas, is 1.1 acres.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (2006), and Chapter 6E of the Hawaii Revised Statutes, 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 requested to contact Mr. Michael Will via email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228-2583.

Please respond by August 24, 2015.





U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

July 10, 2015

In Reply Refer To:
HFPM-16

TO:

FROM: J. MICHAEL WILL, P.E.
PROJECT MANAGER

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 AND HAWAII
REVISED STATUTES, CHAPTER 6E CONSULTATION
HALONA STREET (KAPALAMA CANAL) BRIDGE REPLACEMENT
PROJECT
HONOLULU (KONA) DISTRICT, OAHU ISLAND, KAPALAMA AHUPUAA
PROJECT NO. HI STP H1 (1)
TAX MAP KEY: (1)1-6-002 (Olomea Street and H-1 Interstate Highway Rights-
of-Way, and Kapalama Canal)
(1)1-6-006 (Halona Street, Kokea Street, Kohou Street and H-1
Interstate Highway Rights-of-Way, and Kapalama
Canal)

Dear :

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is proposing to replace the Halona Bridge over the Kapalama Canal on Hawaii State Highway 98 (HI-98) adjacent to Interstate H-1 (H-1), also known as Halona Street, at Mile Post 20.21 (see attached Area of Potential Effects USGS Map for project location). The proposed project is considered a federal action and undertaking, and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006), as well as Hawaii Revised Statutes (HRS) Chapter 6E. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3, by providing information and/or by requesting to be a consulting party. This letter also initiates consultations in accordance with HRS Chapter 6E.

Overview of the Undertaking

The proposed project would replace the existing Halona Bridge and its approaches to maintain the Kapalama Canal crossing on Halona Street as a safe and functional component of the regional transportation system for roadway users. The project would also address safety concerns related to public access to the canal below the adjacent H-1 and Olomea Street bridges.

The existing Halona Bridge would be demolished and removed. The replacement bridge would be a three-span bridge with a total length of approximately 131 feet. The bridge would have a deck width of 39 feet and a depth of 2.5 feet.

The four existing piers would be removed and replaced with two piers that would be aligned with the two existing and adjacent H-1 bridge piers. The pier shapes would be similar to the existing H-1 bridge piers. The proposed new bridge abutments would be set back from and behind the existing abutments. The existing abutments would not be removed to minimize impacts to the canal. The canal's lava rock lining walls, which are located upstream of the Halona Bridge and downstream of the H-1 and Olomea Street bridges, would be retained and protected in place. The existing Kapalama Canal and its lava rock lining walls are potentially eligible for listing on the National Register of Historic Places (NRHP).

The drain pipe outfall makai of the Olomea bridge, in the northwestern corner of the Olomea Street and Kohou Street intersection, would be cut back so that it is flush with the channel wall and would no longer provide an access point for individuals to climb down and access areas beneath the Olomea bridge. The fencing between Olomea Street and H-1 would also be improved. Vertical or cantilevered retaining walls would be added adjacent to the existing Olomea Street bridge on both sides of the canal to deter people from accessing the underside of the bridge.

The proposed improvements would occur within the existing HDOT right-of-way. However, 0.44 acres of land would be needed from four temporary construction parcels to accommodate bridge construction and paving improvements. One of these parcels, the Kapalama Canal, is potentially eligible for listing on the NRHP.

Staging of personnel and equipment would occur within the project limits. Possible staging areas are located along Halona Street (on pavement) north and south of the bridge as well as areas adjacent to the Kohou Street and Kokea Street intersections. The work area would be accessed from the sides of the canal. Construction would occur within the Kapalama Canal under the Halona Bridge and H-1 Bridge, and near the existing pipe outlet makai of the Olomea Bridge.

The Halona Bridge would likely be closed to normal vehicular traffic for the duration of the project, and traffic would be detoured during this time. However, pedestrian and bicyclist access would be maintained in a temporary pedestrian route within the existing landscaped area between the construction work and the H-1 freeway. Access to the H-1 on-ramp would be maintained during construction.

Area of Potential Effects

The archaeological and historic architectural Areas of Potential Effects (APE) are illustrated in the attached APE Aerial Imagery map, and include both temporary and permanent impact areas.

Cultural, Archaeological, and Historical Studies

To provide you information on the cultural, archaeological, and historical settings of the project area, we are including two studies prepared for this project. Please note that the study areas indicated in the reports are larger than the attached APE map. At the start of the project, we

assumed a large study area so that field findings could inform the conceptual design process at an early stage to help avoid or minimize effects to potentially sensitive sites.

1. Draft Archaeological Inventory Survey Report for the Halona Bridge Replacement Project, Kapalama Ahupuaa, Honolulu District, Oahu
2. Hawaii State Historic Preservation Division (SHPD) Historic Resource Inventory Form (Reconnaissance Level) for Halona Bridge

Consultations

Section 106 notice/advertisement will be included in the Honolulu Star Advertiser. 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.

Letters for this project are being sent to the following NHOs as well as other organizations with knowledge of cultural, archaeological, and historical resources:

- Office of Hawaiian Affairs
- Kalihi-Palama Hawaiian Civic Club
- Hawaiian Civic Club of Honolulu
- Koolauloa Hawaiian Civic Club
- Oahu Island Burial Council
- Hui Malama I Na Kupuna O Hawaii Nei
- Paulette Kaanohiokalani Kaleikini
- Historic Hawaii Foundation

We welcome any comments you have on this project's proposed improvements or APE. We are particularly interested in any information you may have on the historic and cultural sites that have been recorded in the area, or other historic or cultural sites about which you may have knowledge. In addition, if you are acquainted with any person 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.

If you have information and/or would like to be a Consulting Party, we would appreciate a written response within 30 days from date of receipt, by email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228.

Please feel free to contact Nicole Winterton, Environmental Protection Specialist, by telephone at (720) 963-3689, or email Nicole.Winterton@dot.gov, if you have any questions.

Sincerely yours,



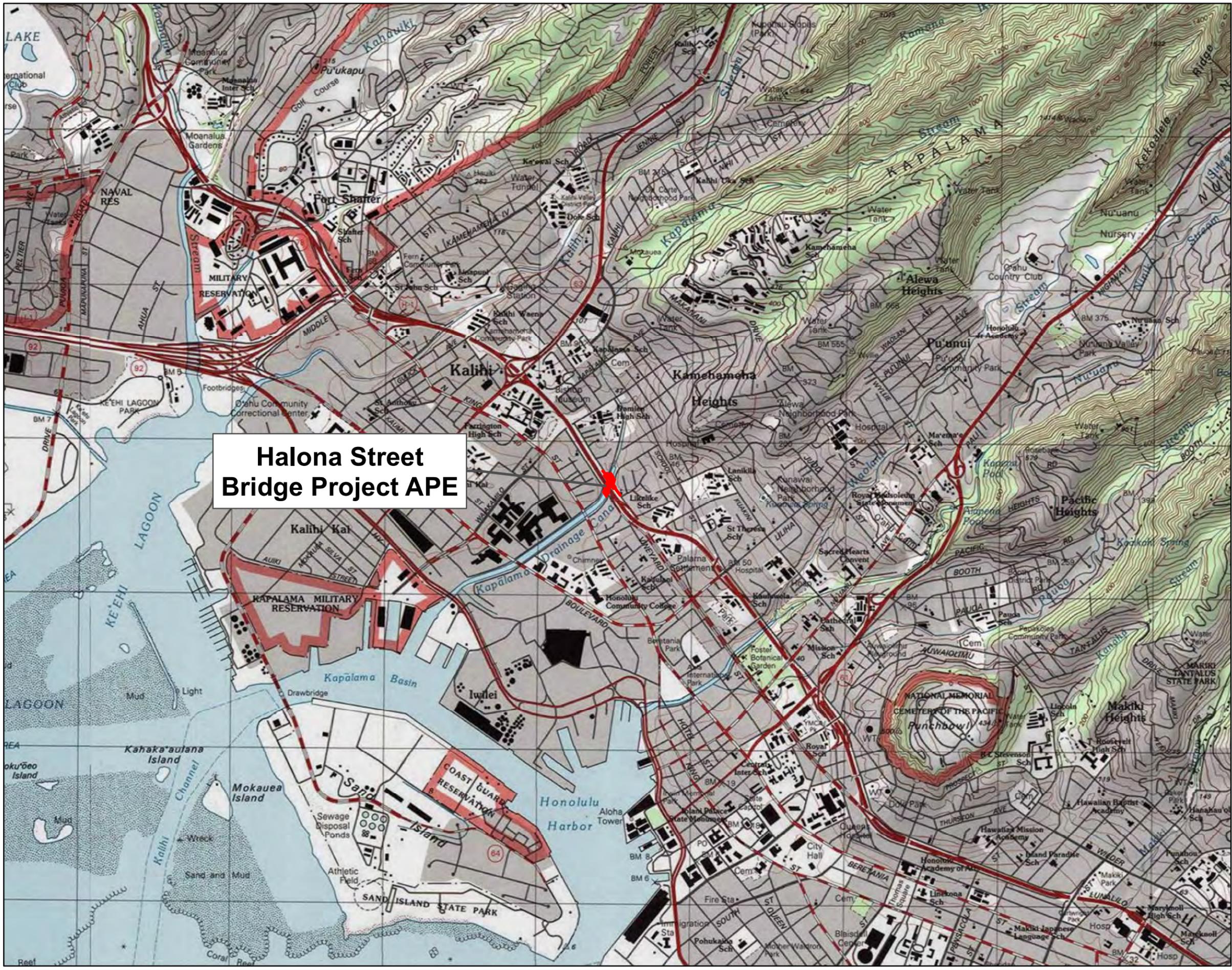
J. Michael Will, P.E.
Project Manager

Enclosures:

- Area of Potential Effects (USGS Map)
- Area of Potential Effects (Aerial Imagery)
- On CD: Draft Archaeological Inventory Survey Report for the Halona Bridge Improvements Project, Kapalama Ahupuaa, Honolulu District, Oahu
- On CD: SHPD Historic Resource Inventory Form (Reconnaissance Level) for Halona Bridge

cc (with enclosures on CD):

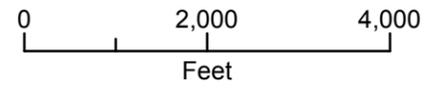
Christine Yamasaki, HDOT
Jessica Puff, SHPD
Dr. Susan Lebo, SHPD



**Halona Street
Bridge Project APE**



LEGEND
■ Area of Potential Effects



Notes:
 1. Imagery Source: ESRI USA Topographic Maps

**Halona Street Bridge Project
 Area of Potential Effects (USGS Map)**
 Central Federal Lands - Kalihi, Oahu

Draft

**Archaeological Inventory Survey Report for the
Halona Street Bridge (H-1 on-ramp at Vineyard Street)
Replacement Project
Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu,
Federal Highway Administration/
Central Federal Lands Highway Division (FHWA/CFLHD)
Contract DTFH68-13-R-00027
TMKs: [1] 1-6-002 (Olomea Street and H-1 Interstate
Highway Rights-of-Way, and Kapālama Canal) and 1-6-006
(Halona Street, Kokea Street, Kohou Street and H-1
Interstate Highway Rights-of-Way, and Kapalama Canal)**

**Prepared for
CH2M HILL
and on behalf of the
Federal Highway Administration (FHWA)
Central Federal Lands Highway Division (CFLHD)**

**Prepared by
Trevor M. Yucha, B.S.
and
Hallett H. Hammatt, Ph.D.**

**Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: KAPALAMA 24)**

August 2015

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Management Summary

Reference	Archaeological Inventory Survey Report for the Halona Street Bridge (H-1 on-ramp at Vineyard Street) Replacement Project, Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu, Federal Highway Administration/Central Federal Lands Highway Division (FHWA/CFLHD) Contract DTFH68-13-R-00027, TMKs: [1] 1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal) and 1-6-006 (Halona Street, Kokea Street, Kohou Street and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal) (Yucha and Hammatt 2015)
Date	August 2015
Project Number(s)	<ul style="list-style-type: none"> • FHWA/CFLHD Contract DTFH68-13-R-00027 • CH2MHILL Project Task ID: 499069.10SU.CS • Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: KAPALAMA 24
Investigation Permit Number	CSH completed the archaeological inventory survey (AIS) fieldwork under archaeological permit number 14-04 (for 2014) and 15-03 (for 2015), issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-13-282.
Agencies	FHWA/CFLHD, SHPD
Land Jurisdiction	State of Hawai‘i
Project Proponent	FHWA/CFLHD, HDOT
Project Funding	FHWA/CFLHD, HDOT
Project Location	The project area is located within Kapālama Ahupua‘a at the location of the Halona Street Bridge and the Kapālama Canal and includes portions of the H-1 Interstate Highway, and Halona Street from the intersection of Kuipaakea Lane to just beyond Kohou Street. The project area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The purpose of the project is to replace the existing bridge to amend structurally deficient conditions and meet current design standards for roadway width, load capacity, pedestrian/bicycle traffic, bridge railing and transitions, and bridge approaches. This existing bridge was built in 1938. It was determined that this bridge shall be replaced due to the existing superstructure conditions. A single span bridge is preferred, but if additional vertical clearance is needed, a reduced structure depth could be accommodated by using a multiple-span bridge with pier locations matching H-1’s pier locations in the channel. New abutments are proposed to be located behind existing abutments to match the H-1 abutment locations and minimize impacts to the masonry walls along the channel. The proposed bridge width is approximately 46 ft.(14.0 m). A bridge barrier study will be performed as part of the project development

AISR for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O‘ahu

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TMKs: [1] 1-6-002 (Olomea St and H-1 Interstate Hwy ROW, and Kapālama Canal) and 1-6-006 (Halona St., Kohou St., Kokea St., and H-1 Interstate Hwy ROW, and Kapālama Canal)

	to consider a variety of types and shapes to meet TL-3 requirements. The bridge railing height will be a minimum of 3 ft 6 inches (1.07 m). Additional bridge width and features will be explored to restrict access to the underside of the bridge. Foundations for the new bridge are expected to consist of deep foundations.
Project Acreage	The project area includes approximately 1.5 acres (0.61 hectares).
Area of Potential Effect (APE)	The APE for the current project is defined as the entire 1.5-acre (0.61 hectare) project area.
Historic Preservation Regulatory Context	<p>This AIS investigation was designed to be compliant with both Federal and Hawai'i State environmental and historic preservation review legislation. Due to federal funding, this project is a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act, the National Environmental Policy Act, and Section 4(f) of the Department of Transportation Act. The proposed project is also subject to Hawai'i State environmental and historic preservation review legislation (Hawai'i Revised Statutes [HRS] §343 and HRS §6E-8/HAR §13-275, respectively).</p> <p>In consultation with the SHPD, this AIS investigation fulfills the requirements of HAR §13-13-276 and the <i>Secretary of the Interior's Standards for Archaeology and Historic Preservation</i>. It was conducted to identify, document, and make National Register of Historic Places (National Register) and Hawai'i Register of Historic Places (Hawai'i Register) eligibility recommendations¹ for any cultural resources/historic properties². This report is also intended to support any project-related historic preservation consultation with stakeholders, such as State and County agencies and interested Native Hawaiian Organizations (NHOs) and community groups, if applicable.</p> <p>A companion architectural study (Ruzicka 2015) is being conducted by Mason Architects, Inc. in conjunction with this AISR. When applicable, the information from the architectural study has been incorporated into the present AIS document.</p> <p>No previous archaeological studies have been conducted and no previously documented cultural resources have been reported within the project area.</p>
Fieldwork Effort	Fieldwork was conducted on 19 September 2014 by CSH archaeologists Joanne DeMaio Starr, M.A. and Nifae Hunkin, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). This work required approximately 1 person-day to complete.
Consultation	The Halona Street Bridge Replacement project is a HDOT and FHWA/CFLHD partnership project, which includes numerous proposed bridge improvement and replacement projects in the State of Hawai'i. Presently, National Historic Preservation Act Section 106 consultation

	<p>with community, agency, and Native Hawaiian Organizations has been initiated and is on-going. Cultural consultation is also being conducted by CSH for a cultural impact assessment (CIA) for Halona Street Bridge (Ishihara and Hammatt 2015). No cultural resources have been assessed as having traditional cultural significance to an ethnic group (Criterion “e”) within the project area.</p>
<p>Cultural Resources Identified</p>	<p>Two cultural resources were identified within the project area:</p> <p>SIHP # 50-80-14-7807 is the Halona Street Bridge. As this is an architectural cultural resource, the assessment of significance (pursuant to HAR §13-13-275-6), and determination of eligibility to the National and Hawai‘i Register (35 CFR 60.4 and HAR §13-198-8, respectively) was conducted by Mason Architects, Inc. (Ruzicka 2015). Ruzicka (2015) evaluated SIHP # -7807 for significance under Criterion “A” (associated with events that have made a significant contribution to the broad patterns of our history), specifically development of Vineyard Street and the Kapālama Canal. However, due to the lack of integrity, SIHP # -7807 was determined by Ruzicka (2015) to be not significant and not eligible to the National Register and Hawai‘i Register. CSH concurs with this assessment and determination.</p> <p>SIHP # 50-80-14-7808 is the Kapālama Canal and associated lava rock walls. As this is an architectural cultural resource, the assessment of significance (pursuant to HAR §13-13-275-6), and determination of eligibility to the National and Hawai‘i Register (35 CFR 60.4 and HAR §13-198-8, respectively) was conducted by Mason Architects, Inc. (Ruzicka 2015). SIHP # -7808 was assessed by Ruzicka (2015) as significant under Criterion “A” (associated with events that have made a significant contribution to the broad patterns of our history) and was determined to be eligible to the National Register and Hawai‘i Register. CSH concurs with this assessment and determination.</p>
<p>Effect Recommendation</p>	<p>In accordance with Federal regulations (36 CFR 800.5), CSH’s project-specific effect recommendation is “No adverse effect.” Under Hawai‘i State historic preservation review legislation, the project’s effect recommendation is “No historic properties affected” (in accordance with HAR §13-13-275-7). To help avoid impact to the lava rock walls of the Kapālama Canal (SIHP # -7808), the existing abutments for the Halona Bridge (SIHP # -7807) will not be removed; however, the tops of the existing abutments will be cut down to accommodate deeper bridge girders.</p>
<p>Mitigation Recommendations</p>	<p>No further historic preservation work is recommended.</p>

¹Cultural resource significance is evaluated and expressed as eligibility for listing on the National and/or Hawai‘i Registers. To be considered eligible for listing on the National and/or Hawai‘i Registers a cultural resource should possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and meet one or more of the following broad cultural/historic significance criteria: “A” reflects major trends or events in the history of the

state or nation; “B” is associated with the lives of persons significant in our past; “C” is an excellent example of a site type/work of a master; and “D” has yielded or may be likely to yield information important in prehistory or history.

²In historic preservation parlance, cultural resources are the physical remains and/or geographic locations that reflect the activity, heritage, and/or beliefs of ethnic groups, local communities, states, and/or nations. Generally, they are at least 50 years old (although there are exceptions) and include buildings and structures; groupings of buildings or structures (historic districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and, in some instances, natural landscape features and/or geographic locations of cultural significance.

Historic properties, as defined under Federal historic preservation legislation (36 CFR 800.16), are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria. Determinations of eligibility are generally made by a federal agency official in consultation with the SHPD. Under Federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated. Under Hawai'i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their historic/cultural significance under State law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to “significant” historic properties (those historic properties assessed as significant using the five broad State of Hawai'i significance criteria).

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Section 1 Introduction

1.1 Project Background

At the request of CH2M HILL and on behalf of the Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), Cultural Surveys Hawai'i, Inc. (CSH) has completed this archaeological inventory survey report for the Halona Street Bridge Replacement project, Kapālama Ahupua'a, Honolulu (Kona) District, O'ahu, FHWA/CFLHD Contract DTFH68-13-R-00027, TMKs: [1] 1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal) and 1-6-006 (Halona Street, Kokea Street, Kohou Street and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal). The project area is located within Kapālama Ahupua'a at the location of the Halona Street Bridge and the Kapālama Canal and includes portions of the H-1 Interstate Highway, and Halona Street from the intersection of Kuipaakea Lane to just beyond Kohou Street. The project area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), tax map plats (Figure 2 and Figure 3), and a 2013 aerial photograph (Figure 4).

The purpose of the project is to replace the existing bridge to amend structurally deficient conditions and meet current design standards for roadway width, load capacity, pedestrian/bicycle traffic, bridge railing and transitions, and bridge approaches. This existing bridge was built in 1938. It was determined that this bridge shall be replaced due to the existing superstructure conditions. A single span bridge is preferred, but if additional vertical clearance is needed, a reduced structure depth could be accommodated by using a multiple-span bridge with pier locations matching H-1's pier locations in the channel. New abutments are proposed to be located behind existing abutments to match the H-1 abutment locations and minimize impacts to the masonry walls along the channel. The proposed bridge width is approximately 46 ft (14.0 m). A bridge barrier study will be performed as part of the project development to consider a variety of types and shapes to meet TL-3 requirements. The bridge railing height will be a minimum of 3 ft 6 inches (1.07 m). Additional bridge width and features will be explored to restrict access to the underside of the bridge. Foundations for the new bridge are expected to consist of deep foundations.

The project area includes approximately 1.5 acres (0.61 hectares). The APE for the current project is defined as the entire 1.5-acre project area.

1.2 Historic Preservation Regulatory Context

This AIS investigation was designed to be compliant with both Federal and Hawai'i State environmental and historic preservation review legislation. Due to federal funding, this project is a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act, the National Environmental Policy Act, and Section 4(f) of the Department of Transportation Act. The proposed project is also subject to Hawai'i State environmental and historic preservation review legislation (Hawai'i Revised Statutes [HRS] §343 and HRS §6E-8/Hawai'i Administrative Rules [HAR] §13-275, respectively).

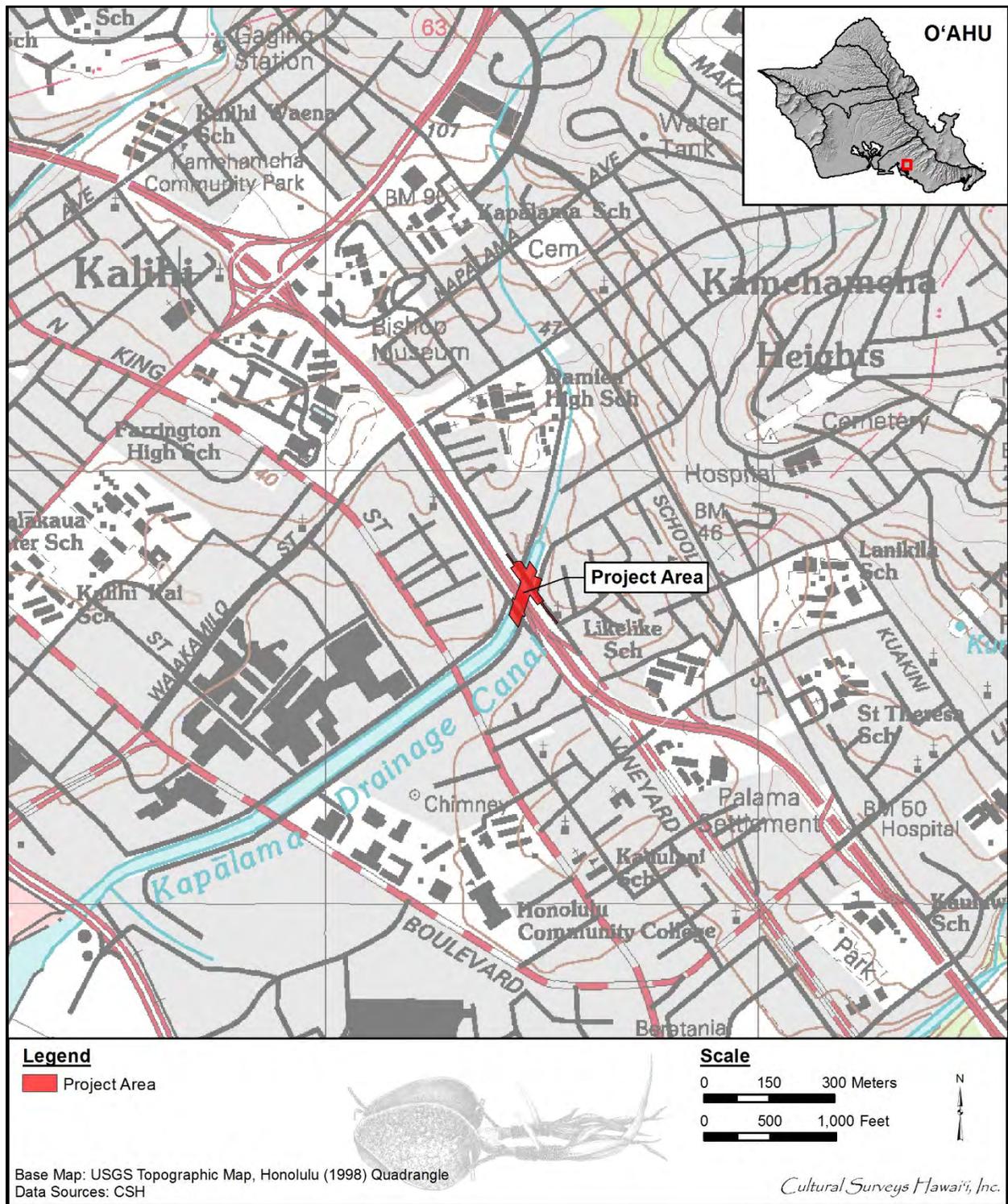


Figure 1. Portion of the 1998 USGS 7.5-minute topographic Honolulu quadrangle showing the location of the project area

AISR for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O'ahu

TMKs: [1] 1-6-002 (Olomea St and H-1 Interstate Hwy ROW, and Kapālama Canal) and 1-6-006 (Halona St., Kohou St., Kokea St., and H-1 Interstate Hwy ROW, and Kapālama Canal)

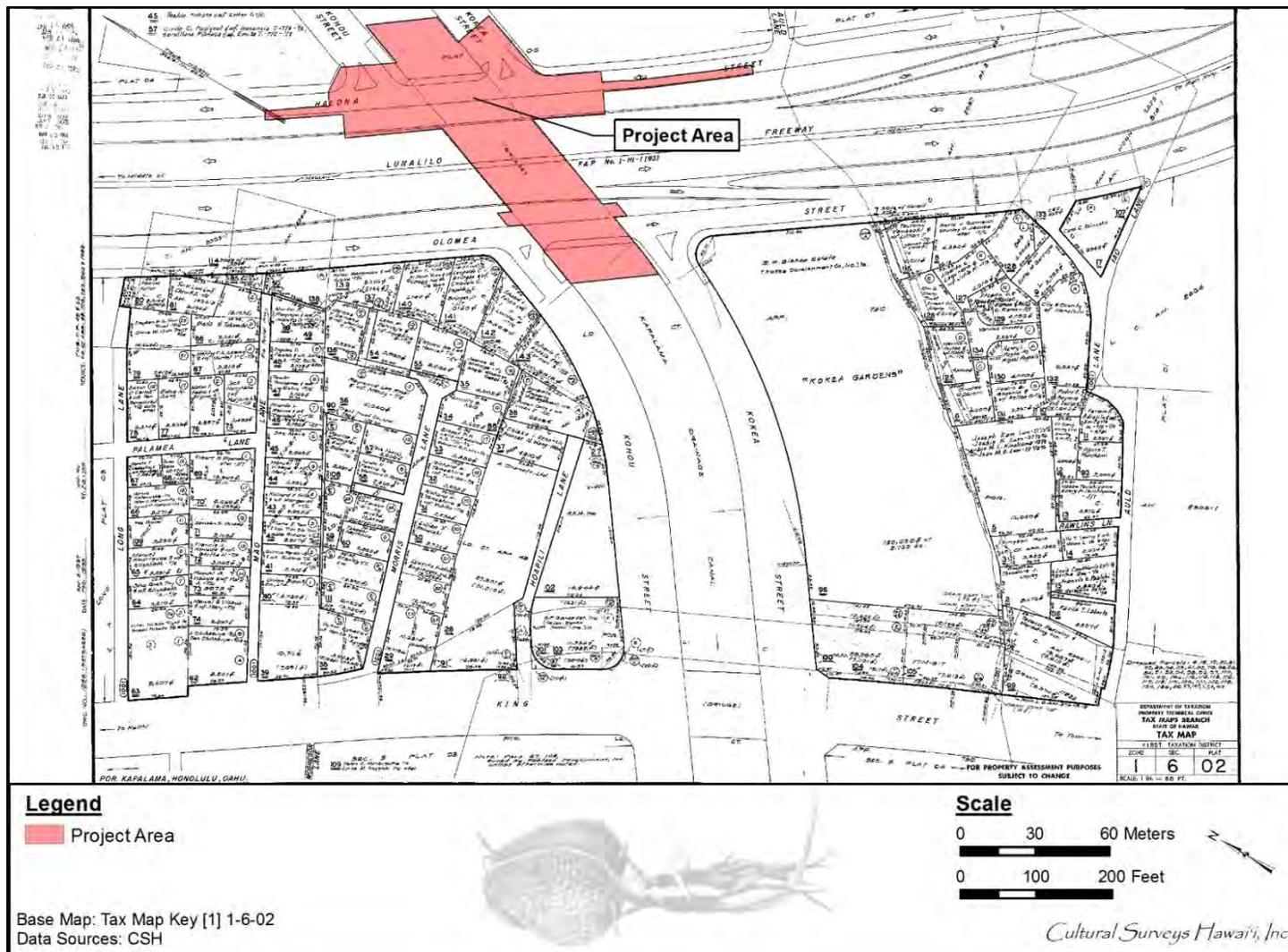


Figure 2. Tax Map Key (TMK) 1-6-002, showing project area at the H-1 Interstate Highway crossing at Kapālama Canal (Hawai'i TMK Service)

AISR for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O'ahu

TMKs: [1] 1-6-002 (Olomea St and H-1 Interstate Hwy ROW, and Kapālama Canal) and 1-6-006 (Halona St., Kohou St., Kokeka St., and H-1 Interstate Hwy ROW, and Kapālama Canal)

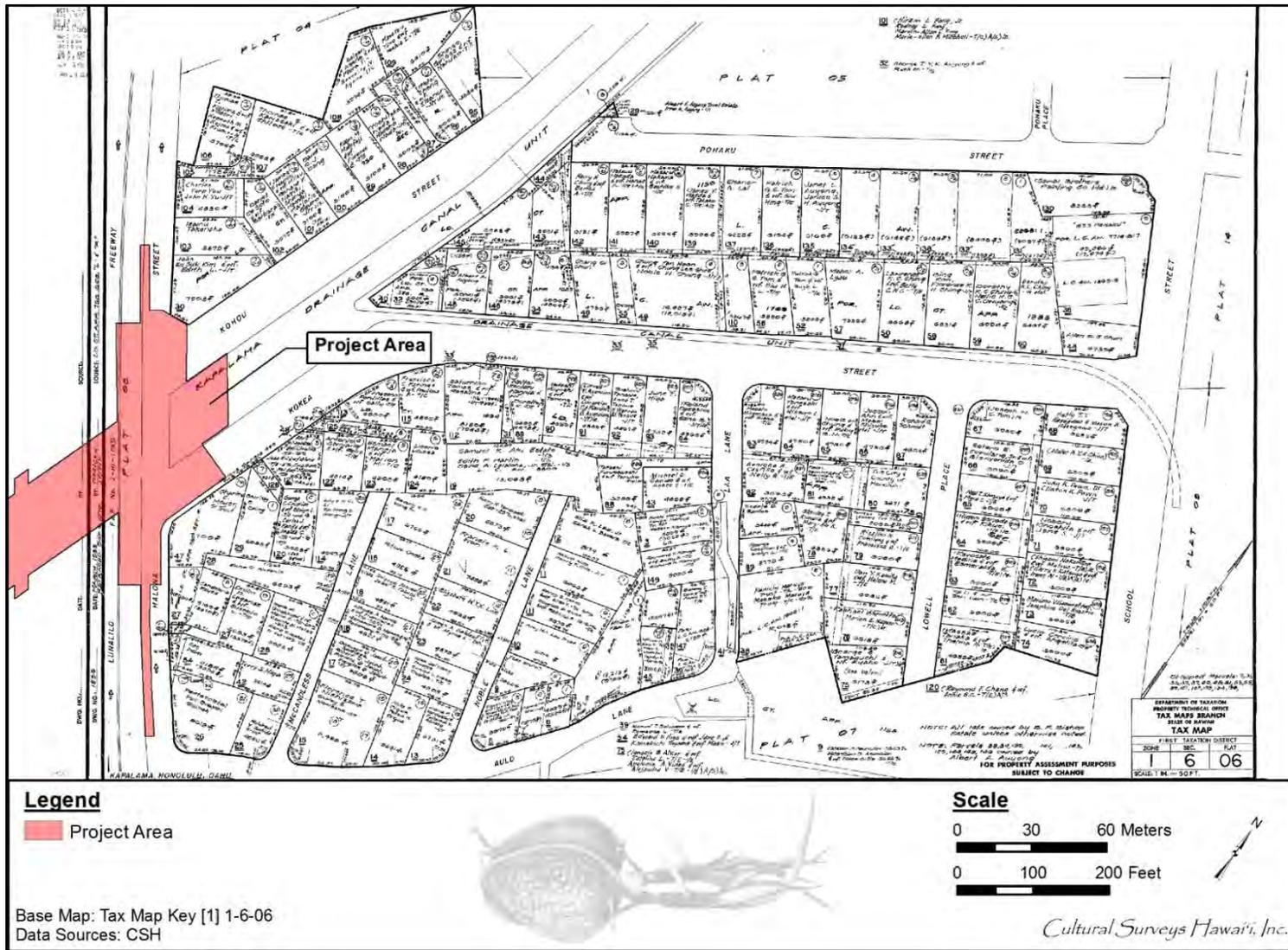


Figure 3. TMK: 1-6-006, showing project area at the H-1 Interstate Highway crossing at Kapālama Canal (Hawai'i TMK Service)

AISR for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O'ahu

TMKs: [1] 1-6-002 (Olomea St and H-1 Interstate Hwy ROW, and Kapālama Canal) and 1-6-006 (Halona St., Kohou St., Kokea St., and H-1 Interstate Hwy ROW, and Kapālama Canal)

In consultation with the SHPD, this AIS investigation fulfills the requirements of HAR §13-13-276 and the *Secretary of the Interior's Standards for Archaeology and Historic Preservation*. It was conducted to identify, document, and make National Register of Historic Places (National Register) eligibility recommendations for any cultural resources/historic properties. This report is also intended to support any project-related historic preservation consultation with stakeholders, such as State and County agencies and interested Native Hawaiian Organizations (NHOs) and community groups, if applicable.

A companion architectural study (Ruzicka 2015) is being conducted in conjunction with this AISR. When applicable, the information from the architectural study has been incorporated into the present AIS document.

No previous archaeological studies have been conducted and no previously documented cultural resources have been reported within the project area.

Definitions of Cultural Resources and Historic Properties

As discussed in the following paragraphs, there are important distinctions between the Federal and Hawai'i State definitions of historic properties. To eliminate any confusion these different definitions might cause, CSH has opted in this document to use the more generic term "cultural resources" as defined below in its discussion of the cultural remains within the current project area.

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

Historic properties, as defined under Federal historic preservation legislation (36 CFR 800.16), are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria. Determinations of eligibility are generally made by a federal agency official in consultation with the SHPD. Under Federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated. Under Hawai'i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their historic/cultural significance under State law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties assessed as significant under the five broad State of Hawai'i significance criteria).

1.3 Environmental Setting

1.3.1 Natural Environment

Kapālama is a small valley, which was once watered by two small streams, the Kapālama and Niuhelewai streams. The *ahupua'a* (land division) of Kapālama is pie-shaped with its apex at approximately 609 m (2,000 ft) AMSL (above mean sea level) on the ridge that separates Nu'uuanu and Kalihi valleys. The shore frontage (presently "Kapālama Basin") is part of the Honolulu Harbor protected shoreline. In 1961, the development of the Kapālama Canal, which follows the lower course of Niuhelewai Stream, channelized the lower streams. Temperatures in the project area range from 60–90° F, while rainfall varies from 50–127 cm (20–50 inches) per year (Juvik and Juvik 1998:62–64).

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), soils within the project area include Kawaihapai stony clay loam, 2 to 6% slopes (KlaB) and Hanalei silty clay loam, 0 to 2% slopes (HnA) (Figure 5).

Soils of the Kawaihapai Series are described as follows:

This series consists of well-drained soils in drainage-ways and on alluvial fans on coastal plains on the islands of Oahu and Molokai. These soils formed in alluvium derived from basic igneous rock in humid uplands. They are nearly level to moderately sloping. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 30 to 50 inches. [Foote et al. 1972:63-64]

Soils of the Hanalei Series are described as follows:

This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from sea level to 800 feet. The annually rainfall amounts to 20 to 120 inches. [Foote et al. 1972:38]

Vegetation observed within the project area included California grass (*Urochloa mutica*), sensitive plant (*Mimosa pudica*), and Java plum (*Syzygium cumini*).

1.3.2 Built Environment

The project area is located within urban Honolulu. The project area's built environment includes a portion of Halona Street, the Halona Street Bridge, and the Kapālama Canal. Halona Street is the former extension of Vineyard Boulevard, which was replaced by a portion of the H-1 Interstate Highway in the 1960s. The Halona Street Bridge is a continuous concrete cast-in-place bridge constructed in 1938. The Kapālama Canal is a channelized drainage that extends through urban Honolulu and is used to control the runoff from both Niuhelewai and Kapālama streams.

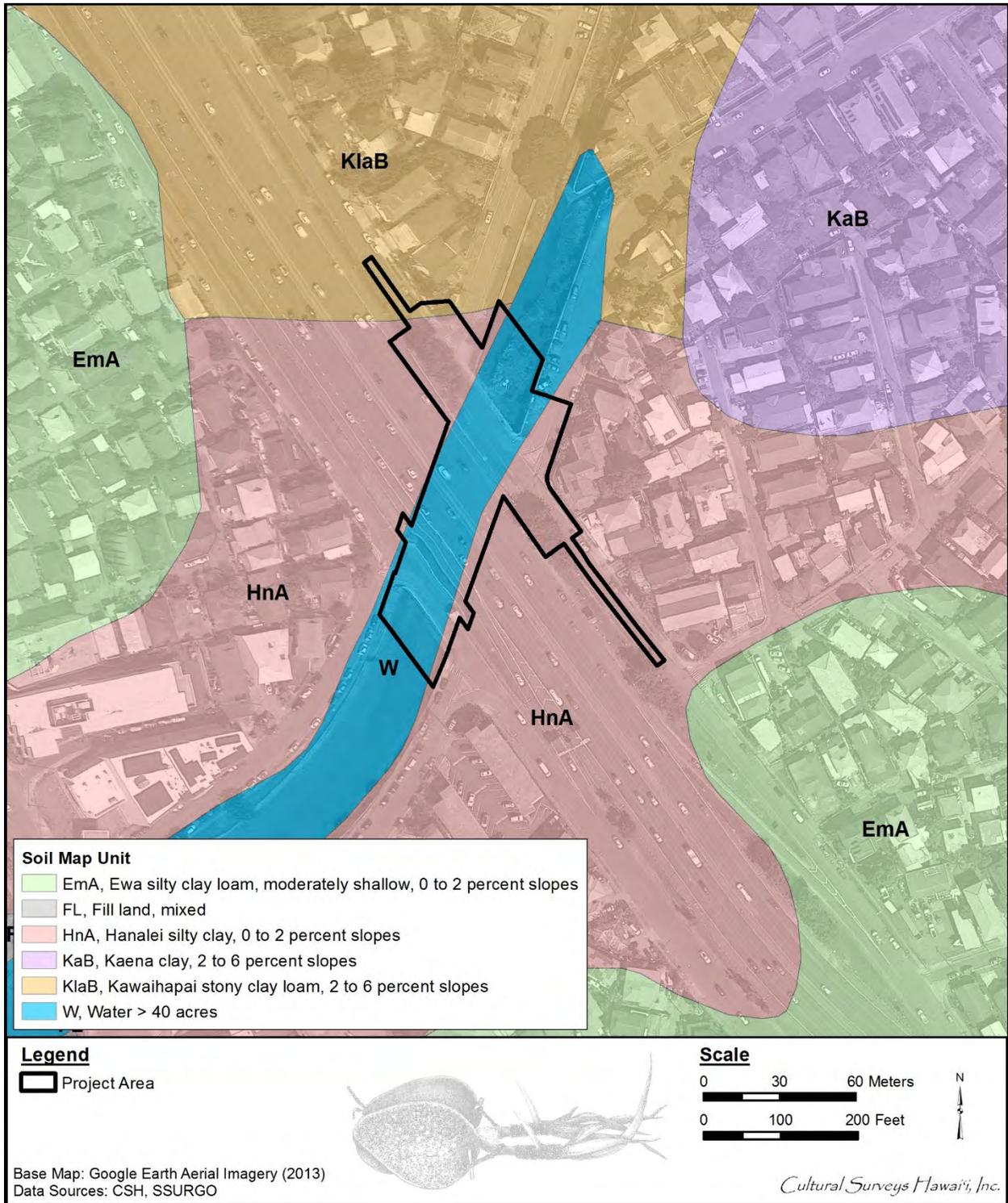


Figure 5. 2013 aerial photograph (Google Earth 2013) with an overlay of the USDA SSURGO database (2001) and soil survey data gathered by Foote et al. (1972)

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of this AIS under archaeological permit number 14-04 (for 2014) and 15-03 (for 2015), issued by the SHPD pursuant to HAR §13-13-282. Fieldwork was conducted on 19 September 2014 by CSH archaeologists Joanne DeMaio Starr, M.A. and Nifae Hunkin, B.A. under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). This work required approximately 1 person-day to complete.

Fieldwork included 100% pedestrian inspection of the project area and GPS data collection.

2.1.1 Pedestrian Survey

A 100%-coverage pedestrian inspection of the project area was undertaken for the purpose of cultural resource identification and documentation. The pedestrian survey was accomplished through systematic sweeps spaced 5 m apart.

2.1.1 GPS Data Collection

Cultural resources were located using a Trimble Pro XH mapping grade GPS unit with a real-time differential correction. This unit provided sub-meter horizontal accuracy in the field. GPS field data was post-processed, yielding horizontal accuracy between 0.5 and 0.3 m. GPS location information was converted into GIS shape files using Trimble's Pathfinder Office software, version 2.80, and graphically displayed using ESRI's ArcGIS 9.1.

2.2 Laboratory Methods

No cultural material was collected during the AIS. No laboratory analysis was conducted.

2.3 Research Methods

Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Mission Houses Museum Library, the Hawai'i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai'i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona 'Aina database (Waihona 'Aina 2000).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected types and locations of cultural resources in the project area.

2.4 Consultation Methods

The Halona Street Bridge Replacement project is a HDOT and FHWA/CFLHD partnership project, which includes numerous proposed bridge improvement and replacement projects in the State of Hawai'i. Presently, National Historic Preservation Act Section 106 consultation with community, agency, and Native Hawaiian Organizations has been initiated and is on-going.

Cultural consultation is also being conducted by CSH for a cultural impact assessment (CIA) for Halona Street Bridge (Ishihara and Hammatt 2015).

No cultural resources have been assessed as having traditional cultural significance to an ethnic group (Criterion “e”) within the project area.

Section 3 Background Research

3.1 Traditional and Historical Background

The project is located within the *ahupua'a* (traditional land division) of Kapālama in the O'ahu *moku* (district) of Kona, now called the District of Honolulu. The *ahupua'a* of Kalihi lies to the west and the *ahupua'a* of Nu'uaniu lies to the east.

3.1.1 Mythological and Traditional Accounts

The place name Kapālama is often understood to refer to an enclosure (*pā*) of *lama* wood that surrounded the place of residence of high ranking *ali'i* (chiefs) (Pukui et al. 1974:87). McAllister (1933:88) relates, "Kapālama is said to have obtained its name from an establishment in which the young *ali'i* were kept just before pairing off for offspring." This information probably came from Nathaniel Emerson, who translated David Malo's *Ka Mo'olelo Hawai'i*. Emerson added many notes to his English translation, including the following:

Hoonoho ia means put in an establishment, placed under the care of a guardian or duenna [chaperone]. Such an establishment was surrounded by an enclosure, *pa*, made of the sacred *lama* . . . Hence this special care or guardianship was called *palama*. It is said that an establishment of this kind was anciently placed at that suburb of Honolulu which to this day bears the name of *Ka-pa-lama*. [Malo 1951:139; note by N.B. Emerson]

Westervelt (1923:165) attributes the O'ahu place name to a chiefess of O'ahu who lived in that area. This chiefess was named Kapālama, the grandmother of Lepeamoa (Hawaiian for "cockscorb"). A chief of Kaua'i named Keāhua traveled to O'ahu to take Kauhao, the daughter of Kapālama, as his wife. He angered a *kupua* (supernatural being that can change form) called Akuapehualē (god of swollen billows) who forced the couple to hide in the uplands of the Wailua River valley of Kaua'i.

Keāhua's daughter was born as an egg, and was adopted by the chiefess Kapālama to raise on O'ahu at her home, also named Kapālama. When the egg hatched, Lepeamoa was a bird with feathers in all the colors of the rainbow. She became able to turn herself into a beautiful young woman wearing a feather *lei*. The girl was so beautiful that a rainbow was always present above her. The girl was guarded by her ancestress, Keaolewa ("the moving cloud"), who could also change forms between human and bird. The lower ridge separating Kapālama and Nu'uaniu (Ālewa Heights) may have been named for this ancestress.

The parents of Lepeamoa had another child, a son called Kau'ilani, who was so strong that he was able to defeat the *kupua* who had threatened his parents. After Kau'ilani's victory over the *kupua* he went to find his sister, searching for the rainbow sign of her presence. In her compound he found Kapālama who advised him to hide in Lepeamoa's house, wait until she was asleep in her bird form, and catch and hold her until she acknowledged him as her brother. Her advice worked, and Lepeamoa lived with her brother thereafter (Westervelt 1923:164-184).

3.1.2 Stories of Heroes and Gods

In the legend of Palila, the hero's war club could magically carry him far distances in a single flight. Palila came to the plain of Keahumoa in 'Ewa to participate in the athletic games given by

the O'ahu king, Ahuapau. The residence of this chief was said to be at Kalaepōhaku, near Wailuakio in Kapālama (Fornander 1917:5(1):142). Kalaepōhaku Peak (meaning “the stone promontory”) is near the intersection of School and Alaneo streets in Kapālama.

A place named Niuhelewai (*lit.* “coconut going in water”) in lower Kapālama, located *makai* (seaward) of King Street (Fornander 1917:4(3):530-531; Fornander 1919:5(2):368) was associated with the deity Haumea and the hero, Kaulu, who was known for his great strength.

Kaulu was born in Kailua on the windward side of O'ahu. His older brother Kaeha was taken by the spirits to a realm of gods in the sky. For love of his brother, Kaulu followed him to this realm, playing a number of tricks on the gods including Makali'i, the god of plenty, who had a magic fish net that would fill with fish whenever used. After playing the tricks, Kaulu then had to rescue his brother from the wrath of the various spirits. The brothers finally returned to the land of men on O'ahu, setting down at Moanalua (*ahupua'a* [land division] west of Kapālama).

A hiki laua ma Moanalua, i Papakolea, hoonoho o Kaulu ia Kaeha ilaila; hele mai la o Kaulu a loa o Haumea i Kapālama. He 'kua o Haumea no Oahu nei, e noho ana ia i Niuhelewai, he wahine of Haumea.

When they arrived at Papakolea, Moanalua, Kaulu left Kaeha at this place while he continued on his way to Kapālama in search of Haumea. Haumea was a spirit that lived at Niuhelewai, Oahu. It was a female spirit.
[Fornander 1917:4(3):530-531]

Haumea, the goddess of childbirth, had a home at Niuhelewai in Kapālama; she challenged anyone who passed by, often killing them. Kaulu challenged Haumea to a fight on the following day. That night he flew back up to the spirit land in the clouds and borrowed the magic nets of Makali'i, and then threw them over Haumea's house. When Haumea could not break through these nets, she fell asleep in exhaustion, tangled in the nets. While asleep, Kaulu burned down her house, killing her.

3.1.3 Legend of the Tapa Board

A brief mention is made of Kapālama in the Legend of the Tapa Board, which has several different versions (Sterling and Summers 1978:25–26, 149; Thrum 1910:129–131). Tapa was placed on a wooden board (also called an anvil), and beaten by women with tapa sticks to soften and smooth out the fibers. This pounding made a resonant sound, and women could often identify the owner of the board by its sound. One day a woman in Kahuku on O'ahu took her favorite tapa board to a pool to clean it and left it at the side of the pool. The next day the board was missing. The pool is identified as Waiakaole, Punaho'olapa, or Waikalai, all in Kahuku, in various versions. The woman first searched the windward districts of the island, but never heard the distinctive ringing sound of her own favorite board. After several months without finding her board, she traveled to the leeward side of O'ahu.

She went from Kahuku on the Koolau side to Kaneohe where she spent the night. There was no sign of the anvil in Koolau, because the sign she sought was the sound it made . . . She went on and spent the night at Wailupe but did not find hers. She heard other anvils but they were not hers. The night turned into day and she went on to Kapālama where she slept but did not hear what she sought till she came to

Waipahu. [*Ka Loea Kalaiaina*, 10 June 1899; English translation in Sterling and Summers 1978:25]

At Waipahu Spring in the 'Ewa District, she finally heard the sound of her own board. She followed the sound to the uplands of Waikele and found a woman beating tapa on her board. The woman claimed she had found the board one day floating on the water at a spring near her house. This legend illustrates the belief of the ancient Hawaiians that there were underground streams and passages that led from one side of the island to the other. In one version of this story, the people of 'Ewa followed the woman back to Kahuku so she could prove the board was the same one she had lost. They wrapped a bundle of *ti* leaves and cast them into the pool near the house of the Kahuku woman. Then returning to 'Ewa, they saw the same bundle of *ti* leaves a few days later in Waipahu at the spring. Because of this, the Waipahu spring was called Ka-puka-na-wai-o-Kahuku, which means "outlet of water from Kahuku."

3.1.4 Keanakamanō, the Cave of the Shark

Near the Kamehameha Schools there was once a cave called Keanakamanō, which means "cave of the shark" (Sterling and Summers 1978:323). The Hawaiians have many stories concerning legendary caves that connected inland springs to the sea or extended below the Ko'olau Mountains, connecting the leeward and windward sides of the island.

On the Kamanaiiki side of the Kalihi Valley there was once a shallow cave called Keana Kamano. It was called the cave of the sharks because the big shark gods from Pearl Harbor often went there to rest.

Keana Kamano led into the fabulous underground cave believed in olden times to occupy the center of the island of Oahu.

One branch of the cave led around and under the mountains to Pearl Harbor. Another branch of the cave led to the center of the Island where there was a sacred pool for swimming.

Hawaiians living today can tell of elders who once traveled these caves and who once swam in the sacred pool. An earthquake about 1900 closed up the caves and no one has been known to travel them since.

It may be that the cave-in of the Wilson Tunnel occurred over the old lava tube leading to Pearl Harbor. [Taylor 1954]

An access street called Kealamanō ("the way of the shark") on the Kamehameha School's Kapālama Heights campus is named for this cave. The shark referred to is Kamohoali'i, king of the sharks, who is the older brother of Pele, the Hawaiian volcano goddess. On the long trip Pele's family made to Hawai'i, it was Kamohoali'i who acted as the navigator. Don Mitchell, who said that earthquakes in 1900 caused the collapse of the cave (1993), states the following:

His [Kamohoali'i] favorite pastime was to swim through the extensive water-filled lava tubes or tunnels that extended from Pearl Harbor to areas under Kalihi Valley. As the tunnels rose above sea level, he assumed his human form and walked to his cave, Keanakamanō, on Kapālama Heights. [Mitchell 1993:146]

3.1.5 Traditional Accounts of Battles at Niuhelewai Stream in Kapālama

Two accounts of traditional Hawaiian warfare suggest mass killings in the vicinity of “Niuhelewai” which is the stream generally now known as Kapālama Canal.

3.1.5.1 Kahahawai‘a Defeat of Kahāhana (AD 1780-1783)

Niuhelewai Stream was the location for a famous battle between Kahahawai‘i, the war chief of Kahekili, king of Maui, and the O‘ahu ruling chief Kahāhana. Fornander (1919:498) states in a footnote to a story that Niuhelewai was the name of the locality of the Pālama cane field between the fire and pumping stations. Ross Cordy (2002:19) places Kahāhana’s reign on O‘ahu around the year 1780 to his death in 1783 after this battle.

I ka wa e noho ana o Kahekili he ‘lii no Maui, a o Kahahana he li‘ i no Oahu nei iloko oia kau i holo mai ai o Kahahawai me na koa e kaua ia Oahu. Ma keia kaua ana ua hee a ua luku ia na kanaka Oahu, ma Niuhelewai, a ua hoi ka wai i uka o ka muliwai, no ka piha i na kanaka.

When Kahekili was reigning as king of Maui, and Kahahana was king of O‘ahu, it was during this period that Kahahawai with a number of warriors came to make war on O‘ahu. In this battle the people of O‘ahu were defeated and slaughtered at Niuhelewai, and the waters of the stream were turned back, the stream being dammed by the corpses of the men. [Fornander 1919:498-499]

3.1.5.2 The Rebellions of the ‘Ewa and Kona Chiefs (post-1783)

After Kahāhana’s death, the chiefs of Maui took over O‘ahu. Some of the chiefs from the O‘ahu districts of ‘Ewa and Kona conceived a plot to murder their new overlords but the Maui chiefs were warned. Although the main backers of the plot were the chiefs of Waipi‘o, ‘Ewa, they were temporarily able to convince Kahekili that the conspiracy originated on Kaua‘i, thus the phrase, *Waipi‘o kīmopō*, “Waipi‘o of the secret rebellion” (Pukui 1983:319). Eventually the truth was revealed and:

*A no kēia mea, ulu maila ke kaua kūloko o Kona me ‘Ewa, nā moku o O‘ahu i luku nui ‘ia; ua luku ‘ia nā moku o O‘ahu i luku nui ‘ia; ua luku ‘ia nā kāne, nā wāhine a me nā keiki, a ua pani kūmano ‘ia nā kahawai a me nā muliwai i nā heana o nā kānaka o Kona a me ‘Ewa. ‘O nā kahawai i ‘oi aku ka nui o nā heana, a ho‘i hou ka wai i uka, ‘o ia nō ‘o Makaho a me Niuhelewai ma Kona, a ‘o Kaho‘ā‘ia i ho‘i ko ‘Ewa. He kūmukena ka nui o nā mea he make, ke lilo ka wai i mea ‘awa-‘awa ke inu aku. Ua ‘ōlelo mai ho‘i ka po‘e ‘ike maka ‘O ka lolo ka mea i ‘awa-‘awa ai ‘o ka wai.’ [Kamakau 1996:91, *Ka Nūpepa Kū‘oko‘a*, 39 March 1867]*

. . . the districts of Kona and ‘Ewa were attacked, and men, women, and children were massacred, until the streams of Makaho and Niuhelewai in Kona [in Kapālama] and of Kahoa‘ai‘ai in ‘Ewa were choked with the bodies of the dead, and their waters became bitter to the taste, as eyewitnesses say, from the brains that turned the water bitter. All the O‘ahu chiefs were killed and the chiefesses tortured. [Kamakau 1992:138]

3.1.6 Early Historic Period

The *ahupua'a* of Kapālama is between the *ahupua'a* of Nuʻuanu to the east and Kalihi to the west. Although Kapālama is not a major river valley like Nuʻuanu or Kalihi, it is watered by two smaller streams, the Kapālama and Niuhelewai. The shore frontage (presently “Kapālama Basin”) is part of the Honolulu Harbor protected shoreline. Kapālama Ahupuaʻa offered desirable environmental conditions for traditional Hawaiian subsistence practices. The well-watered flood plain would have allowed for the development of an extensive *lo'i* system, and the protected shoreline and fringing reef would have allowed for ease of ocean access to the productive near-shore fisheries. E.S. Craighill Handy, who gathered information on former planting areas from local informants in the 1930s and 1940s, reported the following: “Kapālama had two streams watering its terrace area [for taro], which was almost continuous from Iwilei up to the foothills above School Street, an area measuring about three quarters of a mile both in depth inland and in breadth” (Handy 1940:79).

The lower lands were used for taro cultivation; the uplands also had considerable resources. In the early nineteenth century, sandalwood trees were still present in the forests. These trees were extensively harvested between 1810 and 1830 as the fragrant wood could be sold to ship captains sailing to China to trade for exotic Asian goods.

Otto von Kotzebue’s journal and map of Honolulu provide one of our earliest accounts of the environs of Kapālama ca. 1817 (Kotzebue 1967:339-341). Kotzebue’s 1817 map of Honolulu (Figure 6), shows large taro fields (and trees) on both sides of the mouth of Kalihi and Nuʻuanu streams extending to the coast. The path shown was probably the main trail and the route traveled by Kotzebue himself. The 1817 map does not show any taro fields in Kapālama, but a later 1855 map by LaPasse (Figure 7) does show extensive taro *lo'i* (irrigated patches) in the *makai* section of Kapālama.

Kamehameha I, after the devastations to the population caused by the wars of conquest and a ca. 1804 epidemic, encouraged people to replant the land and he set aside several large tracts, including tracts in Kapālama, for them to grow crops for their own use and for trade with visiting ships. The Hawaiian historian Samuel Kamakau noted, “After the pestilence had subsided the chiefs again took up farming, and Kamehameha cultivated land at Waikiki, Honolulu, and Kapālama, and fed the people” (Kamakau 1992:190).

Another early Hawaiian historian, John Papa ʻĪʻī, knew personally that, “He [Kamehameha] also lived in Honolulu, where his farms at Kapālama, Keoneula, and other places became famous. These tasks Kamehameha tended to personally, and he participated in all the projects” (ʻĪʻī 1959:69).

Rev. Hiram Bingham, arriving in Honolulu in 1820, described a predominantly Native Hawaiian environment—still a “village”—on the brink of western-induced transformation:

We can anchor in the roadstead abreast of Honolulu village, on the south side of the island, about 17 miles from the eastern extremity. . . . Passing through the irregular village of some thousands of inhabitants, whose grass thatched habitations were mostly small and mean, while some were more spacious, we walked about a mile northwardly to the opening of the valley of Pauoa, then turning south-easterly,

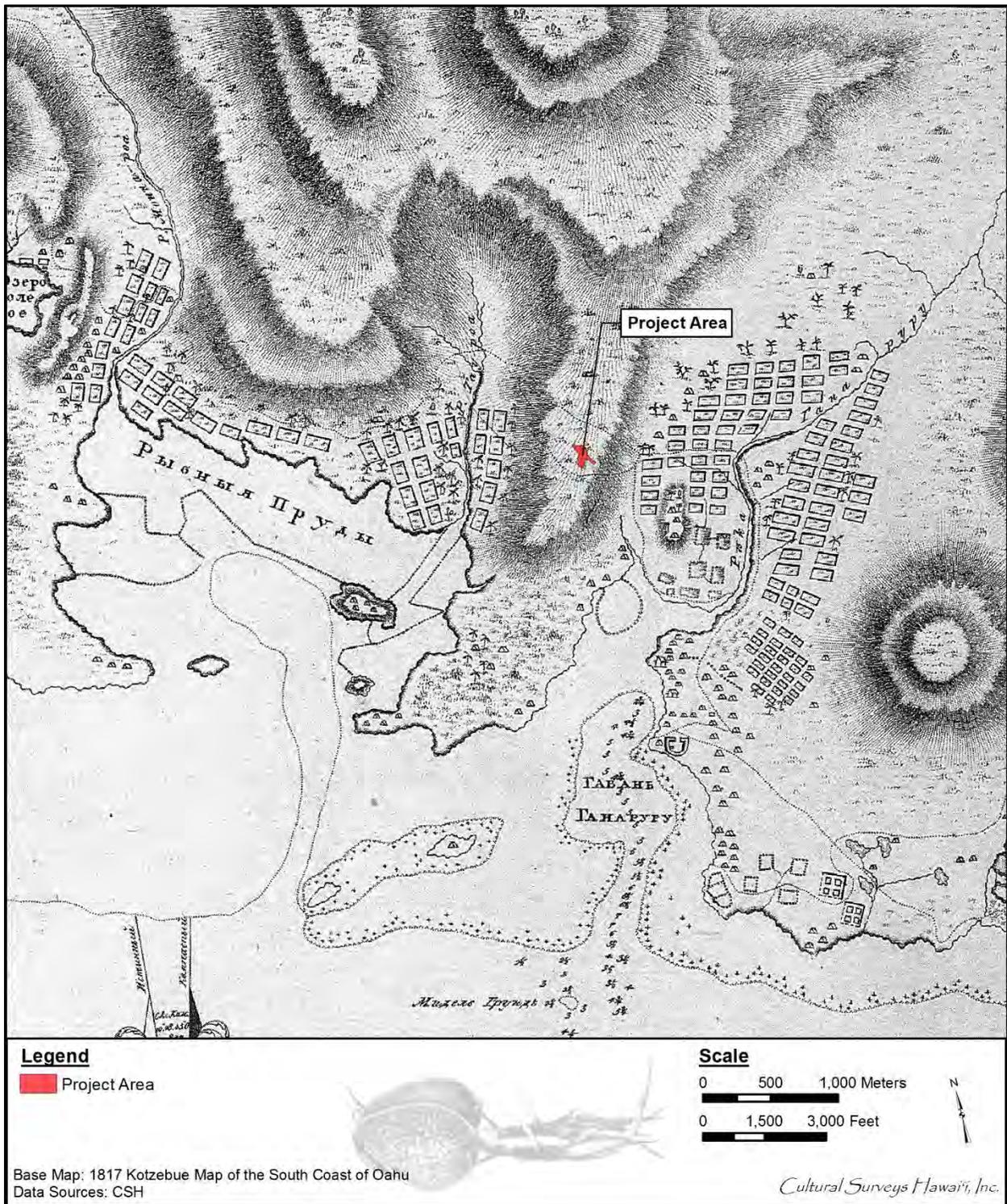


Figure 6. 1817 map of south coast of O’ahu by Otto von Kotzebue (1817) of the Russian ship *Rurik*, showing density of habitations and agriculture around Kapālama (The project area and map have been geo-referenced. The project area is located on a ridge, and it should be noted that this early map should be understood as a “sketch”)

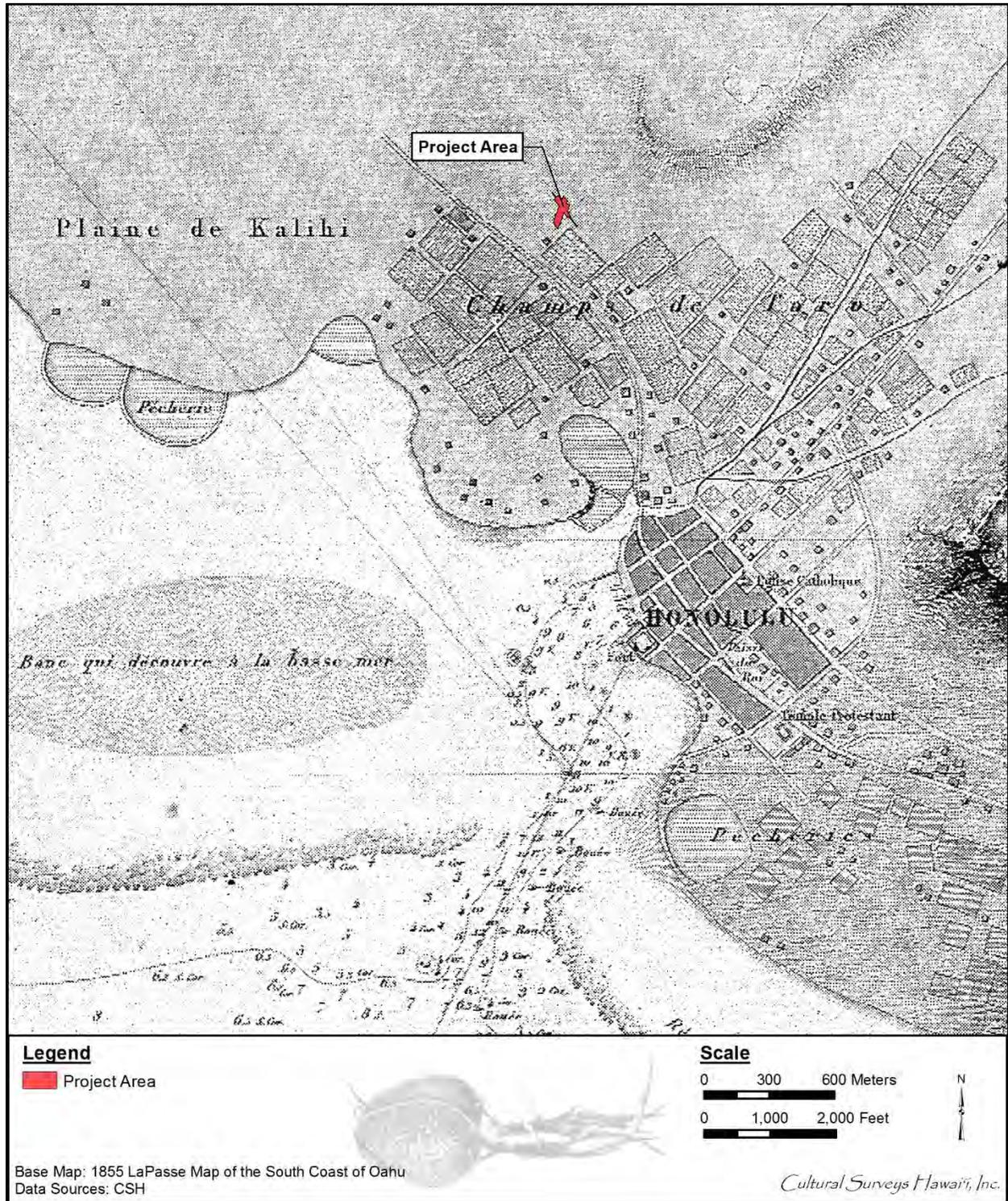


Figure 7. 1855 map of Honolulu by Lt. Joseph de LaPasse of the French vessel, *L'Eurydice* (reprinted in Fitzpatrick 1986:82-83), showing *lo'i*, habitations, and fishponds in Kapālama

ascending to the top of Punchbowl Hill, an extinguished crater, whose base bounds the north-east part of the village or town . . .

Below us, on the south and west, spread the plain of Honolulu, having its fish-ponds and salt making pools along the sea-shore, the village and fort between us and the harbor, and the valley stretching a few miles north into the interior, which presented its scattered habitations and numerous beds of kalo (arum esculentum) in its various stages of growth, with its large green leaves, beautifully embossed on the silvery water, in which it flourishes. [Bingham 1981:92–93]

3.1.7 The Māhele and the Kuleana Act

In 1845, the Hawaii Board of Commissioners to Quiet Land Titles, also called the Land Commission, was established “for the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any landed property” (Chinen 1958:8). This led to the Māhele, the division of lands between the Hawaiian government, the King, the *ali'i* (royalty), and the common people as codified in the Māhele Book (1848), which introduced the concept of private property into Hawaiian society.

In 1848, the crown (Hawaiian government), Kamehameha III, and other *ali'i* such as Victoria Kamāmalu received their land titles, called Konohiki Awards. The Konohiki award claimant had to pay a commutation fee of one-third of the value of their unimproved lands. Usually this fee was settled when the *ali'i* “returned” some of his awarded lands, and “retained” others. The returned lands usually then became Government Lands, which were set aside to generate revenue for the government, or Crown Lands, which were lands reserved for the monarchy (Chinen 1958:8). In the petitioning for Land Commission Awards (LCAs) for their *kuleana* (lands), the commoners had to provide testimony from witnesses, including statements regarding the boundaries of the land and its use. In the 1790s, after Kamehameha had conquered O‘ahu, Kapālama is specifically mentioned along with Nu‘uanu, Mānoa, and Waikīkī as having been “farmed” by Kamehameha. The desirability of Kapālama Ahupua‘a is supported by the fact that Kamehameha “kept of himself” the *ahupua‘a* during the post-1795 division of O‘ahu lands (Kame‘eleihiwa 1992:59). The *ahupua‘a* of Kapālama was awarded to Moses Kekūāiwa, son of Kekūānao‘a and Kīna‘u (who had earlier been married to Kamehameha I). The lands passed down in turn to his sister Victoria Kamāmalu, to her brother Lot Kamehameha, to his half-sister Ruth Ke‘elikōlani, and then to her first cousin, Bernice Pauahi Bishop. The will of Mrs. Bishop set many of her lands as a trust to provide financial aid to educational and charitable institutions, including the schools she founded to educate Hawaiian children (Mitchell 1993:9).

Subsequent to the Māhele award for the bulk of the *ahupua‘a*, individual *kuleana* (commoner) lots were awarded pursuant to the 1850s Kuleana Act. The first detailed map of Kapālama, made by J.F. Brown in 1885 (Figure 8), shows a traditional Hawaiian landscape of small *kuleana* LCA parcels extending across the Kapālama plain. Mid-nineteenth century Māhele documents identify these *kuleana* parcels as comprising house sites and irrigated taro fields. The map also indicates large areas set aside for rice fields near the central *‘auwai* in land managed by the *konohiki* (land agent for the *ali'i*; in this case Moses Kekūāiwa). The LCA testimony for Kapālama indicates there was intensive cultivation of taro in the area, maintenance of fishponds, habitation, and some indication of the use of the *kula* (pasture or waste land). The *kuleana* to Hawaiian *maka‘āinana* were located on the flood plain to the east of Waiakamilo/Houghtailing Street and included houses

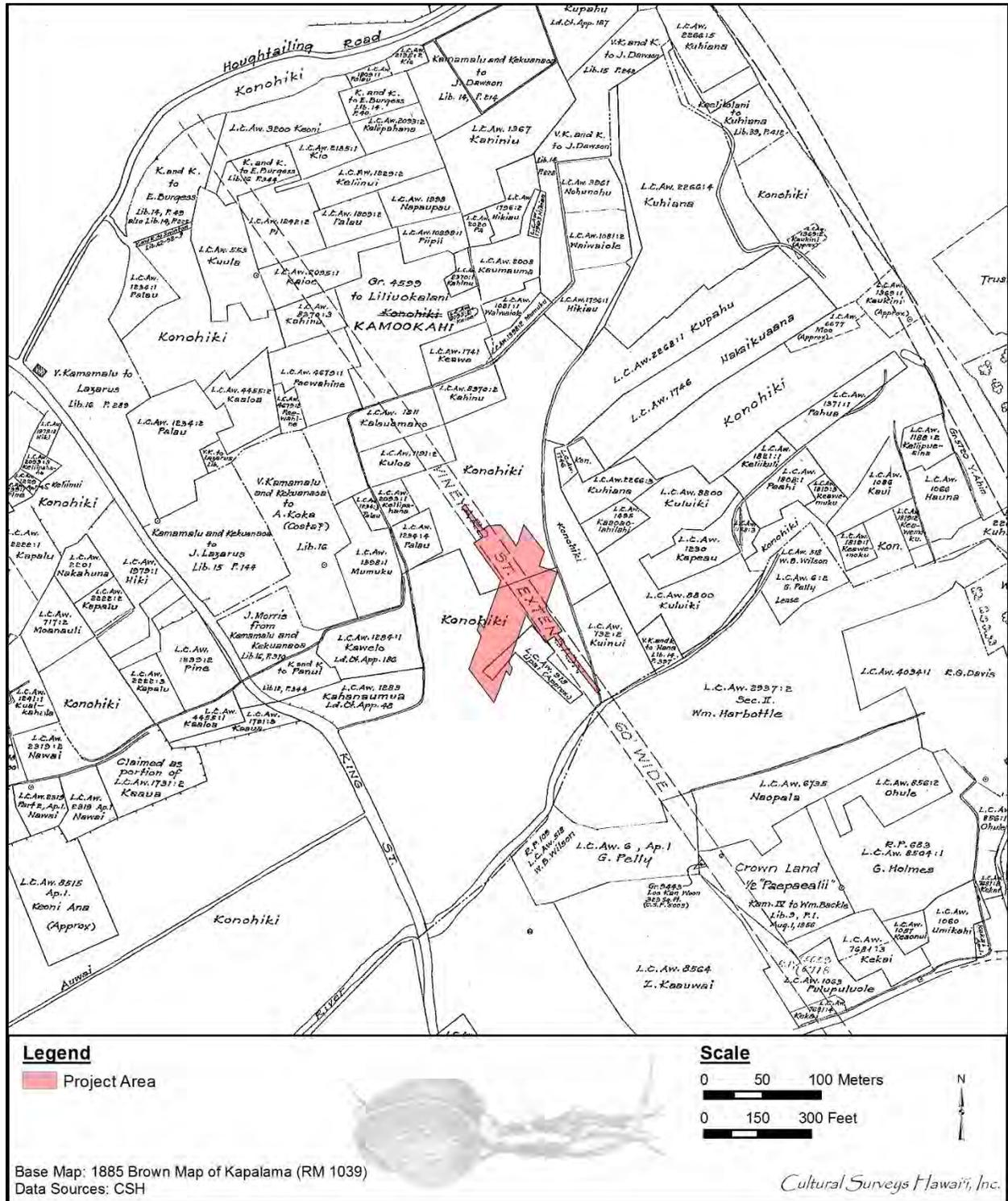


Figure 8. 1885 Brown map of Kapālama depicting LCAs in the vicinity of the project area and the planned extension of the Vineyard Street right-of-way

AISR for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O‘ahu

TMKS: [1] 1-6-002 (Olomea St and H-1 Interstate Hwy ROW, and Kapālama Canal) and 1-6-006 (Halona St., Kohou St., Kokea St., and H-1 Interstate Hwy ROW, and Kapālama Canal)

and *lo'i* (pond fields) for the cultivation of *kalo* (taro). The taro patches in the vicinity were just downstream of Niuhelewai (Kapālāma) Stream. Roughly 100 *kuleana* lots were awarded in Kapālāma. The claimants were generally awarded one to six separate *'āpana* (lots), sometimes contiguous or in the same *'ili* (land division smaller than an *ahupua'a*), but also sometimes scattered through several *'ili*. LCA documentation notes the presence of house sites, irrigated taro fields (*lo'i*), and aquaculture fishponds in the immediate vicinity. The pattern of land-award distribution shown in the LCAs suggests the traditional Hawaiian practice of maintaining residences dispersed within and throughout their agricultural fields continued in Kapālāma at least until the mid-nineteenth century.

The project area is located within portions of LCA 732:2 (to Kuinui) and 918:2 (to Upai) (Figure 9 and Appendix A). The claims include house lots and associated taro patches and pastureland.

3.1.8 Mid- to Late 1800s

The project area vicinity is shown on the 1893 Wall map of Honolulu (Figure 10) as surrounded by rice cultivation but with a north/south trending railroad spur crossing the east portion of the project area. The purpose of the railroad spur is unclear and may have been just to facilitate the loading of rice.

The Kapālāma area on the 1897 Monsarrat map (Figure 11) is dominated by the Kamehameha Schools complex with only a few scattered houses such as the Houghtailing home. The main street is King Street, which extends through Kapālāma, including a mule-drawn tramway, which had its stables southwest of the Kapālāma Canal project block. The O'ahu Insane Asylum was *mauka* (inland) of the future H-1 Interstate Highway corridor. The project area is shown in the middle of a rice plantation.

A site in Kapālāma called Kaiwi'ula (“the red bone”) was chosen for the first Kamehameha School for Boys, which opened in 1887. The construction of many wood frame buildings followed including a principal's house, dormitories, faculty cottages, a preparatory school, a dining hall and kitchen, gymnasiums, and manual school shops. Two stone buildings were constructed first. The Bishop Hall, the main administration building for the school, was completed in 1891 and the Bishop Memorial Chapel was completed in 1897. In 1938, the grounds, the chapel, and the preparatory buildings were sold to the territorial government in order to build an auditorium for the Wallace R. Farrington High School. The chapel was demolished in 1954 (Mitchell 1993:1–42). The first buildings of Farrington High School were constructed in 1940, designed by the noted Hawaiian architect Charles W. Dickey (Farrington High School 2014).

Mr. Charles Bishop was interested in preserving the many artifacts in the possession of his late wife and those of the late Queen Emma, who in 1884 willed her “native curiosities” to him “on the condition that at some future day then, together will all similar articles belonging to the late Bernice Pauahi Bishop . . . be presented to him as trustees of an institution to be called the Kamehameha Museum . . .” (Rose 1980:10). The trustees of Bishop Estate chose a site near the Kamehameha School for Boys and the museum, housed in Bishop Hall, opened to the public in 1891. The official name of the institution was the Bernice Pauahi Bishop Museum but it was also called *Hale Hō'ike'ike o Kamehameha*, or Museum of Kamehameha, the name Queen Emma

preferred (Rose 1980:21). In 1894, a new Polynesian Hall was added, in 1903 a Hawaiian Hall, in 1911 the Pākī Hall, and in 1925 the Konia Hall. In 1947, the Kamehameha Schools moved their

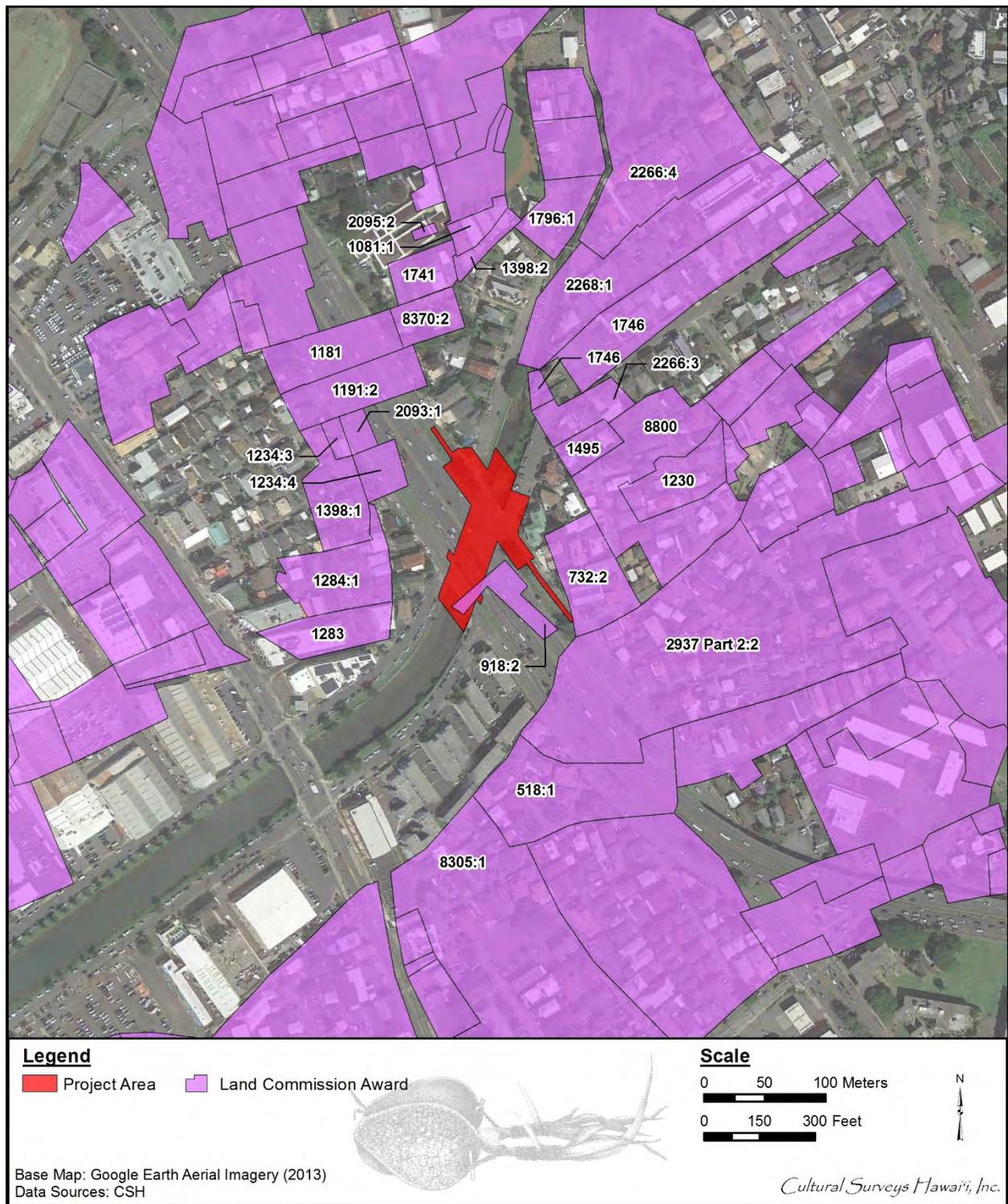


Figure 9. 2013 aerial photograph with an overlay of land commissions awards in the vicinity of the project area (Google Earth 2013)

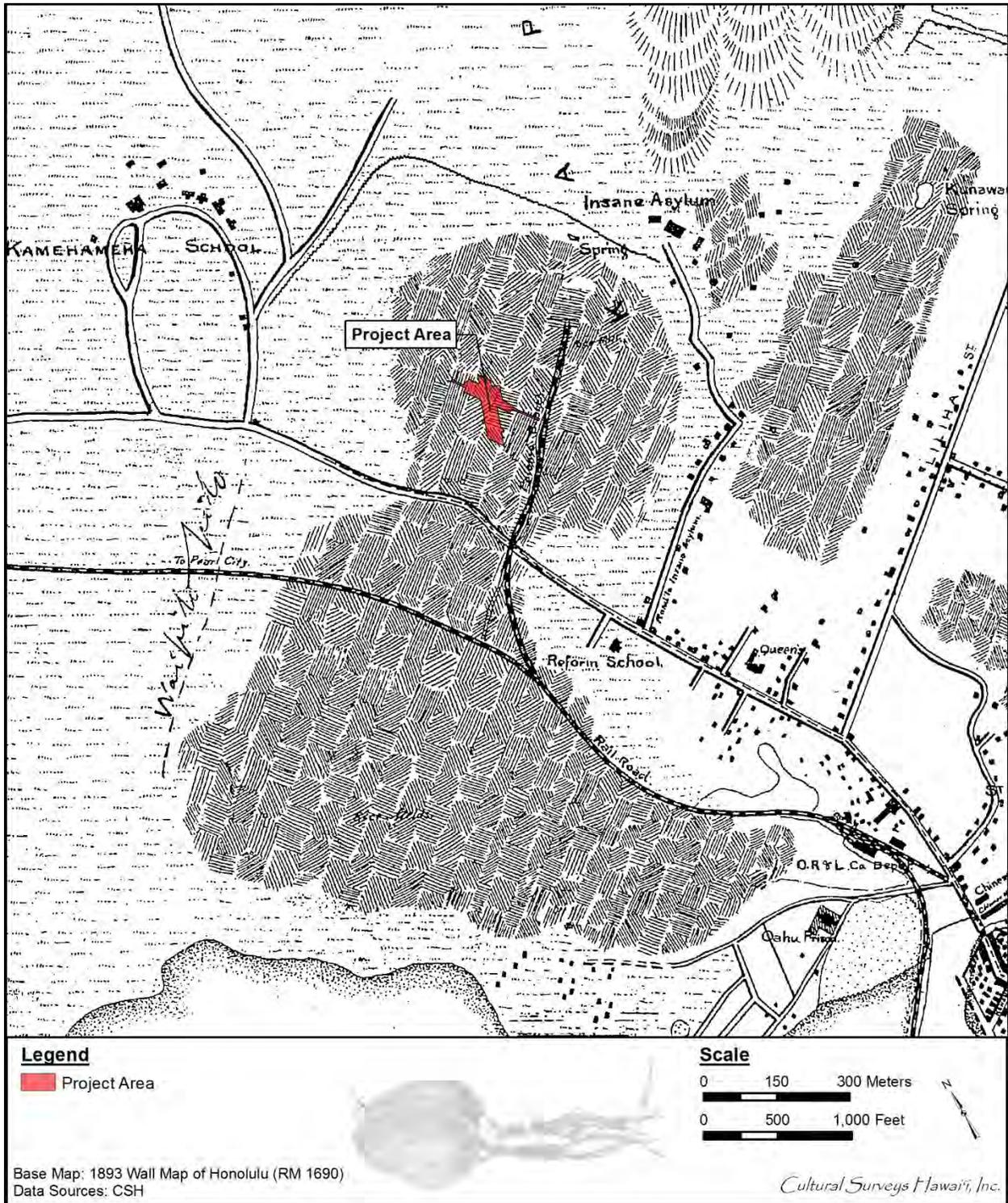


Figure 10. 1893 Wall map of Honolulu showing project area surrounded by rice fields

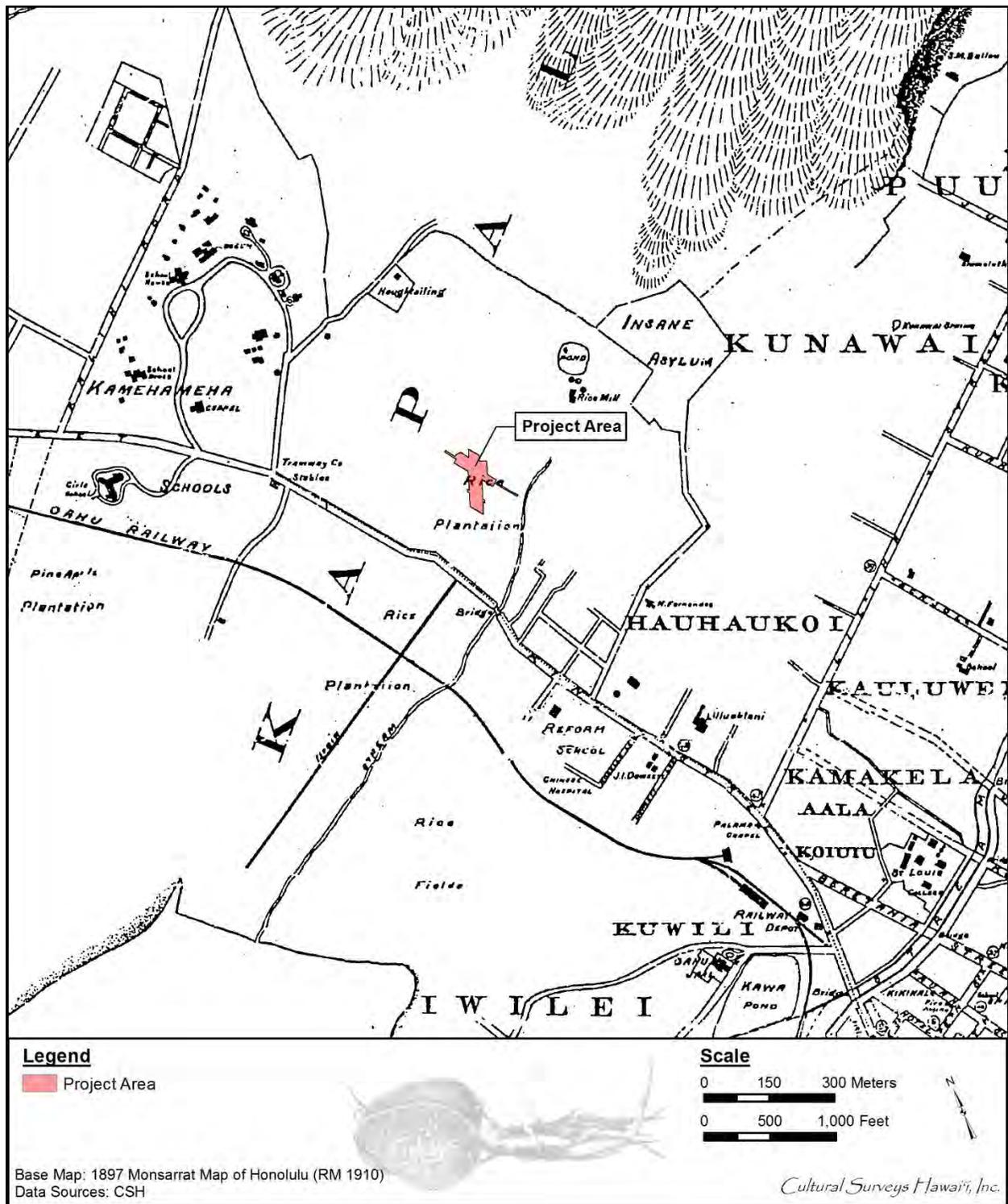


Figure 11. 1897 Monsarrat map of the Honolulu District showing the project area in a rice plantation

campus to Kapālama Heights and the former school grounds were transferred to the Bishop Museum Trust. Bishop Hall was formally transferred to the Bishop Museum in 1980 (Rose 1980:18–62).

The Oahu Insane Asylum was established by the Hawai‘i Legislature in 1862, proposing that “A building is to be erected for the reception of insane persons. This facility will furnish restraint till the person becomes of sane mind or is discharged” (Kimmich 1956:345). The hospital was completed in 1866 and the first six patients were transferred to the hospital from the jails where the mentally ill had previously been kept. In 1930, all 549 patients in the then-named Territorial Hospital were transferred to the new Territorial Hospital in Kāne‘ohe, O‘ahu.

Mr. George Houghtailing’s grandfather came to Hawai‘i around 1845, married a Hawaiian woman in 1850 and ran the Bay Horse Saloon on Bethel and Hotel Street in Honolulu. During the Māhele, he was given several *kuleana*, later consolidated into a 15-acre tract along a road later named after him, Houghtailing Road. The family home was between School and Vineyard streets, now the location of Damien High School, as described by Mr. Houghtailing:

On the premises there was a large pond which had a natural spring and which also fed the lower land where we had taro patches and cultivated the other truck gardening on the land. The land was quite open. We had a couple of bay horses and raised chickens and pigs for family consumption. There was a large open area fronting Houghtailing Road which was used as a park for the neighborhood kids.
[UH 1984:1099]

Mr. Houghtailing located the ponds, taro fields, and rice patches from School Street to Liliha Street; other taro patches were in the area “between Palama Street and Liliha Street, below School Street down to what is now Vineyard Street” (UH 1984:1100). These rice ponds and taro patches, usually operated by the Chinese, were cultivated up to the 1920s when many were filled in for the development of residential subdivisions. The Japanese took over some of the land as truck farms, and Japanese also gradually took over the small stores once operated by Chinese.

Portions of the H-1 Interstate Highway corridor extend through these rice fields and near the pineapple plantations, which are generally *makai* of King Street, although there was a rice mill *mauka* of the project area near the Insane Asylum. Again, there is an established bridge on King Street at the Kapālama Stream crossing. There are no specific structures within or adjacent to the Kapālama project area block.

3.1.9 1900s

3.1.9.1 Residential and Commercial Development

A series of USGS maps, U.S. Army War Department maps, and aerial photographs (Figure 12 through Figure 19) depict the accelerated development of residential neighborhoods and commercial centers in the first half of the twentieth century.

A 1919 map (Figure 12) depicts the grid-like establishment of residential neighborhoods surrounding the Kamehameha School Complex in Kalihi-Pālama. The rice paddies and pineapple plantations are no longer shown, although some of the open areas on the map *mauka* of King Street may still have been cultivated for these crops, or turned into truck farms. There are no open spaces

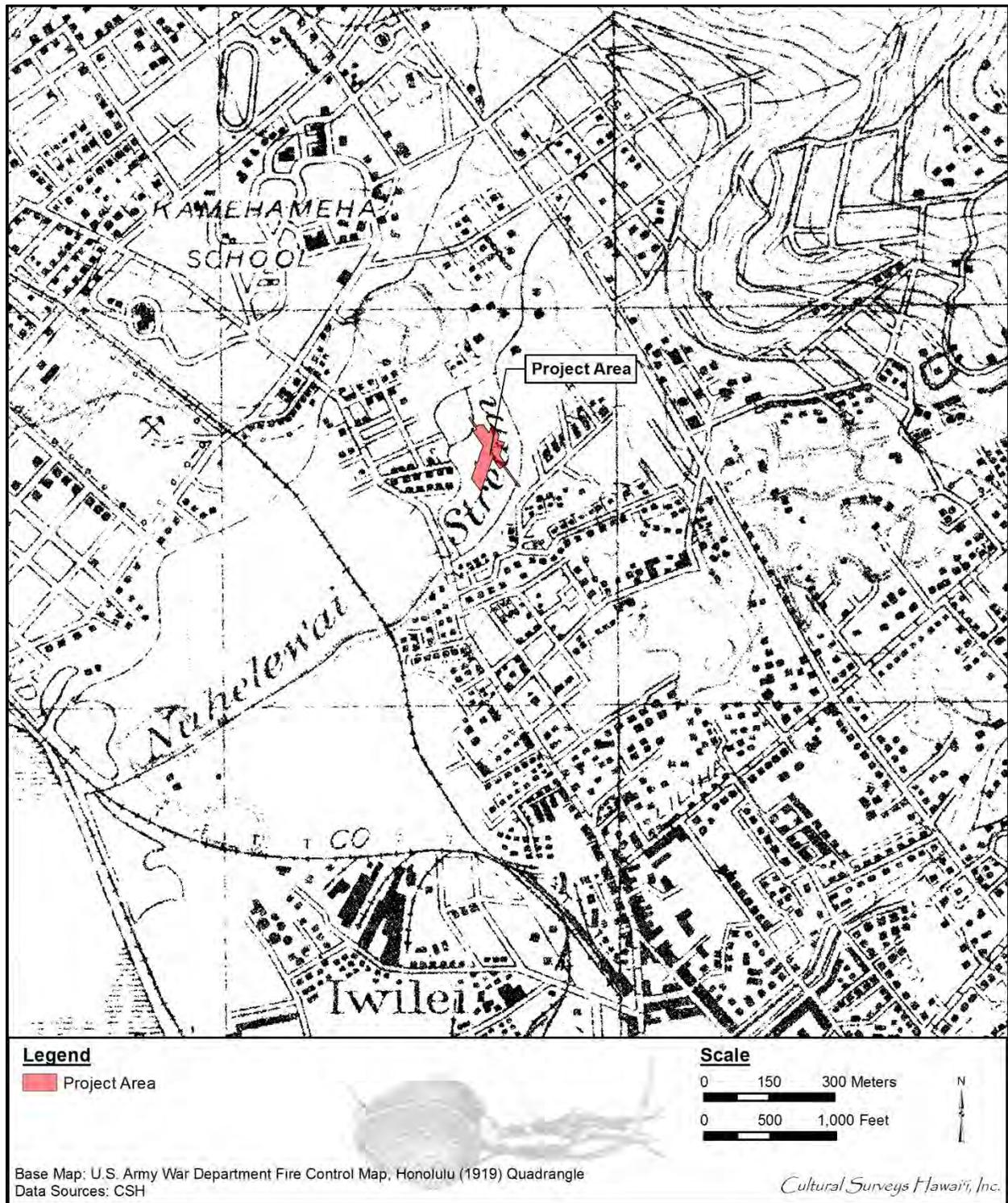


Figure 12. 1919 U.S. Army War Department map, Honolulu Quadrangle, showing commercial and residential development in Kapālama, near the project area

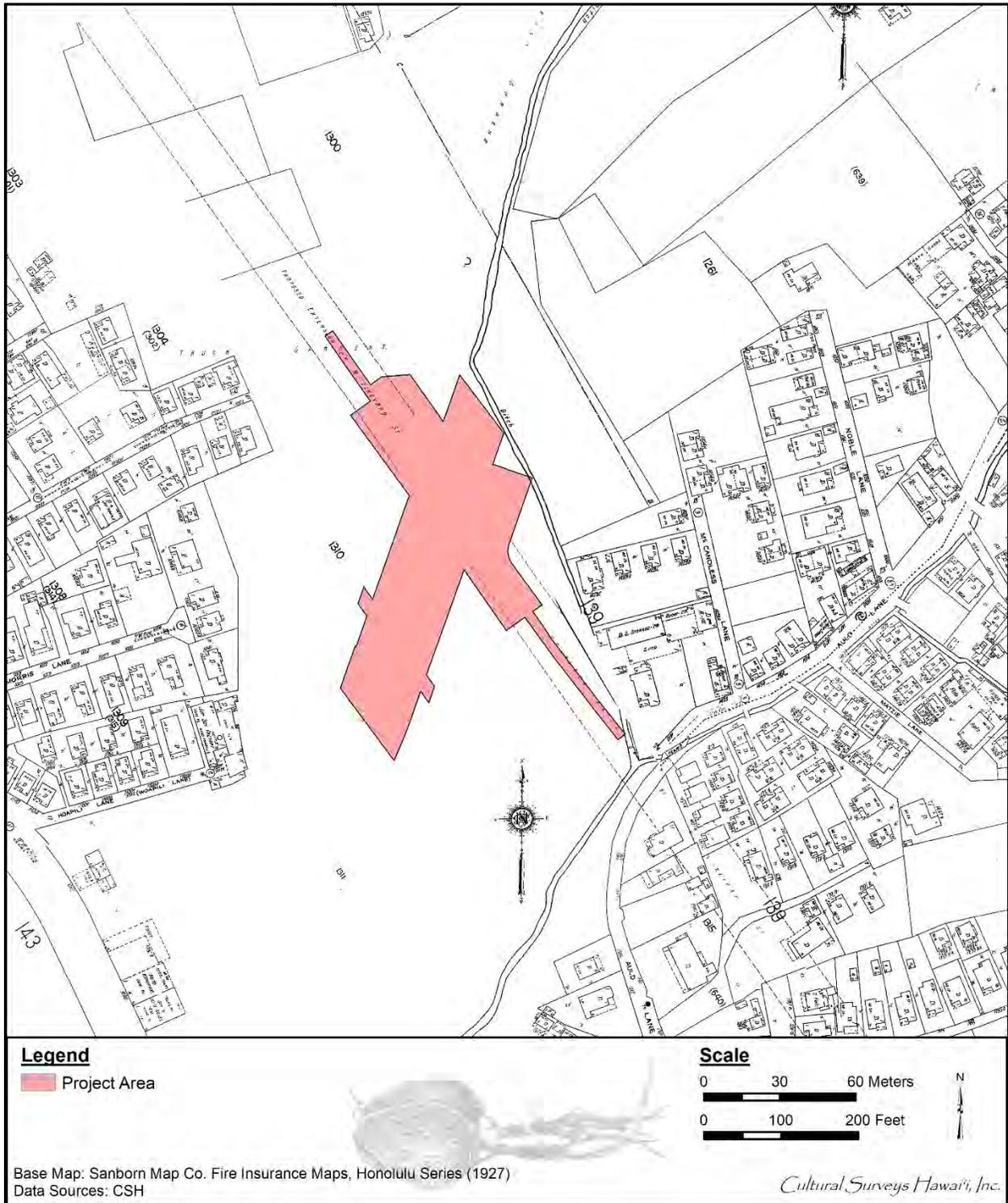


Figure 13. 1927 Sanborn Company Fire Insurance map showing a relative lack of development in the vicinity of the project area

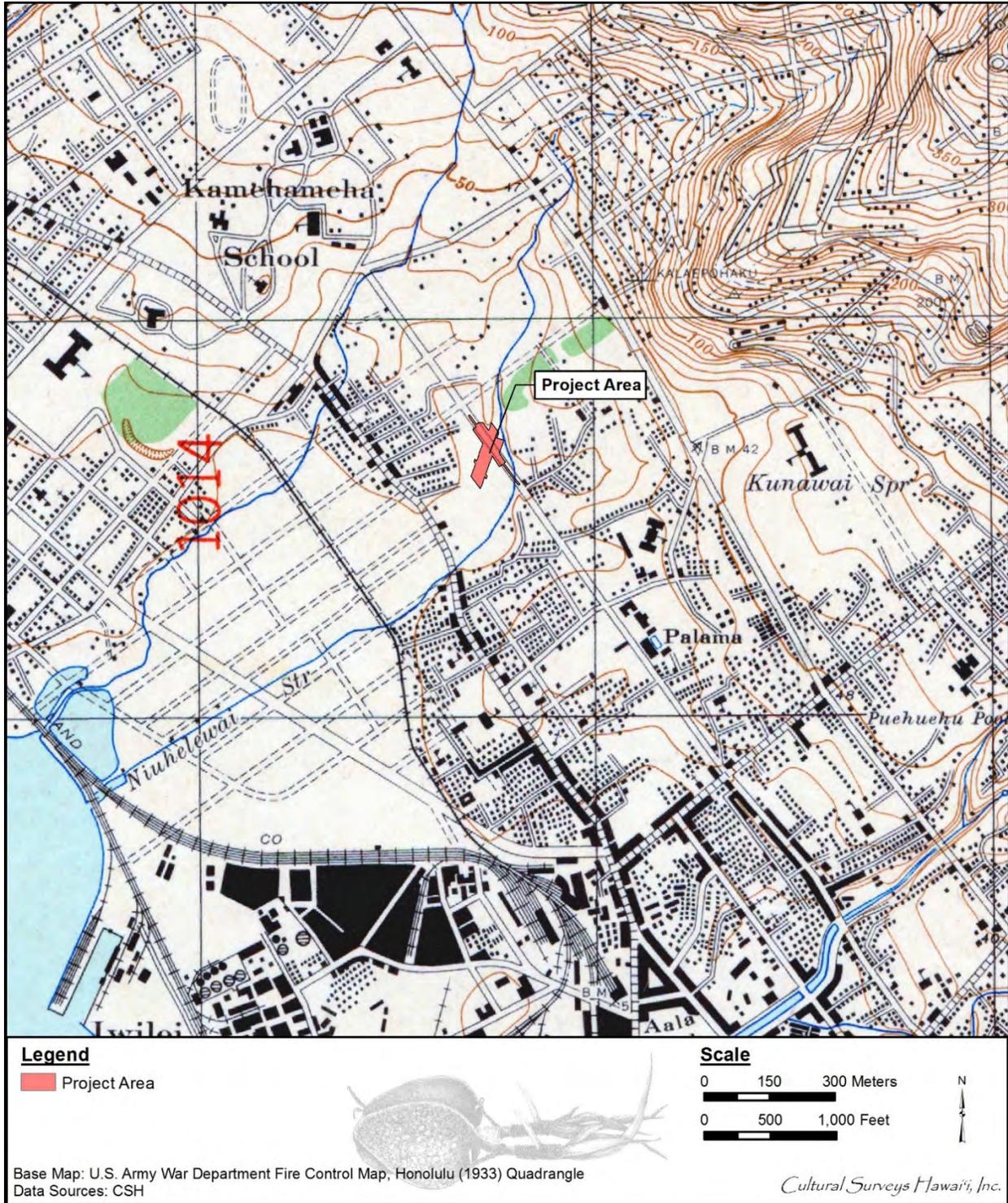


Figure 14. 1933 U.S. Army War Department map, Honolulu Quadrangle, showing commercial and residential development in Kapālama, near the project area

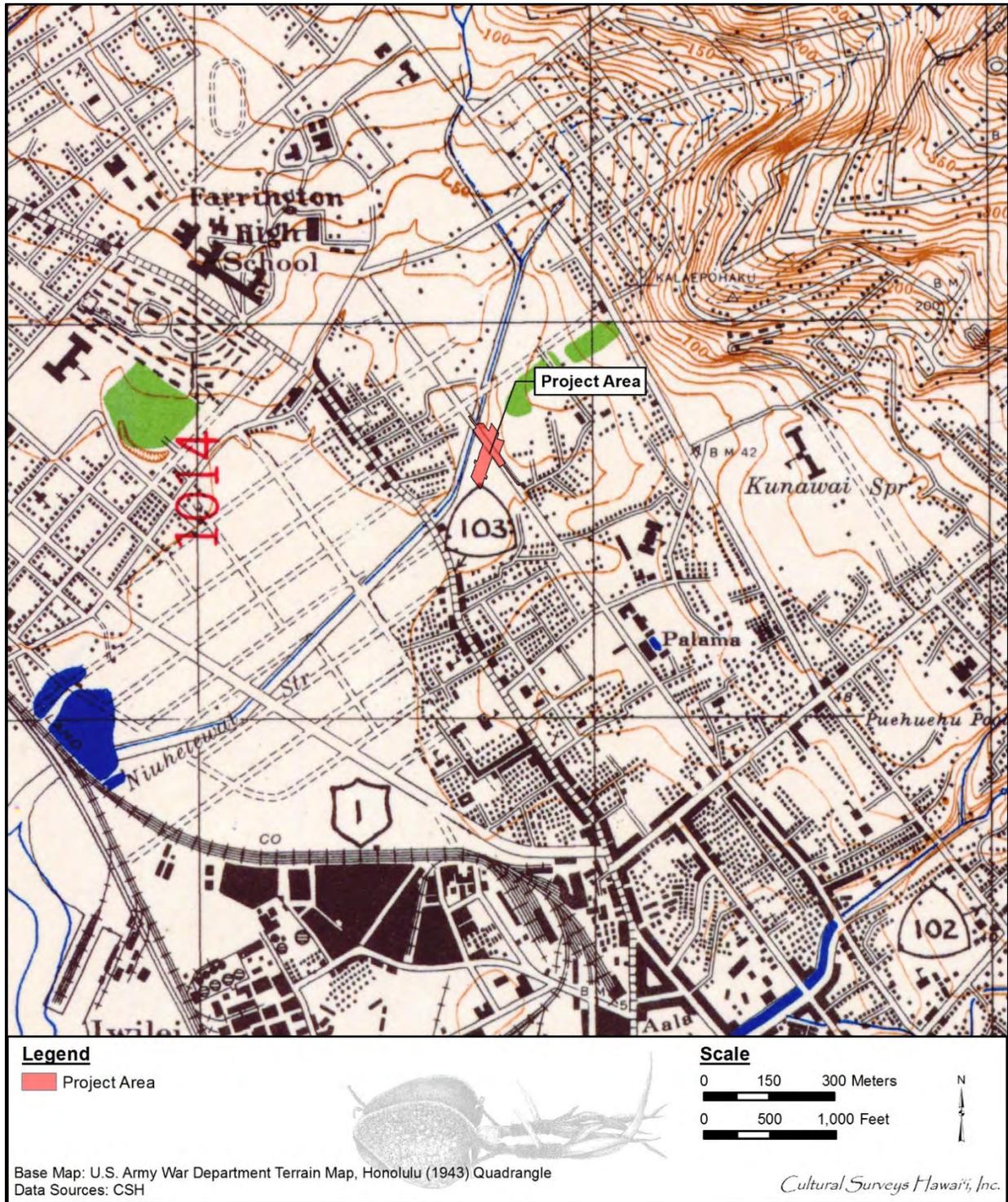


Figure 15. 1943 U.S. Army War Department map, Honolulu Quadrangle showing commercial and residential development in Kapālama, near the project area

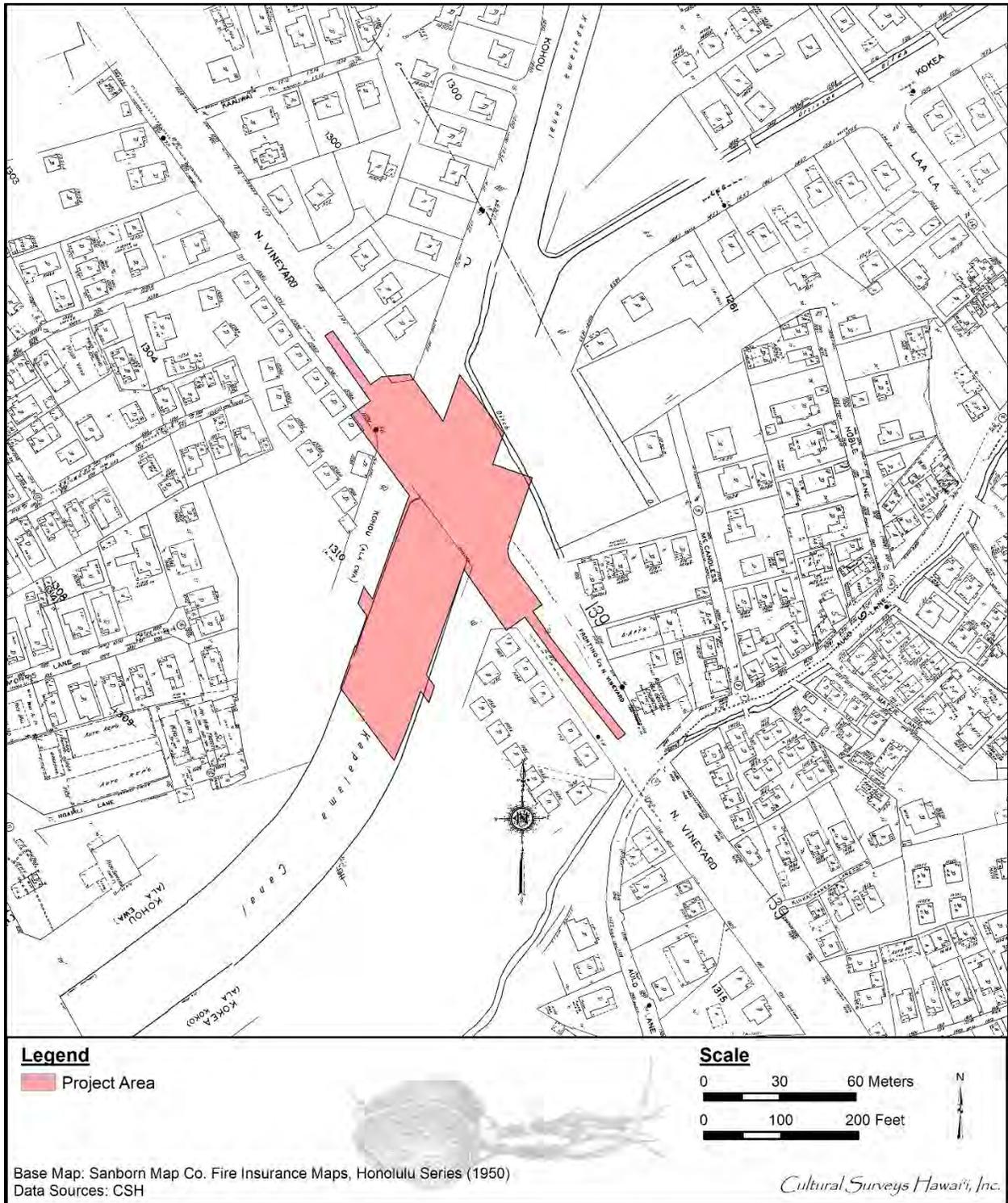


Figure 16. 1950 Sanborn Company Fire Insurance map showing a relative lack of development in the vicinity of the project area



Figure 17. 1952 USGS aerial photograph showing project area

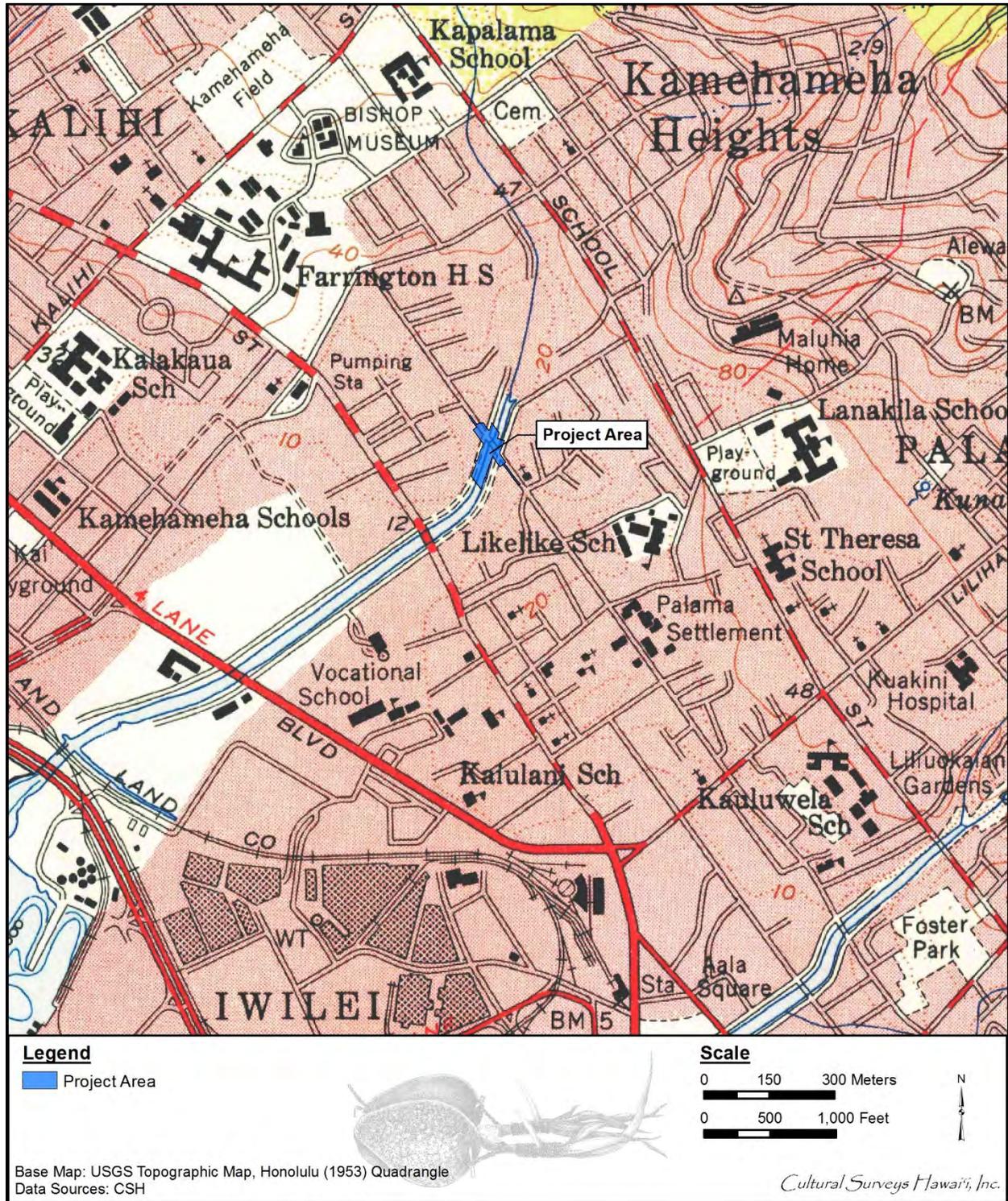


Figure 18. 1953 Honolulu USGS Topographic Quadrangle, showing commercial and residential development in Kapālama, near the project area

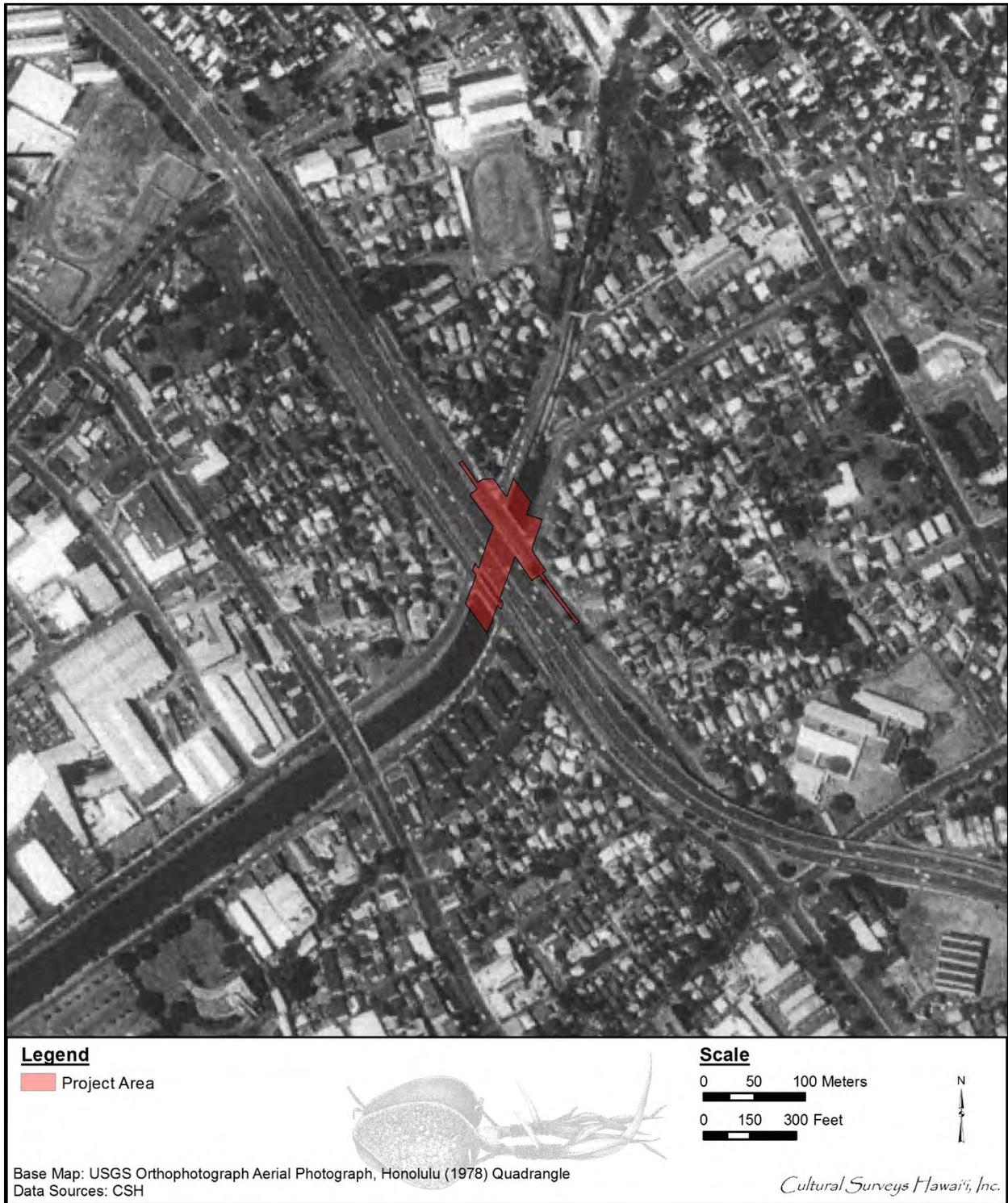


Figure 19. 1978 USGS aerial photograph, Honolulu Quadrangle, showing commercial and residential development in Kapālama near the project area

shown in the Nu‘uanu area at this time. On the 1897 Monsarrat map, (see Figure 11) houses were spaced only along the main roads. By 1919, homes are packed in small residential blocks.

A 1933 U.S. Army War Department map (see Figure 14) continues the trend to greater density in grid-like residential blocks. On this map dashed lines, representing planned roads, are shown in the once empty space east of the Kamehameha Schools campus. The area around Pālama Settlement east of Niuhelewai Stream is also a densely packed neighborhood. This is in contrast to the Nu‘uanu area which still has large houses separated by large yards. A 1943 U.S. Army War Department map (see Figure 15) illustrates the density of homes along the street grids in lower and upper Kalihi-Kapālama. In upper Kalihi, Farrington High School has now taken the place of the Kamehameha Schools. The street grid east of the high school is still in the planning stages. Palama has now become not only a residential area, but has commercial warehouses and stores, mainly lined along King Street. In Nu‘uanu many of the large houses and wide spaces between houses have been lost.

The 1950 Sanborn Fire Insurance map depicts the density of houses and house lots located in the general vicinity of the project area (see Figure 16). There are also large areas of vacant land within the current project area.

A 1952 aerial photograph (see Figure 17) shows substantial housing development but the north and south portions of the project area are still in areas of vacant land.

The 1953 USGS map (see Figure 18) illustrates the large number of schools and churches near the H-1 Interstate Highway corridor. Labeled are Fern School, Kalihi Waena School, Kalākaua School, St. Anthony’s School, and Pu‘uhale School. Lower Kalihi holds Farrington High School, Likelike, St. Theresa School, and the Kaiulani School in Kapālama. The Nu‘uanu survey area is near Kauluwala School, Kuakini Hospital, Liliuokalani Gardens, and Foster Park (Foster Botanical Garden).

3.1.9.2 H-1 Interstate Highway

As the project area lies directly adjacent to the H-1 right-of-way, it is appropriate to give a little background on the history of H-1. It appears construction for the H-1 in the area of Kalihi-Kapālama started in 1960 from Fort Shafter to Houghtailing Street. Although this was not the place of origin for the H-1 system, it was the first time federal money was to be used in Hawai‘i for an Interstate system. Prior to 1960 the H-1 was called the Lunalilo Freeway. This early highway is shown on a 1978 aerial photograph (see Figure 19). The website AARoads has compiled a timeline for the H-1 construction (Table 1).

AARoads (2012) reports that, “Portions of H1 predate statehood, as an upgrade of Lunalilo Street, the freeway’s namesake. The oldest section, from Punahou street east to King Street (Exits 23-25), was open before 1959. Originally signed as Hawaii 72.”

The Hawaiian Historical Society provides a timeline in a little more detail for the earliest stretch of H-1, the Mauka Arterial.

The pioneering highway in Hawai‘i was the Mauka Arterial (later christened Lunalilo Freeway). The three ‘Ewa-bound lanes, extending one mile between Old Wai‘alae Road and Alexander Street, were opened to traffic November 9, 1953. The Kaimuki-bound lanes along the same stretch were opened and the highway was formally dedicated on January 5, 1954. [Schmitt 2013]

Table 1. Construction Timeline of Hawaii 72, Later Renumbered as H-1 Interstate Highway

Year	Development
1953	First section of the Mauka Arterial opened; Mauka Arterial was approximately a mile section around University Avenue, present-day Mile 24
1959	At statehood, first section of what is now called Lunalilo Freeway opened between Punahou St (Mile 23) and King St (Mile 25); maps show proposed route from Punahou St west to Middle St (present H-1/H-201 interchange)
1960	Lunalilo Freeway extended west to Ke'eumoku St (approx. 1/2 mile west of Punahou St); section of present-day H-201 opened through Fort Shafter, signed as Hawaii 72; sections from Fort Shafter east to Houghtailing St (Exit 20B) and Pali Hwy interchange (exit 21A/B) under construction
1961	Open sections are Pu'uloa Rd (present-day H-201) to Houghtailing St (Exit 20B), Pali Hwy interchange, and Ke'eumoku St to King St
1964	Section from Kapahulu St (Mile 25) east to Koko Head Ave (Exit 26A) under construction
1965	Kapahulu St to Koko Head Ave opened; short 1/2 mile section under construction, filling gap in existing freeway sections between King St and Kapahulu St
1967	H-1 first appears on maps, cosigned with Hawaii 72; freeway continuous from Pu'uloa Rd east to Pele St (just east of Pali Hwy, Hawaii 61), as well as existing sections from Ke'eumoku St to King St and Kapahulu St to Koko Head Ave; western section between Kunia Rd and Kamehameha Hwy (Exits 5 through Exit 8A) open, with section between Miles 0 and 5 under construction
1968	Gap between King St and Kapahulu St opened; H-1 extended east to present terminus east of Kilauea Ave; still a gap between Pele and Ke'eumoku Sts
1972	H-1 opened from Kamehameha Hwy (Western terminus) to Kaimakani St, immediately west of Hālawa interchange; Hālawa interchange and sections of H-1 to Middle St proposed; from Middle St east to Kilauea Ave completed freeway; Hawaii 72 truncated at eastern end of H-1; orphaned section between Pu'uloa Rd and Middle St is re-signed as Hawaii 78
1986	H-1 completed between Nimitz Hwy and Middle St (Miles 18-19); through lanes of H-1 east use Middle St tunnel, completed in 1961 for Middle St off-ramp

3.2 Previous Archaeological Research

Development within a 0.8 km (0.5 mile) radius of the project area is primarily residential with some light industry. Most of the development in the area, including the H-1 Interstate Highway corridor itself, has occurred prior to the late 1970s when archaeological investigation became standard during project planning and construction activities. The locations of previous archaeological studies conducted within a 0.8 km (0.5 mile) radius of the project area are shown in Figure 20 and listed in Table 2. The findings of these archaeological studies are shown in Figure 21 and listed in Table 3. These studies and their findings are discussed in more detail in the following paragraphs.

3.2.1 Palama Fire Station (Neller 1980)

During excavations at the Palama Fire Station in September 1980, the SHPD made a site visit to the project. A large charcoal deposit was observed in an excavation sidewall which contained several basalt cobbles. No further information was obtained due to the backfilling of the excavation prior to the SHPD's return to document the feature. It could not be determined whether the deposit represented a historic feature or a traditional *imu* (earth oven) pit; however, no historic artifacts were observed in association with the feature.

3.2.2 Dunn et al. 1991

During archaeological monitoring at the Pālama Chevron Station, highly fragmented human skeletal remains were observed (Dunn et al. 1991). The minimum number of individuals (MNI) appeared to be five—but this was not altogether clear. Of interest was the following comment:

A parishioner of Kaumakapili Church mentioned to PHRI field personnel that the survey area was once a cemetery. Mr. Tom Dye of the DLNR said that older residents of the area had once mentioned that when they were younger they regarded the area as 'spooky,' and that this may be attributable to the fact that they had heard there were burials in the area. [Dunn et al. 1991:10]

Fragmentary human skeletal remains were reported at 80 cm below surface, 105 cm below surface, and 120 cm below surface (Dunn et al. 1991:1, 4).

3.2.3 Bishop Museum (Dixon 1993)

This archaeological monitoring project at the Bishop Museum took place during installation of electrical service for the Space Exhibit in August 1992. Museum staff recognized the potential for subsurface pre- and post-Contact Hawaiian cultural material and human remains as well as the possibility of early historic material on museum property. Stratigraphy and back dirt was observed during mechanical trenching conducted on the Great Lawn. Dixon found no evidence of pre-Contact deposits; however some historic artifacts were found in a fill layer possibly dating back to the Kamehameha Schools period and given SHPD Site number 50-Oa-A6-26.

3.2.4 Austin Lane, Kapālama (Jourdane 1994; Hammatt 1995)

A burial in a coffin was found during construction of a water line on Austin Lane and reported to the SHPD (Jourdane 1994). CSH (Hammatt 1995) conducted background on the property and disinterred the burial. The human remains, designated SIHP # -4929, were turned over to the SHPD for reburial.

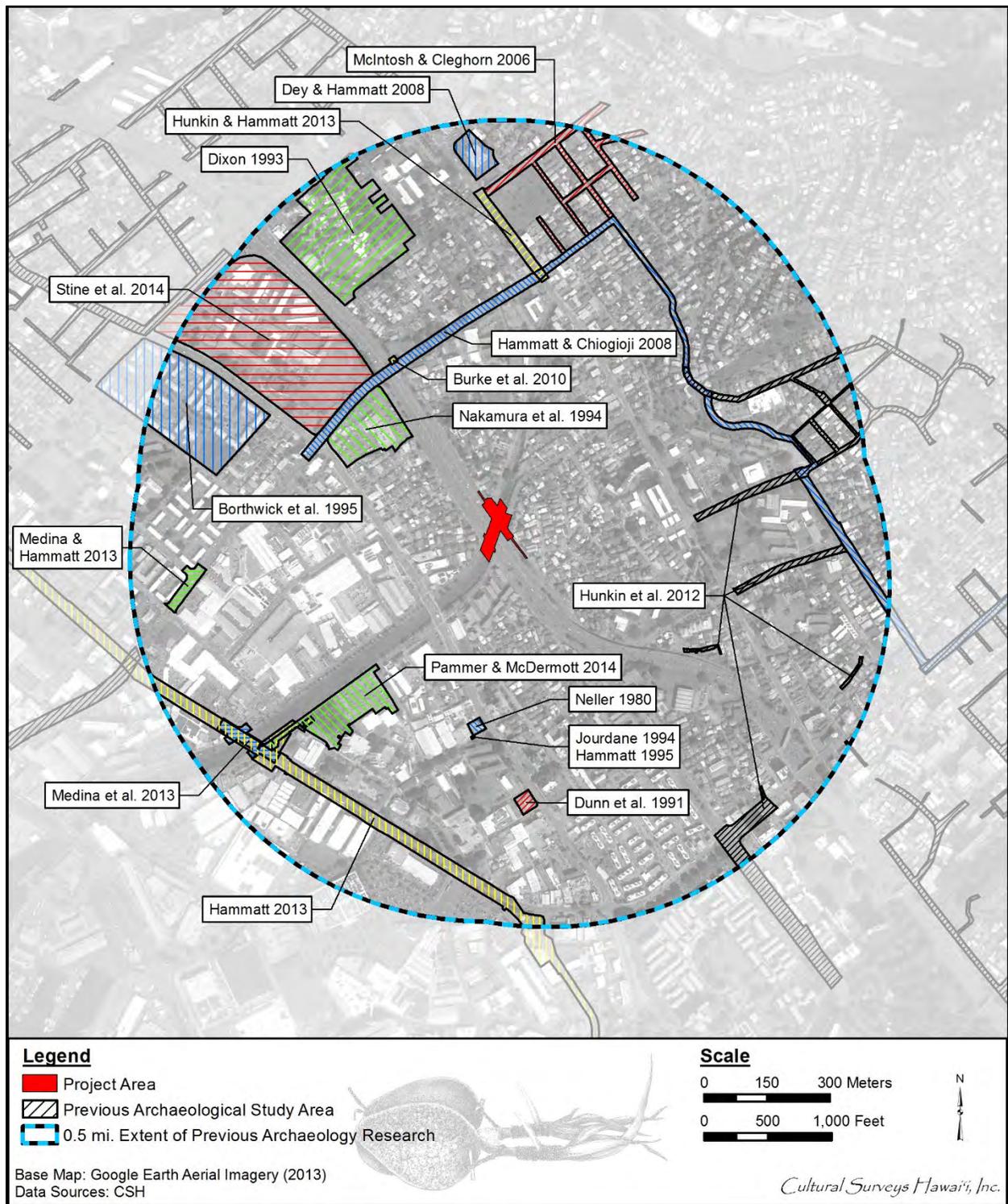


Figure 20. Previous archaeological studies within a 0.8 km (0.5 mile) radius of the project area

Table 2. Previous Archaeological Studies within a 0.8 km (0.5 mile) Radius of the Project Area (arranged chronologically)

Reference	Type of Study	Location	Results (SIHP # 50-80-14-****)
Neller 1980	Field reconnaissance	Kapālama Fire Station	Massive charcoal deposit observed in trench, but significance not determined
Dunn et al. 1991	Archaeological monitoring	Pālama Chevron Station, Kapālama	Nine test trenches for pipelines excavated; burials, human skeletal remains, and historic artifacts (SIHP # -3373) recorded; burials were victims of nineteenth-century epidemics
Dixon 1993	Archaeological monitoring	Bishop Museum grounds near Violet St, Kapālama	No evidence of pre-Contact cultural deposits found; however, historic artifacts found in backfill; Bishop Museum designated SIHP # -1353 as an historic property
Jourdane 1994	Burial report	Austin Lane, Kapālama	Historic human coffin burial (SIHP # -4929) found during excavation on Austin Lane
Nakamura et al. 1994	Archaeological assessment	North King and Houghtailing, Kapālama	No archaeological historic properties found, however, some 50+ year-old buildings found during assessment
Borthwick et al. 1995	Archaeological inventory survey	Kamehameha Homes, Kapālama	No subsurface features found during excavation of 16 trenches on a 14-acre survey area
Hammatt 1995	Burial disinterment	Austin Lane, Kapālama	Historic coffin burial at Austin Lane (SIHP # -4929) disinterred; burial probably associated with Kaumakapili Church cemetery, used from 1870s to at least 1921
McIntosh and Cleghorn 2006	Archaeological monitoring	Kamehameha Heights Water System, Kapālama	Before sewer improvements, Pacific Legacy conducted testing and monitoring to determine if nearby historic graves from Ka'ahumanu and Maluhia Cemeteries extended under Kapālama Ave; ten trenches excavated but no cultural deposits or human bones found
Dey and Hammatt 2008	Archaeological monitoring	1520 North School St, Kapālama	No culturally significant material observed

Reference	Type of Study	Location	Results (SIHP # 50-80-14-****)
Hammatt and Chiogioji 2008	Archaeological inventory survey	BWS Kalihi-Beretania Water Main, Kapālama and Nuʻuanu	Survey confirmed areas affected by proposed water main work were along asphalt areas; two early twentieth-century bridges on Judd and Nuʻuanu streets recommended for architectural evaluation
Burke et al. 2010	Archaeological monitoring	Houghtailing St, Kapālama	No archaeological material observed within sediments disturbed by project's activities at Houghtailing St by H-1
Hunkin et al. 2012	Archaeological monitoring	Kalihi-Nuʻuanu Sewer Rehabilitation project	No cultural deposits identified; isolated human femur fragment found in fill material in one of western Punchbowl slope areas; no site number assigned to this fragment, which was handed over to SHPD for reburial
Hammatt 2013	Archaeological inventory survey	City Center portion of Honolulu High-Capacity Transit Corridor project	Two historic properties identified near current project area—SIHP #s -7426 (subsurface wetland deposit) and -7506 (subsurface incinerated trash deposit); wetland sediments identified along Dillingham Blvd; incinerated trash deposits encountered within HCC campus at corner of Dillingham Blvd and Kokea St
Hunkin and Hammatt 2013	Archaeological monitoring	Kalihi Valley sewer system, Kapālama	No cultural deposits noted
Medina and Hammatt 2013	Archaeological monitoring	Waiakamilo Rd and McNeill St intersection traffic signals	No historical properties or human remains encountered
Medina et al. 2013	Archaeological monitoring	Traffic control signal along Dillingham Blvd	Two historic properties reported, SIHP #s -7426 (previously identified historic property consists of former wetland/agricultural sediments that may have been utilized during late pre-to early post-Contact period) and -7515 (newly identified historic property related to creation of Kapālama Canal during 1920s and in-filling of surrounding area for purposes of urban development)

Reference	Type of Study	Location	Results (SIHP # 50-80-14-****)
Pammer and McDermott 2014	Archaeological inventory survey	Honolulu Community College	Two previously recorded historic properties identified within survey area: SIHP #s -7426 (wetland sediments) and -7506 (incinerated trash layer)
Stine et al. 2014	Archaeological monitoring	Farrington High School property	No cultural deposits identified during monitoring of three excavations

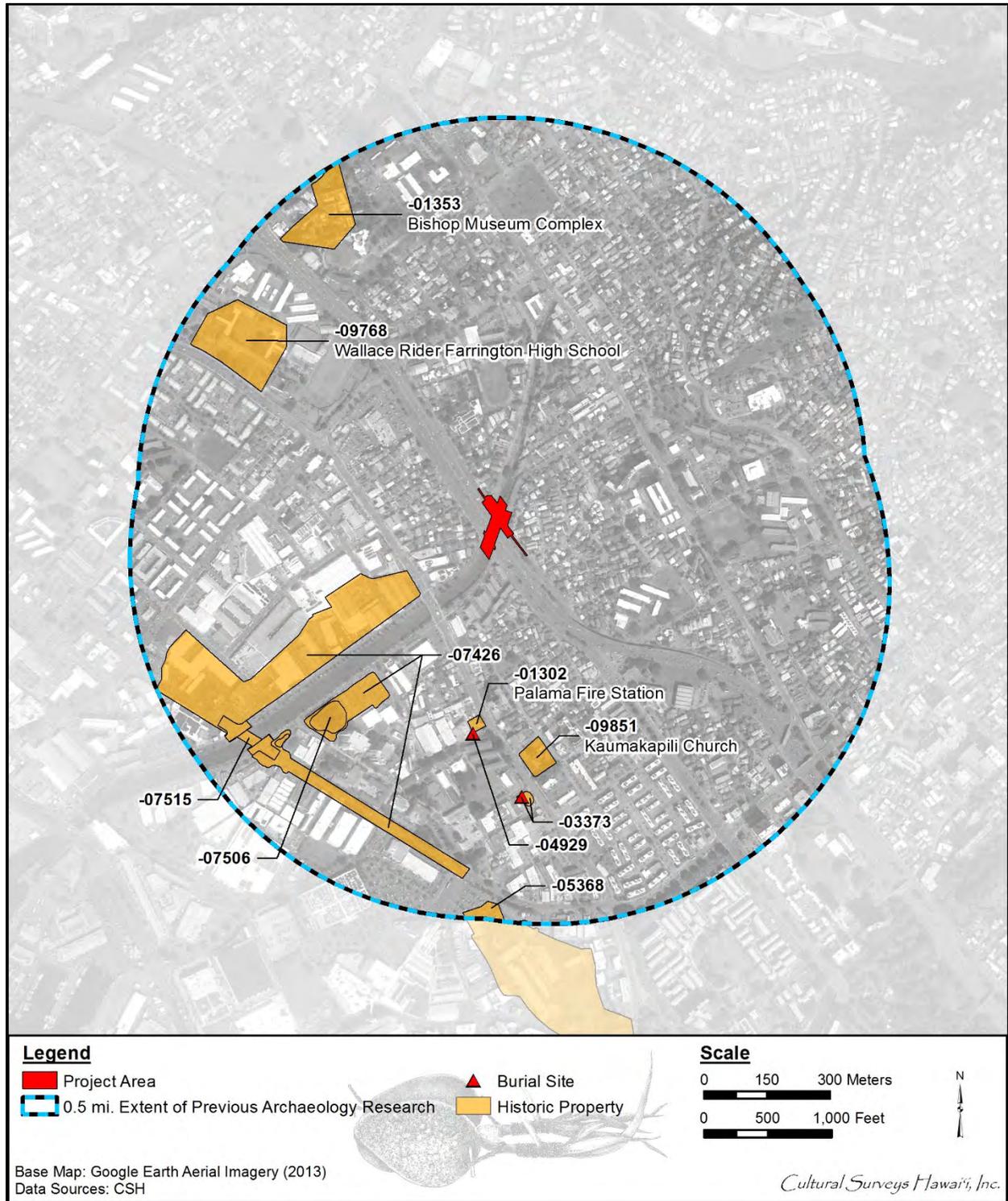


Figure 21. Previously identified historic properties within a 0.8 km (0.5 mile) radius of the project area

Table 3. Previously Identified Historic Properties within a 0.8 km (0.5 mile) Radius of the Project Area

SIHP #	Site Type/ Name	Source
50-80-14-1302	Palama Fire Station	Neller 1980
50-80-14-1353	Bishop Museum Complex	Dixon 1993
50-80-14-3373	Subsurface cultural deposit, burial	Dunn et al. 1991
50-80-14-4929	Burial (coffin)	Jourdane 1994; Hammatt 1995
50-80-14-5368	Kūwili Fishpond	McDermott and Mann 2001
50-80-14-7426	Subsurface wetland sediments	Hammatt 2013, Medina et al. 2013
50-80-14-7506	Subsurface incinerated trash deposit	Hammatt, 2013; Pammer and McDermott 2014
50-80-14-7515	Subsurface dredge sediment	Medina et al. 2013
50-80-14-9768	Wallace Rider Farrington High School	Hawai'i Register Nomination form
50-80-14-9851	Kaumakapili Church	Hawai'i Register Nomination form

3.2.5 Corner of North King and Houghtailing Streets (Nakamura et al. 1994)

The Bernice Pauahi Bishop Museum (Nakamura, Pantaleo, and Sinoto) carried out an archaeological assessment of land in Kapālama on the corner of North King and Houghtailing streets. Background research identified no historic sites within the survey area. Research also showed pre- and early post-Contact use of the area for agriculture but suggested that disturbance in the area from urbanization in the 1900s had reduced the possibility of finding intact deposits from an earlier time.

3.2.6 Kamehameha Homes Project, Kapālama (Borthwick et al. 1995)

CSH (Borthwick et al. 1995) carried out an archaeological subsurface inventory survey of the Kamehameha Homes project in Kapālama. The crew excavated 16 trenches spaced to cover the entire 13.96-acre survey area. All of the trenches had a landscape layer associated with mechanical terracing of the area by bulldozers. No significant finds were reported.

3.2.7 Kamehameha Heights, Puea and Ka‘ahumanu Cemeteries (McIntosh and Cleghorn 2006)

In 2006, Pacific Legacy conducted pre-construction testing along the Puea and Ka‘ahumanu Cemeteries before improvements were made to the Kamehameha Heights water system, due to concerns that unmarked graves could lie outside the modern boundary of the cemeteries. No cultural deposits or human remains were found in the ten test trenches along the north and east streets bounding the cemeteries.

3.2.8 Walgreens Development Project, North School Street (Dey and Hammatt 2008)

In 2008, CSH completed an archaeological monitoring program for a Walgreens development project. Background research identified no historic sites, a low potential for pre-Contact or early post-Contact Hawaiian cultural remains, and a low to moderate potential for early historic remains. Subsequent fieldwork confirmed a lack of pre-Contact or early post-Contact cultural material within that survey area.

3.2.9 Kalihi Beretania 24-Inch Water Main Project (Hammatt and Chiogioji 2008)

CSH carried out an archaeological inventory survey of the proposed Board of Water Supply Kalihi Beretania 24-Inch Water Main project in Nu‘uanu and Kapālama. No prehistoric properties were identified within the survey area but the study emphasized the need to consider the Judd Street and Nu‘uanu Avenue bridges as historic properties. Background research showed the survey area to be part of an expansive agricultural system during the pre- and early post-Contact period. As the survey area was confined to roadway corridors, subsequent testing revealed mostly grading and fill disturbance from roadway construction and utility trenching. No pre- or early post-Contact cultural material was observed during archaeological testing within the survey area.

3.2.10 Traffic Management System Project, Houghtailing Street by the H-1 (Burke et al. 2010)

In 2010, CSH completed an archaeological monitoring program for a Traffic Management System PH 1 project. Background research identified no sites but suggested a potential for early historic remains. Subsequent field monitoring produced no significant finds within the survey area.

3.2.11 Kalihi/Nu‘uanu Sewer Rehabilitation Project (Hunkin et al. 2012)

In 2012, CSH conducted monitoring for the Kalihi-Nu‘uanu Sewer project. No cultural deposits were identified in any of the monitored excavation trenches. One isolated human femur fragment was found in fill material in one of the western Punchbowl slope areas. No site number was assigned to this fragment, which was handed over to the SHPD for reburial.

3.2.12 Honolulu High-Capacity Transit Corridor Project (Hammatt 2013)

CSH performed AIS testing for the Honolulu High-Capacity Transit Corridor project (City Center) within numerous locations between Middle Street and Ala Moana Center. Testing identified multiple sites, two of which were identified near the current project area—SIHP #s -7426 (subsurface wetland deposit) and -7506 (subsurface incinerated trash deposit). The wetland sediments were identified within 28 AIS test excavations along Dillingham Boulevard, *makai* of the current project (T-054 through T-082). The incinerated trash deposits were encountered within three test excavations (T-064, T-066, and T-067) within the HCC campus at the corner of Dillingham Boulevard and Kokea Street.

3.2.13 Kalihi Valley Sewer System Improvements, Kapālama (Hunkin and Hammatt 2013)

In 2013, CSH monitored a portion of the Kalihi Valley Sewer System Improvement project near the junction of Houghtailing Street and North School Street in Kalihi. Due to the survey area's close proximity to Ka‘ahumanu, Puea, and Maluhia Cemeteries, project proponents decided to enact a monitoring project for the installation of two water lines to mitigate any adverse effect to historic properties or burials in the survey area. No cultural deposits or historic properties were observed during excavations. The stratigraphy consisted of various layers of imported fill associated with historic and modern development overlying naturally deposited sediment and bedrock.

3.2.14 Medina and Hammatt 2013

In 2013, CSH (Medina and Hammatt 2013) reported on the results of archaeological monitoring for traffic control signal improvements for the Waiakamilo Road and McNeill Street intersection. No historical properties or human remains were encountered as a result of construction activities.

3.2.15 Traffic Control Signal Improvements along Dillingham Boulevard (Medina et al. 2013)

In 2013, CSH (Medina et al. 2013) reported on the results of archaeological monitoring for traffic control signal improvements along Dillingham Boulevard between Kokea Street and Kohou Street, involving excavations within city streets and sidewalks for subsurface electrical lines, conduits, and boxes. Two historic properties were observed during the course of archaeological monitoring consisting of SIHP #s -7426, a previously identified historic property consisting of former wetland/agricultural sediments that may have been utilized during the late pre-to early post-Contact period, and -7515, a newly identified historic property related to the creation of Kapālama Canal during the 1920s and the in-filling of the surrounding area for the purposes of urban development.

3.2.16 Honolulu Community College (Pammer and McDermott 2014)

In 2013, CSH conducted an archaeological inventory survey on the campus of Honolulu Community College. A total of eight backhoe-assisted excavations were excavated to assess the

stratigraphy and determine the potential for buried archaeological deposits. Two previously recorded historic properties were identified with the survey area, SIHP #s -7526 (wetland sediments) and -7506 (incinerated trash deposit). Both sites were assessed as significant under criterion “d,” but no further work was recommended.

3.2.17 Farrington High School (Stine et al. 2014)

In 2013, CSH conducted archaeological monitoring for renovations and replacements of electrical vaults and lines at Farrington High School. Fieldwork was conducted from 27–29 June 2012. No new historic properties were identified. One previously identified property, Wallace Rider Farrington High School (SIHP # -9768) was placed on the State Register of Historic Places in 1993. No significant cultural material or human remains were observed during monitoring.

3.3 Background Summary and Predictive Model

Based on background research, the primary area of traditional Hawaiian settlement and intensive agriculture within Kapālāma seems to have been in the upper valleys, as well as near streams and springs. The project sits within the central area of Kapālāma along the drainage of Kapālāma and Niuhelewai streams. Historically, agriculture and habitation were intensive in this area. Historically, the area encompassed by the survey area was used for rice cultivation, but immediate habitation within the survey area does not seem to have been prevalent.

Traditional Hawaiian land use indicated in the adjacent land commission awards (LCAs) documentation consisted of habitation, irrigated taro fields (*lo'i*), *kula* (dryland plots used for cultivation and/or pasture), and aquaculture via fishponds. The majority of *kuleana* land claims located near the project area were located near the freshwater sources of Kalihi and Niuhelewai streams as they were the most arable sources of land. This is the area described as an uncultivated plain in John Papa ‘Ī‘Ī’s (1959) account of the area in 1810, until you reached “the taro patches of Kalihi.” Major strife is indicated ca. 1782 in the defeat of the O‘ahu ruling chief Kahāhana when the dead backed up the lagoonal backwaters (*muliwai*) of Niuhelewai Stream—but this may have been well seaward of the current project area. Another uncertainty pertains to the indicated ca. 1855 burial ground on the plains of Kaiwi‘ula which may have been near the current project area.

By the twentieth century, the coastal and central sections of Kapālāma had become suburbs of Honolulu. Much development in Kapālāma primarily occurred prior to the late 1970s when archaeological investigation became standard during construction activities. As a result, few archaeological studies have been conducted in this area. The only previous projects located within the current project area consist of projects dealing with the H-1 Interstate Highway. No previously recorded archaeological sites are located within or directly adjacent to the current project area. Historic infrastructure relating to the Halona Street Bridge and the Kapālāma Canal are anticipated within the project area.

Section 4 Results of Fieldwork

A 100% pedestrian inspection of the project area was conducted on 19 September by Joanne DeMaio Starr, M.A. and Nifae Hunkin, B.A. The pedestrian inspection included the documentation of two cultural resources within the project area and a description of the overall project area including ground visibility, modern use or disturbance, and vegetation.

The current project area includes the Halona Street Bridge (SIHP # -7807) and portions of the Kapālama Canal (SIHP # -7808), both of which were constructed in the early part of the twentieth century. The Halona Street Bridge is a continuous concrete cast-in-place bridge constructed in 1938. The Kapālama Canal is a channelized drainage that extends through urban Honolulu and is used to control the runoff from both Niuhelewai and Kapālama streams. Complete descriptions of these cultural resources are provided in Section 5.

The project area also includes a portion of Halona Street, which is the former extension of Vineyard Boulevard that was replaced by a portion of the H-1 Interstate Highway in the 1960s. The total extent of Halona Street includes approximately 0.9 km of two-lane, asphalt paved roadway extending one way from Vineyard Boulevard at the entrance of Likelike Elementary School in the southeast to the intersection of Houghtailing Street to the northwest.

The project area is completely developed. The only vegetation present within the project area includes small portions of mowed grass islands along the Kapālama Canal and between Halona Street and the westbound lanes of the H-1 Interstate.

Section 5 Cultural Resource Descriptions

Two cultural resources were identified within the current project area. They are summarized in Table 4 and depicted on Figure 22 and Figure 23.

Table 4. Sites Identified within the Current Project Area

SIHP #	Formal Type	Function
50-80-14-7807	Bridge (Halona Street Bridge)	Transportation
50-80-14-7808	Kapālama Canal	Water Control

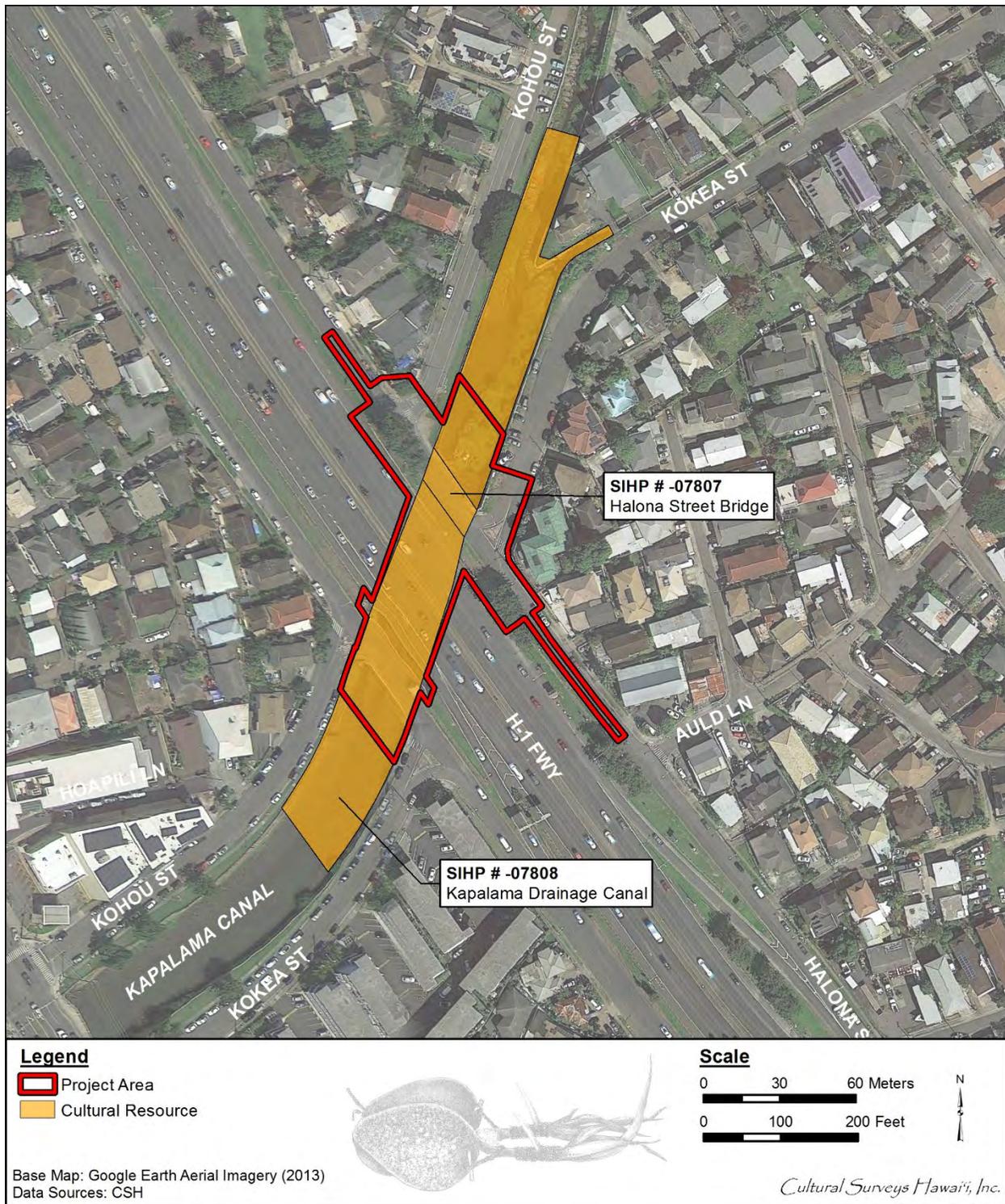


Figure 22. 2013 Google Earth aerial photograph showing the locations of cultural resources identified within the project area.

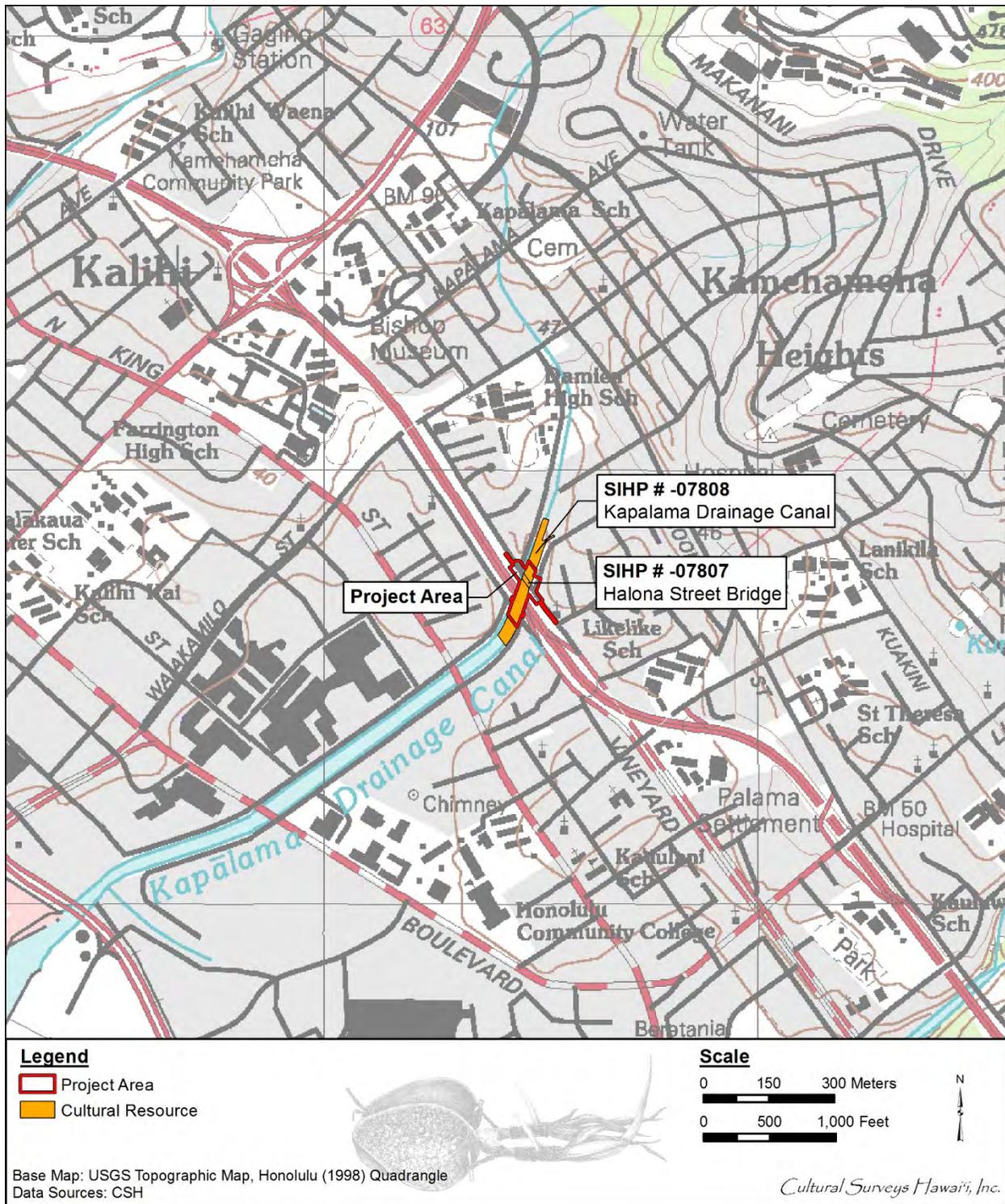


Figure 23. Portion of 1998 Honolulu USGS topographic quadrangle showing the locations of cultural resources identified within the project area

5.1 SIHP # 50-80-14-7807

FORMAL TYPE:	Bridge
FUNCTION:	Transportation
NUMBER OF FEATURES:	1
AGE:	Historic (1938)
TAX MAP KEY:	TMK: [1] 1-6-006 (Halona Street, Kohou Street, Kokea Street, and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal)
LAND JURISDICTION:	City and County of Honolulu, HDOT
PREVIOUS DOCUMENTATION:	None

SIHP # -7807 is the Halona Street Bridge, located along Halona Street northeast of the H-1 Interstate Highway and spanning the Kapālama Drainage Canal (see Figure 23). Halona Street Bridge is identified as a continuous concrete cast-in-place bridge (Figure 24 and Figure 25). The existing structure was built in 1938, however, half of the bridge (the downstream/*makai* portion) was removed during the construction of the H-1 freeway. The bridge is marked with the inscriptions “1938” and “KAPALAMA CANAL” (Figure 26 and Figure 27).

The Halona Street Bridge was not included within previous statewide historic bridge inventory studies. Architectural recordation conducted during the current project states the following:

The Halona Street Bridge does not appear to be eligible for the Hawaii or National Register of Historic Places due to a lack of integrity of its 1938 form. This is due to the removal of the southwest parapet, reduction of the roadway width, and construction of the adjacent H1 Freeway [Ruzicka 2015:9-4]

As this is an architectural cultural resource, the assessment of significance (pursuant to HAR §13-13-275-6), and determination of eligibility to the National and Hawai'i Register (35 CFR 60.4 and HAR §13-198-8, respectively) was conducted by Mason Architects, Inc. (Ruzicka 2015). Ruzicka (2015) evaluated SIHP # -7807 for significance under Criterion “A” (associated with events that have made a significant contribution to the broad patterns of our history), specifically development of Vineyard Street and the Kapālama Canal, however, due to the lack of integrity, SIHP # -7807 was determined by Ruzicka (2015) to be not significant and not eligible to the National Register and Hawai'i Register. CSH concurs with this assessment and determination.

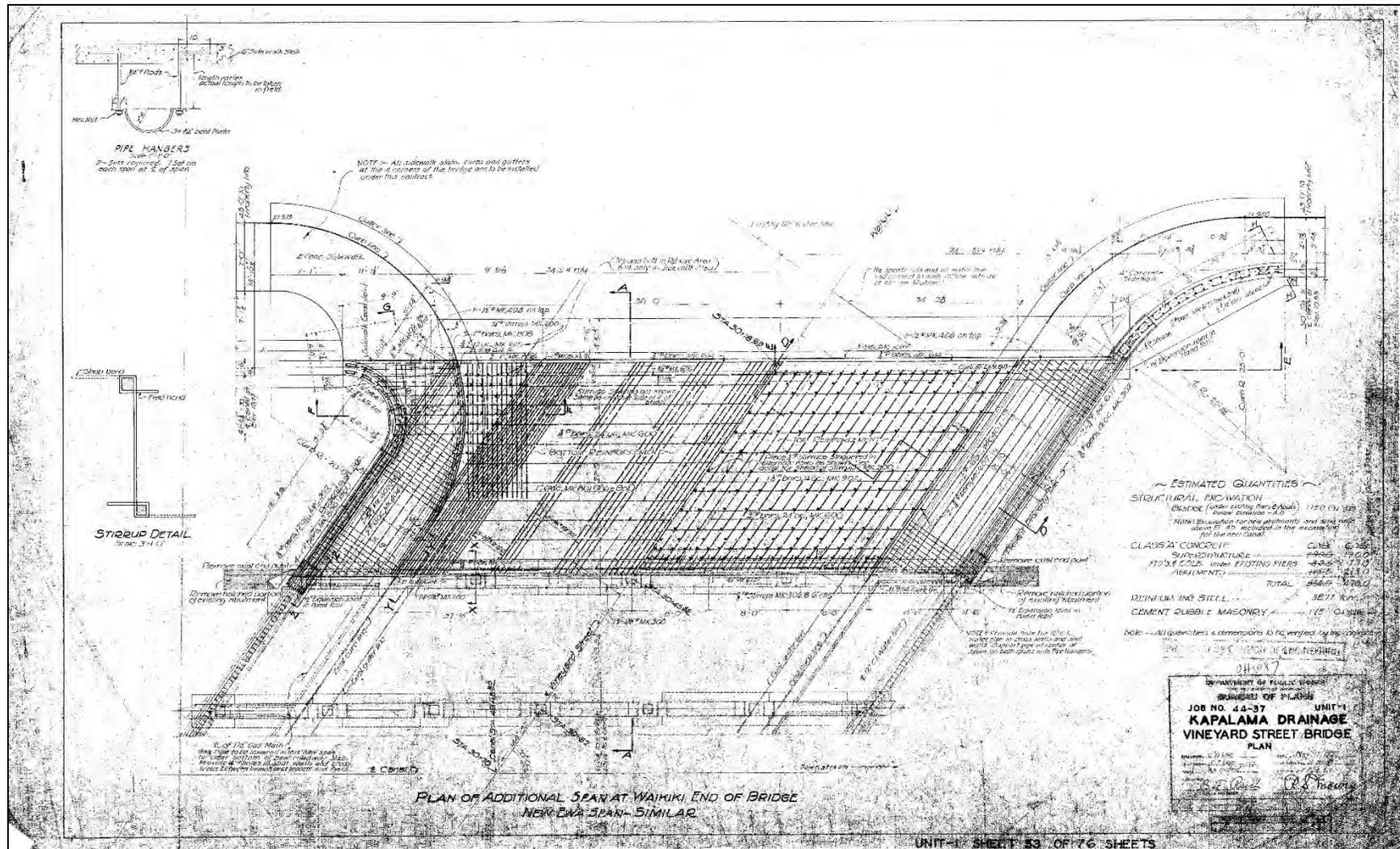


Figure 24. Department of Public Works plan for Kapālama Drainage Vineyard Street Bridge (Halona Street Bridge)

AISR for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O'ahu

TMKs: [1] 1-6-002 (Olomea St and H-1 Interstate Hwy ROW, and Kapālama Canal) and 1-6-006 (Halona St., Kohou St., Kokea St., and H-1 Interstate Hwy ROW, and Kapālama Canal)



Figure 25. SIHP # -7807, Halona Street Bridge, view to southwest



Figure 26. SIHP # -7807, Halona Street Bridge including date inscription of “1938” on the northeast corner of the bridge, view to north



Figure 27. SIHP # -7807, Halona Street Bridge including inscription of “KAPALAMA CANAL” on the northwest corner of the bridge, view to east

5.2 SIHP # 50-80-14-7808

FORMAL TYPE:	Kapālama Canal
FUNCTION:	Water control
NUMBER OF FEATURES:	1
AGE:	Historic
TAX MAP KEY:	TMKs: [1] 1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal) and 1-6-006 (Halona Street, Kohou Street, Kokea Street, and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal).
LAND JURISDICTION:	City and County of Honolulu, HDOT
PREVIOUS DOCUMENTATION:	None

SIHP # -7808 is the Kapālama Canal extending northeast to southwest beneath the Halona Street Bridge and Halona Street within the project area (see Figure 23). The Kapālama Canal is a channelized drainage that extends through urban Honolulu and controls the runoff from both Niuhelewai and Kapālama streams. The total extent of the Kapālama Canal includes approximately 1.5 km from Kapālama Basin in Honolulu Harbor in the southwest to 0.9 km north of Halona Street Bridge where the canal splits into two drainages along Kohou Street and Kokea Street.

The portion of SIHP # -7808 within the project area measures 209.6 m (687.7 ft) long with a variable width between 24.0 m (78.7 ft) and 31.0 m (101.7 ft). This portion of the canal is defined by basalt stone walls that extend from the base of the canal to above the street level (Figure 28 through Figure 31). The stonework observed on the face of the wall suggests multiple phases of construction. Where exposed, the foundation of the canal walls was observed as one to two courses of water-rounded, dry-stacked basalt boulders. Two additional phases of mortared dressed basalt stonework are visible, one extending from the base of the canal to the modern ground surface (six to eight courses), and one extending above the ground surface forming a low wall or curb (two to three courses) (Figure 32). The majority of the wall is constructed of dressed basalt blocks measuring approximately 0.3 m (1 ft) by 0.3 m (1 ft). The canal walls are approximately 2.5 m (8.2 ft) tall from the base to the top. The top of the wall is capped with concrete and a chain-link fence has been installed along the top of the wall to prevent intrusion. Several culvert pips are exposed within the wall that provide drainage for the surrounding urban community.

The earliest depiction of the channelization of Kapālama and Niuhelewai streams is shown on the 1943 U.S. Army War Department map extending along the northwestern boundary of the project area (see Figure 15). This early alignment closely conforms to the natural stream channels of Kapālama and Niuhelewai streams and may have been a temporary design to allow for the construction of Kapālama Canal to the southwest. Historic maps indicate the Kapālama Canal was constructed before 1950 (see Figure 16). An inscription in the concrete wall adjacent to the Halona Street Bridge reads “Kapalama Canal 1965,” which may be indicative of improvements to the canal during the construction of the H-1 Interstate Highway (Figure 33).

SIHP # 50-80-14-7808 is the Kapālama Canal and associated lava rock walls. As this is an architectural cultural resource, the assessment of significance (pursuant to HAR §13-13-275-6), and determination of eligibility to the National and Hawai'i Register (35 CFR 60.4 and HAR §13-198-8, respectively) was conducted by Mason Architects, Inc. (Ruzicka 2015). SIHP # -7808 was assessed by Ruzicka (2015) as significant under Criterion "A" (associated with events that have made a significant contribution to the broad patterns of our history) and was determined to be eligible to the National Register and Hawai'i Register. CSH concurs with this assessment and determination.



Figure 28. SIHP # -7808, Kapālama Canal from the Halona Street Bridge (SIHP # -7807), view to north



Figure 29. SIHP # -7808, Kapālama Canal from north end of project area, view to south



Figure 30. SIHP # -7808, Kapālama Canal from the south side of the H-1 Interstate Highway, view to north



Figure 31. SIHP # -7808, Kapālama Canal from the south side of the H-1 Interstate Highway, view to southwest



Figure 32. SIHP # -7808, Kapālama Canal showing potential multiple construction phases of the canal walls, view to southwest



Figure 33. SIHP # -7808, Kapālama Canal showing inscription on concrete wall of “Kapalama Canal 1965,” view to northwest

Section 6 Summary and Interpretation

At the request of CH2M HILL and on behalf of the FHWA/CFLHD, CSH has prepared this archaeological inventory survey report for the Halona Street Bridge replacement project, Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKS: [1] 1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal) and 1-6-006 (Halona Street, Kohou Street, Kokea Street, and H-1 Interstate Highway Rights-of-Way, and Kapālama Canal).

Background research has indicated Kapālama was a focus for habitation and agriculture in the pre-Contact and post-Contact periods, although it was not as densely inhabited as Nu‘uanu Valley to the east and Kalihi Valley to the west. Stretching out from the base of the ridge toward Honolulu Harbor was the well-watered taro area of Kapālama described by Handy and Handy (1972:475) as “almost continuous from Iwilei up to the foothills of above School Street, an area measuring about three quarters of a mile both in depth inland and in breadth.” Historic information indicates that traditionally, habitation was focused within the same well-watered plain, which extended to the shoreline. John Papa ‘Ī‘Ī (1959:58) noted “innumerable people all over the farming area.”

During and after the Māhele, the importance of Kapālama is evident in the fact that Kamehameha kept these lands for himself and then passed them on to his family through his grandchildren Moses Kekūāiwa, Victoria Kamāmalu, and Lot Kamehameha, and eventually to Bernice Pauahi Bishop where they became part of her estate. Roughly 100 *kuleana* lots were awarded to Hawaiian commoners in Kapālama. These *kuleana* lands were located on the flood plains to the east of Waiakamilo/Houghtailing Street and included house and *lo‘i* for the cultivation of *kalo*.

The first detailed map of Kapālama, made by J.F. Brown in 1885, shows a traditional Hawaiian landscape of small *kuleana* LCA parcels extending across the Kapālama plain (see Figure 8). The project area is located within portions of LCA 732:2 (to Kuinui), 918:2 (to Upai), 1746 (to Nakaikuaana), 2266:3 (to Kuhiana), 2268:1 (to Kapahu), and 2937 Part 2:2 (to Wm. Harbottle) (see Figure 9 and Appendix A). The claims include house lots and associated taro patches and pastureland.

The former taro land that the entire project area was a part of was converted to rice fields between the 1870s and 1910. Subsequently it became housing and industrial subdivisions in the early twentieth century. This land use change was facilitated by the construction of Kapālama Canal. The canal channelized Kapālama and Niuhelewai streams and allowed for sub-street storm drain runoff collection. During the last half of the twentieth century, the Kapālama area continued to undergo changes associated with the urban expansion of Honolulu. Increased housing, industrial, and commercial activities continue to occur today.

Previous archaeological studies have documented architectural historic properties such as the Palama Fire Station (SIHP # -1302), Kaumakapili Church (SIHP # -9851), Wallace Rider Farrington High School (SIHP # -9768), and the Bishop Museum Complex (SIHP # -1353) as well as subsurface cultural deposits including wetland sediments (SIHP # 7426), incinerated trash deposits (SIHP # -7506), and burials (SIHP #s -3373 and -4929).

Two cultural resources have been identified within the project area. These cultural resources include the Halona Street Bridge (SIHP # -7807) and portions of the Kapālama Canal (SIHP # -7808), both of which were constructed in the early part of the twentieth century.

Halona Street Bridge (SIHP # -7807) is identified as a continuous concrete cast-in-place bridge. The existing structure was built in 1938, however half of the bridge (the downstream/*makai* portion) was removed during the construction of the H-1 freeway. The bridge is marked with the inscriptions “1938” and “KAPALAMA CANAL.” This bridge was determined by Ruzicka (2015) to not be a significant historic property.

The Kapālama Canal (SIHP # -7808) is a channelized drainage that extends through urban Honolulu and is used to control the runoff from both Niuhelewai and Kapālama streams. The total extent of the Kapālama Canal includes approximately 1.5 km from Kapālama Basin in Honolulu Harbor in the southwest to 0.9 km north of Halona Street Bridge where the canal splits into two drainages along Kohou Street and Kokea Street.

Section 7 Significance Assessments

As discussed in Section 1.2, cultural resources, are generally at least 50 years old (although there are exceptions) and include: buildings and structures; groupings of buildings or structures (historic districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and, in some instances, natural landscape features and/or geographic locations of cultural significance. The current investigation was tasked with the identification of archaeological cultural resources, however, this report also includes, where appropriate, the architectural cultural resources documented and evaluated in the companion architectural survey conducted by Mason Architects, Inc. (Ruzicka 2015).

For a cultural resource to be significant under HAR §13-275-6, the cultural resource should possess integrity of location, design, setting, materials, workmanship, feeling, and/or association, and meet one or more of the following criterion:

- “a” Be associated with events that have made an important contribution to the broad patterns of our history;
- “b” Be associated with the lives of persons important in our past;
- “c” Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value;
- “d” Have yielded, or is likely to yield, information important for research on prehistory or history; or
- “e” Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

Cultural resource significance was evaluated and expressed by Ruzicka (2015) as eligibility for listing on the National Register (pursuant to 36 CRE 60.4) and/or the Hawai'i Register (pursuant to HAR §13-198-8). To be considered eligible for listing on the National and/or Hawai'i Register, a cultural resource should possess integrity as described above, and meet one or more of the following broad significance criteria:

- “A” that are associated with events that have made a significant contribution to the broad patterns of our history;
- “B” that are associated with the lives of persons significant in our past;
- “C” that embody the distinctive characteristics of a type, period, or method of construction, or that represent that work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;
- “D” that have yielded, or may be likely to yield, information important in prehistory or history;

SIHP # 50-80-14-7807 is the Halona Street Bridge. As this is an architectural cultural resource, the assessment of significance (pursuant to HAR §13-13-275-6), and determination of eligibility to the National and Hawai'i Register (35 CFR 60.4 and HAR §13-198-8, respectively) was conducted by Mason Architects, Inc. (Ruzicka 2015). Ruzicka (2015) evaluated SIHP # -7807 for significance under Criterion "A" (associated with events that have made a significant contribution to the broad patterns of our history), specifically development of Vineyard Street and the Kapālāma Canal, however, due to the lack of integrity, SIHP # -7807 was determined by Ruzicka (2015) to be not significant and not eligible to the National Register and Hawai'i Register. CSH concurs with this assessment and determination.

SIHP # 50-80-14-7808 is the Kapālāma Canal and associated lava rock walls. As this is an architectural cultural resource, the assessment of significance (pursuant to HAR §13-13-275-6), and determination of eligibility to the National and Hawai'i Register (35 CFR 60.4 and HAR §13-198-8, respectively) was conducted by Mason Architects, Inc. (Ruzicka 2015). SIHP # -7808 was assessed by Ruzicka (2015) as significant under Criterion "A" (associated with events that have made a significant contribution to the broad patterns of our history) and was determined to be eligible to the National Register and Hawai'i Register. CSH concurs with this assessment and determination.

The distinctive dressed basalt block walls of the Kapālāma Canal (see Figure 28 through Figure 32) are a contributing feature of the Kapālāma Canal's significance assessment. These dressed basalt block walls are not present under the SIHP # -7807 Halona Street Bridge (see Figure 25) which is supported by concrete bridge abutments. The concrete bridge abutments of the Halona Street Bridge are not regarded as contributing features to the significance of the Kapālāma Canal.

Section 8 Project Effect and Mitigation Recommendations

8.1 Project Effect

In accordance with Federal regulations (36 CFR 800.5), CSH's project-specific effect recommendation is "No adverse effect." Under Hawai'i State historic preservation review legislation, the project's effect recommendation is "No historic properties affected" (in accordance with HAR §13-13-275-7).

To help avoid impact to the lava rock walls of the Kapālama Canal (SIHP # -7808), the existing abutments for the Halona Bridge (SIHP # -7807) will not be removed; however, the tops of the existing abutments will be cut down to accommodate deeper bridge girders.

8.2 Mitigation Recommendations

No further historic preservation work is recommended.

Section 9 References Cited

AA Roads

- 2012 *Interstate H1/Lunalilo Freeway/Queen Liliuokani [sic] Freeway Routing*. AA Roads history of roads website. Electronic document, <http://www.aaroads.com/guide.php?page=i00h1hi>

Bingham, Hiram

- 1981 *A Residence of Twenty-One Years in the Sandwich Islands*. Charles E. Tuttle Company, Rutland, Vermont.

Borthwick, Douglas, Ian Masterson, Victoria Creed, and Hallett H. Hammatt

- 1995 *An Archaeological Inventory Survey of the Kamehameha Homes Project, Kapālama, O'ahu*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Brown, J.F.

- 1885 Map of Kalihi and Kapālama, Makai Sections. Registered Map 1039. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Burke, Kelley, Douglas F. Borthwick, and Hallett H. Hammatt

- 2010 *Final Archaeological Monitoring Report for the Traffic Management System PH 1 Project, Houghtailing Street by the H-1 Kapalama Ahupua'a, Honolulu (Kona) District, O'ahu Island (TMK: [1] 1-6-023:066)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Chinen, Jon J.

- 1958 *The Great Māhele, Hawaii's Land Division of 1848*. University of Hawaii Press, Honolulu.

Cordy, Ross

- 2002 *The Rise and the Fall of the O'ahu Kingdom*. Mutual Publishing, Honolulu.

Dey, Darienne and Hallett H. Hammatt

- 2008 *Archaeological Monitoring Report For the Walgreens Development Project, Kapalama Ahupua'a, Honolulu District, O'ahu Island (TMK: [1] 1-6-027:076)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Dixon, Boyd

- 1993 *Bishop Museum, Site 50-Oa-A6-26, Kaiwiula. Memorandum Regarding Mechanical Trenching on Great Lawn at Bishop Museum during Installation of Electrical Lines*. Bernice Pauahi Bishop Museum, Honolulu.

Dunn, Amy E., Patricia A. Kalima, Lehua Kalima, and Susan Goodfellow

- 1991 *Palama Chevron Station Site Monitoring Project, Land of Kapālama, District of North Kona, Island of O'ahu, (TMK: 1-5-08:17, 18, 23)*. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Farrington High School

- 2014 General Information, Farrington High School. Electronic document, <http://farringtonhighschool.org/about-fhs/general-information.html>.

Fitzpatrick, Gary

1986 *The Early Mapping of Hawai'i*. Editions Limited, Honolulu.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens

1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawai'i Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham

1917 Legend of Kaulu. In *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, Vol. IV, Part III. Bishop Museum Press, Honolulu

1919 Famous Men of Early Days. In *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, Vol. V, Part II. Bishop Museum Press, Honolulu.

Google Earth

2013 Aerial photographs of Hawai'i. Google Inc., Mountain View, California. Available online at www.google.com/earth.html.

Hammatt, Hallett

1995 *Archaeological Disinterment and Investigation of an Inadvertent Burial Find at Austin Lane in Kalihi, Island of O'ahu (TMK: 1-5-05)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

2013 *Archaeological Inventory Survey Report for City Center (Section 4) of the Honolulu High-Capacity Transit Corridor Project, Kalihi, Kapālama, Honolulu, and Waikīkī Ahupua'a, Honolulu (Kona) District, Island of O'ahu TMK [1] 1-2, 1-5, 1-7, 2-1, 2-3*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H. and Rodney Chiogioji

2008 *Archaeological Inventory Survey of the Proposed Board of Water Supply Kalihi Beretania 24-Inch Water Main Project, Nu'uanu and Kapālama Ahupua'a, Honolulu District (Kona moku), O'ahu Island (TMK: [1] 1-6, 1-7-, 2-1, and 2-2)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Handy, E.S. Craighill

1940 *The Hawaiian Planter*. Bishop Museum Bulletin Volume 1, No. 161. Bernice Pauahi Bishop Museum, Honolulu.

Handy, E.S. Craighill and Elizabeth G. Handy

1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.

Hawai'i TMK Service

Tax Map Key [1] 1-6-002 and 006. Hawai'i TMK Service, Honolulu.

Hunkin, Nifae, Douglas Borthwick, and Hallett H. Hammatt

2012 *Archaeological Monitoring Report for Phase 1 Kalihi/Nu'uaniu Sewer Rehabilitation Project, Kalihi, Kapālama, Nu'uaniu, Pauoa, and Makiki Ahupua'a, Honolulu District, Island of O'ahu (TMKs: [1] 1-2-001 to 003, -009 to -011; 1-3-001, -003 to -005, 007 to-012, -015, -016, -018, -019, -021; 1-6-009 to -011; 1-7-009 to -011, -014 to -017, -019, -020, -023, -032, -033, -036; 1-8-004, -012 to -015; 2-2-001, -003 to -007, -009, -010, -013, -014, -019, -024).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hunkin, Nifae and Hallett H. Hammatt

2013 *Archaeological Monitoring Report for the Kalihi Valley Sewer System Improvement Project, Kapālama Ahupua'a, Kona District, O'ahu Island (TMK: [1] 1-6-025:049).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

ʻĪ, John Papa

1959 *Fragments of Hawaiian History as Recorded by John Papa ʻĪ.* Bishop Museum Press, Honolulu.

Ishihara, Nicole and Hallett H. Hammatt

2015 *Cultural Impact Assessment Report for the Halona Street Bridge (H-1 on-ramp at Vineyard Street) Replacement Project, Kapālama Ahupua'a, Honolulu (Kona) District, O'ahu, Federal Highway Administration/Central Federal Lands Highway Division (FHWA/CFLHD) Contract DTFH68-13-R-00027, TMKs: [1] 1-6-002 (Halona Street, Kohou Street, Kokea Street, Olomea Street, and H-1 Interstate Highway Right-of-Ways) and 1-6-006 (Kapālama Canal).* Cultural Surveys Hawai'i, Inc. Kailua Hawai'i.

Jourdane, Elaine

1994 *Inadvertent Discovery of Human Remains at Austin Lane, Honolulu, Hawai'i.* Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Juvik, Sonia P. and James O. Juvik (editors)

1998 *Atlas of Hawai'i.* Third edition. University of Hawai'i Press, Honolulu.

Kamakau, Samuel Manaiakalani

1992 *Ruling Chiefs of Hawai'i.* Revised edition. Kamehameha Schools Press, Honolulu.

1996 *Ke Kumu Aupuni: Ka Mo'olelo Hawai'i No Kamehameha Ka Na'i Aupuni A Me Kāna Aupuni I Ho'okumu Ai.* 'Ahahui 'Ōlelo Hawai'i, Honolulu.

Kame'eleihiwa, Lilikala

1992 *Native Land and Foreign Desires. Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.

Kimmich, Robert A.

1956 100 Years of Hawaiian Psychiatry. *Hawaii Medical Journal* 15 (4):345–347.

Kotzebue, Otto von

1817 South O'ahu. Map by Otto von Kotzebue. Reprinted in *The Early Mapping of Hawai'i*, by Gary L. Fitzpatrick, 1986, pp. 48–49. Editions Limited, Honolulu.

- 1967 *A Voyage of Discovery into the South Seas and Bering's Straits*, Vol. I. Longman, Hurst, Rees, Orme and Brown, London and Da Capo Press, New York.

LaPasse, Lt. Joseph de

- 1855 Plan du Mouillage [Anchorage] d'Honolulu [map]. Lt. Joseph de LaPasse. In *The Early Mapping of Hawaii*, Gary L. Fitzpatrick, 1986, pp. 82–83. Editions Limited, Honolulu.

Malo, David

- 1951 *Hawaiian Antiquities (Moolelo Hawaii)*. Nathaniel B. Emerson, translator and editor. Second edition. Bishop Museum Special Publication No. 2. Bernice Pauahi Bishop Museum, Honolulu.

McAllister, J. Gilbert

- 1933 *Archaeology of Oahu*. Bishop Museum Bulletin 104. Bernice Pauahi Bishop Museum, Honolulu.

McDermott, Matthew and Melanie M. Mann

- 2001 *Archaeological Inventory Survey for the Proposed Nimitz Highway Water System Improvements, Part I, Downtown Honolulu, Nu'uaniu Ahupua'a, District of Kona, Island of O'ahu (TMK: 1-5-08, 1-7-01, 2-1-02)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

McIntosh, James and Paul L. Cleghorn

- 2006 *Archaeological Pre-Construction Testing and Construction Monitoring for the Kamehameha Heights Water System Improvements part II Project: Kapālama Avenue, Alani Street, Kona Street, Apaki Street, Waihe'e, and Ahiahi Street, Kona District, O'ahu Island (TMKs: 10 1-6-015 and 1-6-016)*. Pacific Legacy, Inc., Kailua, Hawai'i.

Medina, Leandra and Hallett H. Hammatt

- 2013 *Archaeological Monitoring Report (AMR) for the Waiakamilo Road and McNeill Street Intersection Traffic Signals Improvement Federal Aid Project No. STP-0001(36) Honolulu Ahupua'a, Kona District, Island of O'ahu TMK: [1] 1-5-023:008, 009; 1-5-024:001; 1-5-026:001*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Medina, Leandra, Jon Lance, and Hallett H. Hammatt

- 2013 *Archaeological Monitoring Report for the Traffic Control Signal Improvements along Dillingham Boulevard (Federal Aid Project No. STP-0001[36]), Honolulu Ahupua'a, Kona District, O'ahu Island TMKs: (1) 1-5-017, 020, and 022 por.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Mitchell, Donald D. Kilolani

- 1993 *Kū Kilakila 'O Kamehameha. A Historical Account of the Campuses of the Kamehameha Schools*. Kamehameha Schools/Bernice Pauahi Bishop Estate, Honolulu.

Monsarrat, M.D.

- 1897 Map of Honolulu. Registered Map 1910. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Nakamura, Barry, Jeffrey Pantaleo, and Aki Sinoto

1994 *An Archaeological Assessment of a Parcel of Land in Kapālama on the Corner of North King and Houghtailing Streets, Kapālama, Kona District, O'ahu Island*. Aki Sinoto Consulting, Honolulu.

Neller, Earl

1980 *Archaeology of the Palama Fire Station, Honolulu, Hawai'i (TMK 1-5-05:14). A Field Reconnaissance Made During Building Renovation*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Pammer, Michelle and Matt McDermott

2014 *Archaeological Inventory Survey for the Honolulu Community College Advanced Technology Training Center (ATTC) Project Kapalama Ahupua'a, Honolulu (Kona) District, Oahu TMKs: [1] 1-5-017:006 por. and 999 (Dillingham Boulevard Right-of-Way), 1-5-018:001–004*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Pukui, Mary K., Samuel H. Elbert, and Esther Mookini

1974 *Place Names of Hawaii*. University of Hawaii Press, Honolulu.

Pukui, Mary Kawena

1983 *'Ōlelo No'eau: Hawaiian Proverbs & Poetical Sayings*. Bishop Museum Press, Honolulu.

Rose, Roger G.

1980 *A Museum to Instruct and Delight. William T. Brigham and the Founding of Bernice Pauahi Bishop Museum*. Bishop Museum Press, Honolulu.

Ruzicka, Dee

2015 *SHPD Historic Recourse Inventory Form – Reconnaissance Level for Halona Street Bridge*. Mason Architects, Inc., Honolulu.

Sanborn Map Company

1927 *Fire Insurance Maps of Honolulu, Oahu, Territory of Hawaii*. Hawai'i State Archives, Honolulu.

1950 *Fire Insurance Maps of Honolulu, Oahu, Territory of Hawaii*. Hawai'i State Archives, Honolulu.

Schmitt, Robert C.

2013 *Life in the Islands. Streets and Sidewalks*. Hawaiian Historical Society Electronic document, <https://www.hawaiianhistory.org/time-capsules/daily-life/streets-and-sidewalks/>

Sterling, Elspeth P. and Catherine C. Summers

1978 *Sites of O'ahu*. Department of Anthropology, Bishop Museum. Bishop Museum Press, Honolulu.

Stine, Cary, Hallett H. Hammatt, and David Shideler

2014 *Archaeological Monitoring Report for the Farrington High School Renovations Project Electrical Upgrade Kapālama Ahupua'a, Honolulu District, O'ahu, TKM: [1] -1-6-021:005*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Taylor, Clarice

1954 Keana Kamano. *Honolulu Star-Bulletin* 19 August 1954.

Thrum, Thomas G.

1910 *Hawaiian Almanac and Annual for 1911*. Thomas G. Thrum, Honolulu

UH (University of Hawai'i, Oral History Project)

1984 *Kalihi: Place of Transition*. Vols. I–III. Ethnic Studies Oral History Project, Social Science Research Institute, University of Hawai'i at Mānoa, Honolulu.

U.S. Army War Department

1919 U.S. Army War Department fire control map of O'ahu, Honolulu Quadrangle. Available at USGS Information Services, Denver, Colorado.

1933 U.S. Army War Department fire control map of O'ahu, Honolulu Quadrangle. Available at USGS Information Services, Denver, Colorado.

1943 U.S. Army War Department terrain map of O'ahu, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

U.S. Department of Agriculture

2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <http://www.nrcs.usda.gov/products/datasets/ssurgo/> (accessed March 2005).

U.S. Geological Survey

1952 Kapalama USGS aerial photograph. USGS Information Services, Denver, Colorado.

1953 Honolulu USGS Survey 7.5-Minute Series Topographic Quadrangle. USGS Information Services, Denver, Colorado.

1978 USGS Orthophotograph, Honolulu Quad (Aerial photograph). USGS Information Services, Denver, Colorado.

1998 Honolulu USGS Survey 7.5-Minute Series Topographic Quadrangle. USGS Information Services, Denver, Colorado.

Waihona 'Aina

2000 *The Māhele Database*. Electronic document, <http://waihona.com> (accessed 10 April 2014).

Wall, Walter E.

1893 Map of Honolulu. Registered Map 1690. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Westervelt, W.D.

1923 *Hawaiian Historical Legends*. Fleming H. Revell Company, New York.

Appendix A Land Commission Awards

A.1 LCA 732 (to Kuinui)

Greetings to the Land Commissioners: I hereby tell of my claim for my house lot at Leleo in Honolulu. The boundaries are: north, a hog enclosure; east, an irrigation channel; south, the irrigation channel; west, the house lot of Kuluahi. The interest in this place was from Kamehameha I. My interest is from my wahine, whose own kupunas and makuas lived here and are buried here. It was I who made the fence; one house stands here, which is mine. No one has objected until this time. I also have four taro patches which are adjacent to the po'alima patches and the stream. They were planted so the stream could irrigate the taro, from the side which adjoins my patches. When I got these taro patches, they were only weed grown, no food was planted and I myself made the patches. They are under the authority of the konohiki.

I am, with aloha,

KUINUI X

F.T. 200v2

Claim 732, Kuinui, February [1848]

Umi, sworn, this place is in Leleo, Honolulu aina, consisting of two pieces, a house lot and kalo ground bounded:

Waititi and Mauka by a water run called Kahala

Ewa by land of Kulamai

Makai by lot of Kulaaka.

It is fenced and and [sic] has 3 house on it; two belong to claimant and one to Kamakakoa, wahine. Claimant got it from Malaikoa in 1828 and has occupied it ever since. I know of no counter claimant.

Kalo land is in Palama, bounded:

Waititi by William Stevens's

Mauka and Ewa by land of Lauu and kalo patches

Makai by land of Puloa.

There are 4 patches. Claimant held it formerly under Keaniani, and since her death under rent to Kanau. He has held it since 1834 and pays his labour days for possession.

I do not know of any counter claimant.

F.T. 205-206v2

Page 2 of 4

<https://www.waihona.com/purchase.asp> 10/22/2014

Claim 732, Kuinui, February 23 [1848]

Umi, sworn, I know this land it is in Leleo, Honolulu aina. It consists of two parts, i.e. house lot & kalo land.

1. The house lot is bounded:

Mauka & Waititi by alaala water course

Ewa by Kukuwai

Makai by land of Kulauuka.

It is fenced & has 3 houses on it; two of which are claimants and one is Kamakakoa's.

Claimant got his title in 1828 from Malaikoa and has occupied it in peace ever since.

N.T. 527-528v2

No. 732, Kuinui

Umi, sworn by the Bible and stated, "I have seen this place. It is at Leleo in Honolulu district.

Aala is on the Waikiki and toward the mountainside

Kuluahi's lot, Ewa and

Kulauka is toward the sea.

This place has been enclosed and there are three houses on the inside. Kuinui had received his interest from Malaekoa. Probably that was the year 1828 and he has lived there since that time to this day. I have also known that Kuinui also has taro land at

Kapalama;

Kiwini's lot is Waikiki

Naluaai's lot, toward the mountain

He (Kuinui) is on the Ewa side and

Paoaaloa, toward the sea.

Kuinui's interest is from Keaniani and he had this land in the year 1834. Kanoa is the konohiki at this time and has four patches. I have not known that anyone has objected to Kuinui, altho' he is working for the konohikis at this time.

See page 536

N.T. 536v2

No. 732, Kuinui, From page 527, February 23 [1848]

Haikauai, sworn by the Bible and stated, "My testimony of the house lot and the taro land of Kuinui is the same as the statements of Umi which have been read here, and I believe they are very authentic.

Page 527

[Award 732; R.P. 2465; Leleo Honolulu Kona; 1 ap.; .56 Ac.; R.P. 2465 & 6726; Kapalama Kona; 2 ap.; 1.55 Acs]

A.2 LCA 918 (to Upai)

To the Land Commissioners, Greetings: I hereby tell you of my house lot claim at Iwilei in Honolulu. The boundaries are: north, the lot of Kananui, east, the lot of Kalaeloa, South, the lot of Haaliku, west, a road. I have occupied this place from the time of Kamehameha 1. It was infertile kula with spiny nohu weed, but at this time it has been improved and completely fenced and a house stands in it which is mine. I held it peacefully and at this time Kelliahonui is objecting. There are also some taro patches; there are three together in one place at Kumuhau in Kapalama, which adjoin the patches of Kauoiaoa and Halulu which have been held peacefully under the konohiki.

I am, with thanks,

UPAI X

F.T. 263v2

Claim 918, Upai, 3 April [1848]

Kekai, sworn, This is a house lot in Honolulu aina, bounded:

Ewa by Kauahanui's place

Mauka by Kailailoa's

Waititi by Poaliku's

Makai by Kealياهو's waste land.

It is fenced and claimant has one house on it, who I know to have lived there without dispute ever since 1834. He [She] took it up as waste land.

Kalaeloa, sworn, confirmed the previous testimony and knew of no counter claim.

N.T. 605v2

No. 918, Upai, April 3 [1848]

Kekai, sworn and stated, "I have seen this place in Honolulu here adjoining to

Kapalama and the boundaries are:

Kananui's land, Ewa

Kalaeloa's land, mountain-side
the konohiki's land, oceanside and
Koaliku's land, Waikiki.

This place has been enclosed, it is idle and Upai has lived here in peace to this time."
Kalaeloa, sworn and said, "I have seen this place and everything is just as Kekai has
related here and no one has ever objected."

N.T. 19v10

No. 918, Upai, Land Office, 1 July 1851

Kekai, sworn, he has seen his [her] land at Kumuohau, Kapalama - 3 taro patches in 1
land section.

Mauka and Waikiki, Makai by the king's land

Ewa by a ditch.

Land from Upai's husband named Kealaiki. He had received it from Oliver Holmes at
the time of Kamehameha I. No disputes to the present.

Kaiuiaao, sworn, both known in the same way.

[Award 918; R.P. 4428; Iwilei Honolulu Kona; 1 ap.; .2 Ac.; R.P., 691; Kumuulu
Kapalama Kona; 1 ap.; .4 Ac.]



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HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

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TMK # [Click here to enter text.](#)

GENERAL INFORMATION

Common / Present Name: Halona Street Bridge

Historic Name: Vineyard Street Bridge

Address: Halona Street at Kapalama Drainage Canal

City/ Town/ Location: Honolulu

County: Honolulu

TMK [(X)-X-X-XXX:XXX]: between (1)-1-6-006:030 on northwest and (1)-1-6-006:047 on southeast

Subdivision/Neighborhood: n/a

Latitude: 21d-19m-36.85s N

Longitude: 157d-52m-02.37s W

Original Use: Vehicular bridge

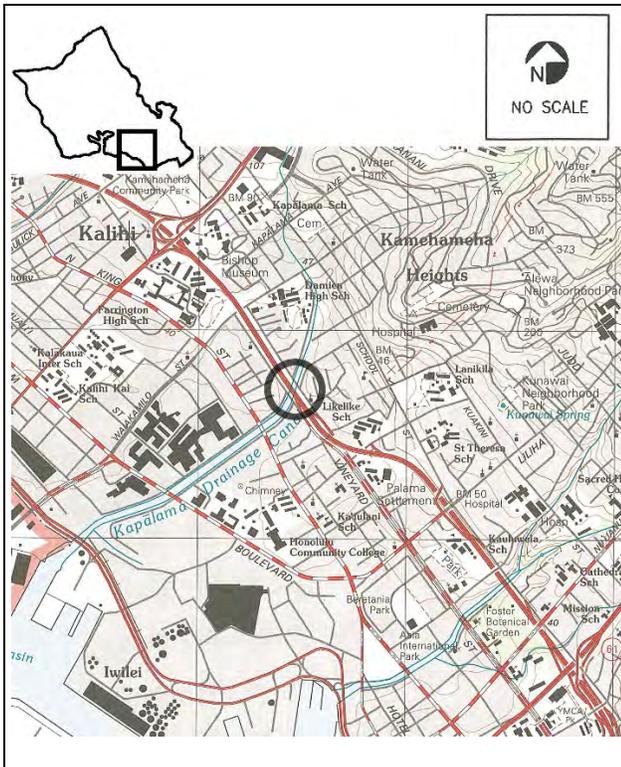
Current Use: Vehicular bridge

Architect/ Builder (if known): Department of Public Works, Bureau of Plans, City and County of Honolulu, C.T. Loo, engineer.

Date of Construction (if known): 1938



Halona Bridge, view facing southwest



LOCATION MAP



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Prepared By: Dee Ruzicka Consulting Firm:
Mason Architects, Inc.
Address: 119 Merchant St. Suite 501 Honolulu, HI 96813
Telephone Number: 808-536-0556 Email: dr@masonarch.com

CONDITION ASSESSMENT

Category (select all that apply):

- Building(s)
 - Residential
 - Commercial
 - Educational
 - Public/Civic
 - Religious
 - Structure(s)
 - Object(s)
 - Site(s)/Landscape(s)
 - Archaeology or potential for archaeology
- Describe: _____

Alterations (additions, etc.) if known: The five span, 1938 bridge was altered in 1963 when the adjacent H1 freeway was constructed. The southwest parapet and end stanchions were removed and the roadway width reduced from about 40' to 26'-6". The abandoned sidewalk on the southwest side that abuts the H1 freeway concrete barrier is likely the original sidewalk from the 1938 bridge. The curb edge of this abandoned sidewalk is about 40' from the curb at the opposite sidewalk at the extant bridge parapet. This corresponds to the approximate 40' roadway width in 1938 when the bridge carried Vineyard Street. It is likely that the bridge parapet that was removed ca. 1963 was at about the position of the current H1 freeway concrete barrier.



Halona Bridge, view facing north



Halona Bridge, view facing west

Original Location, if moved: _____
Reason for move (if known): _____

Condition:

- Excellent
- Good
- Fair
- Deteriorated

Condition Explanation: _____

Eligibility (select all that apply):

- National Register of Historic Places
- State Register of Historic Places
- Not Eligible
- Eligible



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- Listed
- Contributing to Historic District:
- Name of District:
- Unknown

Criteria of Significance (select all that apply)

A: Associated with Events
 Event: Development of Vineyard St. and Kapalama Canal.

B: Associated with Significant Person(s)
 Person(s): _____

C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)

D: Have yielded or may be likely to yield information important to history or prehistory. Explain: _____



Halona Bridge, view facing northwest

DESCRIPTION

Materials (please check those materials that are visible):

Height

- Stories: _____
- Below Ground
- N/A
- Other: bridge

Exterior Walls (siding):

- | | | |
|---|---|--|
| <input type="checkbox"/> Aluminum Siding | <input type="checkbox"/> Log | <input type="checkbox"/> Vinyl Siding |
| <input type="checkbox"/> Asbestos | <input type="checkbox"/> Metal | <input type="checkbox"/> Engineered Siding |
| <input type="checkbox"/> Brick | <input type="checkbox"/> Shingles-Asphalt | <input type="checkbox"/> Plywood |
| <input type="checkbox"/> Ceramic | <input type="checkbox"/> Shingles-Wood | <input type="checkbox"/> OSB |
| <input checked="" type="checkbox"/> Concrete | <input type="checkbox"/> Stone | <input type="checkbox"/> Fiberboard |
| <input type="checkbox"/> Horizontal Wood Siding | <input type="checkbox"/> Stucco | <input type="checkbox"/> Fiber Cement |
| | <input type="checkbox"/> Vertical Wood Siding | <input type="checkbox"/> Other: _____ |

Roof:

- | | | |
|---|-----------------------------------|--|
| <input type="checkbox"/> Asphalt, shingle | <input type="checkbox"/> Metal | <input type="checkbox"/> Ceramic Tile |
| <input type="checkbox"/> Asphalt, roll | <input type="checkbox"/> Slate | <input type="checkbox"/> Wood Shingle |
| <input type="checkbox"/> Other: _____ | <input type="checkbox"/> Built Up | <input checked="" type="checkbox"/> None |

Foundation:

- | | | |
|---|---|---------------------------------------|
| <input type="checkbox"/> Brick | <input type="checkbox"/> None – on earth | <input type="checkbox"/> Stone |
| <input type="checkbox"/> Concrete Block | <input checked="" type="checkbox"/> Poured Concrete | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Concrete Slab | <input type="checkbox"/> Raised/Pile | |

Structural Support:

- | | | |
|---|---|---------------------------------------|
| <input type="checkbox"/> Baled Hay | <input type="checkbox"/> Frame-wood | <input type="checkbox"/> Puddled Clay |
| <input type="checkbox"/> Concrete Block | <input type="checkbox"/> Frame-metal/steel | <input type="checkbox"/> Rammed Earth |
| <input type="checkbox"/> Concrete Framed | <input type="checkbox"/> Brick-load bearing | <input type="checkbox"/> Sod |
| <input checked="" type="checkbox"/> Concrete Poured | <input type="checkbox"/> Stone-load bearing | <input type="checkbox"/> Other: _____ |



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Windows:

- Double Hung Sash
- Single Hung Sash
- Casement
- Fixed
- Stained Glass

- Replacement
 - Aluminum
 - Vinyl
- Jalousie
- Ribbon

- Glass Block
- None/Unknown
- Other: _____

Lanai(s)

- Arcade
- Balcony
- Porte-Cochere
- Recessed

- Stoop
- Portico
- Verandah
- Wrap-around

- None
- Other: _____

Chimney

- Brick
- Concrete
- Stuccoed Masonry

- Stone
- Stove Pipe
- Siding

- None
- Other: _____



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Narrative Description

Narrative Description:

The Halona Street Bridge (Feature MAI A) is a 108' long, five span, reinforced concrete deck bridge that carries the two traffic lanes of Halona Street one way over the Kapalama Drainage Canal in the Kalihi-Palama neighborhood of Honolulu. The overall width of the bridge includes the 26'-6" wide roadway and a 7'-2" wide sidewalk at the upstream (northeast) side of the bridge. The bridge has only one parapet at the upstream side. The other was removed ca. 1963 for the construction of the H1 freeway bridge.

The setting of the bridge is urban with the H1 freeway paralleling Halona Street and abutting the bridge on the southwest side. The upstream sides of the Kapalama Drainage Canal are lined with roughly coursed concrete rubble masonry. To the northeast (upstream) there is a wide view along Kokea and Kohou Streets upstream to where the canal ends at the mouth of Kapalama Stream and the junction of an unnamed drainage channel. Houses line Kokea and Kohou Streets. In the distance, the Koolau Range is visible.

The 3'-3" high concrete parapet of the Halona Street Bridge has narrow arched openings that are typical of 1930s concrete bridges in Hawaii. The arched openings are 6" wide and 1'-2" high and are on 1' horizontal spacing and are set in a 1'-9" high portion of the parapet that is between the 7" high cap rail and the 11" high (typical) base. The parapet is 88'-6" long between the end stanchions which are curved in plan. Each end stanchion is about 3'-6" high on a 9" high (typical) base and is about 1'-10" thick. The curving end stanchions measure about 5'-9" around the front curve and about 4'-3" around the rear curve. Each has a large incised panel, 5' wide x 2' high that has the inscription "KAPALAMA CANAL" or "1938" in 3" high block letters.

The Halona Street roadway has one 14' wide lane and one 12'-6" wide lane. Both lanes are northbound, Halona Street is one way. Off the Halona Street roadway on the southwest side, a curb leads to a 13'-8" wide strip of level earth that is sparsely planted with grass and short weeds. This strip has a chain-link fence, about 6' from the Halona Street curb, which prevents entry to the H1 freeway. At the southwest side of the earth strip, on the freeway side of the fence, is an abandoned sidewalk about 6' or 7' wide that is abutted on the southwest side by the concrete traffic barrier of the freeway. The outer two spans of the five-span bridge are each about 25' and the three center spans are each about 16'. The bridge has concrete abutments. The concrete rubble masonry of the canal lining begins at the edge of the abutments. Four transverse beams on concrete piles driven into the bed of the canal support the bridge. The beams have chamfered noses on their upstream ends and the concrete piles are typically 1' square and set on about 8' spacing.

Halona Street Bridge is bridge number 003000H10202075 in the National Bridge Inventory database. It was last inspected on June 26, 2013 by the State of Hawaii, Department of Transportation, Highways Division.

Integrity: The ca. 1963 construction of the adjacent H1 Freeway has removed about half of the bridge, only the upstream parapet, sidewalk, and two traffic lanes remain. The bridge is on its original location, but all other



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aspects of integrity have been reduced by the freeway construction and removal of the bridges historic fabric. The bridge does not retain the integrity necessary for eligibility to the National Register of Historic Places.

Nearby Resources:

Within the Area of Potential Effect (APE), additional resources were identified:

Feature MAI B: Kapalama Drainage Canal including lava rock lining walls. Location: The canal extends under the bridge in a general northeast to southwest orientation. Lava rock lining walls are upstream of Halona Street Bridge, and downstream of the H1 and Olomea Street bridges. Description and evaluation: The Kapalama Drainage Canal extends from Honolulu Harbor about 1 3/8 miles to Kapalama Avenue. The Halona Street Bridge is about 3/4 mile from the harbor. For most of its length, from the harbor to a fork in the canal that is about 350' above the Halona Street Bridge, the canal is between about 60' to 100' wide. At the fork, the main branch of the canal extending north toward Kapalama Street is about 35' wide. The lesser channel, extending east along Kokea Street is about 15' wide.

The canal typically has 6' high earthen banks below King Street. Above King Street the canal is channelized with hardened side walls of lava rock and concrete mortar that are about 8' high. The walls feature faced stones set in rough courses with protruding, V-profile mortar joints.

The Kapalama Drainage Canal was completed in February 1939 after about a year of construction by the Hawaiian Contracting Company. Planning for the canal dates to the early 1920s when the potential commercial value of the low-lying land of the Kapalama area was recognized. Beginning in 1924, dredging spoils from Honolulu Harbor were used to fill about 11 acres of a 58-acre section makai of Vineyard Street that had been condemned by the Territorial Board of Health as unsanitary. Spoils from the 1925-26 dredging of the Kapalama Basin were used to bring the remaining acreage up to grade level. Along with this filling project, the City and County of Honolulu formed a drainage plan to prevent heavy rains from inundating the new land. This design combined the two streams of the area, Niuhelewai and Kapalama in to the Kapalama Drainage Canal, that was ultimately routed along the approximate contour of Niuhelewai Stream.

The plans for the canal languished until late 1937 or early 1938, when construction got underway. The canal and stonework was accomplished under a Works Progress Administration (WPA) project that built the Kapalama Drainage Canal. A WPA grant of \$310,000 partially funded the overall \$670,000 cost of the canal. Most of the balance was funded by bond sales by the City and county of Honolulu and from the flood control fund of the city and county.

The Kapalama Drainage Canal and its lava rock and concrete side walls are evaluated as potentially eligible for the National Register under Criterion A for their association with WPA projects in Hawaii and under Criterion C as an example of vernacular building materials.



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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During the field inspection of Halona Street/ Vineyard Boulevard for a distance of up to about ½ mile on either side of the Halona Street Bridge the following features were noted which are outside the APE.

Feature MAI C: On Tong Tung Heong Society building, 544 N. Vineyard Blvd. (TMK 1-7-032: 082). Location: About ½ mile southeast of the Halona Street Bridge on Vineyard Blvd. Description and evaluation: This two-story, residential-scale building, built in 1937, is of wood construction with a gable roof. It has a projecting second floor lanai over the front entry that is supported by paired, square columns. This building is outside the APE and was not evaluated for eligibility for the National Register of Historic Places.

Feature MAI D: Buck Toy Club building, 572 N. Vineyard Blvd. (TMK 1-7-032: 025). Location: About 2200' south east of the Halona Street Bridge on Vineyard Blvd. Description and evaluation: This 1957 building, designed by Honolulu architect Ray Akagi, is two-story, built of concrete block with retail spaces on the first floor and areas for club members on the second floor. The building has a gablet on hip roof with "Orientalist" upturned corners and closed eaves that is covered with green glazed tiles. The front façade has a cantilevered canopy. An interior stairway has a moon gate entrance on the front façade that is closed by a Chinese-motif metal gate. The upper part of the front façade has two panels faced with thin courses of stone that flank three bays of windows with Chinese-detailed muntins. Each stone-work panel has a small window, and a small octagonal window is set in the second floor above the moon gate. All three of these small windows have Chinese-inspired decorative grilles. The sashes, muntins, and grilles of all windows, as well as the moon gate are painted bright red. This building is outside the APE and was not evaluated for eligibility for the National Register of Historic Places.

Feature MAI E: Palama Settlement, 810 N. Vineyard Blvd. (TMK 1-7-045: 001). Location: About 1100' southeast of the Halona Street Bridge. Description and evaluation: Two large, two-story Greek Revival Style wooden buildings built ca. 1925 with full-height entry porch with square columns, broken pediment and rectangular transom at the entry. The buildings are outside the APE and were not evaluated for eligibility for the National Register of Historic Places.



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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Halona Bridge Survey Area



 APE
 Survey Area



0 0.05 0.1 0.2 Miles



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

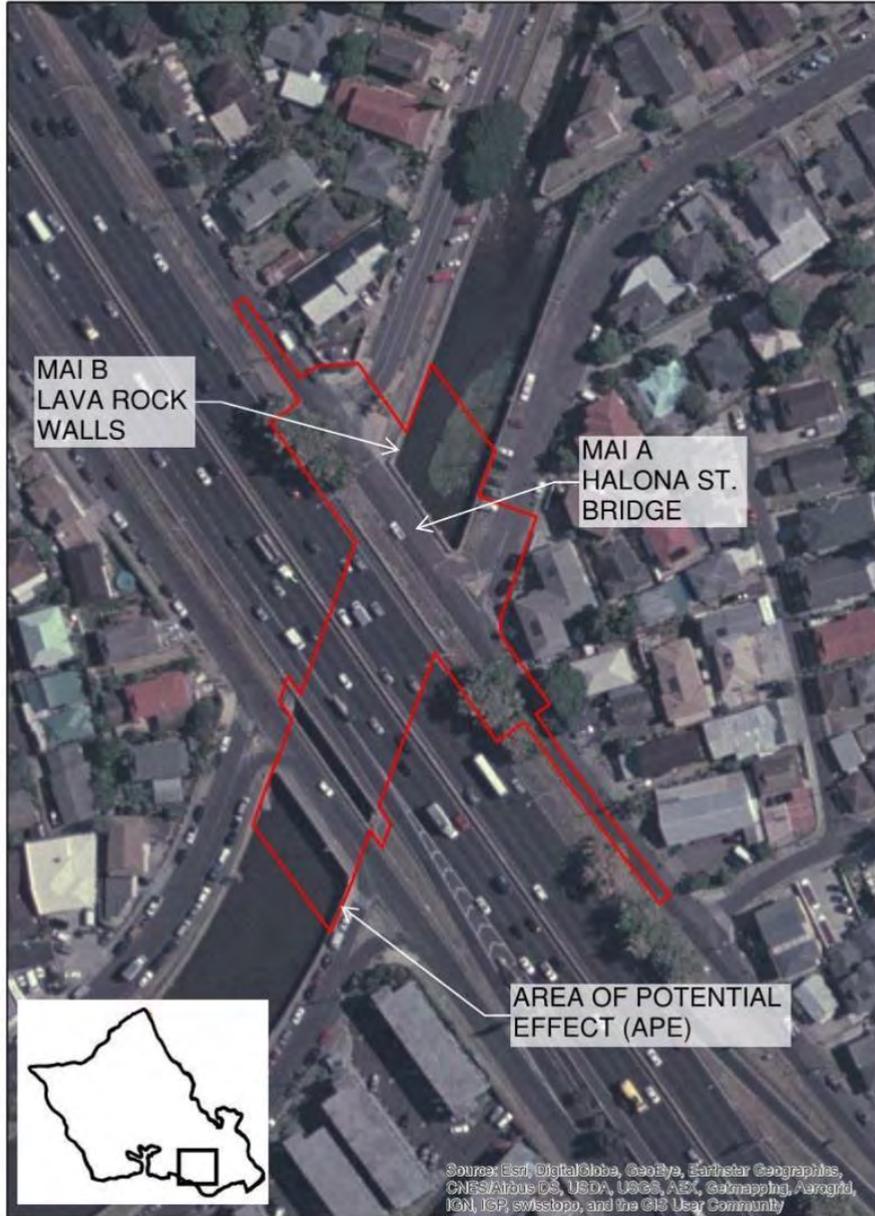
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Halona APE

Historic Resources
within the APE



Halona APE



0 0.01 0.02 0.04 Miles



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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Statement of Significance

Historical Context:

The Halona Street Bridge, in its present five-span form, was built in 1938 by the City and County of Honolulu under Job No. 44-37. This 1938 construction added two, approximate 25' spans on each side of the existing center three spans (approximately 16' spans). At the time of this 1938 construction, it carried Vineyard Street across the canal and was called the Vineyard Street Bridge. The original construction date for the older, three span bridge is not known, but it is likely to be ca. 1930, which is the date of construction for the Dillingham Boulevard bridge, about one mile downstream from the Halona Street Bridge. The Dillingham Boulevard Bridge was built about eight years before the Kapalama Drainage Canal was built (1938). The canal banks at Dillingham are earth and not stabilized with retaining walls, as are the banks at Halona Street. It appears that the 1938 canal was built under the Dillingham Bridge without disturbing it. At Halona Street (Vineyard) in 1938 when the canal was built, the existing 3 span bridge was lengthened with two additional spans to cross the canal between its newly built lava rock retaining walls. The stabilization of the banks of the canal using the lava rock retaining walls was extended downstream to the King Street Bridge (1938).

At the time of the 1938 construction, the older parapets of the bridge (of unknown design) were removed and parapets with arched openings and curved end stanchions were built. The 1938 bridge was about 56' wide.

Original drawings for the five span (1938) bridge are dated November 17, 1937. They were produced by the Department of Public Works, Bureau of Plans, City and County of Honolulu and are signed by the City and County Engineer, B. F. Rush. The engineer of the bridge is indicated in the title block as C. T. Loo.

Significance Statement:

Halona Street Bridge is not included in the November 2013 Hawaii State Historic Bridge Inventory and Evaluation by MKE Associates, LLC, and Fung Associates, Inc. It is also not included in the 1983 Historic Bridge Inventory, Island of Oahu by Bethany Thompson.

Although the Halona Street Bridge is significant under Criterion A for its association with the transportation history of the area, it does not appear to be eligible for the Hawaii or National Register of Historic Places due to a lack of integrity of its 1938 form. This is due to the ca. 1963 removal of the southwest parapet, reduction of roadway width, and construction of the adjacent H1 Freeway.

References

Drawings:

Historic drawings are available at the Hawaii Department of Transportation, Highway Design Section database as electronic scans. These include:



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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Job No. 44-37 Kapalama Drainage, 5 sheets. Dated 1937

FAP No. U-072-1(3) Lunalilo Freeway, 106 sheets. Dated 1963

Sources:

"Another Step Forward in Flood Control." Honolulu Advertiser. February 25, 1939. p. 12.

"Captain Charles R. Welsh Submits First Report To City Planning Commission On Drainage Plan for Kapalama District." Honolulu Advertiser. August 10, 1924. p. 12.

City Planning Commission, City and County of Honolulu, map "Proposed Street Plan Kapalama Section," December 1922.

Cultural Surveys Hawaii, Inc. "Draft, Phase I Archaeological Survey Report for the Halona Bridge Improvements Project." Prepared for CH2M Hill on behalf of the Federal Highways Administration Central Federal Lands Highway Division. October 2014.

"Delay Seen On Flood Project." Honolulu Advertiser. October 1, 1937. p. 3.

Hawaii Highway Planning Survey, Territorial Highway Department. *Bridge Inventory for the Island of Oahu*. Honolulu: Hawaii Territorial Highway Department. September 1950.

"Kapalama Flood Control Bonds May Be Sold In Issue." Honolulu Advertiser. October 1, 1937. p. 4.

"Proposed Kapalama Plan Discussed At Meeting Of Planners and Public." Honolulu Advertiser. November 16, 1924. p. 14.

Ruzicka, Dee. "Kapalama Canal Bridge." Draft of National Register of Historic Places Nomination Form. Prepared for Honolulu High Capacity Transit Corridor, April 15, 2013.

"Start Canal At Kapalama In December." Honolulu Advertiser. October 1, 1937. p. 1.

State of Hawaii, Department of Transportation, Highways Division. "NBI Bridge Inspection Report, Bridge Number 003000H10202075." June 26, 2013. The current bridge inspection report for this bridge, available at the Hawaii Department of Transportation, Highway Division, Bridge Design Office.

Superintendent of Public Works, Territory of Hawaii. *Report to the Governor, Territory of Hawaii by the Superintendent of Public Works*. Honolulu: Advertiser Publishing Co., LTD. Various dates. .



U.S. Department
of Transportation
**Federal Highway
Administration**

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380A
Lakewood, CO 80228-2583
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

January 12, 2016

In Reply Refer To:
HFPM-16

TO: THE HONORABLE SUZANNE CASE, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTN: SUZANNE CASE
STATE HISTORIC PRESERVATION OFFICER

FROM: J. MICHAEL WILL, P.E.
PROJECT MANAGER

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 AND HAWAII
REVISED STATUTES, CHAPTER 6E CONSULTATION
HALONA STREET (KAPALAMA CANAL) BRIDGE REPLACEMENT
PROJECT
HONOLULU (KONA) DISTRICT, OAHU ISLAND, KAPALAMA AHUPUAA
PROJECT NO. HI STP H1 (1)
TAX MAP KEY: (1)1-6-002 (Olomea Street and H-1 Interstate Highway Rights-
of-Way, and Kapalama Canal)
(1)1-6-006 (Halona Street, Kokea Street, Kohou Street and H-1
Interstate Highway Rights-of-Way, and Kapalama
Canal)

Dear Ms. Case:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is proposing to replace the Halona Street Bridge over the Kapalama Canal on Hawaii State Highway 98 (HI-98) adjacent to Interstate H-1 (H-1), also known as Halona Street, at Mile Post 20.21 (see attached Area of Potential Effects [APE] U.S. Geological Survey map for project location). The proposed project is considered a federal action and undertaking, and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006), as well as Hawaii Revised Statutes (HRS) Chapter 6E. This letter is to initiate consultation with the State Historic Preservation Division (SHPD) under Section 106 in accordance with Title 36 of the *Code of Federal Regulations* (CFR), Section 800.3, and with HRS Chapter 6E-8.

Overview of the Undertaking

The proposed project would replace the existing Halona Street Bridge and its approaches to maintain the Kapalama Canal crossing on Halona Street as a safe and functional component of the regional transportation system for roadway users.

The existing Halona Street Bridge would be demolished and removed. The replacement bridge would be a precast three-span bridge with a total length of approximately 131 feet. The bridge

would have a deck width of 39 feet and a depth of 2.5 feet. The new bridge would raise the road profile slightly higher than the existing bridge but would be narrower because of the removal of the landscaped buffer that sits atop the existing bridge deck.

The four existing piers would be removed and replaced with two piers that would be aligned with the two existing and adjacent H-1 bridge piers. The pier shapes would be similar to the existing H-1 bridge piers. The proposed new bridge abutments would be set back from and behind the existing abutments. The tops of the existing abutments would be cut down to accommodate the deeper bridge girders. The canal's lava rock lining walls, which are located upstream of the Halona Street Bridge and downstream of the H-1 and Olomea Street bridges, would be retained and protected in place adjacent to the bridge; however, removal of the existing bridge features may result in some physical damage to the lava rock walls. The existing Kapalama Canal and its lava rock lining walls have been determined by FHWA to be eligible for listing on the National Register of Historic Places (NRHP) (see eligibility discussion below). Photos will be taken prior to the start of construction. If the walls are physically affected during construction, the stone will be salvaged and repaired to match its existing condition.

The proposed improvements would occur within the existing HDOT right-of-way. In addition, 0.44 acre of land would be needed from four temporary construction parcels owned by the City of Honolulu to accommodate bridge construction and paving improvements. One of these parcels, the Kapalama Canal, is eligible for listing on the NRHP.

Staging of personnel and equipment would occur within the project limits. Possible staging areas are located along Halona Street (on pavement) north and south of the bridge, as well as areas adjacent to the Kohou Street and Kokea Street intersections. The work area would be accessed from the sides of the canal. Construction would occur within the Kapalama Canal under the Halona Street Bridge.

The Halona Street Bridge would likely be closed to vehicular traffic for the duration of the project, and traffic would be detoured during this time. However, pedestrian and bicyclist access would be maintained in a temporary pedestrian route within the existing landscaped area between the construction work and the H-1 freeway. Access to the H-1 on-ramp would be maintained during construction. Archaeological monitoring will be conducted for all initial ground disturbance and excavation activities during construction.

Area of Potential Effects

The archaeological and historic architectural APE are illustrated in the attached APE Aerial Imagery map, and includes both temporary and permanent impact areas. The APE was developed to be sufficiently large to accommodate potential improvements on the other side of H-1; however, none were identified as necessary. The APE comprises 1.5 acres and includes the following TMKs: (1)1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, and Kapalama Canal), and (1)1-6-006 (Halona Street, Kokea Street, Kohou Street and H-1 Interstate Highway Rights-of-Way, and Kapalama Canal).

Determination of Eligibility

Pursuant to NHPA Section 106 and HRS Chapter 6E-8, a cultural resources investigation was performed within a field survey area that included the project's APE. The cultural resources investigation comprised an archival literature review, an architectural reconnaissance survey, and an archaeological inventory survey. The surveys identified two resources within the APE: the Halona Street Bridge (SIHP #50-80-14-7807) and the Kapalama Canal and associated lava rock walls (SIHP #50-80-14-7808). The surveys did not identify any new archaeological or

architectural resources within the APE. FHWA believes all historic properties with potential to be affected by the undertaking have been identified.

The Halona Street Bridge lacks integrity and is evaluated by Mason Architects as not eligible for listing on the NRHP or the Hawai'i Register of Historic Places (HRHP). Mason Architects evaluated the Kapalama Canal and its lava rock walls as eligible for the NRHP and HRHP under Criterion A and Criterion C.

FHWA is in agreement with the recommendations of Mason Architects and has therefore determined that SIHP #50-80-14-7808, the Kapalama Canal and associated lava rock walls, is *eligible* for the NRHP under Criterion A for its association with Works Project Administration projects in Hawaii and Criterion C as an example of vernacular building materials. FHWA has also determined that the Halona Street Bridge (SIHP #50-80-14-7807) lacks integrity and is therefore *not eligible* for listing on the NRHP.

Detailed information on the cultural, archaeological, and historical settings of the project area and the evaluation of eligibility are provided in two studies prepared for this project, included on the enclosed CD:

1. Draft Archaeological Inventory Survey Report for the Halona Bridge Replacement Project, Kapalama Ahupuaa, Honolulu District, Oahu
2. SHPD Historic Resource Inventory Form (Reconnaissance Level) for Halona Bridge

Determination of Effects

FHWA has determined that the undertaking will result in a *No Adverse Effect* finding on the Kapalama Canal (SIHP #50-80-14-7808) in accordance with Federal regulations (36 CFR 800.5). In addition, FHWA and HDOT have determined the project will result in an *Effect, With Agreed Upon Mitigation* finding on the Kapalama Canal in accordance with HAR §13-13-275-7. The removal of the existing bridge superstructure that is in contact with the lava rock lining walls may cause minor and incidental damage to the Kapalama Canal wall on the upstream east and upstream west portions of the bridge abutments. The area in contact with lava rock lining walls is approximately 13 square feet at each location to total 26 square feet. Every effort will be made to not impact the lava rock lining walls. Photos of the lava rock walls will be taken prior to the start of construction. In the event of cracked mortar or loosened lava rock stones they will be salvaged and replaced and the mortar restored to match the existing condition.

A detailed Determination of Effects memorandum is enclosed with this letter.

As part of the environmental process for this undertaking, FHWA must also comply with Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966. The intent of the Section 4(f) Statute, 49 U.S.C. Section 303, and the policy of the FHWA is to strive to avoid transportation use of historic sites and publicly owned recreational areas, parks, wildlife and waterfowl refuges. However, the legislation states that a transportation project may be approved if it results in a *de minimis* impact. As defined in FHWA's implementing regulations (23 CFR 774), "for historic sites, *de minimis* impact means that the FHWA has determined, in accordance with 36 CFR part 800, that no historic property is affected by the project or that the project will have "no adverse effect" on the historic property in question." This project has been determined to have *no adverse effect* on the Kapalama Canal. Based on the findings outlined above, FHWA-CFLHD may make a *de minimis* finding for the Section 4(f) requirements for the Kapalama Canal.

Consultations

Section 106 notice/advertisement was published in the Honolulu Star-Advertiser on July 24, 2015. 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 were asked to provide a response within 30 days of notification.

Section 106 consultation letters were sent to the following organizations as potential consulting parties:

- Office of Hawaiian Affairs
- Kalihi Palama Hawaiian Civic Club
- Hawaiian Civic Club of Honolulu
- Koolauloa Hawaiian Civic Club
- Oahu Island Burial Council
- Paulette Kaanohiokalani Kaleikini
- Historic Hawaii Foundation

Request for Concurrence

We request your concurrence with the APE and Determinations of Eligibility and Effects. We would appreciate a written response within 30 days from date of receipt, by email at Michael.will@dot.gov or by U.S. Postal Service to 12300 West Dakota Avenue, Suite 380A, Lakewood, CO 80228-2583.

Please feel free to contact Nicole Winterton, Environmental Protection Specialist, at (720) 963-3689 or by email at nicole.winterton@dot.gov, if you have any questions. We look forward to working with the SHPO on these needed improvements.

Sincerely yours,



J. Michael Will, P.E.
Project Manager

Enclosures:

- Area of Potential Effects (USGS Map)
- Area of Potential Effects (Aerial Imagery)
- Determination of Effects Memorandum, with attached design drawings
- On CD: Draft Archaeological Inventory Survey Report for the Halona Bridge Improvements Project, Kapalama Ahupuaa, Honolulu District, Oahu
- On CD: SHPD Historic Resource Inventory Form (Reconnaissance Level) for Halona Bridge

cc (with enclosures on CD):

Kevin Ito, HDOT
Todd Nishioka, HDOT
Jessica Puff, SHPD
Susan Lebo, SHPD

Appendix E
Draft Cultural Impact Assessment for the Halona
Street Bridge (December 2015)

Draft

**Cultural Impact Assessment for the
Halona Street Bridge (H-1 on-ramp at Vineyard Street)
Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu,
Federal Highway Administration/
Central Federal Lands Highway Division (FHWA/CFLHD)
Contract DTFH68-13-R-00027
TMKs: [1] 1-6-002 (Halona Street Right-of-Way) and
1-6-006 (Kapālama Canal)**

**Prepared for
CH2M HILL
and on behalf of the
Federal Highway Administration (FHWA)
Central Federal Lands Highway Division (CFLHD)**

**Prepared by
Nicole Ishihara, B.A.
and
Hallett H. Hammatt, Ph.D.**

**Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: KAPALAMA 25)**

December 2015

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Management Summary

Reference	Cultural Impact Assessment Report for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu, Federal Highway Administration/Central Federal Lands Highway Division (FHWA/CFLHD) Contract DTFH68-13-R-00027, TMKs: [1] 1-6-002 (Halona Street Right-of-Way) and 1-6-006 (Kapālama Canal) (Ishihara and Hammatt 2015)
Date	December 2015
Project Number(s)	<ul style="list-style-type: none"> • FHWA/CFLHD Contract Code: DTFH68-13-R-00027 • CH2MHILL Project Task ID: 499069.10SU.CS • Cultural Surveys Hawai'i, Inc. (CSH) Job Code: KAPALAMA 25
Agencies	FHWA/CFLHD, SHPD
Land Jurisdiction	State Department of Transportation (HDOT)
Project Proponent	FHWA/CFLHD, HDOT
Project Funding	FHWA/CFLHD
Project Location	The study area is located within Kapālama Ahupua‘a at the location of the Halona Street Bridge and the Kapālama Canal and includes portions of the H-1 Interstate Highway and Halona Street from the intersection of Kuipaakea Lane to just beyond Kohou Street. The study area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The purpose of the project is to replace the existing bridge to meet current design standards for roadway width, load capacity, pedestrian traffic, bridge railing and transitions, and bridge approaches. The existing bridge was built in 1938. It was determined that this bridge shall be replaced due to the existing superstructure conditions. A single span bridge is preferred, but if additional vertical clearance is needed, a reduced structure depth could be accommodated by using a multiple-span bridge with pier locations matching H-1's pier locations in the channel. New abutments are proposed to be located behind existing abutments to match the H-1 abutment locations and minimize impacts to the masonry walls along the channel. The proposed bridge width is approximately 46 feet (ft). A bridge barrier study will be performed as part of the project development to consider a variety of types and shapes to meet TL-3 requirements. The bridge railing height will be a minimum of 3 ft 6 inches. Additional bridge width and features will be explored to restrict access to the underside of the bridge. Foundations for the new bridge are expected to consist of deep foundations.
Project Acreage	The study area includes approximately 4.9 acres.

<p>Document Purpose</p>	<p>This CIA was prepared to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the proposed project’s potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts to cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control’s <i>Guidelines for Assessing Cultural Impacts</i>) which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance criterion “e,” pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance criterion “e” refers to historic properties that “have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity” (HAR §13-275-6 and §13-284-6). The document will likely also support the project’s historic preservation review under HRS §6E and HAR §13-275 and §13-284. The document is intended to support the project’s environmental review and may also serve to support the project’s historic preservation review under HRS §6E-8 and HAR §13-284.</p>
<p>Results of Background Research</p>	<p>Background for this project yielded the following results (presented in approximately chronological order):</p> <ol style="list-style-type: none"> 1. Kapālama is often understood to refer to an enclosure (<i>pā</i>) of <i>lama</i> wood that surrounded the residences of high ranking <i>ali ‘i</i> (chief) (Pukui et al. 1974:87). McAllister (1933:88) relates that Kapālama is said to obtain its name from an establishment for young <i>ali ‘i</i> who were paired off for offspring. Westervelt (1923:165) attributes the place name to a chiefess of O‘ahu named Kapālama, the grandmother of Lepeamoa. 2. Kapālama Ahupua‘a consists of two streams: Kapālama and Niuhelewai (“coconut going [in] water”). The two streams merge and extend through the central fertile former taro and rice fields draining into Kūwili II, a fishpond. Other fishponds within Kapālama include Loko Kapukai and Loko Kealia. Pukui et al. (1974) did not offer any translations, however, the word <i>keālia</i> is the word for “salt bed,” which may indicate that at least one of these ponds was used for salt collection. 3. Two accounts of warfare occurred in Kapālama: Kahahawa‘i defeated Kahāhana with Niuhelewai as the location of the battle; and the rebellion of the ‘Ewa and Kona chiefs, which occurred after Kahāhana’s death. The latter battle took place at Makaho and Niuhelewai streams as well as Kahoa‘ai‘ai Stream in ‘Ewa.

	<ol style="list-style-type: none"> 4. LCA testimonies for Kapālama Ahupua‘a indicate intense taro cultivation of the area, maintenance of fishpond, habitation, and some use of <i>kula</i> (pasture, plain) lands. Large areas were also set aside for the cultivation of rice. 5. An area known as Kaiwi‘ula within Kapālama Ahupua‘a was chosen for the first Kamehameha School for Boys, which opened in 1887. The construction of a principal’s house, dormitories, faculty housing, a preparatory school, dining hall, kitchen, school shops, and administrative buildings followed the opening of the school. 6. Charles Bishop was interested in preserving artifacts and personal treasures of his late wife, Bernice Pauahi Bishop, as well as the late Queen Emma who willed these possessions to him with the condition of curating these items and naming it the Kamehameha Museum. The trustees of the Bishop Estate chose a site near the Kamehameha School for Boys. The museum was housed in Bishop Hall and opened in 1891. In 1894, Polynesian Hall was added; in 1903, Hawaiian Hall opened; in 1911, Pākī Hall was added; and in 1925 the Konia Hall. 7. In 1947, the Kamehameha Schools moved their campus to Kapālama Heights and the former school grounds were transferred to the Bishop Museum Trust. In 1980, Bishop Hall was formally transferred to Bishop Museum. 8. The construction of the H-1 Interstate Highway began during the 1960s from Fort Shafter to Houghtailing Street. It was the first time federal monies were being used in Hawai‘i to construct an interstate highway system. 9. There have been no previous archaeological studies or State Inventory of Historic Properties (SIHPs) reported within the current study area. However, several burial sites (SIHP #s 50-80-14-3373, subsurface cultural deposit and burial; and -4929, coffin burial) were found south of the project area. 10. Several historic properties found in the vicinity of the project area also reflect the diverse pre-Contact (SIHP # 50-80-14-5368, Kuwili Fishpond) and post-Contact (SIHP # 50-80-14-7506, subsurface incinerated trash deposit) history of the area and the shift in the cultural landscape of Kapālama.
<p>Results of Community Consultation</p>	<p>CSH attempted to contact Native Hawaiian Organizations (NHOs), agencies, and community members. Consultation was received from the following community members:</p> <ol style="list-style-type: none"> 1. Jan Becket, retired Kamehameha Schools teacher, author, photographer, knowledgeable in cultural sites, Kona Moku Representative for the Committee on the Preservation of Historic Sites and Cultural Properties

	<ol style="list-style-type: none"> 2. Melvin Ishihara, former Executive Director of the Public Utilities Commission and former resident of Kapālama Ahupua‘a 3. DeSoto Brown, historian at Bishop Museum
Impacts and Recommendations	<p>Based on information gathered from the cultural and historic background, the proposed project may potentially impact undetected <i>iwi kūpuna</i> (ancestral bones). CSH identifies potential impacts and makes the following preliminary recommendations. Please note that CSH is still awaiting approval of an interview transcription and summary that was conducted for this study and the impacts and recommendations may change pending approval of interview transcriptions and summary.</p> <ol style="list-style-type: none"> 1. Māhele documents indicate the vicinity and a portion of the project area was once under intense habitation and cultivation by. Previous archaeology conducted south of the project area has yielded <i>iwi kūpuna</i> (SIHP # 50-80-14-3373 and -4929). However, no archaeology has been conducted within the project area. Based on these findings, there is a high possibility <i>iwi kūpuna</i> may be present within the project area and that land-disturbing activities during construction may uncover presently undetected burials or other cultural finds. Should burials (or other cultural finds) be encountered during ground disturbance or via construction activities, all work should cease immediately and the appropriate agencies should be notified pursuant to applicable law, HRS §6E.

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Section 1 Introduction

1.1 Project Background

At the request of CH2M HILL and on behalf of the Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), Cultural Surveys Hawai‘i, Inc. (CSH) has completed this cultural impact assessment report for the Halona Street Bridge replacement project, Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu, FHWA/CFLHD Contract DTFH68-13-R-00027, TMKs: [1] 1-6-002 (Halona Street Right-of-Way) and [1] 1-6-006 (Kapālama Canal). The study area is located within Kapālama Ahupua‘a at the location of the Halona Street Bridge and the Kapālama Canal and includes portions of the H-1 Interstate Highway and Halona Street from the intersection of Kuipaakea Lane to just beyond Kohou Street. The study area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), tax map plats (Figure 2 and Figure 3), and a 2013 aerial photograph (Figure 4).

The purpose of the project is to replace the existing bridge to meet current design standards for roadway width, load capacity, pedestrian traffic, bridge railing and transitions, and bridge approaches. The existing bridge was built in 1938. It was determined that this bridge shall be replaced due to the existing superstructure conditions. A single span bridge is preferred, but if additional vertical clearance is needed, a reduced structure depth could be accommodated by using a multiple-span bridge with pier locations matching H-1’s pier locations in the channel. New abutments are proposed to be located behind existing abutments to match the H-1 abutment locations and minimize impacts to the masonry walls along the channel. The proposed bridge width is approximately 46 feet (ft). A bridge barrier study will be performed as part of the project development to consider a variety of types and shapes to meet TL-3 requirements. The bridge railing height will be a minimum of 3 ft 6 inches. Additional bridge width and features will be explored to restrict access to the underside of the bridge. Foundations for the new bridge are expected to consist of deep foundations.

The study area includes approximately 4.9 acres (1.9 ha). For the purposes of this archaeological reconnaissance, the area of potential effect includes the entire 4.9-acre project area.

1.2 Document Purpose

The purpose of this CIA is to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the project’s potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts on cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control’s *Guidelines for Assessing Cultural Impacts*), which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance criterion “e,” pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance criterion “e” refers to historic properties that “have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity” (HAR §13-275-6 and

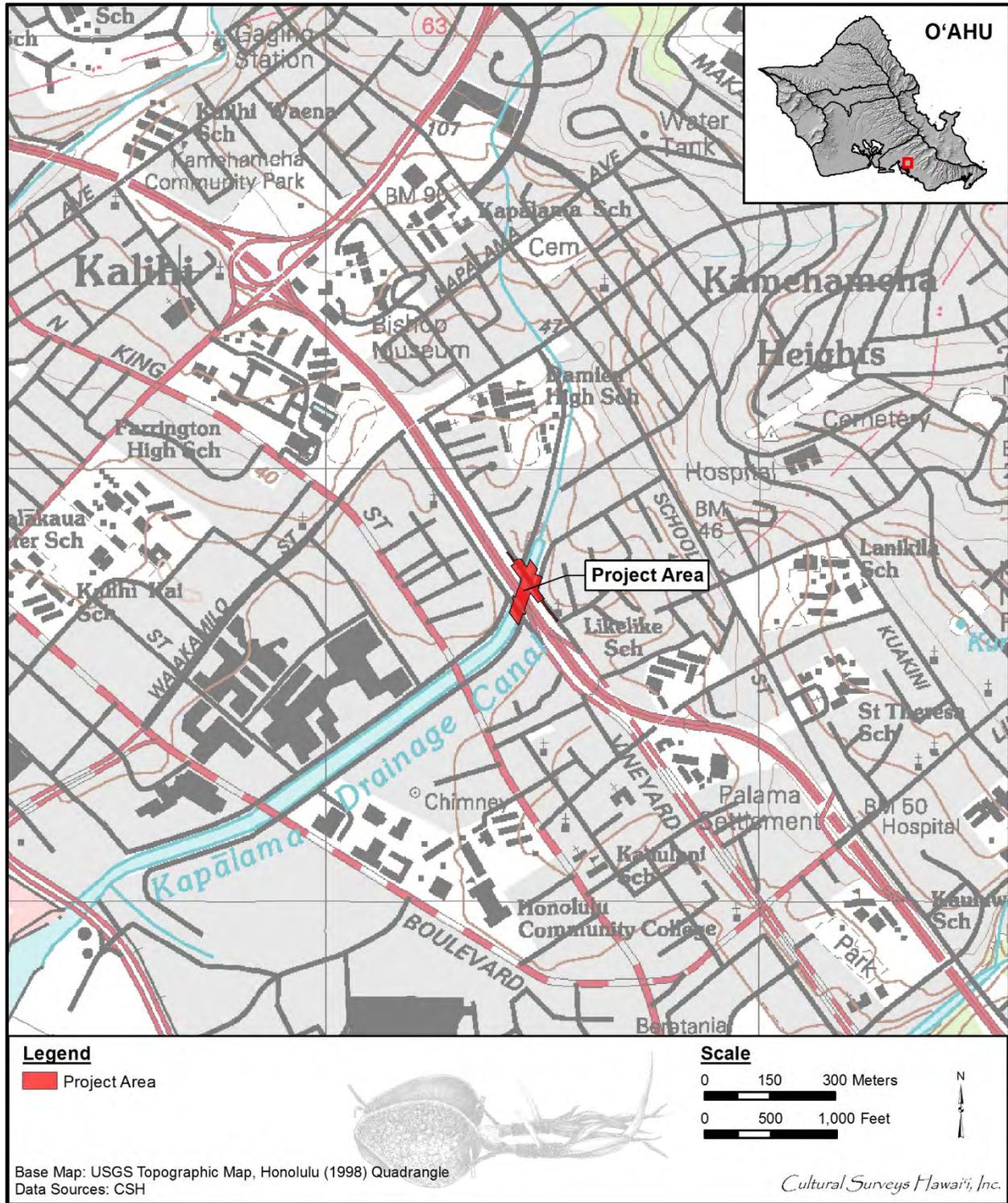


Figure 1. Portion of the 1998 USGS 7.5-minute topographic Honolulu quadrangle showing the location of the study area

CIA for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O'ahu

TMKs: [1] 1-6-002 (Halona Street Right-of-Way) and 1-6-006 (Kapālama Canal)

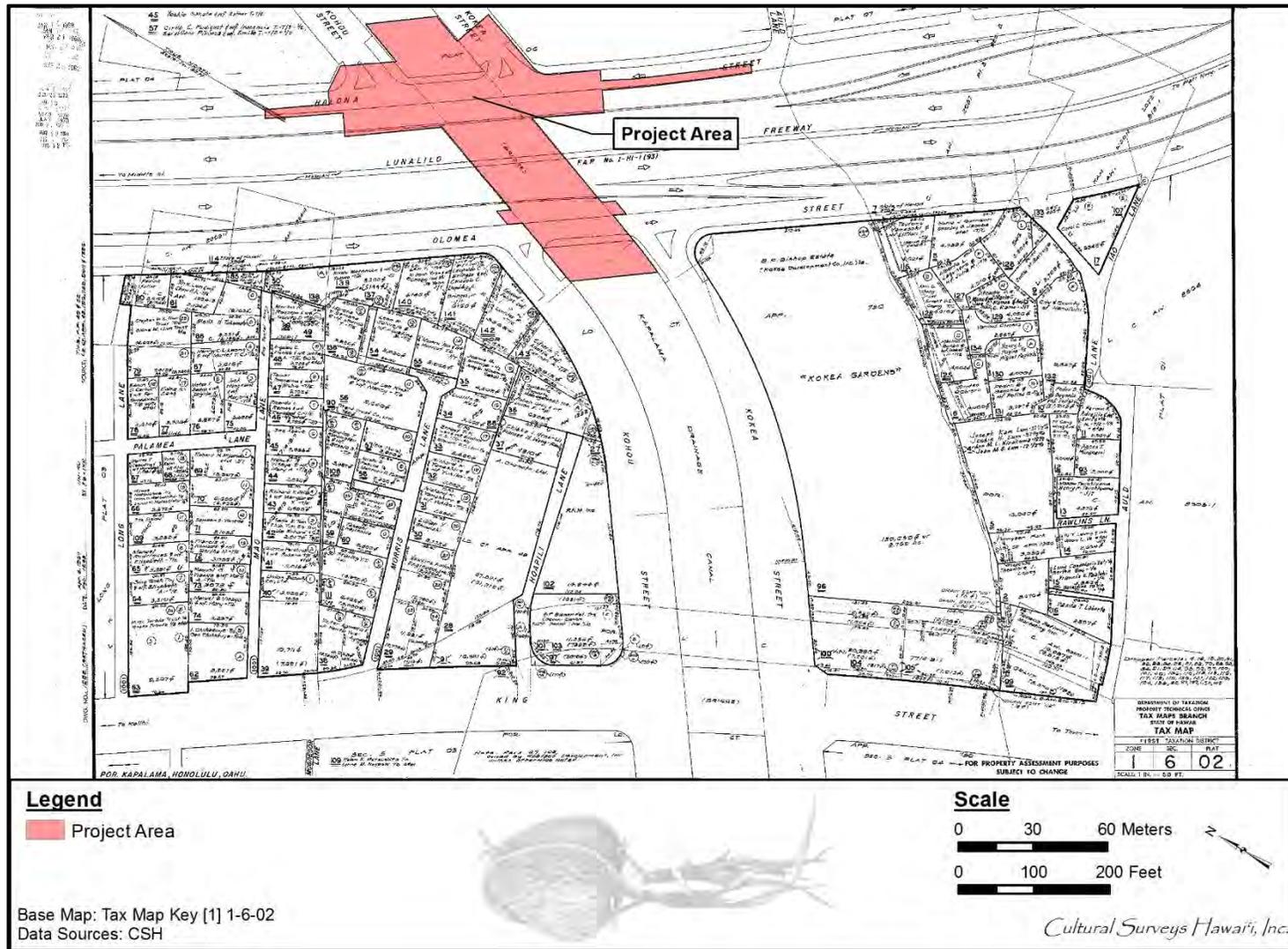


Figure 2. Tax Map Key (TMK) 1-6-002, showing study area at the H-1 Interstate Highway crossing at Kapālama Canal (Hawai'i TMK Service)

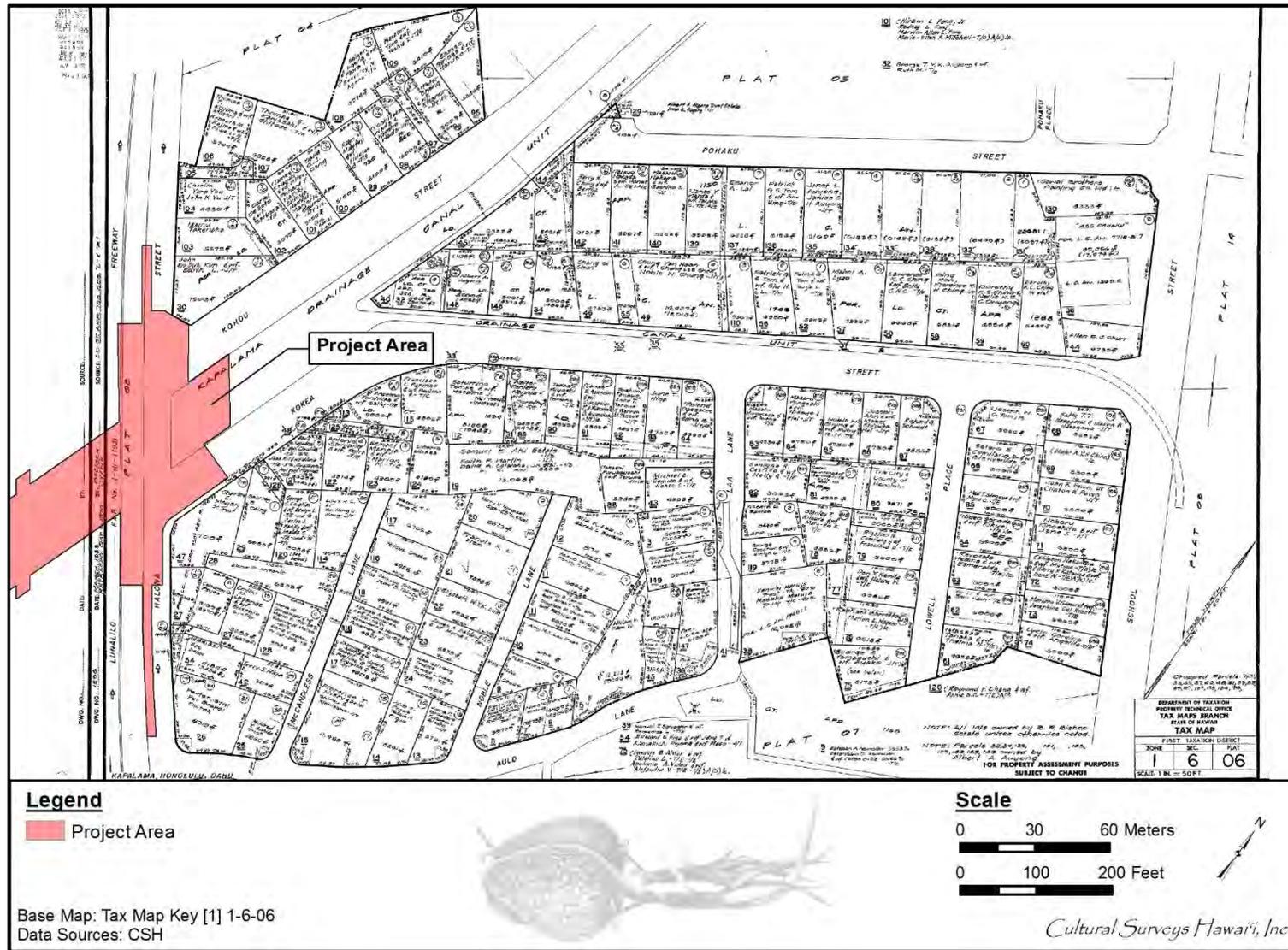


Figure 3. TMK: 1-6-006, showing study area at the H-1 Interstate Highway crossing at Kapālama Canal (Hawai'i TMK Service)

CIA for the Halona Street Bridge (H-1 on-ramp at Vineyard Street), Kapālama, Honolulu, O'ahu

TMKs: [1] 1-6-002 (Halona Street Right-of-Way) and 1-6-006 (Kapālama Canal)

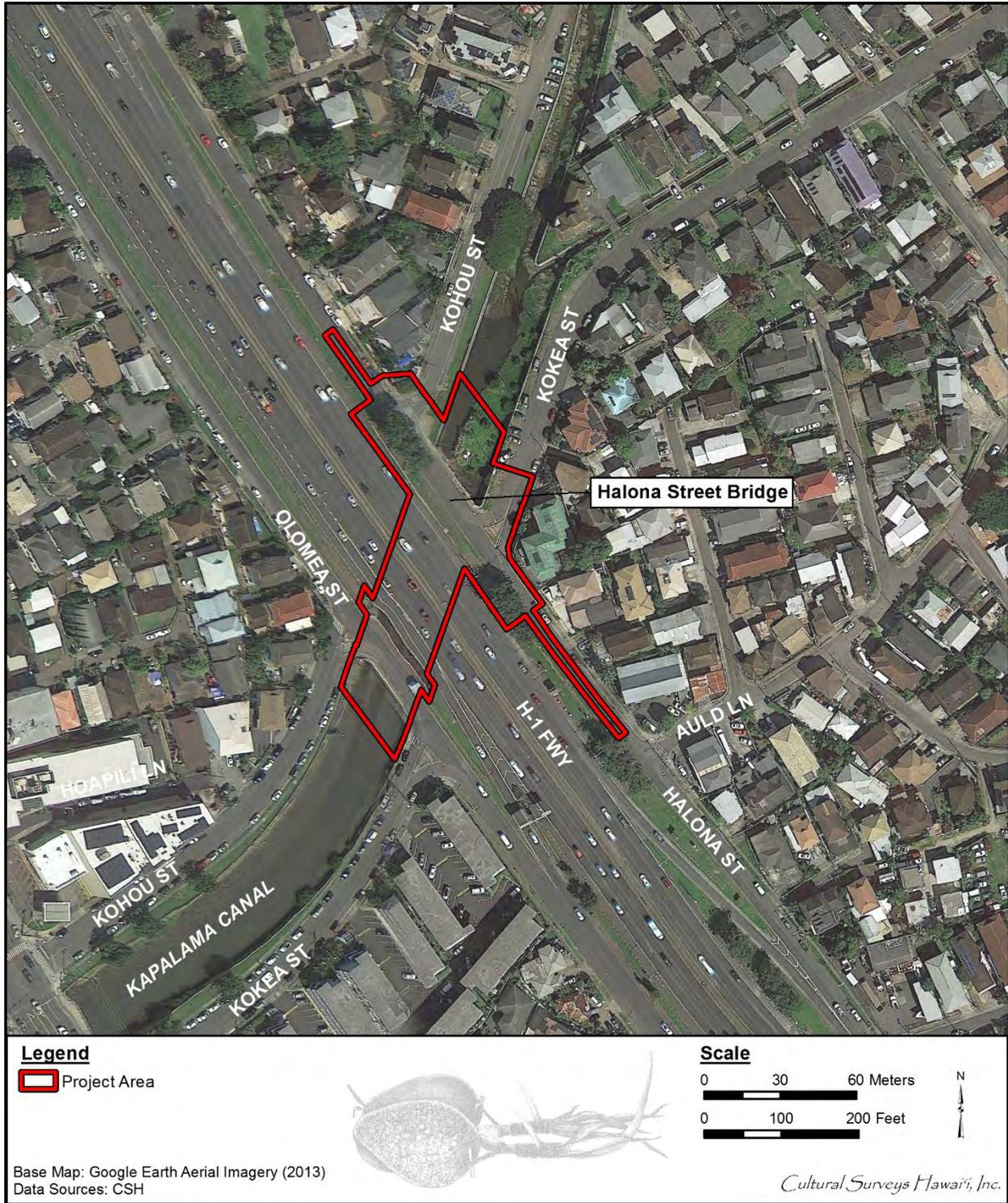


Figure 4. Aerial photograph (Google Earth 2013), showing study area at the H-1 Interstate Highway crossing at Kapālama Canal

§13-284-6). The document will likely also support the project's historic preservation review under HRS §6E and HAR §13-275 and §13-284. The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS §6E-8 and HAR §13-284.

Due to federal funding, this project is a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act, the National Environmental Policy Act, and Section 4(f) of the Department of Transportation Act. The proposed project is also subject to Hawai'i State environmental and historic preservation review legislation (HRS §343 and HRS §6E-8/ HAR §13-275, respectively).

1.3 Scope of Work

The scope of work for this CIA includes the following:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.
2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 Natural Environment

Kapālama is a small valley which was once watered by two small streams, the Kapālama and Niuhelewai streams. The *ahupua'a* (land division) of Kapālama is pie-shaped with its apex at approximately 609 m (2,000 ft) AMSL (above mean sea level) on the ridge that separates Nu'uauu and Kalihi valleys. The shore frontage (presently "Kapālama Basin") is part of the Honolulu Harbor protected shoreline. In 1961, the development of the Kapālama Canal, which follows the lower course of Niuhelewai Stream, channelized the lower streams. Temperatures in the study area range from 60–90° F, while rainfall varies from 50–127 cm (20–50 inches) per year (Juvik and Juvik 1998:62–64).

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), soils within the study area include Kawaihapai stony clay loam, 2 to 6% slopes (K1aB), Hanalei silty clay loam, 0 to 2% slopes (HnA), and Ewa silty clay loam, moderately shallow, 0 to 2% slopes (EmA) (Figure 5).

Soils of the Kawaihapai Series are described as follows:

This series consists of well-drained soils in drainage-ways and on alluvial fans on coastal plains on the islands of Oahu and Molokai. These soils formed in alluvium

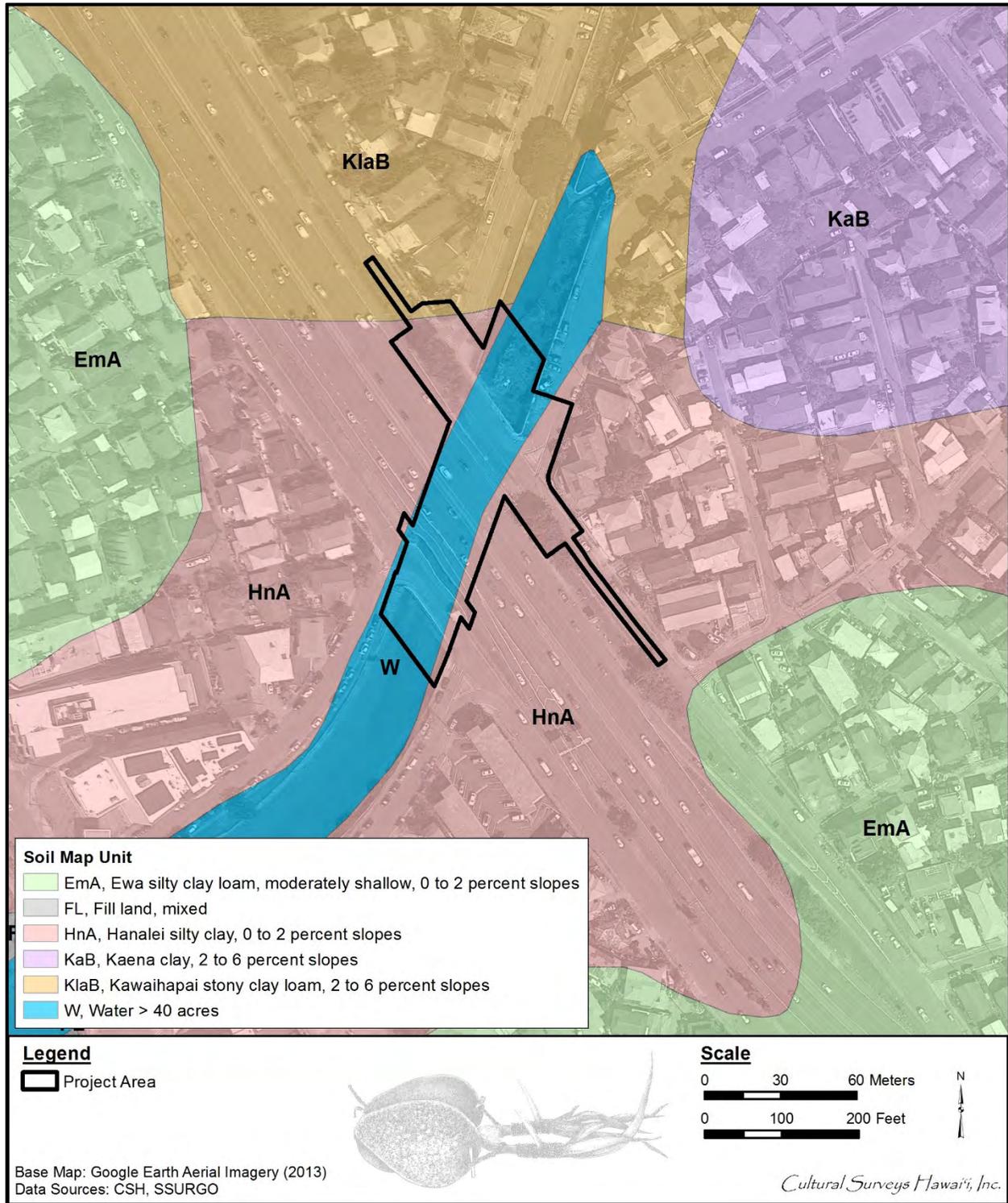


Figure 5. 2013 aerial photograph (Google Earth 2013) with an overlay of the USDA SSURGO database (2001) and soil survey data gathered by Foote et al. (1972)

derived from basic igneous rock in humid uplands. They are nearly level to moderately sloping. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 30 to 50 inches. [Foote et al. 1972:63–64]

Soils of the Hanalei Series are described as follows:

This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from sea level to 800 feet. The annually rainfall amounts to 20 to 120 inches. [Foote et al. 1972:38]

Soils of the Ewa Series are described as follows:

This series consists of well-drained soils in basins and on alluvial fans on the islands of Maui and Oahu. These soils developed in alluvium derived from basic igneous rock. They are nearly level to moderately sloping. Elevations range from near sea level to 150 feet. The annual rainfall amounts to 10 to 30 inches. [Foote et al. 1972:29]

Vegetation observed within the study area includes California grass (*Urochloa mutica*), sensitive plant (*Mimosa pudica*), and Java plum (*Syzygium cumini*).

1.4.2 Winds, Rains, and Seas of Kapālama

Each small geographic area on O‘ahu had a Hawaiian name for its own wind, rain, and seas. The name of the winds of O‘ahu are listed in a chant concerning a powerful gourd called the wind gourd of La‘amaomao. When the gourd was opened, a specific wind could be called to fill the sails of a canoe and take the person in the desired direction. The chant lists the winds of the Honolulu area from east to west.

Kukalahale is of Honolulu,

‘Ao‘oa is of Māmala,

‘Ōluniu is of Kapālama,

Haupe‘epe‘e is of Kalihi,

Ko-momona is of Kahauiki.

[Nakuina 1990:43]

The names of the seas of southeastern O‘ahu are listed in a chant for the high chief Kūali‘i, paramount chief of the Hawaiian Islands from 1720 to 1740 (Cordy 2002:19). From the east end of Waikīkī to the west boundary of the Kona district at Moanalua Ahupua‘a, the seas were as follows:

A sea for surf swimming is Kahaloa [*sic*] [in Waikīkī]

A sea for net fishing is Kalia [in Waikīkī]

A sea for going naked is Mamala [mouth of Honolulu Harbor]

A sea for swimming is Kapuuone [in Kapālama/Kalihi]

A sea for surf-swimming sideways is Makaiwa [in Kapālama/Kalihi]

A sea for catching 'anae [mullet] is Keeia [in Moanalua]

A sea for crabs is Leleiwi [in Moanalua].

[Fornander 1980:390]

1.4.3 Built Environment

The study area is located within urban Honolulu. The study area's built environment includes a portion of Halona Street, the Halona Street Bridge, and the Kapālama Canal. Halona Street is the former extension of Vineyard Boulevard, which was replaced by a portion of the H-1 Interstate Highway in the 1960s. The Halona Street Bridge is a continuous concrete cast-in-place bridge constructed in 1938. The Kapālama Canal is a channelized drainage that extends through urban Honolulu and is used to control the runoff from both Niuhelewai and Kapālama streams.

Section 2 Methods

2.1 Archival Research

Research centers on Hawaiian activities including *ka ‘ao* (legends), *wahi pana* (storied places), *‘ōlelo no ‘eau* (proverbs), *oli* (chants), *mele* (songs), traditional *mo ‘olelo* (stories), traditional subsistence and gathering methods, ritual and ceremonial practices, and more. Background research focuses on land transformation, development, and population changes beginning with the early post-Contact era to the present day.

Cultural documents, primary and secondary cultural and historical sources, historic maps, and photographs were reviewed for information pertaining to the study area. Research was primarily conducted at the CSH library. Other archives and libraries including the Hawai‘i State Archives, the Bishop Museum Archives, the University of Hawai‘i at Mānoa’s Hamilton Library, Ulukau, The Hawaiian Electronic Library (Ulukau.org 2004), the State Historic Preservation Division (SHPD) Library, the State of Hawai‘i Land Survey Division, the Hawaiian Historical Society, and the Hawaiian Mission Houses Historic Site and Archives are also repositories where CSH cultural researchers gather information. Information on Land Commission Awards (LCAs) were accessed via Waihona ‘Aina Corporation’s Māhele database (Waihona ‘Aina 2000), the Office of Hawaiian Affairs (OHA) Papakilo Database (Office of Hawaiian Affairs 2015), and the Ava Konohiki Ancestral Visions of ‘Āina website (Ava Konohiki 2015).

2.2 Community Consultation

2.2.1 Scoping for Participants

The cultural department commences our consultation efforts by utilizing our previous community contact list to facilitate the interview process. We then review an in-house database of *kūpuna* (elders), *kama ‘āina* (native born), cultural practitioners, lineal and cultural descendants, Native Hawaiian Organizations (NHOs; includes Hawaiian Civic Clubs and those listed on the Department of Interior’s NHO list), and community groups. CSH also contacts agencies such as State Historic Preservation Division (SHPD), OHA, and the appropriate Island Burial Council where the proposed project is located for their response on the project and to identify lineal and cultural descendants, individuals and/or NHO with cultural expertise and/or knowledge of the study area. CSH is also open to referrals and new contacts.

2.2.2 “Talk Story” Sessions

Prior to the interview, CSH cultural researchers explain the role of a CIA, how the consent process works, the project purpose, the intent of the study, and how their *‘ike* (knowledge) and *mana ‘o* (thought, opinion) will be used in the report. The interviewee is given an Authorization and Release Form to read and sign.

“Talk Story” sessions range from the formal (e.g., sit down and *kūkā* [consultation, discussion] in the participant’s place of choice over set interview questions) to the informal (e.g., hiking to cultural sites near the study area and asking questions based on findings during the field outing). In some cases, interviews are recorded and transcribed later.

CSH also conducts group interviews, which range in size. Group interviews usually begin with set, formal questions. As the group interview progresses, questions are based on interviewees' answers. Group interviews are always transcribed and notes are taken. Recorded interviews assist the cultural researcher in 1) conveying accurate information for interview summaries, 2) reducing misinterpretation, and 3) adding missing details to *mo'olelo*.

CSH seeks *kōkua* (assistance) and guidance in identifying past and current traditional cultural practices of the study area. Those aspects include general history of the *ahupua'a* (traditional land division extending from the mountain to the sea); past and present land use of the study area; knowledge of cultural sites (for example, *wahi pana*, archaeological sites, and burials); knowledge of traditional gathering practices (past and present) within the study area; cultural associations (*ka'ao* and *mo'olelo*); referrals; and any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the study area.

2.2.3 Interview Completion

After an interview, CSH cultural researchers transcribe and create an interview summary based on information provided by the interviewee. Cultural researchers give a copy of the transcription and interview summary to the interviewee for review and ask that they make any necessary edits. Once the interviewee has made those edits, CSH incorporates their *'ike* and *mana'o* into the report. When the draft report is submitted to the client, cultural researchers then prepare a finalized packet of the participant's transcription, interview summary, and any photos taken during the interview. We also include a thank you card and honoraria.

It is important that CSH cultural researchers cultivate and maintain community relationships. The CIA report may be completed, but CSH researchers continuously keep in touch with the community and interviewees throughout the year—such as checking in to say hello via email or by phone, volunteering with past interviewees on community service projects, and sending holiday cards to them and their *'ohana* (family). CSH researchers feel this is an important component to building relationships and being part of an *'ohana* and community.

“*I ulu no ka lālā i ke kumu*—the branches grow because of the trunk,” is an *'ōlelo no'eau* (#1261) shared by Mary Kawena Pukui with the simple explanation: “Without our ancestors we would not be here” (Pukui 1983:137). As cultural researchers, we often lose our *kūpuna* but we do not lose their wisdom and words. We routinely check obituaries and gather information from other community contacts if we have lost our *kūpuna*. CSH makes it a point to reach out to the *'ohana* of our *kūpuna* who have passed on and pay our respects including sending all past transcriptions, interview summaries, and photos for families to have on file for genealogical and historical reference.

Section 3 *Ka‘ao and Mo‘olelo (Legends and Stories)*

3.1 Traditional Legends

3.1.1 Kapālama and Lepeamoa, the Bird Maiden of Pālama

The place name Kapālama is often understood to refer to an enclosure (*pā*) of *lama* wood that surrounded the place of residence of high ranking *ali‘i* (chiefs) (Pukui et al. 1974:87). McAllister (1933:88) relates: “Kapalama is said to have obtained its name from an establishment in which the young *ali‘i* were kept just before pairing off for offspring.” This information probably came from Nathaniel Emerson, who translated David Malo’s “*Ka Mo‘olelo Hawai‘i*.” Emerson added many notes to his English translation, including the following:

Hoonoho ia means put in an establishment, placed under the care of a guardian or duenna [chaperone]. Such an establishment was surrounded by an enclosure, *pa*, made of the sacred *lama* . . . Hence this special care or guardianship was called *palama*. It is said that an establishment of this kind was anciently placed at that suburb of Honolulu which to this day bears the name of *Ka-pa-lama*. [Malo 1951:139; note by N. B. Emerson]

Westervelt (1923:165) attributes the O‘ahu place name to a chiefess of O‘ahu who lived in that area. This chiefess was Kapālama, the grandmother of Lepeamoa (Hawaiian for “cockscorb”). There are several retellings of this story (Knudsen and Noble 1945:63-69; Pukui and Curtis 1949:118–126; Westervelt 1963a:204–245), but all seem to use Westervelt (1923) as their source. A chief of Kaua‘i, named Keāhua, traveled to O‘ahu to take Kauhao, the daughter of Kapālama, as his wife. He angered the *kupua* (supernatural being that can change form) called Akuapehualē (god of swollen billows), who forced the couple to hide in the uplands of the Wailua River valley of Kaua‘i.

Keāhua’s daughter was born as an egg, and was adopted by the chiefess Kapālama to raise on O‘ahu at her home, also named Kapālama. When the egg hatched, Lepeamoa was a bird with feathers all the colors of the rainbow. She became able to turn herself into a beautiful young woman wearing a feather *lei*. The girl was so beautiful that a rainbow was always present above her. The girl was guarded by her ancestress, Keaolewa (“the moving cloud”), who could also change forms between human and bird. The lower ridge separating Kapālama and Nu‘uanu (‘Ālewa Heights) may have been named for this ancestress.

The parents of Lepeamoa had another child, a son called Kau‘ilani, who was so strong he was able to defeat the *kupua* who had threatened his parents. On Kaua‘i, there are several place names associated with this story. Kauhao (meaning “the scooping”), is the name of a deep valley in the *ahupua‘a* of Miloli‘i in the Waimea District. Lepeamoa is a point at the mouth of Ka‘auhau Valley in the same *ahupua‘a*. The valley in Wailua Ahupua‘a in the Puna District where Kau‘ilani defeated Akuapehualē was named Keāhua (meaning “hillock”) after the chief, his father (Wichman 1998:81, 158).

After Kau‘ilani’s victory over the *kupua*, he went to O‘ahu to find his sister, searching for the rainbow sign of her presence. In her compound, he found Kapālama, who advised him to hide in Lepeamoa’s house, wait until she was asleep in her bird form, and catch and hold her until she

acknowledged him as her brother. Her advice worked, and Lepeamoa lived with her brother thereafter (Westervelt 1923:164-184).

Additional stories are told of Kau'ilani and his magical sister Lepeamoa. In one story, the Maui chief, Mauinui, had a fighting rooster. This rooster was also a *kupua* that could change forms; by the use of its magic it always defeated any challenger. The O'ahu chief Kakuhihewa was hosting the Maui chief at his residence in Waikīkī and was losing many goods while betting on the cock-fighting, which the Maui chief's rooster always won. Kakuhihewa had heard about the hero Kau'ilani and asked him if he could find some way to defeat the Maui rooster. When Kau'ilani agreed, Kakuhihewa gave him his daughter in marriage. Kau'ilani asked for the help of his sister, who turned into a beautiful hen to fight the rooster. The two combatants both changed forms several times during the battle, but eventually Lepeamoa won. The daughter of the king had a child, called Kamano, who Lepeamoa took back to Kapālama to care for (Westervelt 1923:227-245).

3.1.2 Legend of Palila

In the legend of Palila, the hero's war club could magically carry him far distances in a single flight. Palila came to the plain of Keahumoa in 'Ewa to participate in the athletic games given by the O'ahu king, Ahuapau. The residence of this chief was said to be at Kalaepōhaku, near Wailuakio in Kapālama (Fornander 1917:5(1):142). Kalaepōhaku Peak (meaning "the stone promontory") is near the intersection of School and Alaneo streets in Kapālama.

A place named Niuhelewai (*lit.* "coconut going in water") in lower Kapālama, located *makai* (seaward) of King Street (Fornander 1917:4(3):530–531; Fornander 1919:5(2):368) was associated with the deity Haumea and the hero, Kaulu, who was known for his great strength.

Kaulu was born in Kailua on the windward side of O'ahu. His older brother Kaeha was taken by the spirits to a realm of gods in the sky. For love of his brother, Kaulu followed him to this realm, playing a number of tricks on the gods including Makali'i, the god of plenty, who had a magic fish net that would fill with fish whenever used. After playing the tricks, Kaulu then had to rescue his brother from the wrath of the various spirits. The brothers finally returned to the land of men on O'ahu, setting down at Moanalua (*ahupua'a* [land division] west of Kapālama).

A hiki laua ma Moanalua, i Papakolea, hoonoho o Kaulu ia Kaeha ilaila; hele mai la o Kaulu a loaa o Haumea i Kapālama. He 'kua o Haumea no Oahu nei, e noho ana ia i Niuhelewai, he wahine of Haumea.

When they arrived at Papakolea, Moanalua, Kaulu left Kaeha at this place while he continued on his way to Kapālama in search of Haumea. Haumea was a spirit that lived at Niuhelewai, Oahu. It was a female spirit.

[Fornander 1917:4(3):530–531]

Haumea, the goddess of childbirth, had a home at Niuhelewai in Kapālama; she challenged anyone who passed by, often killing them. Kaulu challenged Haumea to a fight on the following day. That night he flew back up to the spirit land in the clouds and borrowed the magic nets of Makali'i, and then threw them over Haumea's house. When Haumea could not break through these nets, she fell asleep in exhaustion, tangled in the nets. While asleep, Kaulu burned down her house, killing her.

3.1.3 Keanakamanō, the Cave of the Shark

Near the Kamehameha Schools campus there was once a cave called Keanakamanō, which means “cave of the shark” (Sterling and Summers 1978:323). The Hawaiians have many stories concerning legendary caves that connected inland springs to the sea or extended below the Ko‘olau Mountains, connecting the leeward and windward sides of the island.

On the Kamañiki side of the Kalihi Valley there was once a shallow cave called Keana Kamano. It was called the cave of the sharks because the big shark gods from Pearl Harbor often went there to rest.

Keana Kamano led into the fabulous underground cave believed in olden times to occupy the center of the island of Oahu.

One branch of the cave led around and under the mountains to Pearl Harbor. Another branch of the cave led to the center of the Island where there was a sacred pool for swimming.

Hawaiians living today can tell of elders who once traveled these caves and who once swam in the sacred pool. An earthquake about 1900 closed up the caves and no one has been known to travel them since.

It may be that the cave-in of the Wilson Tunnel occurred over the old lava tube leading to Pearl Harbor. [Taylor 1954]

An access street, called Kealamanō (“the way of the shark”) on the Kamehameha Schools' Kapālama Heights campus is named for this cave. The shark referred to is Kamohoali'i, king of the sharks, who is the older brother of Pele, the Hawaiian volcano goddess. On the long trip of Pele's family to Hawai'i, it was Kamohoali'i who acted as the navigator. Don Mitchell, who said that earthquakes in 1900 caused the collapse of the cave (1993:146), states,

His [Kamohoali'i] favorite pastime was to swim through the extensive water-filled lava tubes or tunnels that extended from Pearl Harbor to areas under Kalihi Valley. As the tunnels rose above sea level, he assumed his human form and walked to his cave, Keanakamanō, on Kapālama Heights. [Mitchell 1993:146]

3.2 *Wahi Pana* (Legendary Places)

Kapālama Ahupua'a extends from the seacoast to the head of Kapālama (“the *lama* wood enclosure”) Gulch at approximately 4 km from the coast. In the upper section of Kapālama, the high point of the ridge surrounding Kapālama Gulch defines the eastern and western boundary. Unlike most O'ahu leeward *ahupua'a*, it does not extend all the way to the Ko'olau Mountains; instead it is “cut off” by Kalihi (“the edge”) Ahupua'a on the western boundary and Nu'uānu (“cool height”) Ahupua'a on the eastern boundary.

The highest peak in Kapālama is Nāpu'umai'a (“the banana hills”), at the head of Waolani (“heavenly mountain area”) Valley, the western section of Nu'uānu. An alternate name for this high peak may be Pāka'aluna (meaning unknown). Waolani is also the name of a peak on the ridge separating Kapālama from Nu'uānu's Waolani Valley. The boundary with Nu'uānu then extends along the western boundary of 'Ālewa (“suspended on a height”) Heights and then down to the coast on the east side of a high, rocky area called Kalaepōhaku (“the stone promontory”). The

lower eastern boundary of Kapālama is ambiguous, as the early development of Honolulu town obscured boundary lines in the Honolulu coastal plain. On one early map, the eastern boundary of the *ahupua'a* extends all the way to Nu'uanu Stream, and includes within the *ahupua'a* the large *'ili* (smaller land division) of Kūwili (“stand swirling”) and Iwilei (“collarbone” or “a unit of measurement”), and the ponds (*loko*) Kūwili I and Kawa (possibly “precipice or leaping place”; Pukui and Elbert 1986:139). During the Māhele, Iwilei was considered an *'ili* of Honolulu, rather than Kapālama, and thus the eastern boundary of Kapālama extended only to the western point of Kūwili I Pond, generally following the modern alignment of Pālama and Alaneo streets, west of Liliha Street.

Keanakamanō (“the cave of the shark”) is the name of a peak at the head of a narrow valley, on the western side of Kapālama. Tradition also talks of a cave called Keanakamanō, but its exact location is unknown. At the level coastal flats, the western boundary extends from the mouth of Keanakamanō Valley along a low *pali* (cliff) that separates Kapālama from the *'ili* of Mokauea (possibly “broken turtle place”; Thrum 1922:660) in Kalihi. This division line is generally the same as the present alignment of Waiakamilo Street and Houghtailing Street. The boundary point at the coast is the eastern edge of Ananoho Pond (possibly “dweller’s cave”; Thrum 1922:627) in Kalihi.

The *ahupua'a* has two streams, the Kapālama and the Niuhelewai (“coconut going [in] water”; Pukui et al. 1974:166). They merge and extend through the central fertile former taro and rice fields, an area also called Niuhelewai. This area drains into a pond called Kūwili II. There were two other named ponds, Kealia (possibly, “salt bed”) and Kapukui (meaning unknown), to the east of Kūwili II, shown as part of Kapālama or as part of Iwilei, depending on the map. The offshore waters were divided into the Iwilei, Kūwili, Kapālama, and Mokauea Fisheries, between the shore and a high reef called Koholaloa (“long reef”; Pukui et al. 1974:115). At low tide, several islands were clearly visible above this reef, Mokauea Island off Kalihi, and Koholaloa off Kapālama. In the early historic period, the island off Kapālama had several other names, including Mauiola (named for “a god of health”), Kamoku'ākulikuli, (‘Ākulikuli plant island) and Akulikuli Island. Beginning in the 1840s, the reef area was dredged and the resulting material was used to connect and expand some of the small islands off the coast, to form Quarantine Island and ultimately Sand Island.

Early historians have reported there were at least four ceremonial structures in Kapālama, a shrine called Puea, and three *heiau* called Pāka'aluna (or Pāka'alanaluna), Oomaunahale, and Paepaenuileimoku. Pāka'aluna Heiau may have been located on or near Pāka'aluna Peak, but the locations of the other three features are unknown (Figure 6). The meanings for these *heiau* names are also unknown.

3.2.1 *Pōhaku* in Kapālama

A stone measuring 5 ft 8 inches long and 5 ft in height in the shape of a crouching animal when viewed from the west stands on the west side of a ridge in Kapālama Valley (Sterling and Summers 1979:321). The *pōhaku* is located in a direct line between Violet Street and a building at the Kamehameha Schools.

According to an informant, it was revered by Native Hawaiians. The informant, William J. Vierra, resided below the *pōhaku* in Kapālama. Mr. Vierra first saw the *pōhaku* in 1911 when his older brother pointed it out to him. He also learned of its importance from Native Hawaiians in the



Figure 6. Paka'alana Heiau in Kapālama Ahupua'a (courtesy of Pacific Worlds)

area (Sterling and Summers 1979:321). He recalls Hawaiians laying out mats on the ridge between Kapālama and Kamanaiki valleys, spending their entire day worshipping the *pōhaku* from a distance. Worshippers would chew on *kō* (sugarcane) and leave the stalks. It was not indicated whether the chewed *kō* stalks were part of a ritual or not. Mr. Vierra also shared that the *pōhaku* was visited by the “bell stone” located in Kalihi Ahupua‘a in the form of a mist (Sterling and Summers 1979:321).

Kenneth P. Emory, an American anthropologist, visited the *pōhaku* in January 1954 and believed it was a phallic rock.

3.2.2 Fishponds of Kapālama and Iwilei

According to Māhele documents, Kūwili Pond (Kūwili I), Kawa Pond, and the land surrounding them in the ‘ili of Kūwili were considered part of the *ahupua‘a* of Honolulu, not Kapālama. However, these ponds are surrounded by Kapālama lands and were an important resource for the inhabitants of the area.

Kūwili [Kūwili I] Pond is mentioned in the legend of Kū‘ula, the fish god of Hawai‘i. ‘Ai‘ai, son of Kū‘ula, gave the sacred *pā* (fishhook), called Kahuai, to his son, Puniaiki, who used it to summon a school of *aku* (Ocean bonito; *Katsuwonus pelamis*) in Honolulu Harbor. The *aku* “unprecedented in number, fairly leaped into the canoes . . . and the shore people shouted as the akus which filled the harbor swam toward the fishpond of Kuwili and on to the mouth of Leleo stream” (Manu 1898:247–248). No oral traditions, legends, or other ethnographic information have been found regarding Kawa Fishpond. The Hawaiian word “*kawa*” literally translates as a precipice or leaping place, or the pool below a precipice into which swimmers leap (Pukui and Elbert 1986:139).

Three other ponds are labeled on historic maps, Loko Kūwili II and Loko Kapukui in Kapālama and Loko Kealia in Iwilei. Pukui et al. (1974) do not give meanings for Loko Kapukui or Loko Kealia, but *keālia* is the Hawaiian word for salt bed, which may indicate at least one of these ponds was used for salt collection.

3.3 ‘Ōlelo No‘eau (Proverbs)

Hawaiian knowledge was shared by way of oral histories. The following section draws from author and historian Mary Kawena Pukui and her knowledge of Hawaiian proverbs describing ‘āina (land), weather, and places.

3.3.1 ‘Ōlelo No‘eau #1732

The following proverb talks about the sea of Pu‘uhale, which falls into the *ahupua‘a* of Honolulu and not Kapālama. As previously mentioned, the ponds and ocean resources that surrounded Kapālama were utilized by those who inhabited the area.

Ke kai nehe o Pu‘uhale

The murmuring sea of Pu‘uhale.

The sea at Pu‘uhale in Kalihi, O‘ahu, was said to murmur softly as it washed ashore.

There were once many fishponds there. [Pukui 1983:186]

3.3.2 'Ōlelo No'eau #2918

The following 'ōlelo no'eau is actually centered around Waipi'o on O'ahu, however, it relates to a mo'olelo that glosses *wahi pana* in Kapālama Ahupua'a. For an expanded mo'olelo, see Section 4.1.

Waipi'o kīmopō.

Waipi'o of the secret rebellion.

An epithet for the people of Waipi'o, O'ahu. After the death of Kahāhana, the chiefs of Waipi'o plotted to murder the chiefs of Maui, who were then in 'Ewa. Someone warned the Maui chiefs and all but one escaped. To throw off suspicion, the Waipi'o chiefs claimed that the one was killed by someone from Kaua'i. Later Kahekili learned that Elani, chief of 'Ewa, was in the plot, so he launched a massacre that choked the streams of Niuhelewai and Makāho in Palama with the bodies of the dead [Pukui 1983:319].

3.4 Oli (Chants)

3.4.1 The Epic Tale of Hi'iakaikapoliopole

The Epic Tale of Hi'iakaikapoliopole takes the reader on a literary adventure throughout the Hawaiian Islands. The saga begins with the fire goddess, Pele, in pursuit of a lover. Hi'iakaikapoliopole, Pele's younger sister, is tasked with bringing back the handsome *ali'i* of Kaua'i, Lohi'au.

Hi'iakaikapoliopole, her *aikāne* (friend) Wahine'ōma'o, and Lohi'au board a canoe at Pu'uloa (now known as Pearl Harbor) and sail off. When the party of three reach the outskirts of Pu'uloa, Hi'iaka looks *mauka* (toward the mountain) and sees Kinimakalehua, Leinono, and Keālia (Kamehameha Heights). Hi'iaka says, "I must not forget you, and have it said that I did not offer greeting chants to all of you," and then offers an *oli*:

Polenaehu i ka ua Kinimakalehua.

Ka waha i ka la luna o Leinono (Leinono)

Hoahoa Leinono, kiekie Puuloa makai.

Ke hele i ke one kui lima laula o Eewa.

Ma Ewa hoi au.

E uwe hoi au ia oe e Leinono-e

Hoa aloha wale kakou-e [*Ka Na'i Aupuni*, Buke II, Helu 10, 13 Iune 1906]

Translated:

Kinimakalehua is misty gold in the rain

A cleft in Leinono's brow

Leinono appears harsh, Pu'uloa stands tall toward the sea

When on the broad sands of 'Ewa traveled arm in arm

Here I am in 'Ewa

I cry out to you, Leinono

Dear friends, one and all. [Ho'oulumāhiehie 2006:278]

Upon finishing her chant, the three sailed to Kalihi where Hi'iaka turned and looked at the mountains. Hi'iaka could still see Leinono as well as Keālia and called out in *oli* once again:

Aloha oe, e Leinono, e Kinimakalehua,

E Kealia ilalo-e-Aloha,

Eia ke kanaenae, ka mohair

A ka mea hele-la, he leo-e

He leo wale nohoi-e [Ka Na 'i Aupuni, Buke II, Helu 10, 13 June 1906]

Translated:

Greetings to you, O Leinono, O Kinimakalehua

O Keālia there below, aloha

Here is a greeting chant, an offering

From the traveler, a voice

Only a voice. [Ho'oulumāhiehie 2006:278]

3.5 Mele (Song)

There are a number of late nineteenth century and twentieth century *mele* (songs) which concern or mention Kapālama, presented below.

3.5.1 Pu'uhonua Nani

*Pō nei iā 'u e ho'ola 'i mālie ana
I ka nani o ka mahina
Lana ka mana 'o i kau kauoha
I pu'uhonua wahi e maha ai
No na mu 'o kama aloha au
Nou ka welina e Lili'uokalani.*

*Kaulana i 'o nō 'o Mu'olaulani
Malama ola nō nā lei
'Imi ana i kau 'i'ini ai
Ke aloha ka na 'auao ka no 'eau
Keia no na pono no mākou
Mahalo iā 'oe e Lili'uokalani.*

*Hanohano 'oe e Kapālama
Ka 'ōpua ha'aeo o ka lewa lani
I laila no i 'ike maka 'ia
Kou lokomaika 'i no na kama
Ua piha lākou me ka hau 'oli
Aloha noe e Lili'uokalani.*

Beautiful Refuge

Last night, as I sat quietly in the calm
Observing the beauty of the moon
A thought came to me of your will
To have a refuge, a place of peace
For your beloved young people
For you, our fond affection, o Lili'uokalani.

Famed indeed is Mu'olaulani,
A preserver of life for youth
Now come seeking what you had desired
Love, education, and wisdom too
These are the benefits bestowed to us
Thank you, o Lili'uokalani.

Honored indeed are you, of Kapālama
Like a cloud proudly reposing in the sky
There, all can see for themselves
Your generosity to your children,
They are filled with happiness
And love for you, o Lili'uokalani.

*Ha'ina 'ia ka puana i lohe 'ia
Pu'uhonua nani a maika 'i
Ka'apuni nei a puni Hawai'i
No na pono ana kama lehulehu
Pu'uhonua no ka launa aloha
E mau kou inoa e Lili'uokalani.*

This ends my praise; may all hear
A place of refuge, beautiful and good
In every nook here in Hawai'i
For the benefit of many children
A place of refuge, a contact with love
May your name live on, o Lili'uokalani.

This *mele* was written by Malia Craver, a social worker with the Liliu'okalani Trust, which is the “Beautiful Refuge” of the song. Mu'olaulani was the name of Queen Liliu'okalani's home in Kapālama (Grant 499 to Liliuokalani in the *'ili* of Kamookahi), which became the Queen Lili'uokalani Children's Center (now at 1300-A Halona Street). In a 1911 document, Lili'uokalani entrusted her estate to provide for orphan and destitute children, with preference to those of Hawaiian descent; her home in Kapālama became the Kapālama branch of the Queen Lili'uokalani Children's Center. The *mele* is part of the Kimo Alama Keaulana Collection at the Bishop Museum Archives and was translated by Mary Kawena Pukui.

3.5.2 Moana-lua

*I Moana-lua ha 'i ke 'au,
I Ka-hau-iki hemo ka 'umoki.*

*'O ke kula loa ho 'i o Ka-lihi,
'O Ka 'iwi 'ula kīki 'i pau.*

*'O Ka-pā-lama lo 'i laiki,
I Ke-one- 'ula malu ke kiawe.*

*'O Leleo, a he loko wai,
Ha'alili-a-manu honi kāua.*

*'O Ka-pu 'u-kolo, i Ka-nēkina
Holo lio lā 'au me ka ulua.*

*'O Ka-manu-wai moa li 'ili 'i,
Hauna ke kai 'eha 'oe ia 'u.*

*He aha 'ē ke kumu o ka 'eha 'ana?
'Ōno 'onou 'ia i ka hua noni.*

*Auwē 'eha 'ino i ku 'u kīkala,
Pehea la ia e lewa hou ai?*

Moanalua

At Moana-lua the shaft breaks,
At Ka-hau-iki take out the cork.

The long plain of Ka-lihi,
At Ka-iwi- 'ula tilt back.

At Ka-pā-lama rice patches,
At Ke-one- 'ula, *kiawe* shade.

At Leleo, a pond,
At Ha'alili-a-manu, we kiss.

At Ka-pu 'u-kolo and Ka-nēkina
Ride a merry-go-round with an *ulua* fish.

At Ka-manu-wai, little chicks,
Strong-smelling soup and I hurt you.

What's the reason for the pain?
A *noni* fruit forced in.

Auwē, how my hips hurt,
How then to wander anew?

This *mele* was arranged by David Nape and collected by Samuel H. Elbert and Noehani Mahoe. In their interpretation (Elbert and Mahoe 1970:77–78), this is a traveling song about a girl taking a trip from west to east, from Moanalua Ahupua'a, through Kahauiki, Kalihi, Kapālama, Nu'uaniu, and to Honolulu. In Moanalua, her carriage breaks down; in Kahauiki she uncorks a liquor bottle, then passes through Kalihi; in Kaiwi'ula (site of the Bishop Museum in western Kapālama) she staggers from the drink, she then crosses the rice patches of Kapālama; in Keone'ula (site of Ka'iulani School and Kauamakapili Church in eastern Kapālama) she seeks the shade of the *kiawe* trees. At Leleō she notes a pond (probably Kūwili II Pond); she crosses Nu'uaniu Stream to Ha'alili-a-manu; at Ka-pu 'u-kolo and Ka-nēkina (near Hotel Street and Nu'uaniu Stream) she rides

a merry-go-round with her sweetheart (called an *ulu* fish); and, at Ka-manu-wai (an ‘ili of Nu‘uanu near the lower part of the stream) she woos youngsters who she plans to hurt. The *noni* (*Morinda citrifolia*) is a bitter fruit.

3.5.3 Pua Hē‘ī

*Aloha no paha ‘oe
E ka pua o ka hē‘ī
Ke ī a‘e nei nō wau
O ka ‘oi o Kapālama
Mālama ‘ia ko kino
‘O lilo mai ia nei
Ia nei nō māua
I ka malu o ke kukui.*

*Hui: Sweet rosebud o ka uka onaona
Pulupē i ka hunahuna wai
I noho a kama ‘āina
Ka makani ‘Ōlauniu.*

*Aloha no paha ‘oe
E ke anu o Waimea
K ka ua Kīpu‘upu‘u
Lei kōkō‘ula i ke pili
Hāli‘i mai la i luna
I ka welelau o ke kuahiwi
Kuahiwi kū kilakila
Māpu ke ‘ala onaona.*

This song, copyrighted in 1928 by Johnny Noble (1929:98–99), uses the winds of the islands to stand for actions or emotions. The ‘Ōlauniu wind, which means “thrusting coconut fronds” suggests sexual play, while the Kīpu‘upu‘u wind of Waimea on Hawai‘i suggests chilliness.

Papaya Flower

Perhaps you’re dearly loved
Oh papaya flower,
I hold in the highest esteem
The greatness of Kapālama,
Your person is protected
To be won over by me,
Just you and I
In the shade of the kukui.

Chorus: Sweet rosebud of the perfumed island
Drenched in watery spray
Just to abide with to be familiar with
The ‘Ōlauniu wind.

Perhaps you’re dearly adored
Oh chill of Waimea
Oh, the Kīpu‘upu‘u rain
That lays a bright low-lying rainbow upon the grass
Spread out in the heights
To the peaks of the mountains,
Mountains that stand so regal
Where sweet fragrance drifts in the air.

Section 4 Traditional and Historical Accounts

The project is located within the *ahupua‘a* of Kapālama in the O‘ahu *moku* of Kona, now called the District of Honolulu. The *ahupua‘a* of Kalihi lies to the west and the *ahupua‘a* of Nu‘uanu lies to the east.

4.1 Traditional Accounts of Battles at Niuhelewai Stream in Kapālama

Two accounts of traditional Hawaiian warfare suggest mass killings in the vicinity of “Niuhelewai” which is the stream generally now known as Kapālama Canal.

4.1.1 Kahahawa‘i’s Defeat of Kahāhana (AD 1780-1783)

Niuhelewai Stream was the location for a famous battle between Kahahawa‘i, the war chief of Kahekili, king of Maui, and the O‘ahu ruling chief Kahāhana. Fornander (1919:498) states in a footnote to a story that Niuhelewai was the name of the locality of the Pālama cane field between the fire and pumping stations. Ross Cordy (2002:19) places Kahāhana’s reign on O‘ahu around the year 1780 to his death in 1783 after this battle.

I ka wa e noho ana o Kahekili he ‘lii no Maui, a o Kahahana he li‘ i no Oahu nei iloko oia kau i holo mai ai o Kahahawai me na koa e kaua ia Oahu. Ma keia kaua ana ua hee a ua luku ia na kanaka Oahu, ma Niuhelewai, a ua hoi ka wai i uka o ka muliwai, no ka piha i na kanaka.

When Kahekili was reigning as king of Maui, and Kahahana was king of O‘ahu, it was during this period that Kahahawai with a number of warriors came to make war on O‘ahu. In this battle the people of O‘ahu were defeated and slaughtered at Niuhelewai, and the waters of the stream were turned back, the stream being dammed by the corpses of the men. [Fornander 1919:498–499]

4.1.2 The Rebellions of the ‘Ewa and Kona Chiefs (post-1783)

After Kahāhana’s death, the chiefs of Maui took over O‘ahu. Some of the chiefs from the O‘ahu districts of ‘Ewa and Kona conceived a plot to murder their new overlords but the Maui chiefs were warned. Although the main backers of the plot were the chiefs of Waipi‘o, ‘Ewa, they were temporarily able to convince Kahekili that the conspiracy originated on Kaua‘i, thus the phrase, *Waipi‘o kīmopō*, “Waipi‘o of the secret rebellion” (Pukui 1983:319). Eventually the truth was revealed and:

*A no kēia mea, ulu maila ke kaua kūloko o Kona me ‘Ewa, nā moku o O‘ahu i luku nui ‘ia; ua luku ‘ia nā moku o O‘ahu i luku nui ‘ia; ua luku ‘ia nā kāne, nā wāhine a me nā keiki, a ua pani kūmano ‘ia nā kahawai a me nā muliwai i nā heana o nā kānaka o Kona a me ‘Ewa. ‘O nā kahawai i ‘oi aku ka nui o nā heana, a ho‘i hou ka wai i uka, ‘o ia nō ‘o Makaho a me Niuhelewai ma Kona, a ‘o Kaho‘ā‘ia‘i ho‘i ko ‘Ewa. He kūmukena ka nui o nā mea he make, ke lilo ka wai i mea ‘awa-‘awa ke inu aku. Ua ‘ōlelo mai ho‘i ka po‘e ‘ike maka ‘O ka lolo ka mea i ‘awa-‘awa ai ‘o ka wai.’ [Kamakau 1996:91, *Ka Nūpepa Kū‘oko‘a*, 39 March 1867]*

. . . the districts of Kona and ‘Ewa were attacked, and men, women, and children were massacred, until the streams of Makaho and Niuhelewai in Kona [in Kapālama] and of Kahoa‘ai‘ai in ‘Ewa were choked with the bodies of the dead,

and their waters became bitter to the taste, as eyewitnesses say, from the brains that turned the water bitter. All the O'ahu chiefs were killed and the chiefesses tortured. [Kamakau 1992:138]

4.2 Early Historic Period

The *ahupua'a* of Kapālama is between the *ahupua'a* of Nu'uaniu to the east and Kalihi to the west. Although Kapālama is not a major river valley like Nu'uaniu or Kalihi, it is watered by two smaller streams, the Kapālama and Niuhelewai. The shore frontage (presently "Kapālama Basin") is part of the Honolulu Harbor protected shoreline. Kapālama Ahupua'a offered desirable environmental conditions for traditional Hawaiian subsistence practices. The well-watered flood plain would have allowed for the development of an extensive *lo'i* (taro pond field) system, and the protected shoreline and fringing reef would have allowed for ease of ocean access to the productive nearshore fisheries. E.S. Craighill Handy, who gathered information on former planting areas from local informants in the 1930s and 1940s, reported the following: "Kapālama had two streams watering its terrace area [for taro], which was almost continuous from Iwilei up to the foothills above School Street, an area measuring about three quarters of a mile both in depth inland and in breadth" (Handy 1940:79).

The lower lands were used for taro cultivation; the uplands also had considerable resources. In the early nineteenth century, sandalwood trees were still present in the forests. These trees were extensively harvested between 1810 and 1830 as the fragrant wood could be sold to ship captains sailing to China to trade for exotic Asian goods.

Otto von Kotzebue's journal and map of Honolulu provide one of our earliest accounts of the environs of Kapālama ca. 1817 (Kotzebue 1967:339–341). Kotzebue's 1817 map of Honolulu (Figure 7), shows large taro fields (and trees) on both sides of the mouth of Kalihi and Nu'uaniu streams extending to the coast. The path shown was probably the main trail and the route traveled by Kotzebue himself. The 1817 map does not show any taro fields in Kapālama, but a later 1855 map by LaPasse (Figure 8) does show extensive taro *lo'i* in the *makai* (seaward) section of Kapālama. LaPasse's map also shows two fishponds, Kūwili I and Kawa. These ponds are on the eastern side of Kapālama, but the land around them was considered part of Kūwili, an *'ili* of Honolulu rather than Kapālama.

Kūwili [Kūwili I] Pond is classified as a Type II pond (Kikuchi 1973), a *loko pu'one* or *loko hakuone*, an isolated shore fishpond usually formed by the development of a barrier beach building a single elongated sand ridge (*pu'one* or *hakuone*) parallel to the coast. It was adjacent to Kawa Fishpond, a Type I pond, a *loko kuapā*, a fishpond of littoral water whose side or sides facing the sea consist of a stone or coral wall containing one or more sluice grates (Kikuchi 1973:227–228).

Fishponds of Types I and II had the largest variety of fish as food resources. The most common ones were the fish called *āholehole* (*Kuhlia taeniura*, *Kuhlia sandwichensis*, etc.); mullet; tenpounder; milkfish, *'awa'aua*; barracuda (*Sphryaena barracuda*), *kākū*, anchovy (*Anchoviella purpurea*), *nehu*, the fish identified by the Hawaiians as *'o'opu*; and the eel, *puhi*. The uncommon fish were: amber fish (*Caranx mate*), *kahala*; goatfish (*Upeneus prophyreus*), *kūmū*, three surgeonfish called *manini*, *palani*, and *puwalu*; bonefish; parrot fish, and crevally. [Kikuchi 1973:93]

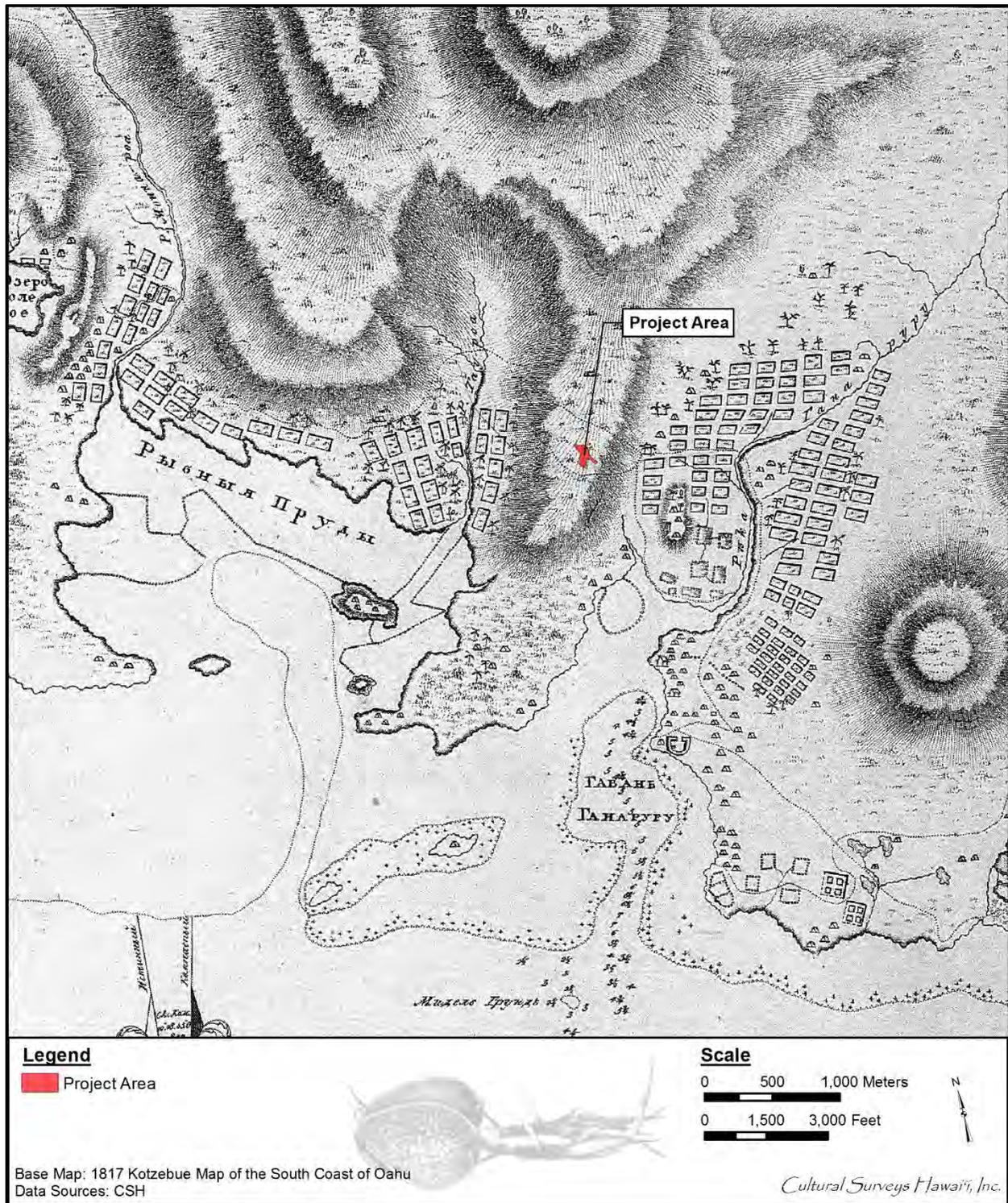


Figure 7. 1817 map of south coast of O’ahu by Otto von Kotzebue (1817) of the Russian ship *Rurik*, showing density of habitations and agriculture around Kapālama (The study area and map have been geo-referenced; the study area is located on a ridge, and it should be noted that this early map should be understood as a “sketch”)

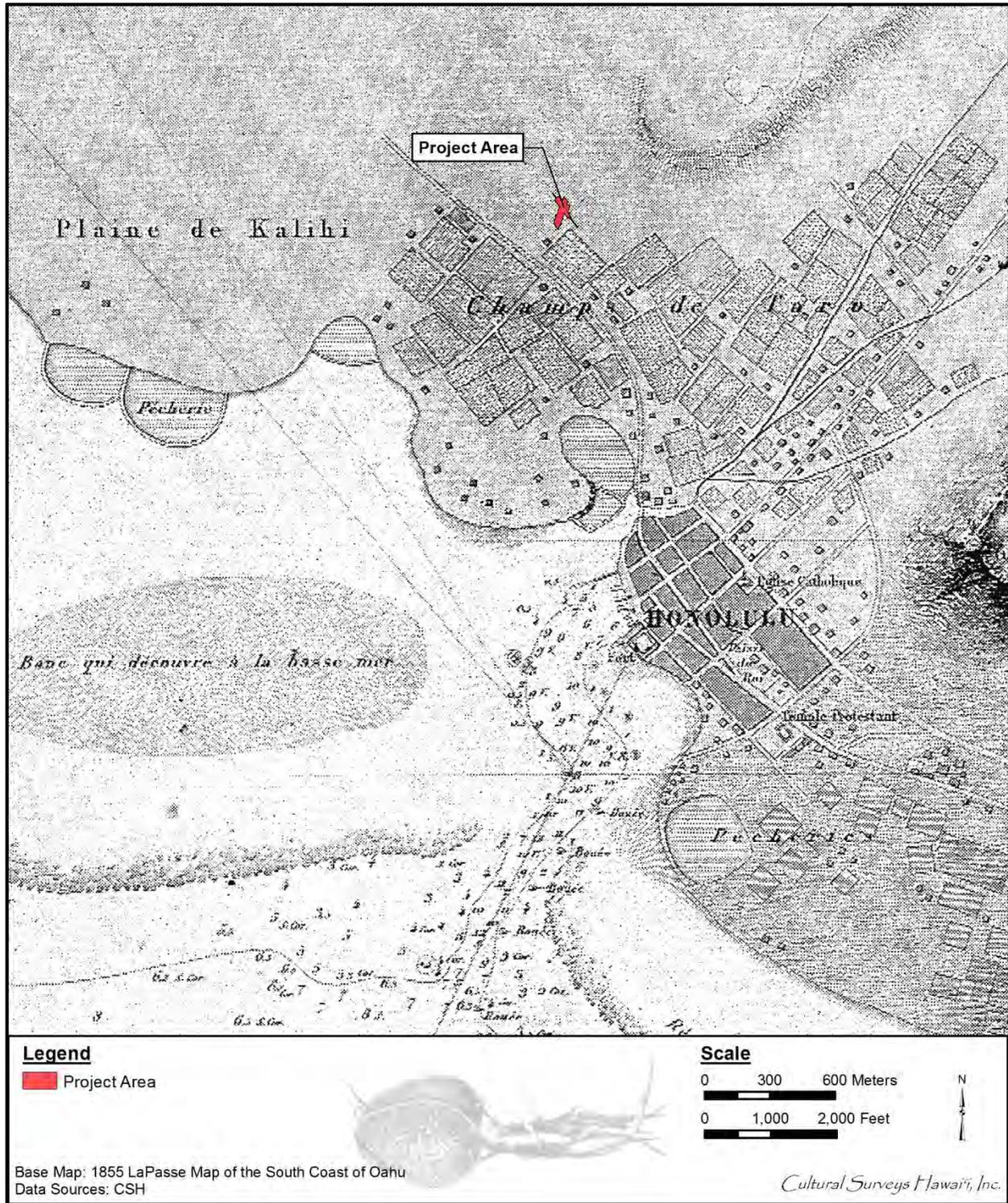


Figure 8. 1855 map of Honolulu by Lt. Joseph de LaPasse of the French vessel, *L'Eurydice* (reprinted in Fitzpatrick 1986:82–83), showing *lo'i*, habitations, and fishponds in Kapālama

In 1869, Samuel Kamakau described the *loko pu'one*:

The *pu'one* ponds near the sea (*loko kai pu'uone*) were much desired by farmers, and these ponds they stocked (*ho'oholo*) with fish. *Pu'uone* ponds were close to shore ponds, *loko kuapa*, or to the seashore, and next to the mouths (*nuku*) of streams. The farmers cleared away the *mokae* sedges, *'aka'akai* bulrushes, and the weeds, and deepened the pond, piling up the muck on the sides, until he had a clean pond. Then he stocked it with *awa* fish. After two or three years the fish from the first gourd would have grown to a *ha'ilima* (18 inches) in length. [Kamakau 1976:49]

Kamakau noted there were often structures on or near the ponds, *hale kia'i*, or guard houses, where the fishpond keepers would stay on certain nights to deter poachers.

On the nights when the tide was high every *kia'i* (keeper) slept by the *mākaha* (sluice gate) of which he had charge, and it was the *kia'i loko* (keeper of the pond) custom to build small *hale kia'i* from which to guard the fish from being stolen or from being killed by pigs and dogs. [Kamakau 1976:48]

Kamehameha I, after the devastations to the population caused by the wars of conquest and a ca. 1804 epidemic, encouraged people to replant the land and he set aside several large tracts, including tracts in Kapālama, for them to grow crops for their own use and for trade with visiting ships. The Hawaiian historian Samuel Kamakau noted, “After the pestilence had subsided the chiefs again took up farming, and Kamehameha cultivated land at Waikiki, Honolulu, and Kapālama, and fed the people” (Kamakau 1992:190).

Another early Hawaiian historian, John Papa 'Ī'ī, knew personally that, “He [Kamehameha] also lived in Honolulu, where his farms at Kapālama, Keoneula, and other places became famous. These tasks Kamehameha tended to personally, and he participated in all the projects” ('Ī'ī 1959:69).

Rev. Hiram Bingham, arriving in Honolulu in 1820, described a predominantly Native Hawaiian environment—still a “village”—on the brink of western-induced transformation:

We can anchor in the roadstead abreast of Honolulu village, on the south side of the island, about 17 miles from the eastern extremity. . . . Passing through the irregular village of some thousands of inhabitants, whose grass thatched habitations were mostly small and mean, while some were more spacious, we walked about a mile northwardly to the opening of the valley of Pauoa, then turning south-easterly, ascending to the top of Punchbowl Hill, an extinguished crater, whose base bounds the north-east part of the village or town . . .

Below us, on the south and west, spread the plain of Honolulu, having its fish-ponds and salt making pools along the sea-shore, the village and fort between us and the harbor, and the valley stretching a few miles north into the interior, which presented its scattered habitations and numerous beds of *kalo* (*arum esculentum*) in its various stages of growth, with its large green leaves, beautifully embossed on the silvery water, in which it flourishes. [Bingham 1981:92–93]

Robert Dampier's ca. 1825 wash drawing "Fishponds of Honoruru, Oahu" (Figure 9) documents a rather idyllic collection of grass huts scattered along the lower portions of Nu'uano Stream and along Honolulu Harbor. The fishponds depicted in the center foreground of the painting are in the right geographical position to be Kawa and Kūwili I Fishponds. In 1828, the fishponds were described by a Dutch merchant:

. . . we arrived at the beach and came upon a small hamlet of several scattered fishermen's huts. The whole arrangement of the place seemed pleasant and cozy.

Now we had to wade through the water and our horses along the banks of the fish ponds of the king of these islands, situated north of the port of Honoruru. These ponds are irregularly shaped basins enclosed by walls of stone from the coral banks. These walls have openings through which the fish can enter the pond, but not, I was assured, leave it again to seek their freedom in the sea. When we approached this part of our trip, it happened to be at low tide so it was very easy to step through the water with the horse. [Broeze 1988:69]

In his history of Hawai'i written in the 1860s, John Papa 'Ī'ī describes the appearance of the trail (around the year 1810) from Nu'uano to Moanalua through Kapālama:

When the trail reached a certain bridge, it began going along the banks of taro patches, up to the other side of Kapalama, to the plain of Kaiwiula; on to the taro patches of Kalihi; down to the other stream and up the other side; turned right to the houses of the Portuguese people . . . ['Ī'ī 1959: 95]

While somewhat general, the 'Ī'ī account supports that of von Kotzebue in relating an abundance of *lo'i* where the main trail crossed Nu'uano and Niuhelewai streams, and Kapālama Stream, a relatively uncultivated plain as the trail traversed the western section of Kapālama in the *'ili* of Kaiwi'ula (area now occupied by the Farrington High School), and then to more *lo'i* on Kalihi Stream.

4.3 The Māhele and the Kuleana Act

In 1845, the Hawaii Board of Commissioners to Quiet Land Titles, also called the Land Commission, was established "for the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any landed property" (Chinen 1958:8). This led to the Māhele, the division of lands among the Hawaiian government, the King, the *ali'i* (royalty), and the common people as codified in the Māhele Book (1848), which introduced the concept of private property into Hawaiian society.

In 1848, the crown (Hawaiian government), Kamehameha III, and other *ali'i* such as Victoria Kamāmalu received their land titles, called Konohiki Awards. The Konohiki award claimant had to pay a commutation fee of one-third of the value of their unimproved lands. Usually this fee was settled when the *ali'i* "returned" some of his awarded lands, and "retained" others. The returned lands usually then became Government Lands, which were set aside to generate revenue for the government, or Crown Lands, which were lands reserved for the monarchy (Chinen 1958:8). In the petitioning for Land Commission Awards (LCAs) for their *kuleana* (lands), the commoners had to provide testimony from witnesses, including statements regarding the boundaries of the land and its use. In the 1790s, after Kamehameha had conquered O'ahu, Kapālama is specifically



Figure 9. Image by Robert Dampier, *Fishponds of Honouliuli, Oahu*, ca. 1825

mentioned along with Nu'uaniu, Mānoa, and Waikīkī as having been “farmed” by Kamehameha. The desirability of Kapālama Ahupua'a is supported by the fact that Kamehameha “kept of himself” the *ahupua'a* during the post-1795 division of O'ahu lands (Kame'eiehiwa 1992:59). The *ahupua'a* of Kapālama was awarded to Moses Kekūāiwa, son of Kekūanao'a and Kīna'u (who had earlier been married to Kamehameha I). The lands passed down in turn to his sister Victoria Kamāmalu, to her brother Lot Kamehameha, to his half-sister Ruth Ke'elikōlani, and then to her first cousin, Bernice Pauahi Bishop. The will of Mrs. Bishop set many of her lands as a trust to provide financial aid to educational and charitable institutions, including the schools she founded to educate Hawaiian children (Mitchell 1993:9).

Subsequent to the Māhele award for the bulk of the *ahupua'a*, individual *kuleana* (commoner) lots were awarded pursuant to the 1850s Kuleana Act. The first detailed map of Kapālama, made by J.F. Brown in 1885 (Figure 10), shows a traditional Hawaiian landscape of small *kuleana* LCA parcels extending across the Kapālama plain. Mid-nineteenth century Māhele documents identify these *kuleana* parcels as comprising house sites and irrigated taro fields. The map also indicates large areas set aside for rice fields near the central *'auwai* (irrigated ditch) in land managed by the *konohiki* (land agent for the *ali'i*; in this case Moses Kekūāiwa). The LCA testimony for Kapālama indicates there was intensive cultivation of taro in the area, maintenance of fishponds, habitation, and some indication of the use of the *kula* (pasture or waste land). The *kuleana* to Hawaiian *maka'āinana* were located on the flood plain to the east of Waiakamilo/Houghtailing Street and included houses and *lo'i* for the cultivation of *kalo* (taro). The taro patches in the vicinity were just downstream of Niuhelewai (Kapālama) Stream. Roughly 100 *kuleana* lots were awarded in Kapālama; Figure 11. The claimants were generally awarded one to six separate *'āpana* (lots), sometimes contiguous or in the same *'ili*, but also sometimes scattered through several *'ili*. LCA documentation notes the presence of house sites, irrigated taro fields (*lo'i*), and aquaculture fishponds in the immediate vicinity. The pattern of land-award distribution shown in the LCAs suggests the traditional Hawaiian practice of maintaining residences dispersed within and throughout their agricultural fields continued in Kapālama at least until the mid-nineteenth century.

The study area is located within portions of LCA 732:2 (to Kuinui), 918:2 (to Upai), 1746 (to Nakaikuaana), 2266:3 (to Kuhiana), 2268:1 (to Kapahu), and 2937 Part 2:2 (to Wm. Harbottle) (Figure 11, Table 1 and Appendix A). The claims include house lots and associated taro patches and pastureland.

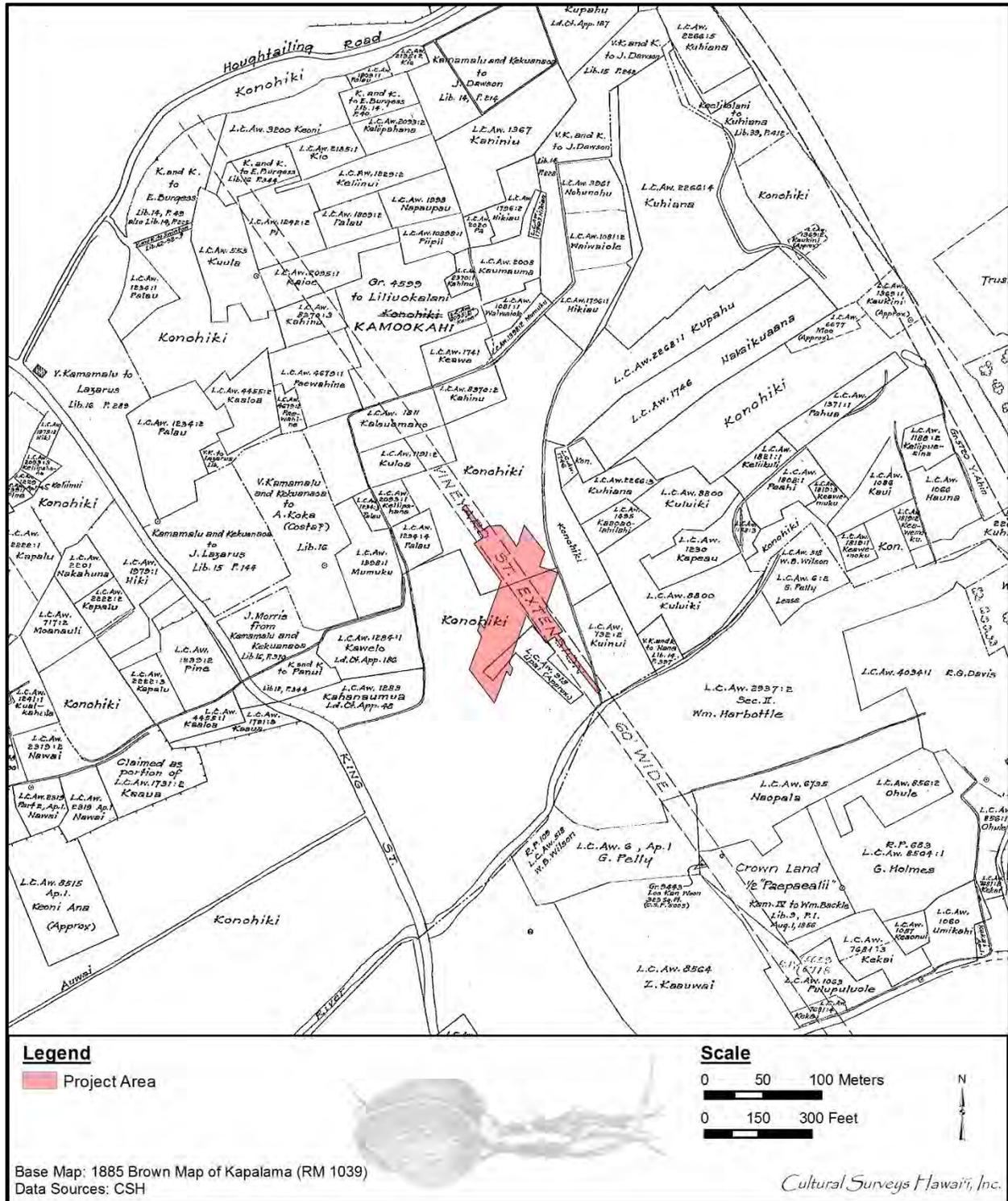


Figure 10. 1885 Brown map of Kapālama depicting LCA parcels in the vicinity of the study area and the planned extension of the Vineyard Street right-of-way

Table 1. LCAs within the Project Area

LCA Number	Claimant	'Ii	Land Use
732	Kuinui	Leleo	'Āpana 1: House lot 'Āpana 2: Four <i>lo 'i kalo</i>
918	Upai (w)	Iwilei, Kumuulu	'Āpana 1: Three <i>lo 'i kalo</i> 'Āpana 2: House lot
1746	Nakaikuaana	Kalaepohaku	'Āpana 1: 21 <i>lo 'i kalo</i>
2266	Kuhiana	Kalaepohaku, Kainapuaa	'Āpana 1: House lot 'Āpana 2: Nine <i>lo 'i kalo</i> 'Āpana 3: Six <i>lo 'i kalo</i> 'Āpana 4: 11 <i>lo 'i kalo</i> 'Āpana 5: <i>Kula 'āina</i> (plain)
2268	Kapahu	Kalaepohaku	'Āpana 1: House lot and <i>kula 'āina</i> 'Āpana 2: Ten <i>lo 'i kalo</i>
2937	Harbottle	Various	'Āpana 1: <i>Kula 'āina</i> and <i>lo 'i kalo</i> 'Āpana 2: <i>Kula 'āina</i> and <i>lo 'i kalo</i>

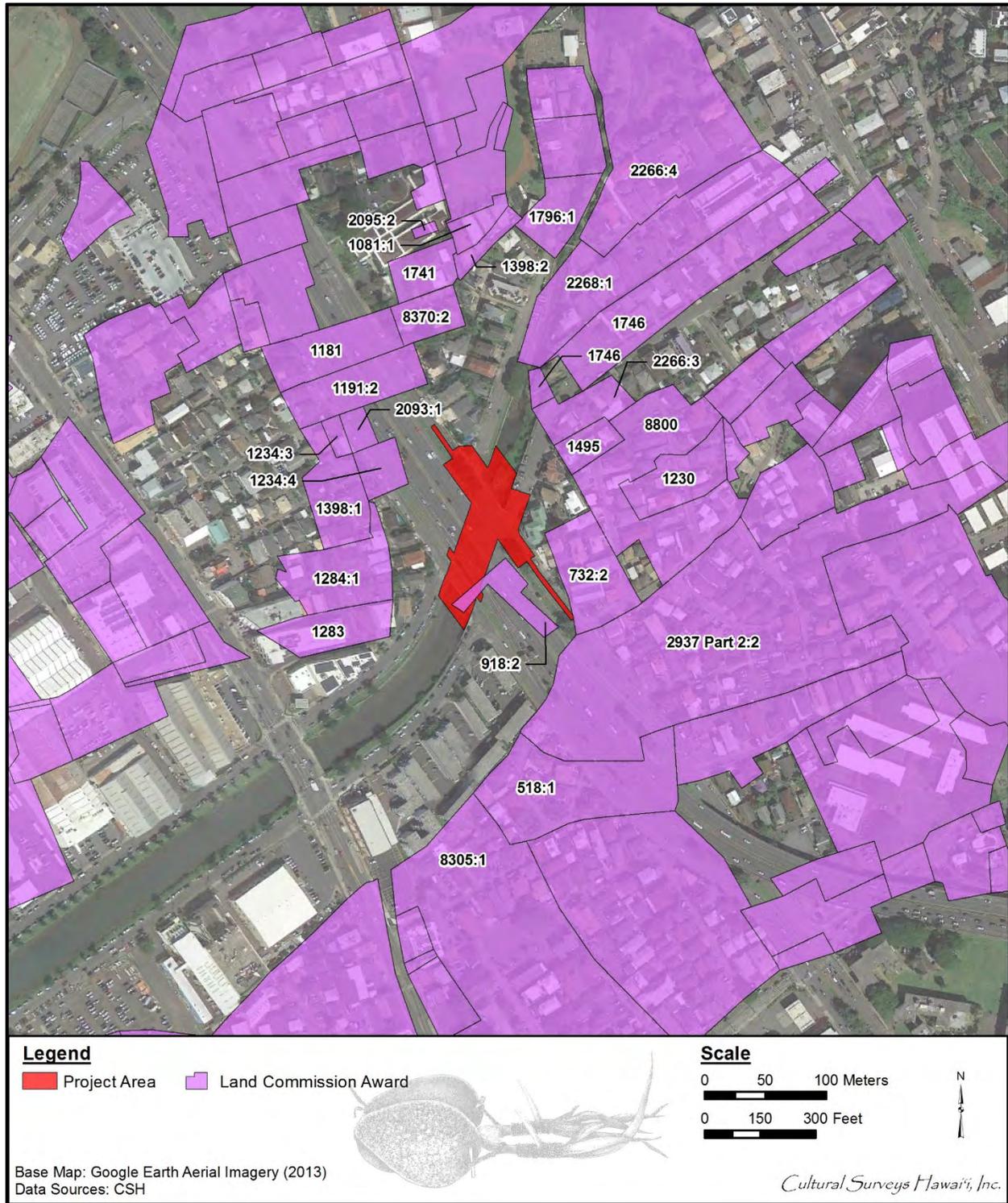


Figure 11. 2013 aerial photograph with an overlay of land commissions awards in the vicinity of the study area (Google Earth 2013)

4.4 Mid- to Late 1800s

The study area vicinity is shown on the 1893 Wall map of Honolulu (Figure 12) as surrounded by rice cultivation but with a north/south trending railroad spur crossing the east portion of the study area. The purpose of the railroad spur is unclear and may have been to facilitate the loading of rice.

The Kapālama area on the 1897 Monsarrat map (Figure 13) is dominated by the Kamehameha Schools complex with only a few scattered houses such as the Houghtailing home. The main street is King Street, which extends through Kapālama, including a mule-drawn tramway, which had its stables southwest of the Kapālama Canal project block. The O'ahu Insane Asylum was *mauka* (inland, toward the mountains) of the future H-1 Interstate Highway corridor. The study area is shown in the middle of a rice plantation.

A site in Kapālama called Kaiwi'ula ("the red bone") was chosen for the first Kamehameha School for Boys, which opened in 1887 (Figure 14). The construction of many wood frame buildings followed including a principal's house, dormitories, faculty cottages, a preparatory school, a dining hall and kitchen, gymnasiums, and manual school shops. Two stone buildings were constructed first. Bishop Hall, the main administration building for the school, was completed in 1891 and the Bishop Memorial Chapel was completed in 1897. In 1938, the grounds, the chapel, and the preparatory buildings were sold to the territorial government in order to build an auditorium for the Wallace R. Farrington High School. The chapel was demolished in 1954 (Mitchell 1993:1-42). The first buildings of Farrington High School were constructed in 1940, designed by the noted Hawaiian architect Charles W. Dickey (Farrington High School 2014).

Mr. Charles Bishop was interested in preserving the many artifacts in the possession of his late wife and those of the late Queen Emma, who in 1884 willed her "native curiosities" to him "on the condition that at some future day then, together will all similar articles belonging to the late Bernice Pauahi Bishop . . . be presented to him as trustees of an institution to be called the Kamehameha Museum . . ." (Rose 1980:10). The trustees of Bishop Estate chose a site near the Kamehameha School for Boys and the museum, housed in Bishop Hall, opened to the public in 1891 (Figure 15). The official name of the institution was the Bernice Pauahi Bishop Museum but it was also called *Hale Hō'ike'ike o Kamehameha*, or Museum of Kamehameha, the name Queen Emma preferred (Rose 1980:21). In 1894, a new Polynesian Hall was added, in 1903 a Hawaiian Hall, in 1911 the Pākī Hall, and in 1925 the Konia Hall. In 1947, the Kamehameha Schools moved their campus to Kapālama Heights and the former school grounds were transferred to the Bishop Museum Trust. Bishop Hall was formally transferred to the Bishop Museum in 1980 (Rose 1980:18-62).

The Oahu Insane Asylum was established by the Hawai'i Legislature in 1862, proposing that "A building is to be erected for the reception of insane persons. This facility will furnish restraint till the person becomes of sane mind or is discharged" (Kimmich 1956:345). The hospital was completed in 1866 and the first six patients were transferred to the hospital from the jails where the mentally ill had previously been kept. In 1930, all 549 patients in the then-named Territorial Hospital were transferred to the new Territorial Hospital in Kāne'ohe, O'ahu.

Mr. George Houghtailing's grandfather came to Hawai'i around 1845, married a Hawaiian woman in 1850 and ran the Bay Horse Saloon at Bethel and Hotel streets in Honolulu. During the

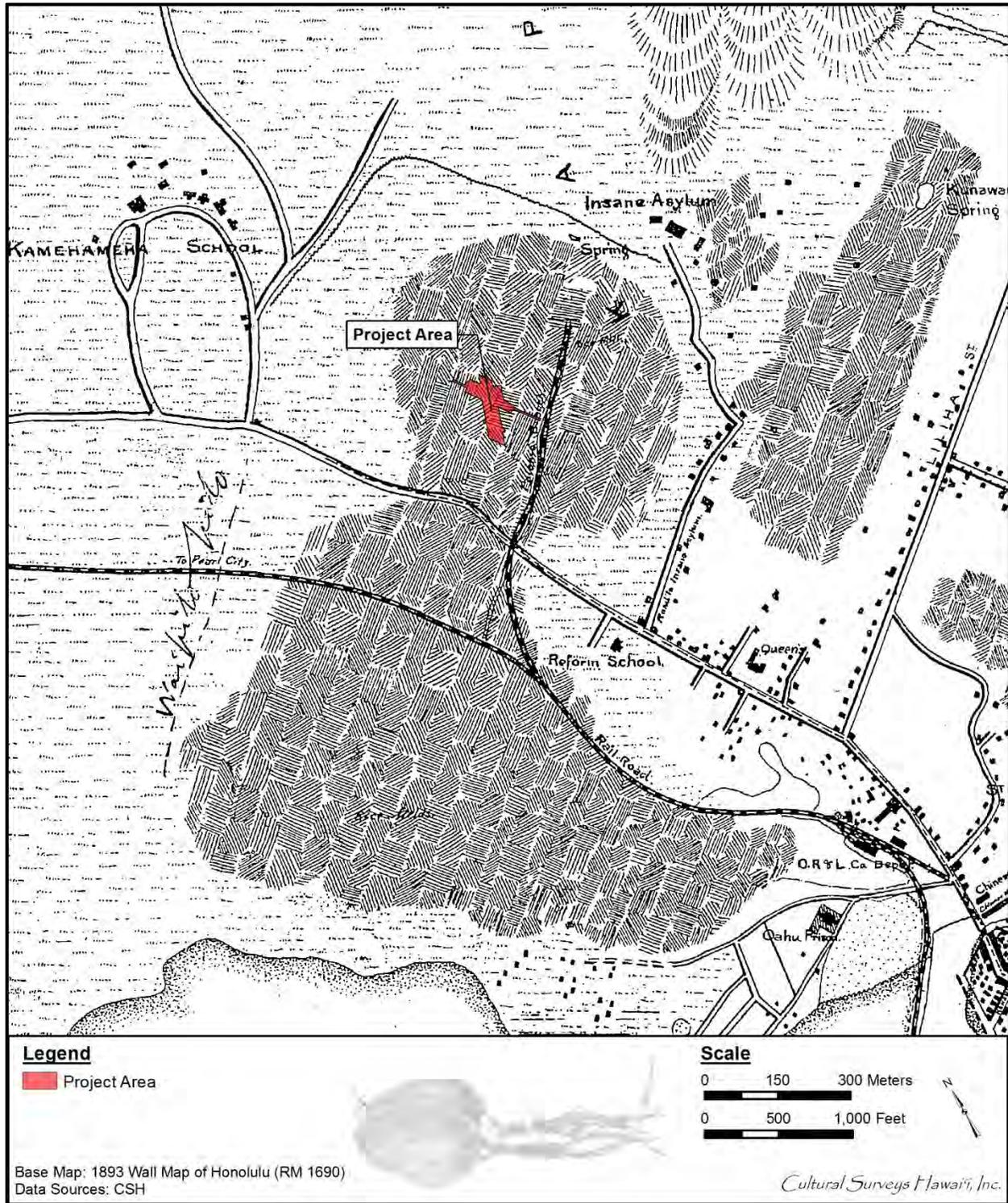


Figure 12. 1893 Wall map of Honolulu showing study area surrounded by rice fields

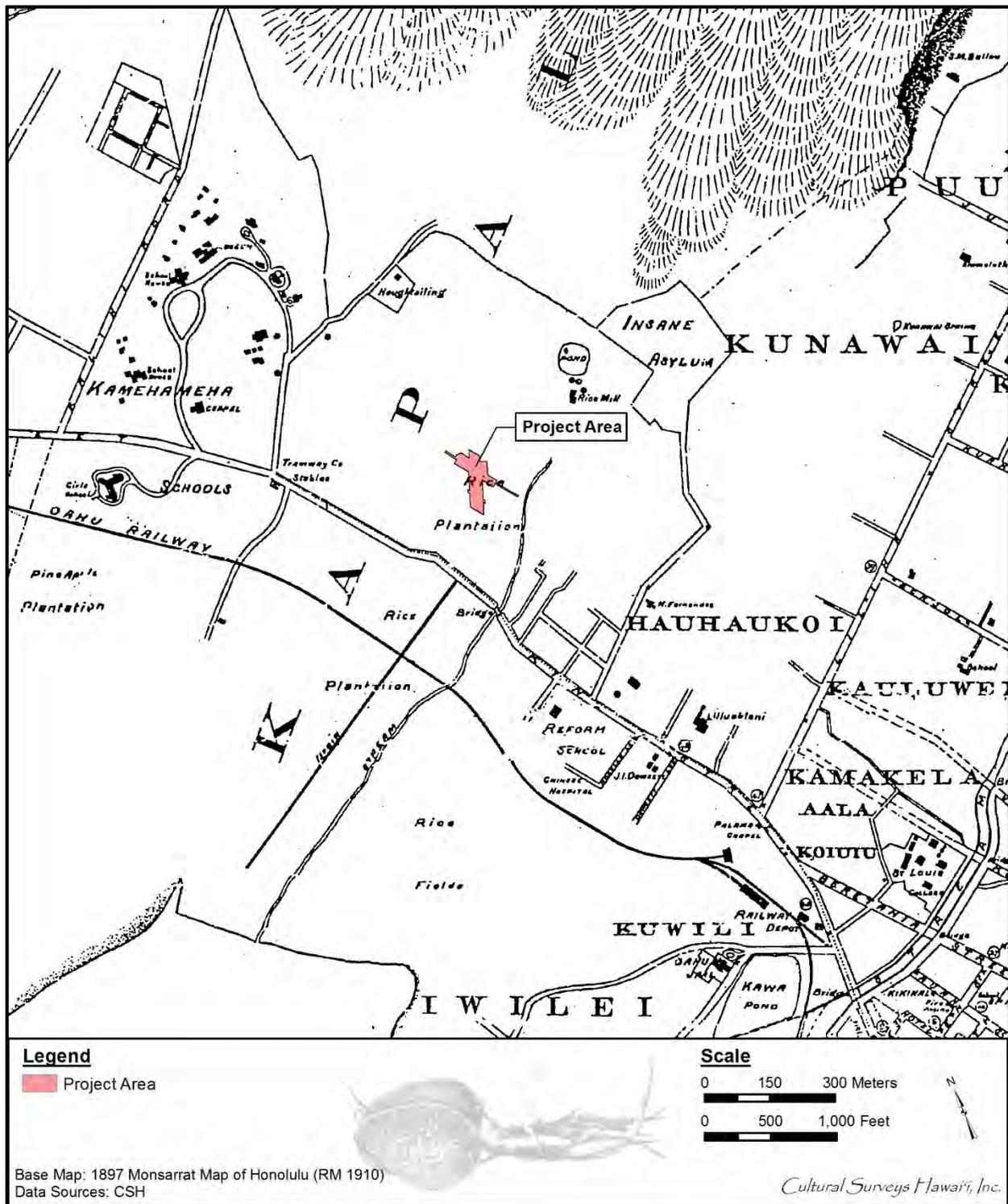


Figure 13. 1897 Monsarrat map of the Honolulu District showing the study area in a rice plantation



Figure 14. Photo of Kamehameha School for Boys, ca. 1933

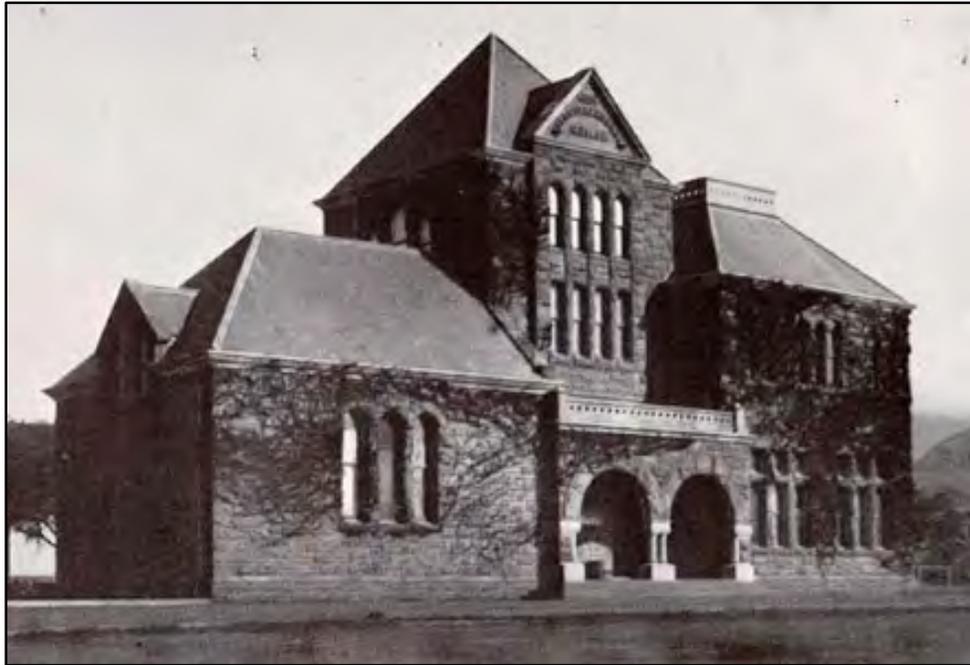


Figure 15. Photo of the Bishop Museum ca. 1889



Figure 16. Photo of the Houghtailing sisters' plantation home, now the location of Damien Memorial School., ca. 1912-1913

Māhele, he was given several *kuleana*, later consolidated into a 15-acre tract along a road later named after him, Houghtailing Road. The family home was between School and Vineyard streets, now the location of Damien High School, as described by Mr. Houghtailing (see Figure 16):

On the premises there was a large pond which had a natural spring and which also fed the lower land where we had taro patches and cultivated the other truck gardening on the land. The land was quite open. We had a couple of bay horses and raised chickens and pigs for family consumption. There was a large open area fronting Houghtailing Road which was used as a park for the neighborhood kids. [UH 1984:1099]

Mr. Houghtailing located the ponds, taro fields, and rice patches from School Street to Liliha Street; other taro patches were in the area “between Palama Street and Liliha Street, below School Street down to what in now Vineyard Street” (UH 1984:1100). These rice ponds and taro patches, usually operated by Chinese, were cultivated up to the 1920s when many were filled in for the development of residential subdivisions. Japanese took over some of the land as truck farms, and Japanese also gradually took over the small stores once operated by Chinese.

Portions of the H-1 Interstate Highway corridor extend through these rice fields and near the pineapple plantations, which are generally *makai* of King Street, although there was a rice mill *mauka* of the study area near the Insane Asylum. Again, there is an established bridge on King Street at the Kapālama Stream crossing. There are no specific structures within or adjacent to the Kapālama study area block.

4.5 1900s

4.5.1 Residential and Commercial Development

A series of USGS maps, U.S. Army War Department maps, and aerial photographs (Figure 17 through Figure 24) depict the accelerated development of residential neighborhoods and commercial centers in the first half of the twentieth century.

A 1919 map (see Figure 17) depicts the establishment of grid-like residential neighborhoods surrounding the Kamehameha School Complex in Kalihi-Pālama. The rice paddies and pineapple plantations are no longer shown, although some of the open areas on the map *mauka* of King Street may still have been cultivated for these crops, or turned into truck farms. There are no open spaces shown in the Nu‘uanu area at this time. On the 1897 Monsarrat map, (see Figure 13) houses were spaced only along the main roads. By 1919, homes are packed in small residential blocks.

A 1933 U.S. Army War Department map (see Figure 19) continues the trend to greater density in grid-like residential blocks. On this map dashed lines, representing planned roads, are shown in the once empty space east of the Kamehameha Schools campus. The area around Pālama Settlement east of Niuhelewai Stream is also a densely packed neighborhood. This is in contrast to the Nu‘uanu area which still has large houses separated by large yards.

A 1943 U.S. Army War Department map (see Figure 20) illustrates the density of homes along the street grids in lower and upper Kalihi-Kapālama. In upper Kalihi, Farrington High School has now taken the place of the Kamehameha Schools. The street grid east of the high school is still in the planning stages. Palama has now become not only a residential area, but has commercial

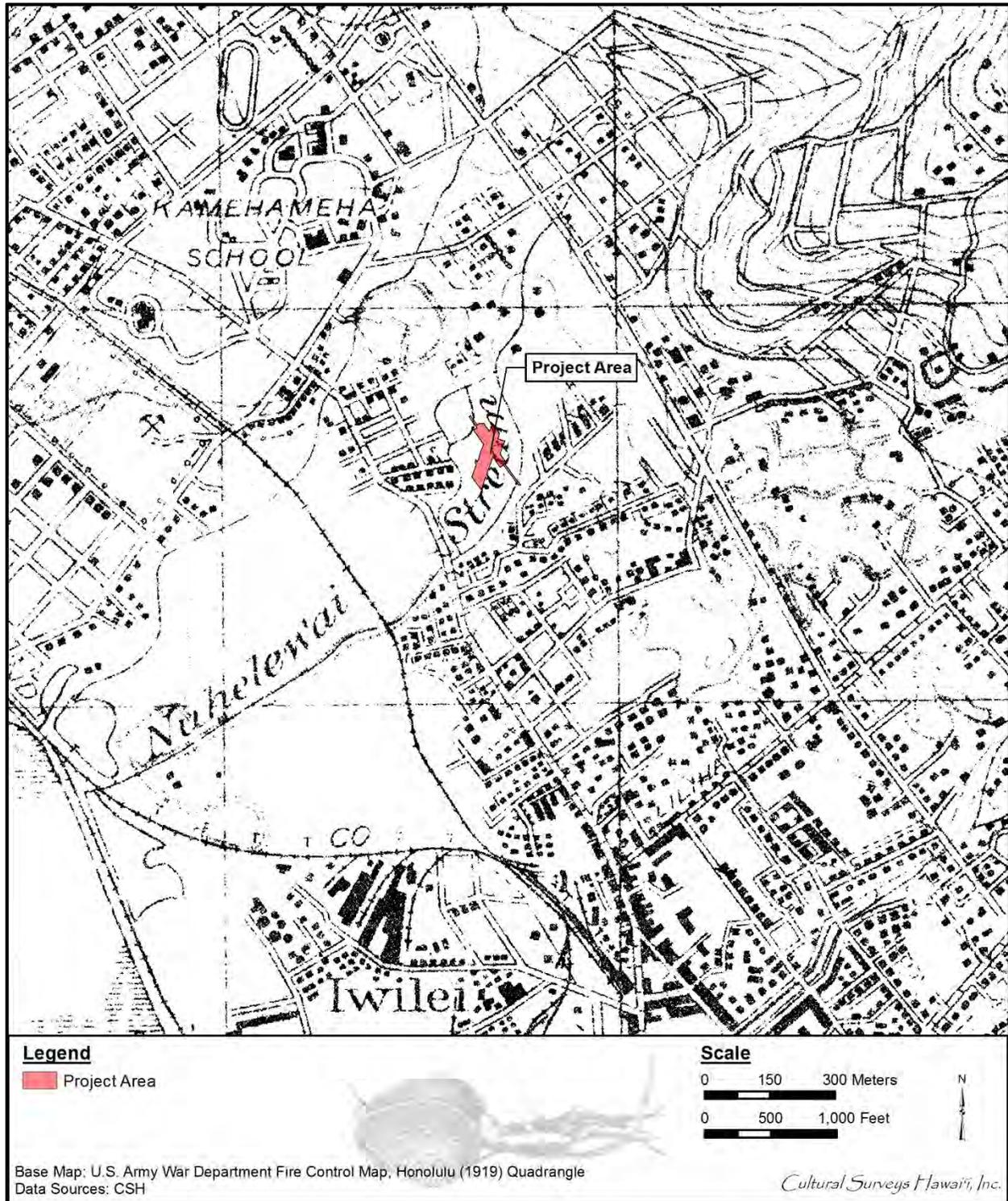


Figure 17. 1919 U.S. Army War Department map, Honolulu Quadrangle, showing commercial and residential development in Kapālama, near the study area

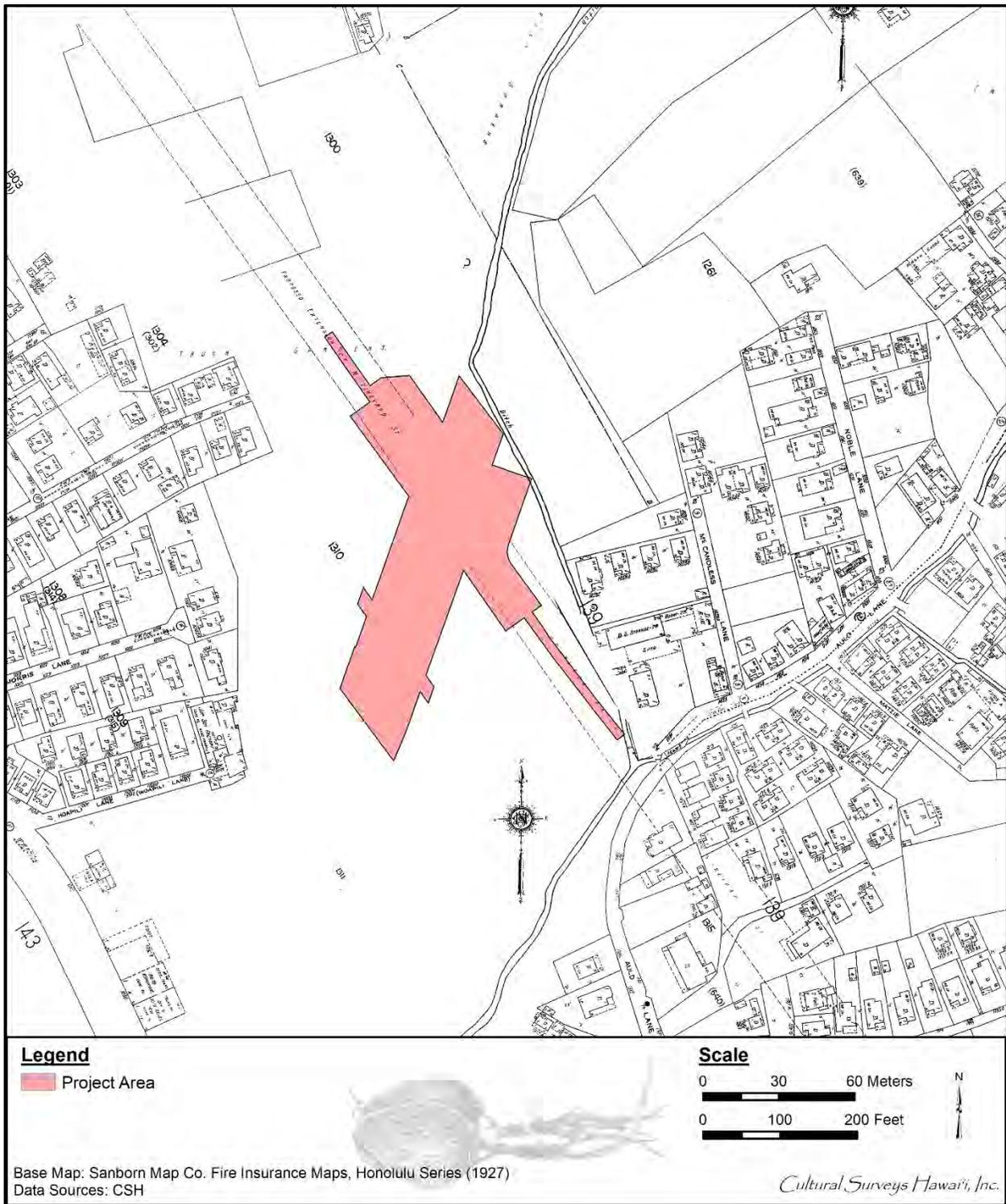


Figure 18. 1927 Sanborn Company Fire Insurance map showing a relative lack of development in the vicinity of the study area

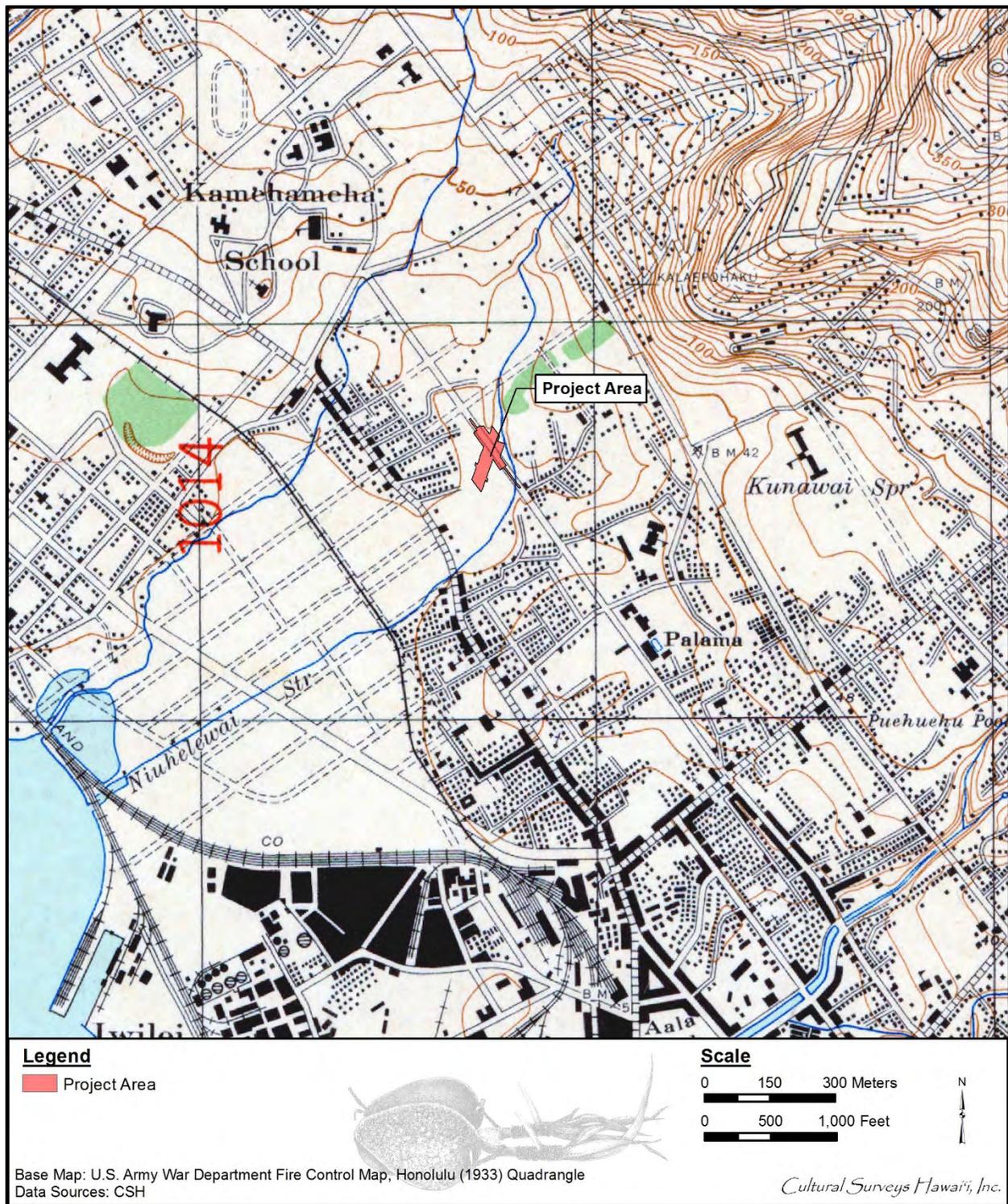


Figure 19. 1933 U. S. Army War Department map, Honolulu Quadrangle, showing commercial and residential development in Kapālama, near the study area

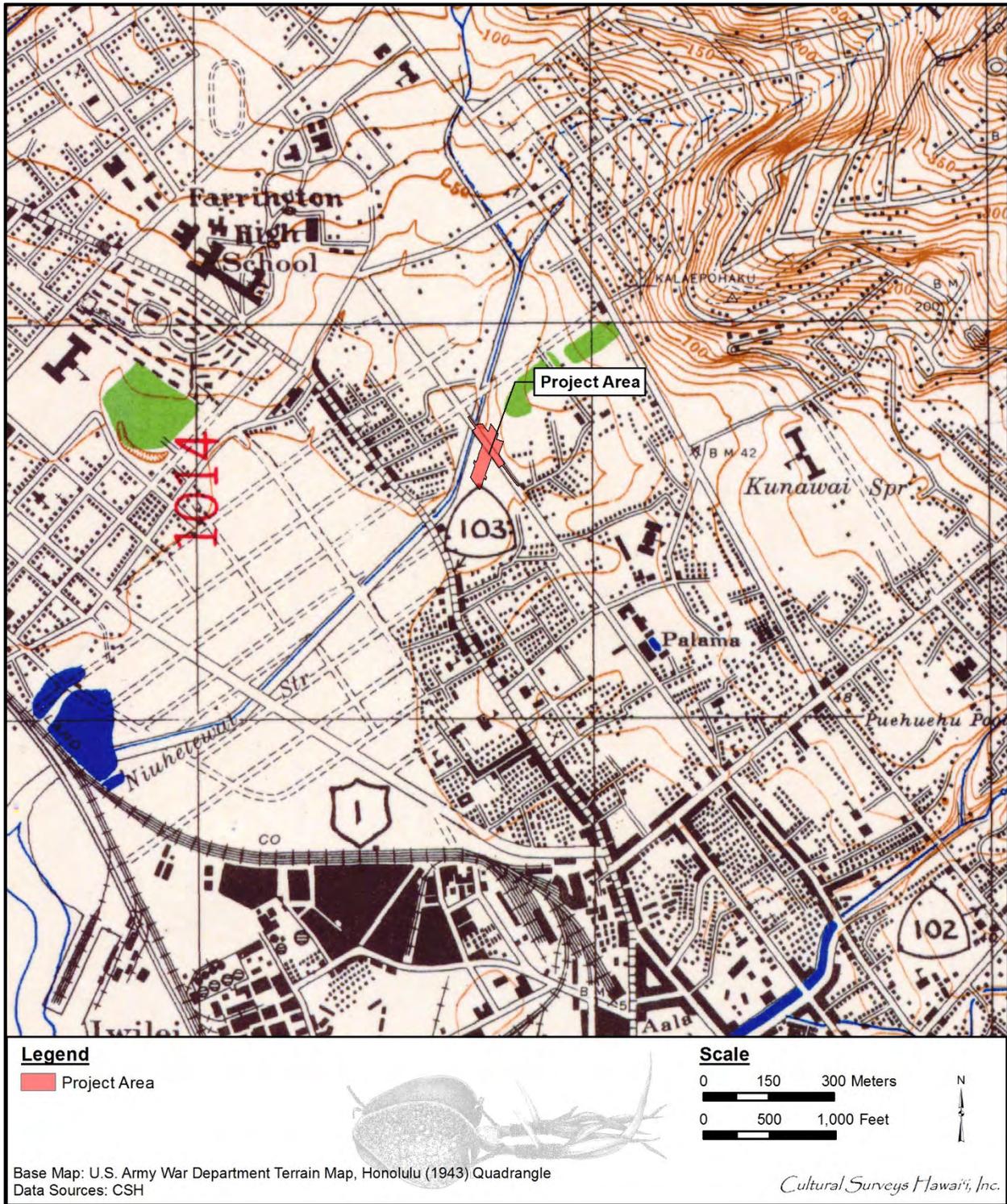


Figure 20. 1943 U.S. Army War Department map, Honolulu Quadrangle showing commercial and residential development in Kapālama, near the study area

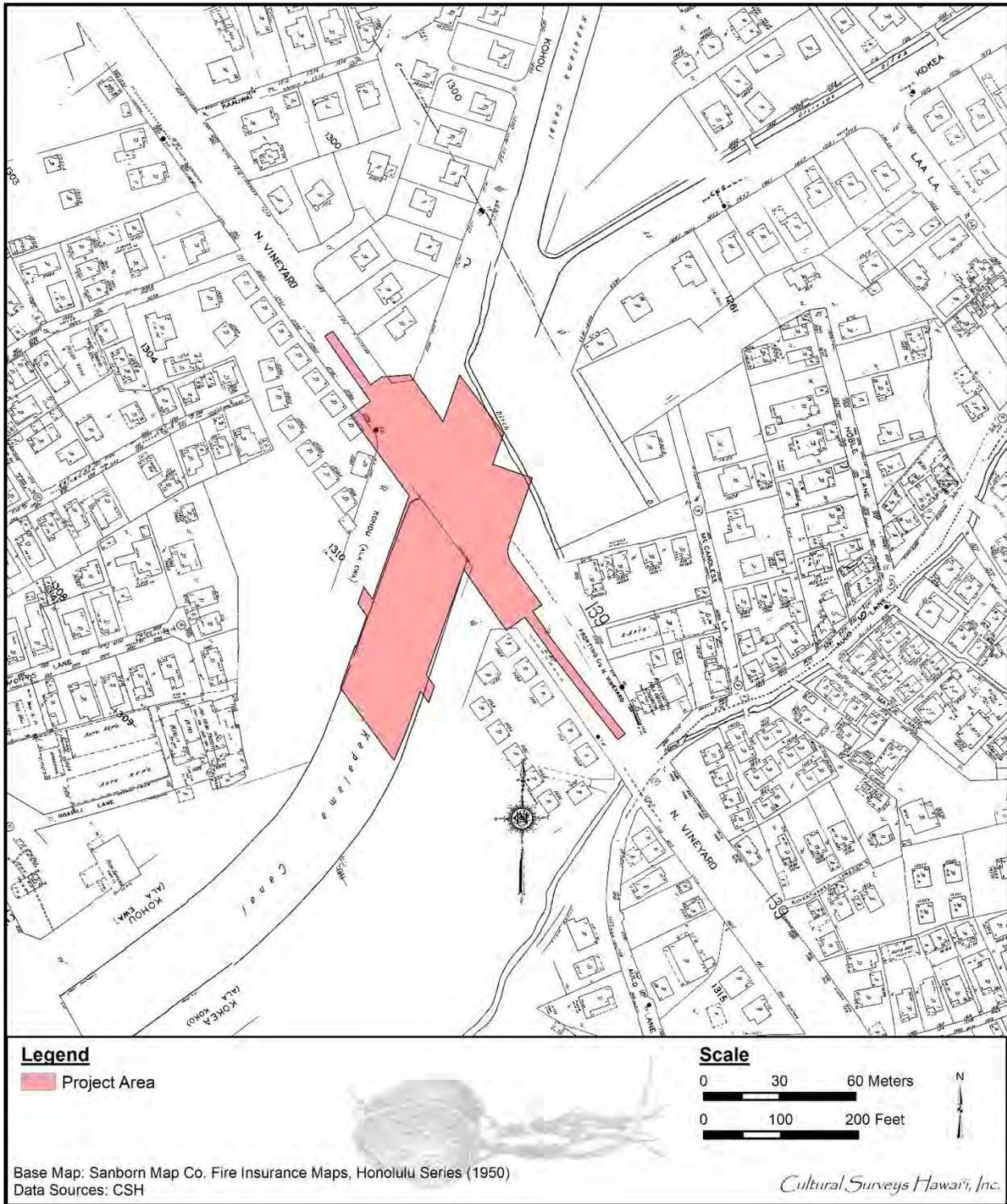


Figure 21. 1950 Sanborn Company Fire Insurance map showing a relative lack of development in the vicinity of the study area



Figure 22. 1952 aerial photograph showing study area

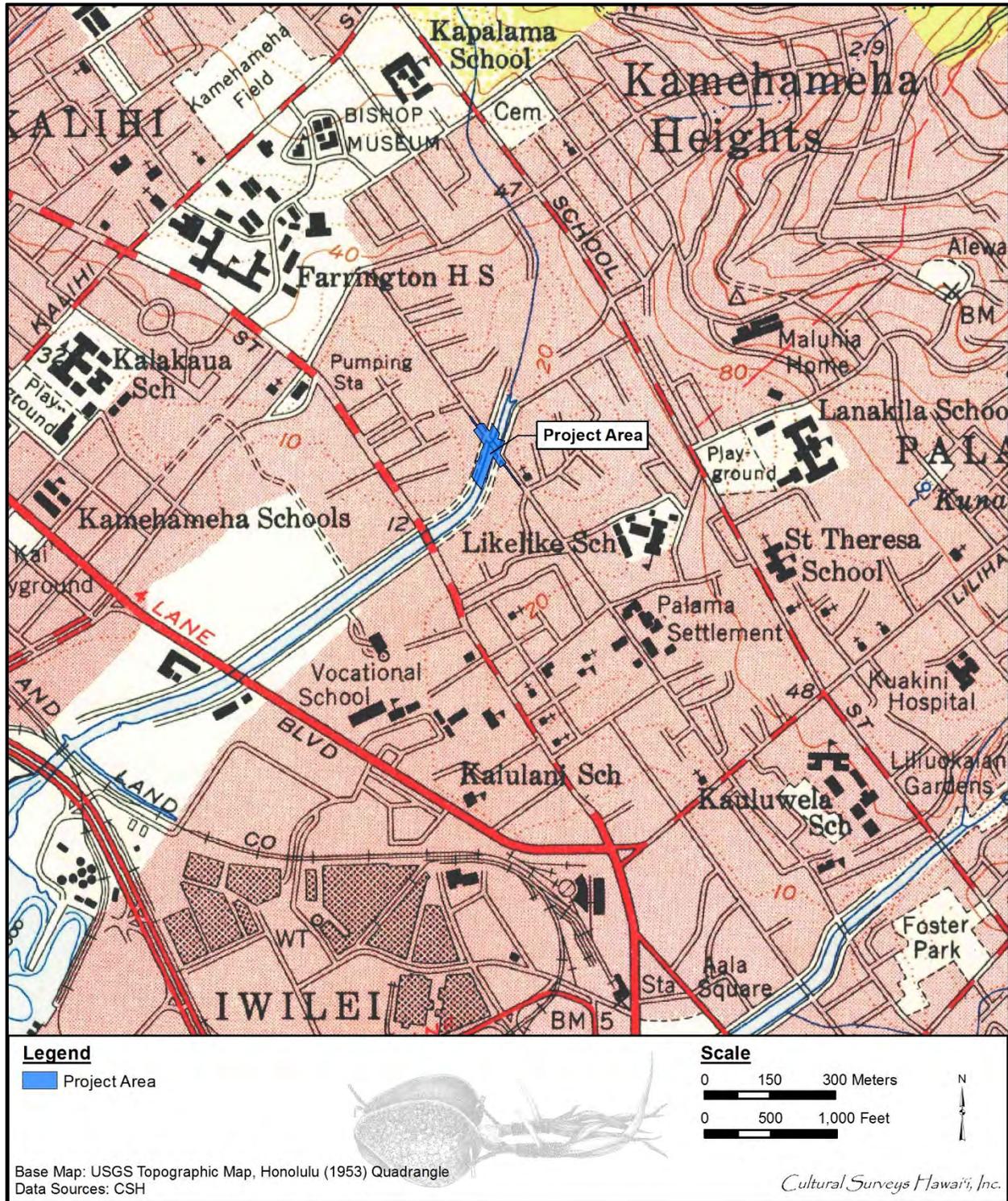


Figure 23. Portion of 1953 Honolulu USGS Topographic Quadrangle, showing commercial and residential development in Kapālama, near the study area

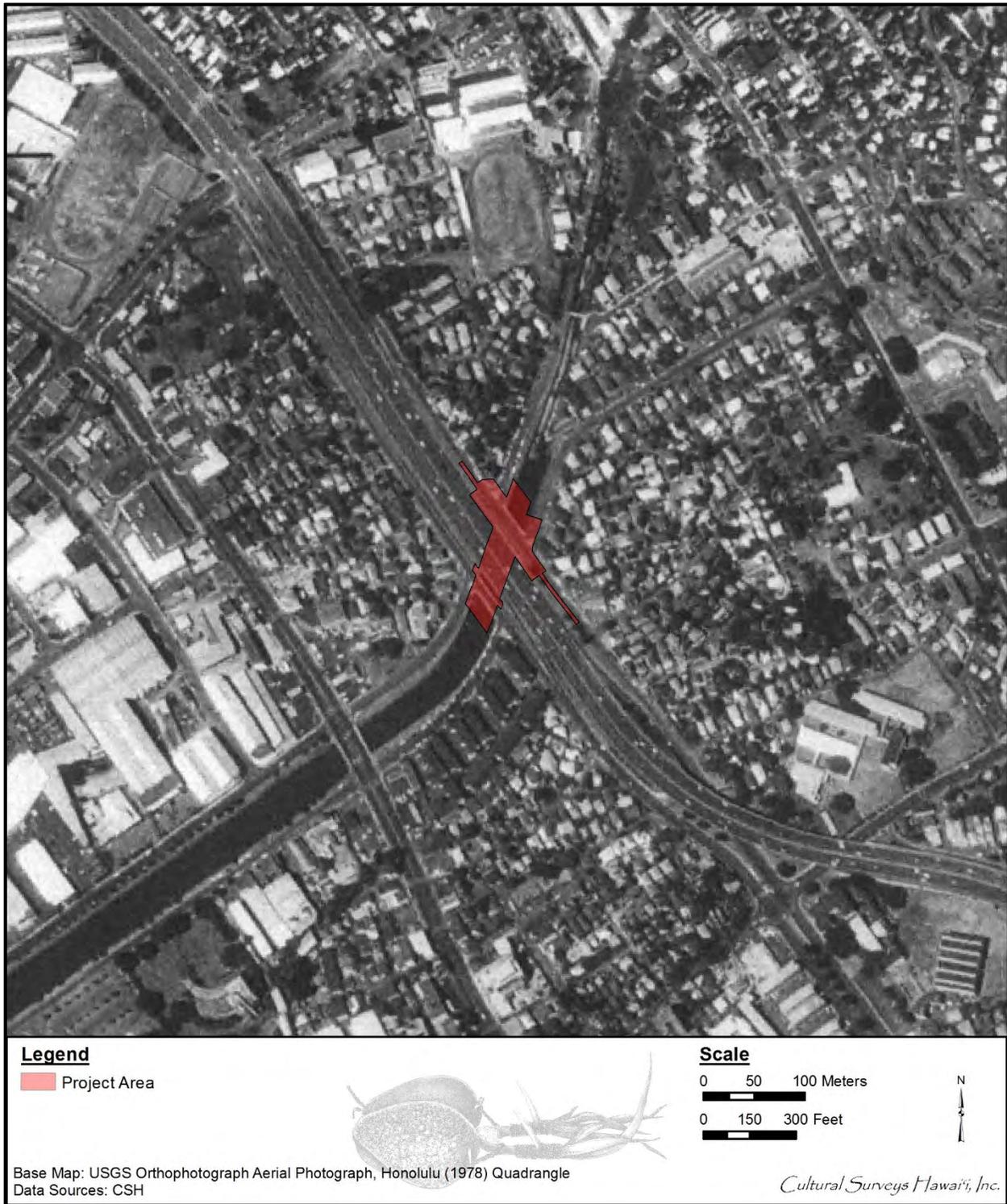


Figure 24. 1978 USGS aerial photograph, Honolulu Quadrangle, showing commercial and residential development in Kapālama near the study area

warehouses and stores, mainly lined along King Street. In Nu‘uanu many of the large houses and wide spaces between houses have been lost.

The 1950 Sanborn Fire Insurance map depicts the density of houses and house lots located in the general vicinity of the study area (see Figure 21). There are also large areas of vacant land within the current study area.

A 1952 aerial photograph (see Figure 22) shows substantial housing development but the north and south portions of the study area are still in areas of vacant land.

The 1953 USGS map (see Figure 23) illustrates the large number of schools and churches near the H-1 Interstate Highway corridor. Labeled are Fern School, Kalihi Waena School, Kalākaua School, St. Anthony’s School, and Pu‘uhale School. Lower Kalihi holds Farrington High School, Likelike, St. Theresa School, and the Kaiulani School in Kapālama. The Nu‘uanu survey area is near Kauluwala School, Kuakini Hospital, Liliuokalani Gardens, and Foster Park (Foster Botanical Garden).

4.5.1.1 H-1 Interstate Highway

As the study area lies directly adjacent to the H-1 right-of-way, it is appropriate to give a little background on the history of H-1. It appears construction for the H-1 in the area of Kalihi-Kapālama started in 1960 from Fort Shafter to Houghtailing Street. Although this was not the place of origin for the H-1 system, it was the first time federal money was used in Hawai‘i for an Interstate system. Prior to 1960, the H-1 was called the Lunalilo Freeway. This early highway is shown on a 1978 aerial photograph (see Figure 24). The website AARoads has compiled a timeline for the H-1 construction (Table 2).

AARoads (2012) writes, “Portions of H1 predate statehood, as an upgrade of Lunalilo Street, the freeway’s namesake. The oldest section, from Punahou street east to King Street (Exits 23-25), was open before 1959. Originally signed as Hawaii 72.”

The Hawaiian Historical Society provides a timeline in a little more detail for the earliest stretch of H-1, the Mauka Arterial.

The pioneering highway in Hawai‘i was the Mauka Arterial (later christened Lunalilo Freeway). The three ‘Ewa-bound lanes, extending one mile between Old Wai‘alae Road and Alexander Street, were opened to traffic November 9, 1953. The Kaimuki-bound lanes along the same stretch were opened and the highway was formally dedicated on January 5, 1954. [Schmitt 2013]

Table 2. Construction Timeline of Hawaii 72, Later Renumbered as H-1 Interstate Highway

Year	Development
1953	First section of the Mauka Arterial opened; Mauka Arterial was approximately a mile section around University Avenue, present-day Mile 24
1959	At statehood, first section of what is now called Lunalilo Freeway opened between Punahou St (Mile 23) and King St (Mile 25); maps show proposed route from Punahou St west to Middle St (present H-1/H-201 interchange)

Year	Development
1960	Lunalilo Freeway extended west to Ke'eumoku St (approx. 1/2 mile west of Punahou St); section of present-day H-201 opened through Fort Shafter, signed as Hawaii 72; sections from Fort Shafter east to Houghtailing St (Exit 20B) and Pali Hwy interchange (exit 21A/B) under construction
1961	Open sections are Pu'uloa Rd (present-day H-201) to Houghtailing St (Exit 20B), Pali Hwy interchange, and Ke'eumoku St to King St
1964	Section from Kapahulu St (Mile 25) east to Koko Head Ave (Exit 26A) under construction
1965	Kapahulu St to Koko Head Ave opened; short 1/2 mile section under construction, filling gap in existing freeway sections between King St and Kapahulu St
1967	H-1 first appears on maps, co-signed with Hawaii 72; freeway continuous from Pu'uloa Rd east to Pele St (just east of Pali Hwy, Hawaii 61), as well as existing sections from Ke'eumoku St to King St and Kapahulu St to Koko Head Ave; western section between Kunia Rd and Kamehameha Hwy (Exits 5 through Exit 8A) open, with section between Miles 0 and 5 under construction
1968	Gap between King St and Kapahulu St opened; H-1 extended east to present terminus east of Kilauea Ave; still a gap between Pele and Ke'eumoku streets
1972	H-1 opened from Kamehameha Hwy (western terminus) to Kaimakani St, immediately west of Hālawa interchange; Hālawa interchange and sections of H-1 to Middle St proposed; from Middle St east to Kilauea Ave completed freeway; Hawaii 72 truncated at eastern end of H-1; orphaned section between Pu'uloa Rd and Middle St is re-signed as Hawaii 78
1986	H-1 completed between Nimitz Hwy and Middle St (Miles 18-19); through lanes of H-1 east use Middle St tunnel, completed in 1961 for Middle St off-ramp

4.6 Previous Archaeological Research

Development within a 0.8-km (0.5-mile) radius of the study area is primarily residential with some light industry. Most of the development in the area, including the H-1 Interstate Highway corridor itself, has occurred prior to the late 1970s when archaeological investigation became standard during project planning and construction activities. The locations of previous archaeological studies conducted within a 0.8-km (0.5-mile) radius of the study area are shown in Figure 25 and listed in Table 3. The findings of these archaeological studies are shown in Figure 26 and listed in Table 4. These studies and their findings are discussed in more detail in the following paragraphs.

4.6.1 Palama Fire Station (Neller 1980)

During excavations at the Palama Fire Station in September 1980, the SHPD made a site visit to the project. A large charcoal deposit was observed in an excavation sidewall which contained several basalt cobbles. No further information was obtained due to the backfilling of the excavation prior to the SHPD's return to document the feature. It could not be determined whether the deposit

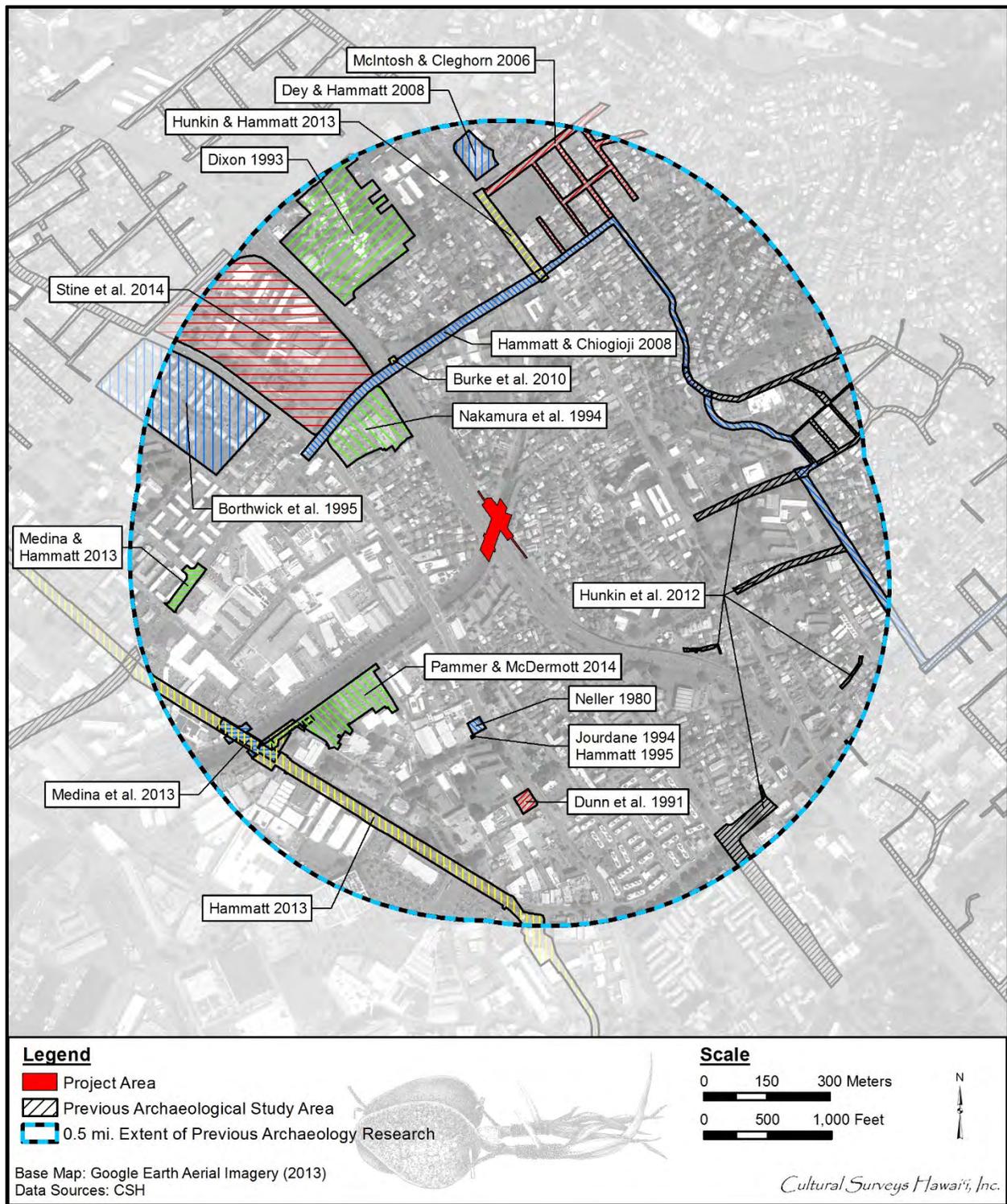


Figure 25. Previous archaeological studies within a 0.8-km (0.5-mile) radius of the study area

Table 3. Previous Archaeological Studies within a 0.8-km (0.5-mile) Radius of the Study Area (arranged chronologically)

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Neller 1980	Field reconnaissance	Kapālama Fire Station	Massive charcoal deposit observed in trench, but significance not determined
Dunn et al. 1991	Archaeological monitoring	Pālama Chevron Station, Kapālama	Nine test trenches for pipelines excavated; burials, human skeletal remains, and historic artifacts (SIHP # -3373) recorded; burials were victims of nineteenth-century epidemics
Dixon 1993	Archaeological monitoring	Bishop Museum grounds near Violet St, Kapālama	No evidence of pre-Contact cultural deposits found; however, historic artifacts found in backfill; Bishop Museum designated SIHP # -1353 as an historic property
Jourdane 1994	Burial report	Austin Lane, Kapālama	Historic human coffin burial (SIHP # -4929) found during excavation on Austin Lane
Nakamura et al. 1994	Archaeological assessment	North King and Houghtailing, Kapālama	No archaeological historic properties found, however, some 50+ year-old buildings found during assessment
Borthwick et al. 1995	Archaeological inventory survey	Kamehameha Homes, Kapālama	No subsurface features found during excavation of 16 trenches on a 14-acre survey area
Hammatt 1995	Burial disinterment	Austin Lane, Kapālama	Historic coffin burial at Austin Lane (SIHP # -4929) disinterred; burial probably associated with Kaumakapili Church cemetery, used from 1870s to at least 1921
McIntosh and Cleghorn 2006	Archaeological monitoring	Kamehameha Heights Water System, Kapālama	Before sewer improvements, Pacific Legacy conducted testing and monitoring to determine if nearby historic graves from Ka'ahumanu and Maluhia Cemeteries extended under Kapālama Ave; ten trenches excavated but no cultural deposits or human bones found
Dey and Hammatt 2008	Archaeological monitoring	1520 North School St, Kapālama	No culturally significant material identified

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Hammatt and Chiogioji 2008	Archaeological inventory survey	BWS Kalihi-Beretania Water Main, Kapālama and Nuʻuanu	Survey confirmed areas affected by proposed water main work were along asphalt areas; two early twentieth century bridges on Judd and Nuʻuanu streets recommended for architectural evaluation
Burke et al. 2010	Archaeological monitoring	Houghtailing St, Kapālama	No archaeological material observed within sediments disturbed by project's activities at Houghtailing St by H-1
Hunkin et al. 2012	Archaeological monitoring	Kalihi-Nuʻuanu Sewer Rehabilitation project	No cultural deposits identified; isolated human femur fragment found in fill material in one of western Punchbowl slope areas; no site number assigned to this fragment, which was handed over to SHPD for reburial
Hammatt 2013	Archaeological inventory survey	City Center portion of Honolulu High-Capacity Transit Corridor project	Two historic properties identified near current study area—SIHP #s -7426 (subsurface wetland deposit) and -7506 (subsurface incinerated trash deposit); wetland sediments identified along Dillingham Blvd; incinerated trash deposits encountered within HCC campus at corner of Dillingham Blvd and Kokea St
Hunkin and Hammatt 2013	Archaeological monitoring	Kalihi Valley sewer system, Kapālama	No cultural deposits noted
Medina and Hammatt 2013	Archaeological monitoring	Waiakamilo Rd and McNeill St intersection traffic signals	No historical properties or human remains encountered
Medina et al. 2013	Archaeological monitoring	Traffic control signal along Dillingham Blvd	Two historic properties observed during course of archaeological monitoring: SIHP #s -7426 (previously identified historic property consists of former wetland/agricultural sediments that may have been utilized during late pre- to early post-Contact period) and -7515 (newly identified historic property related to creation of Kapālama Canal during 1920s and in-filling of surrounding area for purposes of urban development)

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Pammer and McDermott 2014	Archaeological inventory survey	Honolulu Community College	Two previously recorded historic properties identified within survey area: SIHP #s -7426 (wetland sediments) and -7506 (incinerated trash layer)
Stine et al. 2014	Archaeological monitoring	Farrington High School property	No cultural deposits identified during monitoring of three excavations

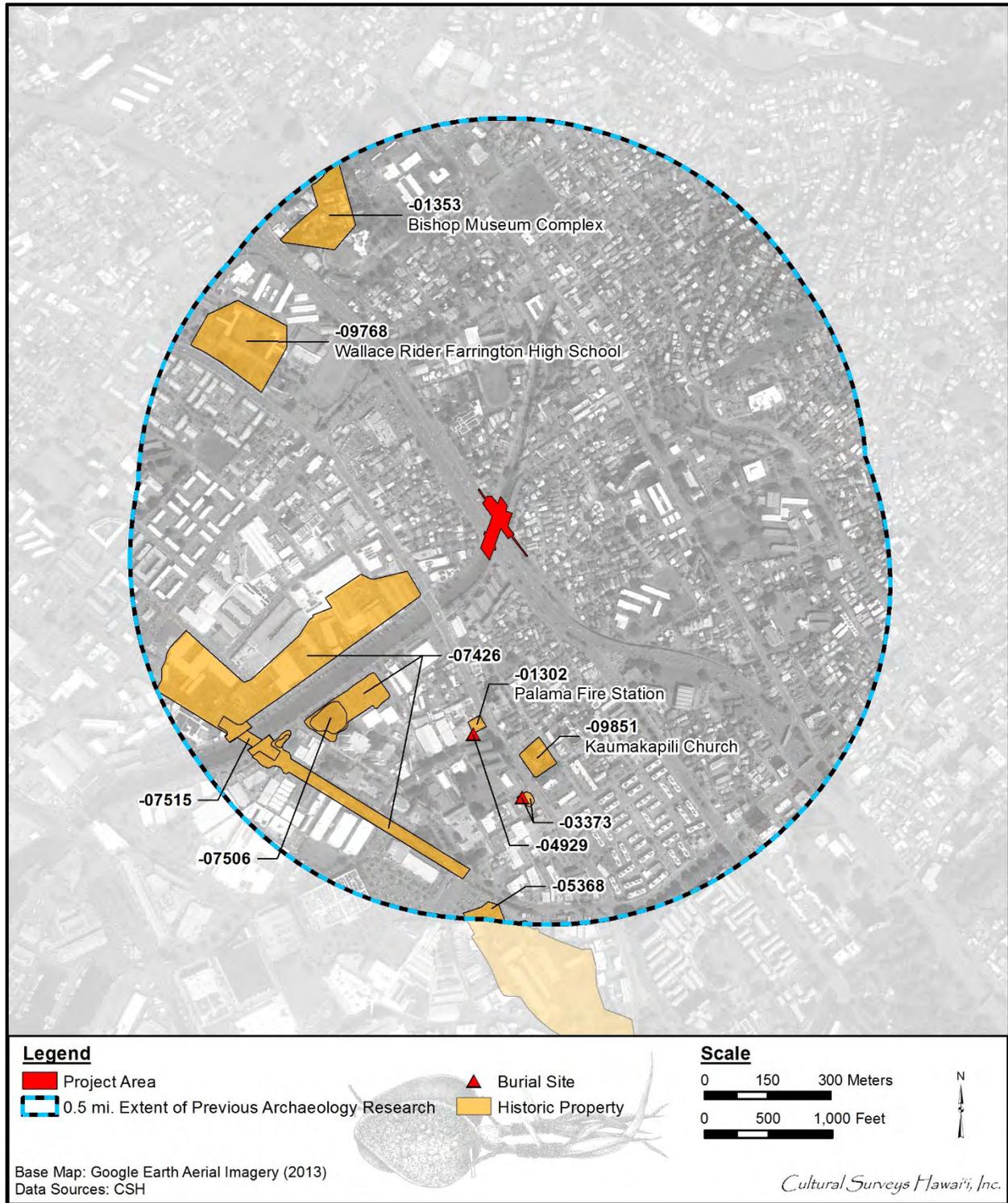


Figure 26. Previously identified historic properties within a 0.8-km (0.5-mile) radius of the study area

Table 4. Previously Identified Historic Properties within a 0.8-km (0.5-mile) Radius of the Study Area

SIHP #	Site Type/ Name	Source
50-80-14-1302	Palama Fire Station	Neller 1980
50-80-14-1353	Bishop Museum Complex	Dixon 1993
50-80-14-3373	Subsurface cultural deposit, burial	Dunn et al. 1991
50-80-14-4929	Burial (coffin)	Jourdane 1994; Hammatt 1995
50-80-14-5368	Kuwili Fishpond	McDermott and Mann 2001
50-80-14-7426	Subsurface wetland sediments	Hammatt 2013, Medina et al. 2013
50-80-14-7506	Subsurface incinerated trash deposit	Hammatt, 2013; Pammer and McDermott 2014
50-80-14-7515	Subsurface dredge sediment	Medina et al. 2013
50-80-14-9768	Wallace Rider Farrington High School	Hawai'i Register Nomination form
50-80-14-9851	Kaumakapili Church	Hawai'i Register Nomination form

represented a historic feature or a traditional *imu* (earth oven) pit; however, no historic artifacts were observed in association with the feature.

4.6.2 Dunn et al. 1991

During archaeological monitoring at the Pālama Chevron Station, highly fragmented human skeletal remains were observed (Dunn et al. 1991). The minimum number of individuals (MNI) appeared to be five—but this was not altogether clear. Of interest was the following comment:

A parishioner of Kaumakapili Church mentioned to PHRI field personnel that the survey area was once a cemetery. Mr. Tom Dye of the DLNR said that older residents of the area had once mentioned that when they were younger they regarded the area as ‘spooky,’ and that this may be attributable to the fact that they had heard there were burials in the area. [Dunn et al. 1991:10]

Fragmentary human skeletal remains were reported at 80 cm below surface, 105 cm below surface, and 120 cm below surface (Dunn et al. 1991:1, 4).

4.6.3 Bishop Museum (Dixon 1993)

This archaeological monitoring project at the Bishop Museum took place during installation of electrical service for the Space Exhibit in August 1992. Museum staff recognized the potential for subsurface pre- and post-Contact Hawaiian cultural material and human remains as well as the possibility of early historic material on museum property. Stratigraphy and backdirt was observed during mechanical trenching conducted on the Great Lawn. Dixon found no evidence of pre-Contact deposits; however, some historic artifacts were found in a fill layer possibly dating back to the Kamehameha Schools period. This fill layer and artifacts were given SHPD site number 50-Oa-A6-26.

4.6.4 Austin Lane, Kapālama (Jourdane 1994; Hammatt 1995)

A burial in a coffin was found during construction of a water line on Austin Lane and reported to the SHPD (Jourdane 1994). CSH (Hammatt 1995) conducted background on the property and disinterred the burial. The human remains, designated SIHP # -4929, were turned over to the SHPD for reburial.

4.6.5 Corner of North King and Houghtailing Streets (Nakamura et al. 1994)

The Bernice Pauahi Bishop Museum (Nakamura, Pantaleo, and Sinoto 1994) carried out an archaeological assessment of land in Kapālama on the corner of North King and Houghtailing streets. Background research identified no historic sites within the survey area. Research also showed pre- and early post-Contact use of the area for agriculture but suggested that disturbance in the area from urbanization in the 1900s had reduced the possibility of finding intact deposits from an earlier time.

4.6.6 Kamehameha Homes Project, Kapālama (Borthwick et al. 1995)

CSH (Borthwick et al. 1995) carried out an archaeological subsurface inventory survey of the Kamehameha Homes project in Kapālama. The crew excavated 16 trenches spaced to cover the entire 13.96-acre survey area. All of the trenches had a landscape layer associated with mechanical terracing of the area by bulldozers. No significant finds were reported.

4.6.7 Kamehameha Heights, Puea and Ka‘ahumanu Cemeteries (McIntosh and Cleghorn 2006)

In 2006, Pacific Legacy (McIntosh and Cleghorn 2006) conducted pre-construction testing along the Puea and Ka‘ahumanu Cemeteries before improvements were made to the Kamehameha Heights water system, due to concerns that unmarked graves could lie outside the modern boundary of the cemeteries. No cultural deposits or human remains were found in the ten test trenches along the north and east streets bounding the cemeteries.

4.6.8 Kalihi/Nu‘uanu Sewer Rehabilitation Project (Hunkin et al. 2012)

In 2012, CSH conducted monitoring for the Kalihi-Nu‘uanu Sewer project. No cultural deposits were identified in any of the monitored excavation trenches. One isolated human femur fragment was found in fill material in one of the western Punchbowl slope areas. No site number was assigned to this fragment, which was handed over to the SHPD for reburial.

4.6.9 Walgreens Development Project, North School Street (Dey and Hammatt 2008)

In 2008, CSH completed an archaeological monitoring program for a Walgreens development project. Background research identified no historic sites, a low potential for pre-Contact or early post-Contact Hawaiian cultural remains, and a low to moderate potential for early historic remains. Subsequent fieldwork confirmed a lack of pre-Contact or early post-Contact cultural material within that survey area.

4.6.10 Traffic Management System Project, Houghtailing Street by the H-1 (Burke et al. 2010)

In 2010, CSH (Burke et al. 2010) completed an archaeological monitoring program for a Traffic Management System PH 1 project. Background research identified no sites but suggested a potential for early historic remains. Subsequent field monitoring produced no significant finds within the survey area.

4.6.11 Kalihi Beretania 24-Inch Water Main Project (Hammatt and Chiogioji 2008)

CSH carried out an archaeological inventory survey of the proposed Board of Water Supply Kalihi Beretania 24-Inch Water Main project in Nu‘uanu and Kapālama (Hammatt and Chiogioji 2008). No prehistoric properties were identified within the survey area but the study emphasized the need to consider the Judd Street and Nu‘uanu Avenue bridges as historic properties. Background research showed the survey area to be part of an expansive agricultural system during the pre- and early post-Contact period. As the survey area was confined to roadway corridors, subsequent testing revealed mostly grading and fill disturbance from roadway construction and utility trenching. No pre- or early post-Contact cultural material was observed during archaeological testing within the survey area.

4.6.12 Kalihi/Nu‘uanu Sewer Rehabilitation Project (Hunkin et al. 2012)

Archaeological monitoring for Phase 1 of the Kalihi/Nu‘uanu Sewer Rehabilitation project included limited work just east of the present survey area in their “Area 4-Lanakila” area. The nearest results reported were from along Alaneo Street more than 400 m (1312.3 ft) east of the present study area. There were no historic properties identified near the present survey area.

4.6.13 Honolulu High-Capacity Transit Corridor Project (Hammatt 2013)

CSH performed AIS testing for the Honolulu High-Capacity Transit Corridor project (City Center) within numerous locations between Middle Street and Ala Moana Center (Hammatt 2013). Testing identified multiple sites, two of which were identified near the current study area—SIHP #s -7426 (subsurface wetland deposit) and -7506 (subsurface incinerated trash deposit). The wetland sediments were identified within 28 AIS test excavations along Dillingham Boulevard, *makai* of the current project (T-054 through T-082). The incinerated trash deposits were encountered within three test excavations (T-064, T-066, and T-067) within the HCC campus at the corner of Dillingham Boulevard and Kokea Street.

4.6.14 Kalihi Valley Sewer System Improvements, Kapālama (Hunkin and Hammatt 2013)

In 2013, CSH monitored a portion of the Kalihi Valley Sewer System Improvement project near the junction of Houghtailing Street and North School Street in Kalihi (Hunkin and Hammatt 2013). Due to the survey area's close proximity to Ka'ahumanu, Puea, and Maluhia Cemeteries, project proponents decided to enact a monitoring project for the installation of two water lines to mitigate any adverse effect to historic properties or burials in the survey area. No cultural deposits or historic properties were observed during excavations. The stratigraphy consisted of various layers of imported fill associated with historic and modern development overlying naturally deposited sediment and bedrock.

4.6.15 Medina and Hammatt 2013

In 2013, CSH (Medina and Hammatt 2013) reported on the results of archaeological monitoring for traffic control signal improvements for the Waiakamilo Road and McNeill Street intersection. No historical properties or human remains were encountered as a result of construction activities.

4.6.16 Traffic Control Signal Improvements along Dillingham Boulevard (Medina et al. 2013)

In 2013, CSH (Medina et al. 2013) reported on the results of archaeological monitoring for traffic control signal improvements along Dillingham Boulevard between Kokea and Kohou streets, involving excavations within city streets and sidewalks for subsurface electrical lines, conduits, and boxes. Two historic properties were observed during the course of archaeological monitoring consisting of SIHP #s -7426, a previously identified historic property consisting of former wetland/agricultural sediments that may have been utilized during the late pre-to early post-Contact period, and -7515, a newly identified historic property related to the creation of Kapālama Canal during the 1920s and the in-filling of the surrounding area for the purposes of urban development.

4.6.17 Honolulu Community College (Pammer and McDermott 2014)

In 2013, CSH conducted an archaeological inventory survey on the campus of Honolulu Community College (Pammer and McDermott 2014). A total of eight backhoe-assisted excavations were excavated to assess the stratigraphy and determine the potential for buried archaeological deposits. Two previously recorded historic properties were identified with the survey area, SIHP #s -7526 (wetland sediments) and -7506 (incinerated trash deposit). Both sites were assessed as significant under criterion "d," but no further work was recommended.

4.6.18 Farrington High School (Stine et al. 2014)

In 2013, CSH conducted archaeological monitoring for renovations and replacements of electrical vaults and lines at Farrington High School (Stine et al. 2014). Fieldwork was conducted from 27–29 June 2012. No new historic properties were identified. One previously identified property, Wallace Rider Farrington High School (SIHP # -9768) had been placed on the State Register of Historic Places in 1993. No significant cultural material or human remains were observed during monitoring.

4.7 Background Summary and Predictive Model

Based on background research, the primary area of traditional Hawaiian settlement and intensive agriculture within Kapālāma seems to have been in the upper valleys, as well as near streams and springs. The project sits within the central area of Kapālāma along the drainage of Kapālāma and Niuhelewai streams. Historically, agriculture and habitation were intensive in this area. The area encompassed by the survey area was used for rice cultivation, but immediate habitation within the survey area does not seem to have been prevalent.

Traditional Hawaiian land use indicated in the adjacent land commission awards (LCAs) documentation consisted of habitation, irrigated taro fields (*lo'i*), *kula* (dryland plots used for cultivation and/or pasture), and aquaculture via fishponds. The majority of *kuleana* land claims located near the study area were located near the freshwater sources of Kalihi and Niuhelewai streams as they were the most arable sources of land. This is the area described as an uncultivated plain in John Papa 'Ī'ī's (1959) account of the area in 1810, until you reached “the taro patches of Kalihi.” Major strife is indicated ca. 1782 in the defeat of the O'ahu ruling chief Kahāhana when the dead backed up the lagoonal backwaters (*muliwai*) of Niuhelewai Stream—but this may have been well seaward of the current study area. Another uncertainty pertains to the indicated ca. 1855 burial ground on the plains of Kaiwi'ula which may have been near the current study area.

By the twentieth century, the coastal and central sections of Kapālāma had become suburbs of Honolulu. Much development in Kapālāma primarily occurred prior to the late 1970s when archaeological investigation became standard during construction activities. As a result, few archaeological studies have been conducted in this area. The only previous projects located within the current study area consist of projects dealing with the H-1 Interstate Highway. No previously recorded archaeological sites are located within or directly adjacent to the current study area. Historic infrastructure relating to the Halona Street Bridge and the Kapālāma Canal are anticipated within the study area.

Section 5 Community Consultation

5.1 Introduction

Throughout the course of this assessment, an effort was made to contact and consult with Native Hawaiian Organizations (NHO), agencies, and community members including descendants of the area, in order to identify individuals with cultural expertise and/or knowledge of the *ahupua'a* of Honolulu. CSH initiated its outreach effort in August 2015 through letters, email, telephone calls, and in-person contact. CSH completed the community consultation in December 2015.

5.2 Community Contact Letter

In the majority of cases, letters (Figure 27 and Figure 28) along with a map and an aerial photograph of the project were mailed with the following text:

At the request of CH2M HILL and on behalf of the Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), Cultural Surveys Hawai'i, Inc. (CSH) is conducting a cultural impact assessment (CIA) for the Halona Street Bridge replacement project, Kapālama Ahupua'a, Honolulu (Kona) District, O'ahu, FHWA/CFLHD Contract DTFH68-13-R-00027, TMKs: [1] 1-6-002 (Olomea Street and H-1 Interstate Highway Rights-of-Way, Kapālama Canal) and [1] 1-6-006 (Halona Street, Kokea Street, Kohou Street). The project area is located within Kapālama Ahupua'a at the location of the Halona Street Bridge and the Kapālama Canal and includes portions of the H-1 Interstate Highway, and Halona Street from the intersection of Kuipaakea Lane to just beyond Kohou Street. The project area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle and a 2013 aerial photograph (see attachments), and covers approximately 1.5 acres.

The purpose of the project is to replace the existing bridge to meet current design standards for roadway width, load capacity, pedestrian traffic, bridge railing and transitions, and bridge approaches. This existing bridge was built in 1938 and is structurally deficient and functionally obsolete. The replacement bridge would be a three-span, concrete structure. It would be supported on two piers similar to, and aligned with, the existing H-1 Bridge piers. New abutments would be set back from and behind the existing abutments which would be left in place, thereby minimizing impacts to the masonry walls along the canal. For safety reasons, another consideration is to develop provisions to discourage individuals from accessing the area under the bridge.

The purpose of the CIA is to gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about this area. The research and interview assists us when assessing potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the planned project. We are seeking your *kōkua* (assistance) and guidance regarding the following aspects of our study:

- General history and present and past land use of the project area.**

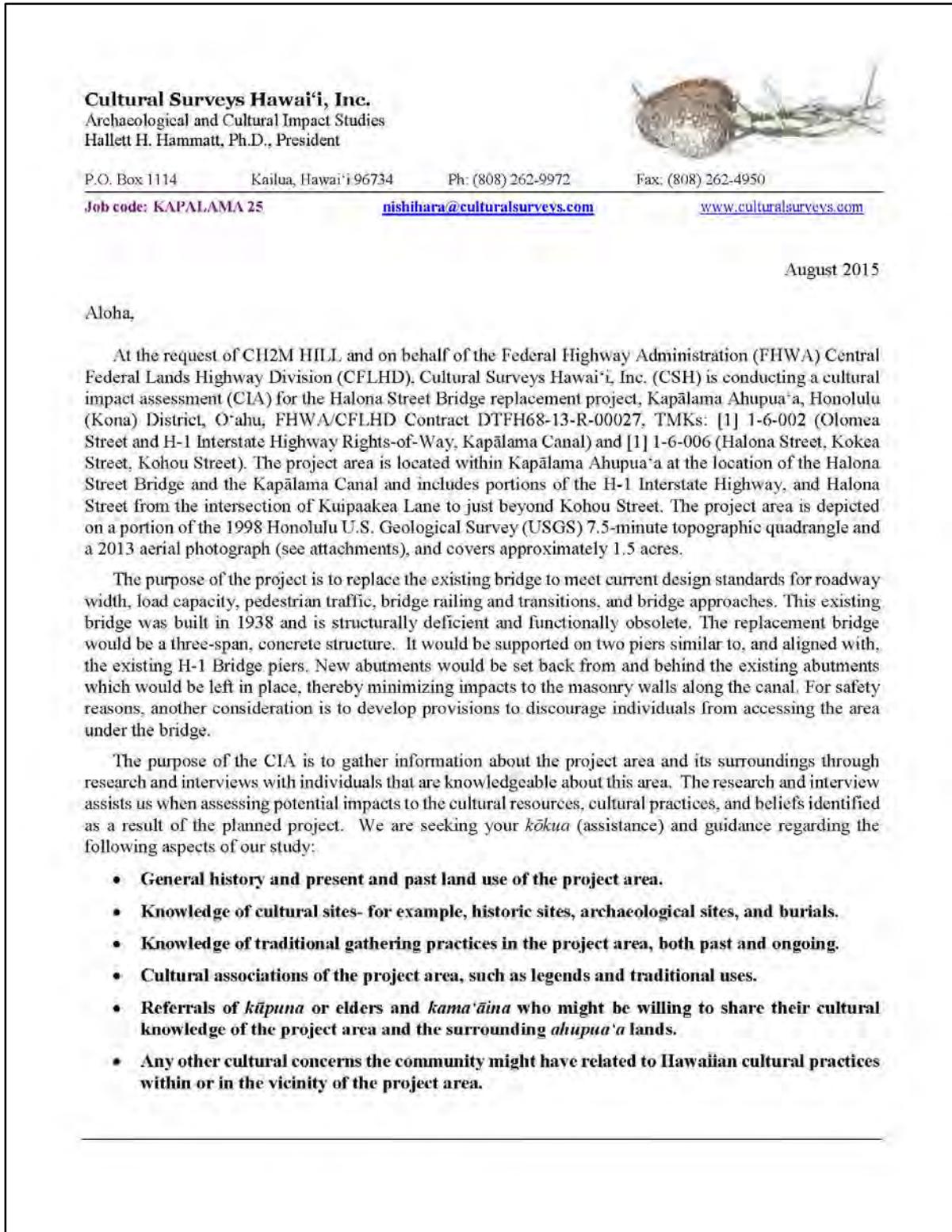


Figure 27. Community consultation letter, page one

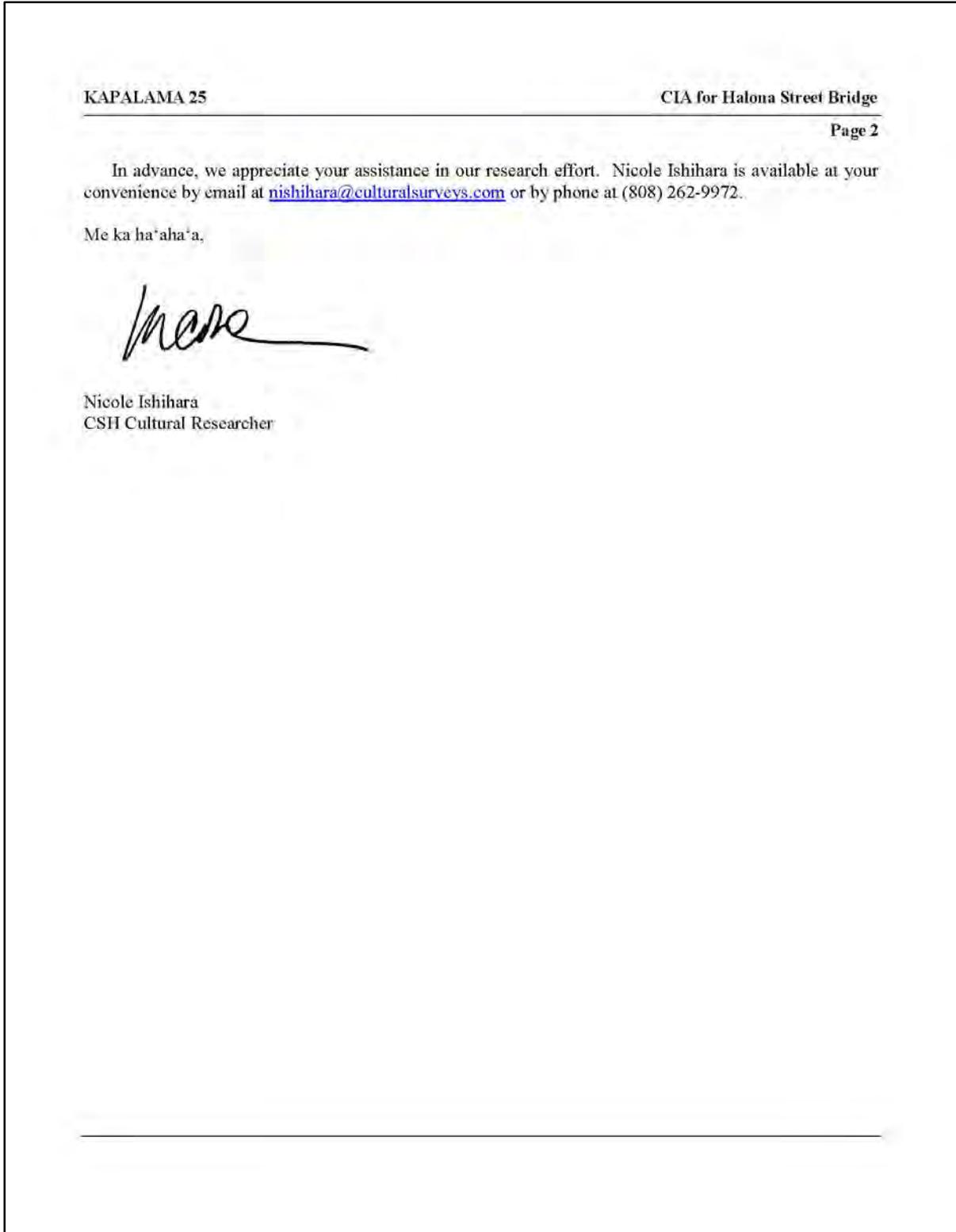


Figure 28. Community consultation letter, page two

- **Knowledge of cultural sites- for example, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**
- **Cultural associations of the project area, such as legends and traditional uses.**
- **Referrals of *kūpuna* or elders and *kama'āina* who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua'a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.**

5.3 Community Contact Table

Below in Table 5 are names, affiliations, dates of contact, and comments from NHOs, individuals, organizations, and agencies contacted for this project. Results are presented below in alphabetical order.

Table 5. Results of Community Consultation

Name	Affiliation	Comments
Becket, Jan	Author, photographer, knowledgeable in cultural sites Kona Moku Representative, Council of Hawaiian Civic Club's Committee on the Preservation of Historic Sites and Cultural Properties	Letter and figures sent via email 19 August 2015 Mr. Becket responded via email 20 August 2015 stating that he would be interested in a possible site visit to Kamehameha Schools–Kapālama CSH emailed Mr. Becket and gave dates of availability to <i>huaka'i</i> (journey, field trip) Mr. Becket confirmed via email a date of 26 September 2015 to access sites in Kapālama Mauka CSH and Mr. Becket attended a site visit on 26 September 2015 to sites in Kapālama Mauka CSH interviewed Mr. Becket in his home on 29 September 2015 CSH sent Mr. Becket his draft transcription for approval via email on 8 December 2015 Mr. Becket emailed CSH on 8 December 2015 stating he would review the transcription

Name	Affiliation	Comments
		Mr. Becket emailed CSH on 9 December 2015 stating he has edits to his transcription and would email later
Brown, Desoto	Historian, Bishop Museum	Letter and figures sent via email 13 August 2015 Mr. Brown emailed CSH on 14 August 2015 stating he forwarded letter to Cultural Collections Department that can advise on specific traditional practices for the area and the Archives photo collection has pictures of Kapālama Stream in 1938 “after Hawaiian Dredging had completed the construction of the walls that line the stream. This was when the bridge was built as well.” CSH emailed Mr. Brown on 17 August 2015 thanking him for the referral
Carganilla, Alfredo “Al”	Principal, Farrington High School	Letter and figures sent via U.S. Postal Service (USPS) 11 August 2015
Casey, Brother Daniel	Principal, Damien High School	Letter and figures sent via email 13 August 2015 Brother Daniel Casey responded to CSH via email 4 September 2015 stating that he can find someone at Damien High School or <i>kama 'āina</i> who may be interested; he recently moved to the islands and has no background CSH emailed Brother Daniel Casey on 4 September 2015 thanking him for his assistance and would be open to communicating with any interested parties or referrals
Crabbe, Kamana'opono	<i>Ka Pouhana</i> (Chief Executive Officer), Office of Hawaiian Affairs (OHA)	Letter and figures sent via USPS 11 August 2015 CSH received a letter from Mr. Crabbe dated 3 September 2015; had no comments or information to provide to CSH See Appendix B for OHA response letter

Name	Affiliation	Comments
Farden, Hailama	Vice Principal, Kamehameha Schools	Letter and figures sent via email 13 August 2015
Hilo, Regina	O'ahu Island Burial Sites Specialist, Department of Land and Natural Resources (DLNR)–State Historic Preservation Division (SHPD)	Letter and figures sent via email 13 August 2015
Ishihara, Melvin	Raised in Kapālama Ahupua'a	Letter and figures hand delivered 10 August 2015 Interview scheduled for 24 August 2015 Interview with Mr. Ishihara on 24 August 2015 at his home in Kāne'ohe Hand delivered draft interview transcription to Mr. Ishihara on 16 September 2015 Mr. Ishihara provided CSH edits to his draft interview transcription on 6 October 2015 CSH provided Mr. Ishihara with a draft interview summary on 18 November 2015 Mr. Ishihara provided CSH with edits to his draft interview summary on 19 November 2015; Mr. Ishihara reviewed and approved See Section 5.4.1 for his interview
Kalihi-Pālama Hawaiian Civic Club		Letter and figures sent via email 13 August 2015 Ms. Khan forwarded to Kalihi-Pālama Hawaiian Civic Club members via email on 13 August 2015; CSH was cc'd; no responses
Palama Settlement		Letter and figures sent via USPS 11 August 2015
Rodrigues, Hinano	Branch Chief of History and Culture, DLNR–SHPD	Letter and figures sent via email 13 August 2015
Wong, Hinalaimoana	O'ahu Island Burial Council (OIBC) Chair and Kona Moku Representative	Letter and figures sent via email 13 August 2015

Name	Affiliation	Comments
Zisk, Janet	Archivist, Kamehameha Schools	Letter and figures sent via email 13 August 2015

5.4 Kama'āina Interviews

The authors and researchers of this report extend our deep appreciation to everyone who took time to speak and share their *mana'o* and *'ike* with CSH whether in interviews or brief consultations. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and in no way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

5.4.1 Melvin Ishihara

CSH interviewed Melvin Ishihara, former Executive Director of the Public Utilities Commission, on 24 August 2015 at his home in Kāne'ohe, O'ahu. Melvin Shigeru Shimokawa was born on 24 July 1933 to Shigeru Shimokawa and Elsie Kochiyama. Shigeru Shimokawa was born on Kaua'i. He worked for Theodore H. Richards, a contracting firm in Honolulu that built bridges. One bridge in particular that Shigeru Shimokawa worked on was a bridge that crosses Nu'uānu Stream on Vineyard Street. He later died from contracting tetanus:

. . . he didn't die according to grandma from poisoning on the job . . . it was . . . he played a lot of sports. He played sports with Alan Nagata who was the Assistant Coach to Neil Blaisdell . . . and whenever he wasn't feeling well with an injury—according to Alan Nagata, he went to get acupuncture treatment by this lady in Mō'ili'ili . . . he died in 1938 . . . But if it was infected that way [the acupuncture needle]—that's how you can get tetanus poisoning.

His mother, Elsie Kochiyama, was employed as a housekeeper to wealthy families and businessmen. She also raised her children—Melvin and Pat. She was pregnant with her son Roy when Shigeru passed away from tetanus. She raised her family at the Shimokawa Camp where the Hawaiian Humane Society is today. The Shimokawa family owned a large piece of property in Mō'ili'ili. For the construction of the H-1 Freeway, the Shimokawa's property was condemned and they were compensated. In turn, the Shimokawa's purchased a large property on 12th Avenue in Kaimuki where approximately six homes were built. Elsie Kochiyama remarried in the early 1940s.

Robert Ishihara was born on Maui and later relocated to Honolulu where he worked at Pearl Harbor. He was injured from an explosion during the construction of Pearl Harbor. He joined the United States Army and was part of the 100th Battalion until he was discharged due to his previous injury. Elsie and Robert married and relocated to Kukui Street and lived with the Kochiyama family in Kapālama. During this time, Robert also adopted Melvin, Pat, and Roy.

Mr. Ishihara recalls living on King Street in Kapālama where the United States Post Office is today. He states that the family did not live in a house but a commercial complex. One end of the building consisted of a foundry while the other end had a furniture store. Mr. Ishihara's grandfather also had a stall for his business as a vegetable peddler. He describes the layout of the complex:

What it is, is a building that had all of these segments. And the first one in this lane was Yamashita General Store where we used to buy shave ice. They lived upstairs in the back. Every house, every unit inside there other than the Chinese restaurant and the barber shop and the furniture and the foundry—we were the only ones with family that lived inside that complex.

Approximately 8-10 people in their family lived in the complex, which did not have a bedroom. Instead *futons* (Japanese mattress) were placed in an open area during the evening and stored in small cabinets during the day. Mr. Ishihara's uncle slept on a deck in the hallway near the entrance to the complex, "Every night Uncle Jig used to have to climb up there to go to sleep. That's where he slept." Across from the kitchen was a toilet. In addition, there was a separate area for the *furo* (Japanese bath with water). The family would heat the *furo* with a fire on their own and would wash clothes in the bathroom as well.

As a child, Mr. Ishihara recalls peddling vegetables with his Grandpa Yamane from Waiakamilo Road to Libby Cannery. The area he peddled his vegetables in consisted of homes, dirt streets, and patches of pasture land. Leftover vegetables from Grandpa Yamane's cart would be used for the family's cooking, which was a traditional Japanese diet.

Mr. Ishihara describes the Kapālama area as a "mixture of nationalities." Neighbors of different ethnic backgrounds including Hawaiian, Japanese, Chinese, and African-American lived in the area. Growing up, the neighborhood children often played in a large pasture land bounded by Dillingham Boulevard and adjacent to Kohou Street. The pasture contained horses, cows, and bushes such as *koa haole* (*Leucaena leucocephala*). While out playing with the neighborhood children, they often snacked on what was available in the fields. Mr. Ishihara shares his memory of catching doves and consuming them:

And then the stream ran in and then there was a big mango tree and we'd go up in the mango tree and Willie Keola [a neighbor] was a little bit older than us. He used to catch doves. The way he catch doves two ways: the old style and Indian way where you get the—you know the wire. You make the wire da kine and make the entrance and then they go in and cannot come out. And the other stuff, I really remember, clearly, clearly, clearly was an Indian type . . . He bends the *haole koa* branch down and makes it . . . ties a string on it. Make a loop. Make a platform and build a platform like that—put sticks on it. And then he puts his corn down and we sitting in the tree now! The dove pick it up, pick it up, pick it up. As soon as he stepped on that platform it unhooks the da kine the thing and the da kine snaps up and catches the thing by the leg and we run down from the tree, we pick it up, put it in the cage . . . And then we barbeque 'um . . . Yeah, you gotta make hot water and make it like chicken.

He also utilized Kapālama Canal to catch mullet and Samoan crab. He adds that the canal was very clean and was made up of mostly rainwater. Because the canal was so clean, he would swim in the canal regularly and ride in homemade boats made of *totong* (Hawaiian Creole English for corrugated roofing):

We'd bend it and we'd nail it on both ends and it becomes a boat. We put outriggers on it . . . Cover it up with tar from the road. We chew the tar after we dig um out

from the road. Heat it up. I used to literally chew it . . . the canal was kind of deep. Maybe about seven, eight feet.

Another place he frequented was Kotohira Jinsha, a Japanese temple in the vicinity of the current project area. Growing up, the neighborhood kids would refer to the temple as Kompira because that's what they thought they heard when it was pronounced. The temple often showcased *sumo* (Japanese competitive full-contact wrestling sport where a wrestler forces another wrestler out of a circular ring), *kendo* (Japanese martial arts), Japanese movies, and *bon* dances (Japanese Buddhist custom to honor the ancestors' spirits).

Mr. Ishihara remembers several historic events that took place during his lifetime, including World War II and the Tsunami of 1946. On 7 December 1941, he recalls hearing an explosion. The explosion was the result of a bomb dropping in pasture land (Kohou Street, Dillingham Boulevard, and Waiakamilo Road). In addition, a home on Dillingham Boulevard and Mokuea Street was strafed with machine gun bullets. World War II changed the dynamics of the Kapālama area. Farrington High School was converted into a makeshift hospital from 1941 to 1945. Barracks and warehouses were set up next to the school for the war. And although his family was of Japanese descent, they had no fear of being transferred to a relocation camp because the women in his family volunteered at Kotohira Jinsha to make slippers for patients at Tripler Hospital.

Occasionally, between 1940-1943, when he was younger, Mr. Ishihara would swim in Honolulu Harbor at Pier 19. In 1946, Pier 19 is where he saw the *tsunami* (Japanese for tidal wave) recede and rise, specifically at Nu'uānu Stream, which is parallel to River Street:

1946, I was going to school. Ok, we live right next to the canal so I was going to school about 7:30 in the morning. Everybody was yelling, 'TIGER WAVE! TIGER WAVE!' I was like, 'What kind of wave? Tiger wave?!' . . . They said tidal wave but I thought they said 'tiger wave' because we never used the term *tsunami* . . . Anyway, that's what we saw. The thing would recede and all of the mullet—cause all the mullet inside that river—and *pāpio* [juvenile crevalle]—'cause it was a mixture of salt water and fresh water coming from Waiakalulu Falls . . . Yeah and the guys go all run down and pick um up . . . all local guys. Young guys.

As the water began to rise, those who were gathering the fish below had to exit the streambed quickly. The water eventually reached the height of the concrete archway over the bridge that spans Nu'uānu Stream at Beretania Street and 'A'ala Park. The archway does not exist today.

Farther up Nu'uānu Stream near School Street is where cars would get washed in the streambed. Cars would drive to the Kawahara Nursery where there was a driveway. Cars would regularly park in the streambed and people would wash their cars. This is also where Mr. Ishihara caught 'o'opu (general name for fishes in the families *Eleotridae*, *Gobiidae*, and *Blennidae*), 'ōpae (general name for shrimp), and crab. In addition he discusses several waterways including Waikalulu Falls; a spring near Sacred Hearts Convent near Liliha Street; and another spring near Saint Francis Hospital. He recalls his Aunt Florence's parents having a *lo'i* on their property in Liliha during the 1940s where Saint Francis Hospital stands today.

Prior to the construction of the H-1 Freeway, the area between School and Kukui streets was a park. Several homes were located *makai* of the freeway, however, the majority of the area was a park. When the H-1 Freeway was being constructed, they needed to dig deep to create the roadway

below. He remembers Foster Botanical Gardens being a much larger property until parts of the garden were condemned for the major roadways that border the area (H-1 Freeway, North Vineyard Boulevard, and Nu'uauu Avenue). The original entrance to Foster Botanical Gardens was on Nu'uauu Avenue. Today, the main entrance is on North Vineyard Boulevard. Many other streets were altered or constructed for the freeway including Olomea Street. According to Mr. Ishihara, while growing up there was no Olomea Street—it was previously an open field.

Although the landscape of Kapālama has changed, Mr. Ishihara notes that some historic buildings still exist in the area. On the corner of Kamenani Street (near Waiakamilo Road and North King Street) is an old, two-story building and in the back of that is another old building that Mr. Ishihara remembers from when he was younger. Across from the Board of Water Supply Pumping Station are two old, wooden buildings as well. He remembers that while growing up the bottom portion of the building was a furniture store and the upstairs was where a family resided. Near Diners Drive Inn was a row of buildings. Coyne Mattress was in the first building and still continues to make mattresses today. Mr. Ishihara points out that these buildings that still exist in Kapālama were constructed before he was born.

5.4.2 Jan Becket

Approval of transcription and interview summary pending.

5.5 Summary of Kama'āina Interviews

Based on Mr. Ishihara's reviewed and approved summary, the following is a synthesis of findings within Kapālama Ahupua'a. Please note that CSH is still awaiting approval of additional interviews and the synthesis of findings will change.

Mr. Ishihara recalls living on King Street in Kapālama where the United States Post Office is located today. He did not live in a house, but rather a commercial complex that consisted of multiple businesses including a general store, Chinese restaurant, barber shop, furniture store, and foundry. Mr. Ishihara's grandfather was a vegetable peddler who parked his cart in one of the stalls within the commercial complex daily.

Kāpalama consisted of mixed ethnic neighborhoods bound by pasture lands. Mr. Ishihara shares his memory of playing in a large pasture land bound by Dillingham Boulevard and adjacent to Kohou Street. The pasture contained horses, cows, and bushes such as *koa haole*. He recalls catching doves in the pasture land while out playing and cooking them "like chicken." He would also catch mullet and Samoan crab in Kapālama Canal. The canal was very clean consisting of mostly rainwater, therefore he would often swim in the canal and ride in homemade boats made of corrugated roofing.

Several historic events occurred during Mr. Ishihara's lifetime, some which directly impacted the *ahupua'a* of Kapālama. During the Japanese attack on O'ahu on 7 December 1941, Mr. Ishihara recalls hearing an explosion. The explosion was the result of a bomb dropping within the pasture lands that he played in bound by Dillingham Boulevard, Kohou Street, and Waiakamilo Road. A home on Dillingham Boulevard and Mokuea Street was strafed with machine gun bullets. Farrington High School was converted into a makeshift hospital from 1941 to 1945. Barracks and warehouses were set up next to the high school for military purposes. Although Mr. Ishihara and his family are of Japanese descent, they had no fear of being transferred to a relocation camp

because the women in his family volunteered at nearby *hongwanji*, Kotohira Jinsha, to make slippers for patients at Tripler Hospital.

Another historic event that occurred was the *tsunami* of 1946. Walking to school one morning near Nu‘uanu Stream, Mr. Ishihara heard people yelling, “TIGER WAVE!” He misunderstood the screams “tidal wave” as “TIGER WAVE” because the word *tsunami* was not widely used at the time. He recalls seeing the water recede from Nu‘uanu Stream revealing mullet and *pāpio*. Young men jumped into the streambed gathering the fish. As the water began to rise, those who were in the streambed quickly exited. The water eventually reached the height of the concrete archway that was once over the bridge that spanned Nu‘uanu Stream at Beretania Street and ‘A‘ala Park. Farther up Nu‘uanu Stream is where Mr. Ishihara caught ‘o‘opu, ‘ōpae, and crab.

Prior to the construction of the H-1 Freeway, the area between School and Kukui streets was a park. The construction of major roadways in the area altered neighboring businesses. Foster Botanical Gardens was much larger than it is today. Parts of the garden property were condemned for the major roadways that border the area including H-1 Freeway, North Vineyard Boulevard, and Nu‘uanu Avenue. The original entrance to Foster Botanical Gardens was on Nu‘uanu Avenue. Today the main entrance is located on North Vineyard Boulevard. Olomea Street, which is within the current project area, had not yet been constructed when Mr. Ishihara was younger. He recalls the area where Olomea Street is today an open field.

Although the cultural landscape of Kapālama has changed, he notes that some historic buildings still exist in the area. Historic buildings of Kapālama include a two-story building on Kamenani Street; two wooden buildings across from the Board of Water Supply Pumping Station; and a building near Diners Drive Inn where Coyne Mattress was located. The significance of these buildings was that they were constructed prior to Mr. Ishihara’s birth in 1933. The buildings are at least 83 years old.

Section 6 Traditional Cultural Practices

6.1 Gathering of Plant Resources

Kapālama Ahupua‘a was watered by two smaller streams: Kāpalama and Niuhelewai. Kapālama Ahupua‘a offered desirable conditions for traditional Hawaiian subsistence practices. The well irrigated plain also allowed for an extensive *lo‘i* system. The protected shoreline and reef allowed for easy access to the ocean. Sandalwood trees were found in the *mauka* sections of Kapālama Ahupua‘a. Early travelers such as Otto von Kotzebue detailed early Honolulu in a journal and map. An 1817 map drawn by Kotzebue indicates large taro fields and trees on both sides of Kalihi and Nu‘uanu Stream. An 1855 map by LaPasse indicates extensive *lo‘i* in the *makai* section of Kapālama. The map also depicts two fishponds: Kūwili I and Kawa. Kūwili was classified as a Type II pond (Kikuchi 1973), a *loko pu‘uone* or *loko hakuone*, an isolated shore fishpond formed by the development of a barrier beach building a single elongated sand ridge parallel to the coast. Kawa was classified as a Type I pond, a *loko kuapā*, a fishpond where one side or sides face the sea and consist of stone or coral walls with one or more sluice gates (Kikuchi 1973:227–228).

Māhele documents indicate Kapālama was in fact a very productive land. Land Commission Awards indicate *‘āpana* (parcels) were used for house lots, *lo‘i kalo*, and *kula ‘āina*. The project area is surrounded by LCAs as well. Kapālama Stream was most likely tapped and used for *‘auwai* to irrigate surrounding *lo‘i kalo*.

Interviewee Melvin Ishihara fished for mullet and caught Samoan crab from Kapālama Canal when he was younger. He adds that the canal was very clean and mostly comprised of rainwater. Although outside Kapālama Ahupua‘a, Mr. Ishihara caught *‘o‘opu*, *‘ōpae*, and crab in Nu‘uanu Stream. His Aunt Florence’s parents had a *lo‘i* on their property in Liliha during the 1940s where Saint Francis Hospital is today.

6.2 Burials

Previous archaeological studies indicate two burials were found south of the current project area. In 1991 during archaeological monitoring at the Pālama Chevron Station, burials, human skeletal remains, and historic artifacts were recovered (SIHP # -3373; Dunn et al. 1991). According to a parishioner of Kaumakapili Church, the area was part of a cemetery and burials were victims of nineteenth century epidemics. In 1994, a human coffin burial was found during excavation on Austin Lane (SIHP # -4929; Jourdane 1994).

6.3 *Wahi Pana*

Keanakamanō (“the cave of the shark”) is the name of a peak on the western side of Kapālama Ahupua‘a. There is also a cave called Keanakamanō, however, the exact location is unknown. Sterling and Summers (1978:323) place the cave near the Kamehameha Schools and relate *mo‘olelo* concerning the cave with springs to the ocean or that extended to the Ko‘olau Mountain range that connected the leeward and windward sides of the island. According to one *mo‘olelo*, the cave was called the “cave of the sharks” because the shark gods of Pearl Harbor would rest at the cave (Taylor 1954). One branch of the cave led around and under the mountains to Pearl Harbor while another led to the center of O‘ahu (presumably Kūkaniloko) where there was a sacred pool.

An earthquake closed up the caves in the early 1900s cutting off access to the sacred pool. An access street called Kealamanō (“the way of the shark”) is located on the Kamehameha Schools campus in Kapālama Heights. The street is named after the cave. The shark referred to for the access street is Kamohoali‘i, king of the sharks and elder brother of Pele.

At least four *heiau* have been reported in Kapālama including Puea, Pāka‘aluna (also known as Pāka‘alanluna), Oomaunahale, and Paepaenuileimoku. Pāka‘aluna Heiau may have been located on or near Pāka‘aluna Peak since the names are associated. The names for the *heiau* are unknown.

A large *pōhaku* measuring 5 ft 8 inches in length and 5 ft in height with a shape resembling a crouching animal when viewed from the west stands on the west side of a ridge in Kapālama Valley (Sterling and Summers 1978:321). The *pōhaku* is located in a direct line between Violet Street and a building at the Kamehameha Schools. An informant documented by Sterling and Summers (1978:321) stated he first saw the *pōhaku* in 1911 when his brother pointed it out to him. Native Hawaiians who resided in the area also indicated the importance of this rock. He recalled Hawaiians laying out on mats on the ridge between Kapālama Valley and Kamaikai Valley, spending the entire day worshipping the rock from afar, while chewing on sugarcane and leaving the stalks behind. It was not indicated if the chewing sugarcane or leaving the stalks behind were part of a ritual or not.

6.4 Trails

An 1817 map drawn by Otton von Kotzebue indicated several trails traversing the plains of Kona Moku with some trails traveling *mauka*. Two trails can be found *mauka* and *makai* of the current project area.

Section 7 Summary and Recommendations

CSH undertook this CIA at the request of CH2M HILL and on behalf of the FHWA/CFLHD. The research broadly covered the entire *ahupua'a* of Kapālama, including the current project area.

7.1 Results of Background Research

Background research for this study yielded the following results:

1. Kapālama is often understood to refer to an enclosure (*pā*) of *lama* wood that surrounded the residences of high ranking *ali'i* (Pukui et al. 1974:87). McAllister (1933:88) relates that Kapālama is said to obtain its name from an establishment for young *ali'i* who were paired off for offspring. Westervelt (1923:165) attributes the place name to a chiefess of O'ahu named Kapālama, the grandmother of Lepeamoa.
2. Kapālama Ahupua'a consists of two streams: Kapālama and Niuhelewai ("coconut going [in] water"). The two streams merge and extend through the central fertile former taro and rice fields draining into Kūwili II, a fishpond. Other fishponds within Kapālama include Loko Kapukai and Loko Kealia. Pukui et al. (1974) do not offer any translations, however, the word *keālia* is the word for "salt bed," which may indicate that at least one of these ponds was used for salt collection.
3. Two accounts of warfare occurred in Kapālama: Kahahawa'i defeated Kahāhana with Niuhelewai as the location of the battle; and the rebellion of the 'Ewa and Kona chiefs, which occurred after Kahāhana's death. The latter battle took place at Makaho and Niuhelewai streams as well as Kahoa'ai'ai Stream in 'Ewa.
4. LCA testimonies for Kapālama Ahupua'a indicate intense taro cultivation of the area, maintenance of fishpond, habitation, and some use of *kula* lands. Large areas were also set aside for the cultivation of rice.
5. An area known as Kaiwi'ula within Kapālama Ahupua'a was chosen for the first Kamehameha School for Boys, which opened in 1887. The construction of a principal's house, dormitories, faculty housing, a preparatory school, dining hall, kitchen, school shops, and administrative buildings followed the opening of the school.
6. Charles Bishop was interested in preserving artifacts and personal treasures of his late wife, Bernice Pauahi Bishop, as well as the late Queen Emma who willed these possessions to him with the condition of curating these items and naming it the Kamehameha Museum. The trustees of the Bishop Estate chose a site near the Kamehameha School for Boys. The museum was housed in Bishop Hall and opened in 1891. In 1894, Polynesian Hall was added; in 1903, Hawaiian Hall opened; in 1911, Pākī Hall was added; and in 1925 the Konia Hall.
7. In 1947, the Kamehameha Schools moved their campus to Kapālama Heights and the former school grounds were transferred to the Bishop Museum Trust. In 1980, Bishop Hall was formally transferred to Bishop Museum.
8. The construction of the H-1 Interstate Highway began during the 1960s from Fort Shafter to Houghtailing Street. It was the first time federal monies were used in Hawai'i to construct an interstate highway system.
9. There has been no previous archaeological studies or historic properties that have been reported within the current study area. However, several burial sites (SIHP # -3373,

subsurface cultural deposit and burial; and -4929, coffin burial) were found south of the project area.

10. Several historic properties found in the vicinity of the project area also reflect the diverse pre-Contact (SIHP # -5368, Kuwili Fishpond) and post-Contact (SIHP # -7506, subsurface incinerated trash deposit) history of the area and the shift in the cultural landscape of Kapālama.

7.2 Results of Community Consultations

CSH attempted to contact NHOs, agencies, and community members. Below is a list of individuals who shared their *mana* 'o and *'ike* about the project area and Kapālama Ahupua'a:

1. Jan Becket, retired Kamehameha Schools teacher, author, photographer, knowledgeable in cultural sites, Kona Moku Representative for the Committee on the Preservation of Historic Sites and Cultural Properties
2. Melvin Ishihara, former Executive Director of the Public Utilities Commission and former resident of Kapālama Ahupua'a
3. DeSoto Brown, historian at Bishop Museum

7.3 Impacts and Recommendations

Based on information gathered from the cultural and historic background, the proposed project may potentially impact undetected *iwi kūpuna* (ancestral bones). CSH identifies potential impacts and makes the following preliminary recommendations. Please note that CSH is still awaiting approval of an interview transcription and summary that was conducted for this study and the impacts and recommendations may change pending approval of interview transcriptions and summary.

1. Māhele documents indicate the vicinity and a portion of the project area was once under intense habitation and cultivation by. Previous archaeology conducted south of the project area has yielded *iwi kūpuna* (SIHP # 50-80-14-3373 and -4929). However, no archaeology has been conducted within the project area. Based on these findings, there is a high possibility *iwi kūpuna* may be present within the project area and that land-disturbing activities during construction may uncover presently undetected burials or other cultural finds. Should burials (or other cultural finds) be encountered during ground disturbance or via construction activities, all work should cease immediately and the appropriate agencies should be notified pursuant to applicable law, HRS §6E.

Section 8 References Cited

AA Roads

- 2012 *Interstate H1/Lunalilo Freeway/Queen Liliuokani [sic] Freeway Routing*. AA Roads history of roads website. Electronic document, <http://www.aaroads.com/guide.php?page=i00h1hi>

Ava Konohiki

- 2015 Acentral Visions of 'Āina website. Available online at <http://www.avakonohiki.org/>.

Bingham, Hiram

- 1981 *A Residence of Twenty-One Years in the Sandwich Islands*. Charles E. Tuttle Company, Rutland, Vermont.

Borthwick, Douglas, Ian Masterson, Victoria Creed, and Hallett H. Hammatt

- 1995 *An Archaeological Inventory Survey of the Kamehameha Homes Project, Kapālama, O'ahu*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Broeze, Frank J.A. (editor)

- 1988 *A Merchant's Perspective: Captain Jacobus Boelen's Narrative of his Visit to Hawai'i in 1828*. Hawaiian Historical Society, Honolulu.

Brown, J.F.

- 1885 Map of Kalihi and Kapālama, Makai Sections. Registered Map 1039. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Burke, Kelley, Douglas F. Borthwick, and Hallett H. Hammatt

- 2010 *Final Archaeological Monitoring Report for the Traffic Management System PH 1 Project, Houghtailing Street by the H-1 Kapalama Ahupua'a, Honolulu (Kona) District, O'ahu Island (TMK: [1] 1-6-023:066)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Chinen, Jon J.

- 1958 *The Great Māhele, Hawaii's Land Division of 1848*. University of Hawaii Press, Honolulu.

Cordy, Ross

- 2002 *The Rise and the Fall of the O'ahu Kingdom*. Mutual Publishing, Honolulu.

Dampier, Robert

- 1825 "View of Saltwater Fish Ponds near Honoruru, Sandwich Islands" [pencil sketch]. Original photograph at Bernice Pauahi Bishop Museum, Honolulu.

Dey, Darienne and Hallett H. Hammatt

- 2008 *Archaeological Monitoring Report For the Walgreens Development Project, Kapalama Ahupua'a, Honolulu District, O'ahu Island (TMK: [1] 1-6-027:076)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Dixon, Boyd

- 1993 *Bishop Museum, Site 50-Oa-A6-26, Kaiwiula. Memorandum Regarding Mechanical Trenching on Great Lawn at Bishop Museum during Installation of Electrical Lines*. Bernice Pauahi Bishop Museum, Honolulu.

Dunn, Amy E., Patricia A. Kalima, Lehua Kalima, and Susan Goodfellow

1991 *Palama Chevron Station Site Monitoring Project, Land of Kapālama, District of North Kona, Island of O'ahu, (TMK: 1-5-08:17, 18, 23)*. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Elbert, Samuel H. and Noelani K. Mahoe

1970 *Nā Mele o Hawai'i Nei*. University of Hawaii Press, Honolulu.

Farrington High School

2014 *General Information, Farrington High School*. Electronic document, <http://farringtonhighschool.org/about-fhs/general-information.html>.

Fitzpatrick, Gary

1986 *The Early Mapping of Hawai'i*. Editions Limited, Honolulu.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens

1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawai'i Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham

1917 Legend of Kaulu. In *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, Vol. IV, Part III. Bishop Museum Press, Honolulu

1919 Famous Men of Early Days. In *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, Vol. V, Part II. Bishop Museum Press, Honolulu.

1980 *An Account of the Polynesian Race, Its Origin and Migrations and the Ancient History of the Hawaiian People to the Time of Kamehameha I*. Tuttle and Company, Rutland, Vermont.

Google Earth

2013 Aerial photographs of Hawai'i. Google Inc., Mountain View, California. Available online at www.google.com/earth.html.

Hammatt, Hallett

1995 *Archaeological Disinterment and Investigation of an Inadvertent Burial Find at Austin Lane in Kalihi, Island of O'ahu (TMK: 1-5-05)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

2013 *Archaeological Inventory Survey Report for City Center (Section 4) of the Honolulu High-Capacity Transit Corridor Project, Kalihi, Kapālama, Honolulu, and Waikīkī Ahupua'a, Honolulu (Kona) District, Island of O'ahu TMK [1] 1-2, 1-5, 1-7, 2-1, 2-3*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H. and Rodney Chiogioji

2008 *Archaeological Inventory Survey of the Proposed Board of Water Supply Kalihi Beretania 24-Inch Water Main Project, Nu'uaniu and Kapālama Ahupua'a, Honolulu District (Kona moku), O'ahu Island (TMK: [1] 1-6, 1-7-, 2-1, and 2-2)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H. and David W. Shideler

2011 *Draft-Archaeological Literature Review and Field Inspection (LRFI) Report for the Interstate Route HI (EB) Widening, Ola Lane Overpass to Vineyard Boulevard Project, Kalihi and Kapālama Ahupua'a, Honolulu District, Island of O'ahu (TMK: [1] 1-3, 1-6)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Handy, E.S. Craighill

1940 *The Hawaiian Planter*. Bishop Museum Bulletin Volume 1, No. 161. Bernice Pauahi Bishop Museum, Honolulu.

Handy, E.S. Craighill and Elizabeth G. Handy

1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.

Hawai'i TMK Service

Tax Map Key [1] 1-6-002 and 006. Hawai'i TMK Service, Honolulu.

Ho'oulumāhie

2008 *The Epic Tale Of Hi'iakaikapoliopole*. Puakea Nogelmeier, translator. Awaiaulu Press, Honolulu.

Hunkin, Nifae, Douglas Borthwick, and Hallett H. Hammatt

2012 *Archaeological Monitoring Report for Phase 1 Kalihi/Nu'uaniu Sewer Rehabilitation Project, Kalihi, Kapālama, Nu'uaniu, Pauoa, and Makiki Ahupua'a, Honolulu District, Island of O'ahu (TMKs: [1] 1-2-001 to 003, -009 to -011; 1-3-001, -003 to -005, 007 to -012, -015, -016, -018, -019, -021; 1-6-009 to -011; 1-7-009 to -011, -014 to -017, -019, -020, -023, -032, -033, -036; 1-8-004, -012 to -015; 2-2-001, -003 to -007, -009, -010, -013, -014, -019, -024)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hunkin, Nifae and Hallett H. Hammatt

2013 *Archaeological Monitoring Report for the Kalihi Valley Sewer System Improvement Project, Kapālama Ahupua'a, Kona District, O'ahu Island (TMK: [1] 1-6-025:049)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Īī, John Papa

1959 *Fragments of Hawaiian History as Recorded by John Papa Īī*. Bishop Museum Press, Honolulu.

Jourdane, Elaine

1994 *Inadvertent Discovery of Human Remains at Austin Lane, Honolulu, Hawai'i*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Juvik, Sonia P. and James O. Juvik (editors)

1998 *Atlas of Hawai'i*. Third edition. University of Hawai'i Press, Honolulu.

Kamakau, Samuel Manaiakalani

1976 *The Works of the People of Old, Na Hana a ka Po'e Kahiko*. Bishop Museum Special Publication 61. Bishop Museum Press, Honolulu.

1992 *Ruling Chiefs of Hawai'i*. Revised edition. Kamehameha Schools Press, Honolulu.

Kame'elehiwa, Lilikala

1992 *Native Land and Foreign Desires. Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.

Kikuchi, William K.

1973 Hawaiian Aquaculture System. Ph.D. Dissertation. Department of Anthropology, University of Arizona, Tempe, Arizona.

Kimmich, Robert A.

1956 100 Years of Hawaiian Psychiatry. *Hawaii Medical Journal* 15(4):345–347.

Knudsen, Eric A. and Gurre P. Noble

1945 *Kanuka of Kauai*. Tongg Publishing Company, Honolulu.

Kotzebue, Otto von

1817 South O'ahu. Map by Otto von Kotzebue. Reprinted in *The Early Mapping of Hawai'i*, by Gary L. Fitzpatrick, 1986, pp. 48–49. Editions Limited, Honolulu.

1967 *A Voyage of Discovery into the South Seas and Bering's Straits*, Vol. I. Longman, Hurst, Rees, Orme and Brown, London and Da Capo Press, New York.

LaPasse, Lt. Joseph de

1855 Plan du Mouillage [Anchorage] d'Honolulu [map]. Lt. Joseph de LaPasse. In *The Early Mapping of Hawaii*, Gary L. Fitzpatrick, 1986, pp. 82–83. Editions Limited, Honolulu.

Māhele Book

1848 *Buke Kakau Paa no ka Māhele aina i hooholoia iwaena o Kamehameha 3 a me Na Lii a me Na Konohii ana. Hale Alii Honolulu. Ianuari 1848*. [He kope 1868.] Hawai'i State Archives, Honolulu.

Malo, David

1951 *Hawaiian Antiquities (Moolelo Hawaii)*. Nathaniel B. Emerson, translator and editor. Second edition. Bishop Museum Special Publication No. 2. Bernice Pauahi Bishop Museum, Honolulu.

2006 *Ka Moolelo Hawaii*. First People's Productions, Honolulu.

Manu, Moke

1898 Aiai, Son of Ku'ula: Part II of the Legend of Ku'ula, the Fish God of Hawaii. Translated from Moke Manu by M.K. Nakuina. In *Hawaiian Folk Tales: A Collection of Native Legends*, compiled by Thomas G. Thrum, pp. 230–249. Mutual Publishing, Honolulu.

McAllister, J. Gilbert

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

McDermott, Matthew and Melanie M. Mann

2001 *Archaeological Inventory Survey for the Proposed Nimitz Highway Water System Improvements, Part I, Downtown Honolulu, Nu'uaniu Ahupua'a, District of Kona, Island of O'ahu (TMK: 1-5-08, 1-7-01, 2-1-02)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

McIntosh, James and Paul L. Cleghorn

2006 *Archaeological Pre-Construction Testing and Construction Monitoring for the Kamehameha Heights Water System Improvements part II Project: Kapālama Avenue, Alani Street, Kona Street, Apaki Street, Waihe'e, and Ahiahi Street, Kona District, O'ahu Island (TMKs: 10 1-6-015 and 1-6-016)*. Pacific Legacy, Inc., Kailua, Hawai'i.

Medina, Leandra and Hallett H. Hammatt

2013 *Archaeological Monitoring Report (AMR) for the Waiakamilo Road and McNeill Street Intersection Traffic Signals Improvement Federal Aid Project No. STP-0001(36) Honolulu Ahupua'a, Kona District, Island of O'ahu TMK: [1] 1-5-023:008, 009; 1-5-024:001; 1-5-026:001*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Medina, Leandra, Jon Lance, and Hallett H. Hammatt

2013 *Archaeological Monitoring Report for the Traffic Control Signal Improvements along Dillingham Boulevard (Federal Aid Project No. STP-0001[36]), Honolulu Ahupua'a, Kona District, O'ahu Island TMKs: (1) 1-5-017, 020, and 022 por*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Mitchell, Donald D. Kilolani

1993 *Kū Kilakila 'O Kamehameha. A Historical Account of the Campuses of the Kamehameha Schools*. Kamehameha Schools/Bernice Pauahi Bishop Estate, Honolulu.

Monsarrat, M.D.

1897 Map of Honolulu. Registered Map 1910. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Nakamura, Barry, Jeffrey Pantaleo, and Aki Sinoto

1994 *An Archaeological Assessment of a Parcel of Land in Kapālama on the Corner of North King and Houghtailing Streets, Kapālama, Kona District, O'ahu Island*. Aki Sinoto Consulting, Honolulu.

Nakuina, Moses K.

1990 *The Wind Gourd of La'amaomao*. First edition. Esther T. Mookini and Sarah Nākoā, translators. Kalamakū Press, Honolulu.

Neller, Earl

1980 *Archaeology of the Palama Fire Station, Honolulu, Hawai'i (TMK 1-5-05:14). A Field Reconnaissance Made During Building Renovation*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Office of Hawaiian Affairs

2015 *Papakilo Database*. Office of Hawaiian Affairs cultural and historical database. Electronic document, <http://papakilodatabase.com/main/index.php>.

Pammer, Michelle and Christopher Monahan

- 2011 *Archaeological Literature Review and Field Inspection with Limited Subsurface Testing for the Kapalama Shopping Center Redevelopment Project, Kapalama Ahupua'a, Honolulu (Kona) District, O'ahu Island (TMK: [1] 1-5-002: 001, 002).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Pammer, Michelle and Matt McDermott

- 2014 *Archaeological Inventory Survey for the Honolulu Community College Advanced Technology Training Center (ATTC) Project Kapalama Ahupua'a, Honolulu (Kona) District, Oahu TMKs: [1] 1-5-017:006 por. and 999 (Dillingham Boulevard Right-of-Way), 1-5-018:001-004.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Pukui, Mary Kawena

- 1983 *'Ōlelo No'eau: Hawaiian Proverbs & Poetical Sayings.* Bishop Museum Press, Honolulu.

Pukui, Mary Kawena and Caroline Curtis

- 1949 *Pikoi, and Other Legends of the Island of Hawai'i.* Compiled by Mary Kawena Puku'i and retold by Caroline Curtis. Kamehameha Schools, Honolulu.

Pukui, Mary K. and Samuel H. Elbert

- 1986 *Hawaiian Dictionary.* Second edition. University of Hawaii Press, Honolulu.

Pukui, Mary K., Samuel H. Elbert, and Esther Mookini

- 1974 *Place Names of Hawaii.* University of Hawaii Press, Honolulu.

Rose, Roger G.

- 1980 *A Museum to Instruct and Delight. William T. Brigham and the Founding of Bernice Pauahi Bishop Museum.* Bishop Museum Press, Honolulu.

Sanborn Map Company

- 1927 *Fire Insurance Maps of Honolulu, Oahu, Territory of Hawaii.* Hawai'i State Archives, Honolulu.
- 1950 *Fire Insurance Maps of Honolulu, Oahu, Territory of Hawaii.* Hawai'i State Archives, Honolulu.

Schmitt, Robert C.

- 2013 *Life in the Islands. Streets and Sidewalks.* Hawaiian Historical Society Electronic document, <https://www.hawaiianhistory.org/time-capsules/daily-life/streets-and-sidewalks/>

Sterling, Elspeth P. and Catherine C. Summers

- 1978 *Sites of O'ahu.* Department of Anthropology, Bishop Museum. Bishop Museum Press, Honolulu.

Stine, Cary, Hallett H. Hammatt, and David Shideler

- 2014 *Archaeological Monitoring Report for the Farrington High School Renovations Project Electrical Upgrade Kapālama Ahupua'a, Honolulu District, O'ahu, TKM: [1] -1-6-021:005.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Taylor, Clarice

- 1954 Keana Kamano. *Honolulu Star-Bulletin* 19 August 1954.

Thrum, Thomas G.

- 1922 Hawaiian Place Names. In *A Dictionary of the Hawaiian Language*. Originally published 1865. Revised by Henry Parker. Board of Commissioners of Public Archives of the Territory of Hawaii, Honolulu.

Tulchin, Jon and Hallett H. Hammatt

- 2013 *Archaeological Literature Review and Field Inspection for Kamehameha Schools Commercial Lands in the Makai Portion of Kapālama Ahupua'a, Honolulu (Kona) District, Island of O'ahu, TMK: [1] 1-5-003; [1] 15-019; & [1] 1-5-022 (various parcels)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

UH (University of Hawai'i, Oral History Project)

- 1984 *Kalihi: Place of Transition*. Vols. I–III. Ethnic Studies Oral History Project, Social Science Research Institute, University of Hawai'i at Mānoa, Honolulu.

U.S. Army War Department

- 1919 U.S. Army War Department fire control map of O'ahu, Honolulu Quadrangle. Available at USGS Information Services, Denver, Colorado.
- 1933 U.S. Army War Department fire control map of O'ahu, Honolulu Quadrangle. Available at USGS Information Services, Denver, Colorado.
- 1943 U.S. Army War Department terrain map of O'ahu, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

U.S. Army Map Service

- 1953 U.S. Army Map Service 7.5-minute topographic map of O'ahu, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

U.S. Department of Agriculture

- 2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <http://www.nrcs.usda.gov/products/datasets/ssurgo/> (accessed March 2005).

USGS (U.S. Geological Survey)

- 1952 Kapalama USGS Survey 7.5-Minute Series Topographic Quadrangle. USGS Information Services, Denver, Colorado.
- 1953 Honolulu USGS Survey 7.5-Minute Series Topographic Quadrangle. USGS Information Services, Denver, Colorado.
- 1978 USGS Orthophotograph, Honolulu Quad (Aerial photograph). USGS Information Services, Denver, Colorado.
- 1998 Honolulu USGS Survey 7.5-Minute Series Topographic Quadrangle. USGS Information Services, Denver, Colorado.

Waihona 'Aina

- 2000 *The Māhele Database*. Electronic document, <http://waihona.com> (accessed 10 April 2014).

Wall, Walter E.

- 1893 Map of Honolulu. Registered Map 1690. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Westervelt, W.D.

1923 *Hawaiian Historical Legends*. Fleming H. Revell Company, New York.

1963 *Hawaiian Legends of Old Honolulu*. Charles Tuttle Company, Rutland, Vermont.

Wichman, Frederick B.

1998 *Kaua'i. Ancient Place-Names and Their Stories*. University of Hawai'i Press, Honolulu.

Appendix A Land Commission Awards

A.1 LCA 732 (to Kuinui)

Greetings to the Land Commissioners: I hereby tell of my claim for my house lot at Leleo in Honolulu. The boundaries are: north, a hog enclosure; east, an irrigation channel; south, the irrigation channel; west, the house lot of Kuluahi. The interest in this place was from Kamehameha I. My interest is from my wahine, whose own kupunas and makuas lived here and are buried here. It was I who made the fence; one house stands here, which is mine. No one has objected until this time. I also have four taro patches which are adjacent to the po'alima patches and the stream. They were planted so the stream could irrigate the taro, from the side which adjoins my patches. When I got these taro patches, they were only weed grown, no food was planted and I myself made the patches. They are under the authority of the konohiki.

I am, with aloha,

KUINUI X

F.T. 200v2

Claim 732, Kuinui, February [1848]

Umi, sworn, this place is in Leleo, Honolulu aina, consisting of two pieces, a house lot and kalo ground bounded:

Waititi and Mauka by a water run called Kahala

Ewa by land of Kulamai

Makai by lot of Kulaaka.

It is fenced and and [sic] has 3 house on it; two belong to claimant and one to Kamakakoa, wahine. Claimant got it from Malaikoa in 1828 and has occupied it ever since. I know of no counter claimant.

Kalo land is in Palama, bounded:

Waititi by William Stevens's

Mauka and Ewa by land of Lauu and kalo patches

Makai by land of Puloa.

There are 4 patches. Claimant held it formerly under Keaniani, and since her death under rent to Kanau. He has held it since 1834 and pays his labour days for possession.

I do not know of any counter claimant.

F.T. 205-206v2

Page 2 of 4

<https://www.waihona.com/purchase.asp> 10/22/2014

Claim 732, Kuinui, February 23 [1848]

Umi, sworn, I know this land it is in Leleo, Honolulu aina. It consists of two parts, i.e. house lot & kalo land.

1. The house lot is bounded:

Mauka & Waititi by alaala water course

Ewa by Kukuwai

Makai by land of Kulauuka.

It is fenced & has 3 houses on it; two of which are claimants and one is Kamakakoa's.

Claimant got his title in 1828 from Malaikoa and has occupied it in peace ever since.

N.T. 527-528v2

No. 732, Kuinui

Umi, sworn by the Bible and stated, "I have seen this place. It is at Leleo in Honolulu district.

Aala is on the Waikiki and toward the mountainside

Kuluahi's lot, Ewa and

Kulauka is toward the sea.

This place has been enclosed and there are three houses on the inside. Kuinui had received his interest from Malaekoa. Probably that was the year 1828 and he has lived there since that time to this day. I have also known that Kuinui also has taro land at Kapalama;

Kiwini's lot is Waikiki

Naluaii's lot, toward the mountain

He (Kuinui) is on the Ewa side and

Paoaaloa, toward the sea.

Kuinui's interest is from Keaniani and he had this land in the year 1834. Kanoa is the konohiki at this time and has four patches. I have not known that anyone has objected to Kuinui, altho' he is working for the konohikis at this time.

See page 536

N.T. 536v2

No. 732, Kuinui, From page 527, February 23 [1848]

Haikauai, sworn by the Bible and stated, "My testimony of the house lot and the taro land of Kuinui is the same as the statements of Umi which have been read here, and I

believe they are very authentic.

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[Award 732; R.P. 2465; Leleo Honolulu Kona; 1 ap.; .56 Ac.; R.P. 2465 & 6726;
Kapalama Kona; 2 ap.; 1.55 Acs]

A.2 LCA 918 (to Upai)

To the Land Commissioners, Greetings: I hereby tell you of my house lot claim at Iwilei in Honolulu. The boundaries are: north, the lot of Kananui, east, the lot of Kalaeloa, South, the lot of Haaliku, west, a road. I have occupied this place from the time of Kamehameha I. It was infertile kula with spiny nohu weed, but at this time it has been improved and completely fenced and a house stands in it which is mine. I held it peacefully and at this time Kelliahonui is objecting. There are also some taro patches; there are three together in one place at Kumuhau in Kapalama, which adjoin the patches of Kauoiaao and Halulu which have been held peacefully under the konohiki.

I am, with thanks,

UPAI X

F.T. 263v2

Claim 918, Upai, 3 April [1848]

Kekai, sworn, This is a house lot in Honolulu aina, bounded:

Ewa by Kauahanui's place

Mauka by Kailailoa's

Waititi by Poaliku's

Makai by Kealiihonu's waste land.

It is fenced and claimant has one house on it, who I know to have lived there without dispute ever since 1834. He [She] took it up as waste land.

Kalaeloa, sworn, confirmed the previous testimony and knew of no counter claim.

N.T. 605v2

No. 918, Upai, April 3 [1848]

Kekai, sworn and stated, "I have seen this place in Honolulu here adjoining to

Kapalama and the boundaries are:

Kananui's land, Ewa

Kalaeloa's land, mountain-side

the konohiki's land, oceanside and

Koaliku's land, Waikiki.

This place has been enclosed, it is idle and Upai has lived here in peace to this time." Kalaelo, sworn and said, "I have seen this place and everything is just as Kekai has related here and no one has ever objected."

N.T. 19v10

No. 918, Upai, Land Office, 1 July 1851

Kekai, sworn, he has seen his [her] land at Kumuohau, Kapalama - 3 taro patches in 1 land section.

Mauka and Waikiki, Makai by the king's land

Ewa by a ditch.

Land from Upai's husband named Kealaiki. He had received it from Oliver Holmes at the time of Kamehameha I. No disputes to the present.

Kaiuiaao, sworn, both known in the same way.

[Award 918; R.P. 4428; Iwilei Honolulu Kona; 1 ap.; .2 Ac.; R.P., 691; Kumuulu Kapalama Kona; 1 ap.; .4 Ac.]

A.3 LCA 1746 (to Nakaikuaana)

To the Honorable Mr. Lee and the Land Commissioners, Greetings: I, Nakaikuaana, hereby state my claim for land at Kalaepohaku in Kapalama. The name of my mo`o is Kalauhulumoa. From the time of Kawailepolepo, through Keaniani, to Kanoa at this time, I have had three landlords on my mo`o.

NAKAIKUAANA

Kaloihulumoa, Kapalama

N.T. 92v10

No. 1746, Nakaikuaana, 17 January 1852

Hueu, sworn, I have seen his land at Kalepohaku in Kapalama, Oahu - 21 patches, 1 ditch and pasture in 1 section.

Mauka, Nalauai's land

Honolulu, Moo's land

Makai, Kaupena's land

Ewa, Kupahu's land.

Land from Nakaikuaana's older brother Hao at the time of Kawailepolepo before 1831. Life has been peaceful.

Kupahu, sworn, every statement above is true, I have known in the same way.

[Award 1746; R.P. 2493; Kalaepohaku Kapalama Kona; 1 ap.; 2.4 Acs]

A.4 LCA 2266 (to Kuhiana)

To the Land Commissioners, Greetings: I, the one whose name is below, hereby state my claim for land in the `ili of Kalaepohaku, Ahupua`a of Kapalama, Island of Oahu. There are 10 lo`i.

KUHIENA
December 25, 1847

N.T. 207-208v10

No. 2266, Kuhiana, 4 March 1853

Ualanai, sworn, I have seen his land sections in Kalaepohaku, Kapalama, Oahu of five land sections.

Section 1 - House lot at Kainapuaa.

Section 2 - 9 taro patches at Kalaepohaku.

Section 3 - 6 taro patches at Kalaepohaku.

Section 4 - 11 taro patches at Kalaepohaku.

Section 5 - pasture sections in Kalaepohaku.

Section 1:

Mauka and Waikiki by Hanoa's land

Makai to Ewa, a trail

Ewa, Peahi's house lot.

Section 2:

Mauka by Kanoa's land

Waikiki by Wm. Harbottle's land

Makai by Bil Haole's land

Ewa by Hauna, Keomuku, konohiki's land.

Section 3:

Mauka by Moo's land

Waikiki by Kaaoalahilahi's land, Palakiko's land

Makai by konohiki's land

Ewa by Nakaikuaana's land.

Section 4:

Mauka by konohiki's land
 Waikiki by Kaia's land
 Makai by Kaupena's land
 Ewa by Kupahu's house lot.

Section 5:

Mauka, Waikiki, Makai by konohiki's land
 Ewa by Kupahu's land.

Land sections from Ualanai in 1843 and Kuhiana's life has been peaceful to the
 3/19/13 <https://www.waihona.com/purchase.asp>

<https://www.waihona.com/purchase.asp> 3/3

Land sections from Ualanai in 1843 and Kuhiana's life has been peaceful to the
 present time. Ualanai is assistant konohiki.

[Award 2266; R.P. 2816; Kainapuaa Kapalama Kona; 1 ap.; .50 Ac.; Kalaepohaku
 Kapalama Kona; 1 ap.; 7.45 Acs]

A.5 LCA 2268 (to Kapahu)

To the Land Commissioners, Greetings: I, the one whose name is below, hereby state my claim
 for land in the `ili of Kalaepohaku, Ahupua`a of Kapalama, Island of Oahu. There are 11 lo`i, 1
 kula.

KUPAHU

December 25, 1847

N.T. 193v10

No. 2268, Kupahu, 2 Febrary 1853

Pahua, sworn, I have seen his land sections in the moo of Kumuhahane in the ili of
 Kalaepohaku, Kapalama, Oahu.

Section 1 - House lot and pasture at Puea.

Section 2 - 10 patches at Kumuhahane.

Section 1:

Mauka by Kanoa's land

Honolulu by Nalanai's land

Makai by Kaupena's land

Ewa by Kanoa's land.

Section 2:

Mauka by Kanoa's land

Honolulu by Nakaikuaana's land

Makai by Kaupena's land

Ewa by Kaia's land.

Land sections from Nalanai before 1839 and he has lived peacefully to the present day.

Nalanai (assistant konohiki), sworn, I am the assistant konohiki, no objections.

[Award 2268; R.P. 2521; Kalaepohaku Kapalama Kona; 2 ap.; 3.76 Acs]

A.6 LCA 2937 (to Wm. Harbottle)

No. 2937*O, William Harbottle, Honolulu, Oahu, January 10 1848

N.R. 701-702v3

To the Land Commissioners of the Hawaiian Islands, Greetings: I hereby state my claim, for my house lot in Honolulu, whose boundaries are: north, Nuuanu Street and Mr. Boyd's place, east, house lot of Keo Bu /George Booth/, south, lot of M. Peke /Beck?/, west, house lot of E. Dennis. Those are the boundaries - those of these house lots. The original right to this claim was from John Harbottle, who had it from Kamehameha I, and another claim from Paki which is combined with this house lot where I am living, without dissent from any one.

Also, there are the lands of Kuipaakea in Kapalama /Oahu/, and Iloli on Molokai which were left to us, the keikis of John Harbottle, who had these lands from Kamehameha I.

The lands which were taken by the Mo`i are: Ohikilolo, Waiape, on Oahu, Waipio District, Kumunui on Maui. These lands were for John Harbottle, who had them from Kamehameha I. Hanapouli on Oahu, is for Edward Harbottle, from the Mo`i, Kamehameha III. Keana, in Kaneohe, is mine, from Kamehameha III.

I am, with thanks,

WILLIAM HARBOTTLE

F.T. 501v3

No. 2937, Part 6, William Harbottle

Komo, sworn, says he knows the ili of "Hanapouli," Ewa, Oahu, claimed by W. Harbottle. The father of claimant received this ili from the King, in ancient times. Claimant and his father have held undisputed possession of this land since the gift of the King. I saw Mr. Bishop survey this

land from claimant, leaving out the part taken up in kuleanas. The survey made by Mr. Bishop of the kalo land is correct.

N.T. 1-4v10

No. 2937, William Harbottle, Honolulu, 18 April 18, 1851

Holowale, sworn, He has seen his house lot sections in Honolulu - 2 house lot sections, the boundaries:

Section 1:

Mauka by Boyd and J. Booth's house lots

Waikiki by Beck and Nicholson's house lots

Makai by Dennis's house lot

Ewa by Nuuanu street.

3 houses in this lot.

Section 2 - 2nd house lot.

Mauka by M. Kekuaanoa lot, Kuapanio lot

Waikiki by Kuapanio lot, J.Booth

Makai by J. Booth lot

Ewa by Nuuanu street.

Land to William Harbottle from his father, Jack Harbottle, father's land from Kamehameha I. William Harbottle inherited land in 1832, upon father's death, no objections.

Kauliokamoa, sworn, certifies above statements, he has known in the same way.

No. 2937, William Harbottle, (Section 2), 18 April 1851

Paele, sworn he has seen his land named Kuipaakea, an ili land in Kapalama, Kona, Oahu - 2 land sections.

Section 1 - Pasture land with taro.

Mauka by M. Kekuaanoa and R. G. Davis's land

Waikiki by Naopala and Mossom's land

Makai by Hakuohia and Pila's land

Ewa by a stream.

Section 2 - Pasture land with taro.

Mauka by George Holmes [LCA 8504] and Kekai's land [LCA 7681]

Waikiki by Kekai's land, ditch

Makai by M. Kekauonohi's land

Ewa by M. Kekuaanaoa's land, Kekai and Zupplien's land [LCA 275B-1], Government land.

Land from father John Harbottle from Kamehameha I. John Harbottle died in 1832, land inherited by children, no disputes.

Kanamū, sworn, certifies all statements above.

No. 2927, William Harbottle, (Section 3), 18 April 1851

Mahi, sworn, he has been his land named Ilohi, an ahupuaa in Molokai - 2 land sections.

Section 1 - A pond and pasture land.

Mauka M. Kekauonohi's land

Kaluaaha by Hoolehua land

Makai by outer surf.

Malalo (below) "Punakou."

Section 2 - Pasture land of Kaahaloa: Surrounded by M. Kekauonohi's land.

Land from William Harbottle's father, who had received it from Kamehameha I, upon his death in 1832, the children inherited the land and they have it to the present time without disputes.

Oihi, sworn, they both have known in the same way, no objections.

No. 2937, William Harbottle, (section 4), 18 April 1851

Oili, sworn, he has seen his land named Ohikilolo, an ahupuaa in Waianae, Oahu. This is pasture land only. The boundaries are:

Mauka by Government land
 Honolulu by M. Kekuanaoa's land
 Makai by M. Kekuanaoa's land
 Kaena by Government land.

The father had received this land from Kamehameha I, he had lived peacefully all his life and upon his death had bequested this land to his children. They have it now, no disputes.

No. 2937, William Harbottle, (section 5), 18 April 1851

Pahia, sworn, he has seen his ili land named Waiape, in Kaneohe, Koolaupoko, Oahu.

The boundaries are:

Mauka by Kuaana's land of "Kaluaahuawa"
 Koolauloa by Kuaana's land of "Kaluaahuawa"
 Makai by Paul F. Marin's land of Punaluu
 Kailua by The King's land.

Land from Kamehameha I to John Harbottle, William Harbottle's father. John Harbottle had lived peacefully and upon his death had bequested this land to his children. They have it at the present time, no disputes.

No. 2937, William Harbottle, (section 7), 18 April 1851

Kanamu, sworn, he has seen his land named "Opana" in Hamakualoa, Maui, it is an ahupuaa.

Mauka by Lot Kamehameha's land
 Wailuku by Haiku, Kaalaea, Ulumalu, Kaupakulua,
 Makai by sea
 Hana by Keaaula, Uaoa, Peahi ahupua`a

Land from Kamehameha I to John Harbottle, his (Wm. Harbottle) father where on he had lived peacefully until his death. The children have inherited the land and are there at the present time.

Mahi, sworn, Both have known in the same way, no one has objected.

No. 2937, William Harbottle (section 8)

Kanamu, sworn, he has seen his land named "Kamakialoa" in Waipio ahupuaa. The boundaries are:

Mauka, Lot Kamehameha's land

Wailuku, Mokupapakua, Mokupapa-kanaka, Holowa ahupuaas

Makai, Sea

Hana, Waipio 2, Puolua, Huelo

Land to John Harbottle from Kamehameha I, upon Harbottle's death, land was inherited by his children and they still have it today, no objections.

Mahi, sworn, both have known in the same way.

William Harbottle states, "There is in these lands mentioned above the interest of Kanaka, but it should be separated according to what is proper about their place."

No. 2937, William Harbottle (section 9)

William L. Lee has worked on this claim. No. 10893, William Harbottle: Work done by W. Lee (L.)

No. 2937, Section 10, William Harbottle

Paihahowale, sworn, he has seen his ili land Keana, in Kaneohe, Koolaupoko of 5 land sections.

Section 1 - 5 sand dunes, sea and a pasture, the boundaries are:

Mauka by Kalama's land

Koolauloa by Ocean

Makai by Kalama and the King's land

Kailua by Kalama's land.

Section 2 - 4 patches, 3 sand dunes, the sea and a pasture.

Mauka by the King's land

Koolauloa by the King's land

Makai by J. Pukoi's [Piikoi's] land

Kailua by a pali.

Section 3 - 20 patches and a pasture.

Mauka by Hoopupule, Uluhoaloha's land

Koolauloa by stream

Makai by Pupule's land, the King's land

Kailua by pali.

Section 4 - 10 patches.

Mauka by "Waiakalua," Kawana's land

Koolauloa by Kekia's land

Makai by Kapu's land

Koolauloa by Paiku's land

Makai by Kauwana's land

Kailua by Keaukee's land.

Land from Kamehameha III in 1833. And he has lived there continuously to this time.

[Award 2937; R.P. 577; Nuuanu St. Honolulu Kona; 1 ap.; .11 Ac.; R.P. 3589; Nuuanu St. Honolulu Kona; 1 ap.; .11 Ac.; R.P. 3588; Kalaepohaku Kapalama Kona; 1 ap.; 8.32 Acs; R.P. 4539 & 7505; Kuipaakea Kapalama Kona; 1 ap.; 5.78 Acs; R.P. 5583; Keana Kaneohe Koolaupoko; 4 ap.; 141.20 Acs; R.P. 7391; Hanapouli Waipio Ewa; 1 ap.; 20 sq. chains; R.P. 8468, Kaneohe Koolaupoko (ap. 5); Ohikilolo Waianae; 1 ap.; 532.2 Acs]

Appendix B OHA Response Letter

PHONE (808) 594-1888



FAX (808) 594-1938

STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
 580 N. NIMITZ HWY., SUITE 200
 HONOLULU, HAWAII 96817

HRD 15-7581

September 3, 2015

Nicole Ishihara
 Cultural Surveys Hawai'i, Inc.
 P. O. Box 1114
 Kailua, Hawai'i 96734

Re: Cultural Impact Assessment for Halona Street Bridge Replacement
 Kapālama Ahupua'a, Kona Moku, O'ahu Moku

Aloha Ms. Ishihara:

The Office of Hawaiian Affairs (OHA) received your letter dated August 2015, requesting comments on the above-titled project. Given the project descriptions provided, our agency has no comments or information to provide at this time. Should you have any questions, please contact Everett Ohta at 594-0231 or everetto@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Kamana'opono M. Crabbe, Ph.D.
 Ka Pouhana, Chief Executive Officer

KC: rg

**Please address replies and similar, future correspondence to our agency:*

*Dr. Kamana'opono Crabbe
 Attn: OHA Compliance Enforcement
 560 N. Nimitz Hwy., Ste. 200
 Honolulu, Hawai'i 96817*

Appendix C Melvin Ishihara Transcription

Cultural Impact Assessment, Hālonā Street Bridge: Cultural Surveys Hawai'i (CSH) interview with Melvin Ishihara (MI), former resident of Kapālama, on August 24, 2015 at his home in Kāneʻohe

CSH: Nicole Ishihara

MI2: Muriel Ishihara, wife of Melvin Ishihara

CSH: Ok, so I have to record this. Are you OK with that?

MI: Yeah.

CSH: Ok. Ok, so we can do that after at the end.

MI: No, this is important in the beginning.

CSH: Ok.

MI: So you have a pictorial picture of what I'm talking about.

CSH: Ok. Sure.

MI: Ok, you see that title on the top it says "Kapālama Canal Area"?

CSH: Ok.

MI: Ok. That's the so-called project area.

CSH: Ok.

MI: But that's before, that's before, you see the period is from 19—39--1938, 1939 to 1945. So that's a period of six years.

CSH: Ok.

MI: Well, when I was growing up because I stayed with grandma them.

CSH: Ok. Can we start from, like, your name and where you were born and all that?

MI: Ok.

CSH: Ok, let's start with all that.

MI: Ok.

CSH: Ok, so you are obviously you are Melvin Ishihara.

MI: No.

CSH: Oh no?

MI: Initially I was Melvin Shigeru Shimokawa.

CSH: That's right.

MI: I was adopted in the 1940s. Early...mid...1940s prior, Ishihara, before he went off with the 100th Battalion.

CSH: So who are your parents? Who's your birth mother and....

MI: Well, grandma was a Kochiyama.

CSH: Elsie. Kochiyama.

MI: Yeah.

CSH: Was she born here?

MI: Sheesh, not so sure she was born here. I think she was born in Japan, I think.

CSH: And then your father?

MI: My father was Shigeru Shimokawa. And he was...he died at such a young age. He must've been born on Kaua'i.

CSH: Thank you [talking to MI2]

MI: Because he died when he was only 30-something years old.

CSH: Wow, so young. He was born on Kaua'i?

MI: Yeah, that's what my mom told me.

CSH: Was he was son of plantation workers or immigrants? I thought he was born here. Or no?

MI: Not in Honolulu. I think he was born on Kaua'i. Because I always wanted to go back to Kaua'i and grandma used to always tell me, "Oh how come? Because that's where your father was born."

CSH: Interesting. What did he do? Shigeru?

MI: Oh, he worked for Theodore H. Richards.

CSH: What is that?

MI: A contracting firm in Honolulu that built all the bridges.

CSH: Oh.

MI: You know like the bridge on Nu'uaniu Stream?

CSH: Ok.

MI: The one on Vineyard Street and all of those? But he worked for Theodore H. Richards as an operator...construction....construction job. And he died because of that job.

CSH: Which job?

MI: Working at....

CSH: The Nu'uaniu one?

MI: Yeah. He died from...tetanus poisoning. But he didn't die according to grandma from poisoning on the job...it was...he played a lot of sports. He played sports with Alan Nagata who was the Assistant Coach to Neil Blaisdell. He used to like to sumo. I have pictures of him when he used to sumo with Alan Nagata and them. But he used to baseball for this Mō'ili'ili baseball team

and whenever he wasn't feeling well with an injury--according to Alan Nagata, he went to get acupuncture treatment by this lady in Mō'ili'ili. By the way, we used to live right next to the—I was born next to that Honolulu Stadium on Algaroba Street. I mean, right next to it. On the side street that runs right parallel to the stadium. But anyway, when I was a...he died in 1930... '38. He died 1938. So...

CSH: Was it because of a...the needle was infected?

MI: Well, that's what Alan Nagata thinks it was.

CSH: Oh, ok.

MI: But if it was infected that way—that's how you can get tetanus poisoning.

CSH: Right.

MI: So grandma was really upset with the hospital at the time. I think that was Queen's Hospital because when he died, he died at such a young age.

CSH: What did Baban do for a living? Was she a homemaker or did she work?

MI: She worked but I think she was more of a housekeeper for one of the high makamaka...you know the old, the old guard. When I say the old guard, I mean, the ones at like Punahou and all like that. And she was like a housemaid. Then she just raised children—me, Uncle Pat. Uncle Pat was two years after me—and Uncle Roy was born—well, she was pregnant with Uncle Roy when my father died. My father died in November of 1938. And Uncle Roy was born in January of 1939.

CSH: And then when ...what did... was his first name for Ishihara?

MI: Robert.

CSH: Robert. So when did he enter the picture?

MI: Ok, he died...dad died in 1938. At that time we lived at the Shimokawa Camp. The Shimokawa Camp was that area in which the H-1 freeway runs right by Humane Society. They owned all that property.

CSH: Wow.

MI: So in payment for that property they were compensated, they bought, Grandma and Grandpa Shimokawa bought this multiple, this good sized property up on 12th Avenue in Kaimuki with houses on it because in the Shimokawa Camp there was 1, 2, 3, 4, 5...about 6 houses. It was a big piece of property.

CSH: So when did she meet Robert Ishihara?

MI: Well, it was just after the war started in 1941...must've been in 1942 when they sent the 100th Battalion over to the mainland. You know? The 100th Battalion was the forerunner to the 442nd.

CSH: Which is like....Dan Inouye?

MI: Yeah, because them guys was only like 18 years old.

CSH: Ok. So somewhere around there?

MI: Yes. By the way, my stepdad was born on Maui and then he worked at Pearl Harbor. And then he had an injury from an explosion, not by the war, but by the construction when they were building Pearl Harbor. Water Town, what they call Water Town. Anyway, so he joined the Army and was sent to...the mainland. And then because of that injury I think he was discharged, he came home in 1943 or '44 and that's when they got married. And that's when he married mom. But in the meantime, we were staying with the Shimokawa's in Mō'ili'ili—you know the [inaudible]. And then she married him—must've been in the early 40s—I mean, '43 or '44 because in '43—sometime in '43—he moved us to Kapālama in that area.

CSH: Your stepdad?

MI: Yeah.

CSH: Why did he move you guys over there?

MI: Because that's where Grandma Kochiyama-Yamane lived there. Grandma's mother lived there.

CSH: Oh!

MI: She was married to —she came over with Grandma, Uncle Bob, Aunty Chieko, Uncle Jigs...

MI2: Are you talking about when she came from Japan?

CSH: No, we're talking about when he lived in

MI2: Kalihi?

CSH: Yeah.

MI2: That's right then.

CSH: Ok. So this is Baban's....

MI: Family. Her name was Kochiyama but her mother married a Yamane.

MI2: Second marriage.

MI: Ok and that's why we lived—and that's why I showed this map...we lived...

CSH: Must be where this X is?

MI: No, that's the temple.

CSH: OH!

MI: Right here. See this area right here? This is where the industrial is now but before that it was a pasture land. This street—this is King Street—'cause we lived right where the Post Office is now.

CSH: Ok.

MI: I mean, literally right where the Post Office is now.

CSH: What kind of house was it? Before you used to say you used to take a bath in a furo.

MI: Right, it was a furo. But we did not live in a house. It was a complex. It was a commercial complex where one end had a foundry and another one was a furniture store. Another one was a rental by Grandpa.

CSH: So you're saying he lived at Gems? [laughing]

MI: Something like it.

CSH: Interesting.

MI: What it is, is a building that had all of these segments. And the first one in this lane was Yamashita General Store where we used to buy shave ice. They lived upstairs in the back. Every house, every unit inside there other than the Chinese restaurant and the barber shop and the furniture store and the foundry—we were the only ones with family that lived inside that complex.

CSH: You were the only ones?

MI: Uh huh. There was no bedroom you know? It was actually a storefront. We literally bordered King Street.

CSH: Why did you guys live in there?

MI2: Don't look at me!

MI: What do you mean why did we live in there?

CSH: Did you family own the building or some of the stores?

MI: No. Well, ok. Grandpa Yamane was a vegetable peddler.

CSH: Oh.

MI: He pushed this great big wagon around the---you know Waiakamilo and Kalākaua and down by Libby Cannery?

CSH: Uh huh.

MI: He pushed that wagon all over that place with me inside.

CSH: Cute.

MI: But it wasn't that cute when he ran over my toe.

CSH: [Laughing]

MI: Don't laugh cause from that day on—I was just a young baby—I would run around and I didn't go to school yet. From that day on, my toenail, my big toe—had a crack. And that crack existed until I retired 55 years later.

CSH: Oh my God! It never grew out and....

MI: It grew. But it was never infected—it just had a crack right in that big toe nail and it just kept—the new nail just kept growing.

CSH: So weird.

MI: Today there's no line. But for many years it always had that crack. But anyway, he would push me around that neighborhood in what they call Waiakamilo Road behind Kalākaua School

because all of that used to have houses and streets. Dirt streets. Ok, that area that I showed you was pasture land, today is an industrial area where Sears Warehouse is and everything else. You see that part that says "Pasture Land"? And a bomb dropped there on December 7th. Ok...

CSH: Can you describe what that was like?

MI: Well....

CSH: Did you guys know it was a bomb?

MI: Oh yeah, we heard the explosion and everything. 'Cause I moved there right after the war had started. Well, I was there in 1941 to 1945. In 1939 we stayed with Grandma them in that house. Ok, this is...this is Kalihi Street right here. Ok, this Kalākaua School. Right down on Dillingham Boulevard next to Mokauea and it's almost by the prison, one house was strafed with machine gun bullets.

CSH: Oh my God.

MI: On Dillingham Boulevard.

CSH: Was anybody in there?

MI: Yeah, they lived there. People lived there but nobody died that I know of [pause]. Ok so this map is my recollection of what it was like in 1940—from the time I stayed with Grandma and Grandpa Yamane in Kalihi-Kapālama.

CSH: I have a bigger map. If you want to mark it. I wanted to wait until the end but...

MI: What you mean a bigger map?

CSH: I mean, you can mark it up if you want. And then later on I'm going to give it to our map people and they can put points on it.

MI: You can take this one here.

CSH: But this one is way better!

MI: Well, the only thing that's not better is that this does not have the freeway.

CSH: Oh yeah, that's true! That's true cause never had the freeway.

MI: Right.

CSH: Ok. Well, maybe I'll just save it for later?

MI: And never had the buildings. You see where I show the pasture land?

CSH: Yeah.

MI: That was literally a pasture land.

CSH: Was there cows on it?

MI: There was horses and cows. And just bushes. And the stream. You see that little stream I drew inside there?

CSH: Uh huh.

MI: We used to catch crayfish inside there.

CSH: Is that Kapālama Canal today?

MI: No, this is Kapālama Canal. It's always been Kapālama Canal. This the pasture land.

CSH: What is...where is the little stream you're talking about?

MI: Right here, you see this blue line?

CSH: Oh, ok, ok. Where did it originate from—the water?

MI: That line went across the street and came up here and ran up on Houghtailing and eventually it became like a drainage canal. And the other part that you can see here is that you see—this canal—you see the canal?

CSH: Uh huh.

MI; You see this line here that I have going?

CSH: Uh huh.

MI: That was a feeder line that came up in Kalihi. All the way up in Kalihi. You see that blue line going up?

CSH: Uh huh.

MI: Went up into Kalihi Valley that fed that stream. That fed Kapālama Canal.

CSH: Is that the one that goes up to Ice Pond or all the way up?

MI: Yeah, just about.

CSH: Did you go to Ice Pond?

MI: Nope. We couldn't go that far in.

CSH: Why?

MI: We too young! You see where Kapālama School is right here? Okay, that drainage canal literally had a wall and I walked on that wall and I was looking at the mango tree and I fell down eight feet. Into the ditch but it was all concrete. So I got up and went home but it hurt like hell. But that...the other thing that I have to point out. You see I drew this, this map because, this map doesn't have the freeway! You see where this portion is?

CSH: Vineyard?

MI: Yeah. That's where the freeway is now today! Because it kind of came this way and when make a big turn to go down along this way not along Vineyard. Came along this way—big turn. But Vineyard used to end right on where Halona Street is today. You know the street that runs parallel to the freeway?

CSH: Uh huh.

MI: That's Halona Street. Never had that street before. It was Vineyard. Vineyard would come to Palama Settlement about here and then go under that bridge and that's what your gonna be doing when you work on the bridge—go under the bridge, go alongside the H-1, and then there was a gate here. And that's how you went into Bishop Museum. Right as you entered the gate, they had a gymnasium. Beyond the gymnasium they had elementary school for the boys and dormitories.

CSH: So that was the original location of Kamehameha Schools?

MI: Only the boy's elementary portion. The school was already up on the heights. The girls were not located there now. Mom would tell you where they were located. You know where they were located?

CSH: No.

MI: On King Street. You know where the Kamehameha Schools Administrative building is now?

CSH: Kawaiha'ō Plaza? By the Missionary Homes....

MI: Yeah, right behind that. That's where the girl's dormitories were at.

CSH: And their school? Just the school or the dorms?

MI: The school would be up at the heights.

CSH: They really wanted them to be far apart.

MI: But later they moved the dorms even up to the heights. But that's why this map is....for that period up until 1945 and before the freeway.

CSH: So you know how the freeway—obviously it's down—right? There's a big cut out.

MI: Right. It is really down.

CSH: Right. So how did they—did they dig that all out?

MI: They did. However, I was not there because I was away in school.

CSH: What was there....

MI: It was built in 1950 or so. About 1950-something.

CSH: What was there before? Was there homes before?

MI: Oh yeah. Oh yeah! You know where School Street is?

CSH: Yes.

MI: Where's School Street? Here's School Street. Well, once it went past...well, it never went—this map doesn't show beyond Liliha Street. Anyway, once it passed Liliha and continued on to Nu'uanu. Not Nu'uanu, Fort Street. Actually it was Fort Street. It passed Nu'uanu, where Kukui Plaza, where Foster Garden is.

CSH: Yes.

MI: Between Nu'uanu and Fort Street. By the way, Fort Street went all the way to Pauoa Valley, you know? It was...there was no Pali Highway. Pali Highway—today, if you recall goes from Bishop Street right straight up. It never used to. It used to stop right at Beretania. And Pali Highway went from the fire station and Princess Theater straight up Fort Street. Up Fort Street. So Fort Street used to go up all the Pauoa Valley. Anyway, on School Street—let's see—School Street—on School Street. This is School Street, between Foster Garden and Fort Street there used to be a theater called—where Kaneda's—you know where Kaneda's Catering—there's a catering service right on the mauka side. On the makai side was a park!

CSH: You mean where Zippy's would be today?

MI: No, no. This is up. Zippy's is on Vineyard.

CSH: Oh, I see where you're saying.

MI: This is above Kukui Gardens. You know Kukui Gardens? You know where they built Kukui Gardens? By the way, that's where Grandma Ishihara them used to live. Was all Chinese families inside there. Used to walk from the Kukui Apartments go down on Vineyard Street, walk over to Nu'uaniu, walk over to Grandma Ishihara's. Grandma Ishihara was blind from diabetes. Grandpa Ishihara was an amputee. Both legs. From diabetes.

CSH: Oh my gosh. That's horrible.

MI: And that's why, the Ishihara line and when I say the Ishihara line, Uncle Gary, Aunty Emi, and Wayne all have...all was diabetic. Type 1. Anyway, that's basically the line that Vineyard took. It went right into Bishop Museum. Now there's no freeway on this map. But the freeway was all dug down.

CSH: Uh huh, but you're saying there was homes there, right? Where the freeway is today. Like sitting on top, right? There was homes?

MI: Yeah.

CSH: Was it pastureland?

MI: Not really, I'll tell you why. You see where this Vineyard is?

CSH: Uh huh.

MI: Ok, that street where Vineyard Boulevard was there but there was a lot of pasture land there. Now, the ironic part of it is this. You see, Waiakamilo Road went to King Street. That's King Street right there. It was called Waiakamilo. For some reason that portion that goes mauka all the way up to Kamehameha Heights is called Houghtailing. Named after George Houghtailing who was one of the political big wigs. So that's strange—if you go past King Street, “Oh you talking about Waiakamilo on the mauka side of King?” But no, that's Houghtailing. Ok, it went into, it went into. Ok—the interesting part I want to tell you is that on Houghtailing from Vineyard is School Street. On the side where Damien and the Carpenter's Union and all those others it used to be nothing but bushes. And it was only a dirt road. There was—if you notice in this map here—there is no homes on Bishop Estate land. It was not built until sometime in the 1950s. That's why I don't have the streets and everything inside there.

CSH: Oh yeah, yeah. All the little side streets.

MI: You see, Tatsuku used to lived right down on this Kapālama Street that goes down here in Bishop Estate land. He lived right off of School Street but I didn't drive any of those units inside there.

CSH: The what?! The suku?

MI: Tatsuku.

CSH: Who's that?

MI: Tatsuku. You don't know Tatsuku? He used to work for the court. He used come here all the time. He was a court clerk.

CSH: That's your friend?

MI: Yeah, he belonged to the Y's Men Club. He used to come here all the time. Nice guy. But then he got into trouble because he was gambling. And then he left the court system and then he worked for a travel agency. Nice guy, he didn't do anything criminal! He didn't go to jail for it but he had to leave the job. Anyway, that's why I don't have any buildings at Bishop Estate or this development because this development was not in existence in 1945. This area did have development because this where the Puerto Rican community is located.

CSH: Interesting. So where the freeway would be today?

MI: Huh?

CSH: Is that where the freeway would be today?

MI: No, this is School Street.

CSH: Ok, so makai of that.

MI: Yeah, makai of that. From here to here there was houses. This side had houses. This is...right here is ok, this is Pālama. You know Pālama Street? You see on this corner right here?

CSH: The church thing?

MI: Right here. No, right here. Right here.

CSH: Ok.

MI: Yeah, this yeah. You see this street right here?

CSH: Yeah.

MI: It's Banyan. And it's a dead end. And at the end of the dead end is where Grandma and Uncle Bob's ashes are stored at that Japanese temple. So there is a Japanese temple there, a Japanese temple there, and a Japanese temple across the street on here someplace. Right here.

CSH: So, was this...was Kalihi-Kapālama a mixed community?

MI: Oh yeah....

CSH: Like how Kaka'ako was?

MI: Oh more so. Because we had Japanese, Chinese, Hawaiian, haole, pōpolo.

CSH: And they lived in like little areas together? Or was it all mixed up?

MI: Oh no, this whole area was all congested. All congested. All Japanese and everything inside there.

CSH: So all mixed up?

MI: All mixed up! The lane that I lived in—you see this little lane right here? Significant because that's where Calvin McGregor lived.

CSH: Who's that?

MI: Calvin McGregor is a judge. He's also a major contributor to Kamehameha Schools. His wife—there's one trophy named the McGregor trophy in the Kamehameha Song Contest.

CSH: OH! So it's named after him!

MI: Yeah, Calvin McGregor. And his wife for many years used to make that presentation. McGregor.

CSH: So where....

MI: That's McGregor Lane.

CSH: So where you lived...was it just stores?

MI: Yeah, you see that block right there?

CSH: Even around you? Besides what you lived in?

MI: What you mean stores?

CSH: Well, you lived in a store. But was there other stores around you or were there homes around you?

MI: Not on that side of the street. It was on this side of the street there was.

CSH: And how many people lived in your house or area?

MI: Well, it was the three of us—Uncle Roy, me, and Uncle Pat. Then there was Aunty Florence, Uncle Bob. Later Merle and Milton came but it was much later than 1945. Uncle Jigs. Aunty Violet, Uncle Reggie. Grandma and Grandpa. So there was about 8, 9, 10 people. And there was no bedroom.

CSH: So you guys all slept on futons or something?

MI: Futons on a big open area. It was like a...like a hall-like, you know. You know you see some of these Japanese movies where they have this kendo or sword da kine instruction place? Like that. And you lay your futon down and you store your futon in little cabinets. Oh, there was one area that Uncle Jigs slept on cause to go from the, from the main entrance in, Grandpa Yamane used to park his vegetable wagon in front of there. Then to get to the living area you had to go down this hallway. The hallway. And above the hallway there was this deck and every night Uncle Jig used to have to climb up there to go to sleep. That's where he slept. Uncle Bob, Aunty Florence at that time they were just married. Aunty Chieko, Uncle Reggie—Uncle Reggie left and went right into the military right after high school. And then from there he went to England, Florida, and we never saw him after that.

CSH: Wow.

MI: Other than the pictures that he sent home. But he must've passed away and we never knew that.

CSH: So what would you guys eat? Would you guys eat the vegetables—the leftover the vegetables?

MI: Oh yeah, grandma would do the cooking. By the way, the kitchen was something else! You would not believe what the kitchen looked like. Right after she does the cooking, on the adjacent side of it was a toilet.

CSH: That's clean [laughing].

MI: No, it's separated but it's a furo.

CSH: Ah so you guys had your own furo there!

MI: Yeah, we used to have to make the fire on our own and everything there. And then the bathroom. So she had to wash the clothes in there too.

CSH: Did you guys eat traditional Japanese food?

MI: Yeah, definitely. Everything was traditionally Japanese. I mean straight Japanese.

CSH: Did you ever eat local stuff? You were saying you caught crayfish. Did you ever eat that?

MI: Not at home. We ate it outside in the field.

CSH: Like as a snack?

MI: Like I told you, it was a mixture of nationalities, right? Ok, one of the guys was Willie Keola. Willie Keola played football for Farrington. His son got a scholarship to 'Iolani. He made all-star but Willie Keola was about a 250 pound guy. Nice Hawaiian guy. He lived next to George Okanishi, one Japanese guy. And then had some Chinese guys. And then down the street was the Nicholas family which was a pōpolo guy.

CSH: So this was your childhood friends that you hung out with?

MI: They lived in the neighborhood. So the kitchen was one level, the same level as how the hallway and the wagon was parked. The living area was little bit raised.

CSH: The what?

MI: Living area. Where I told you. Where we slept. Was little bit up. But you gotta go up. It's not that high a da kine.

CSH: A step?

MI: Not that high you gotta climb up. The eating area was like that, you gotta climb up into a little cubby hole like. And they had this—the table was like from here to there wide. And about that—not even that long so you gotta sit inside there to eat.

CSH: Wow.

MI: [laughing]

CSH: So when you would eat traditional Japanese food at home, but when you're out playing you would eat crayfish?

MI: Crayfish. Pigeon.

CSH: Ew. So you'd catch it and then fire it up?

MI: Yeah, ok, like I said, you see this pasture land? By the way, you see this other lane here? Naipers Lane. Right between those two was O'ahu Lumber and Hardware. In the back of O'ahu Lumber and Hardware was a junkyard. When I say junkyard they had all these soda cans....not soda....soda water bottles, palettes, and left over stuff all stack up. And then they had a tree. You know Kohou Street where they just when move the guys?

CSH: Yes. Yes.

MI: It wasn't a street. It was just a dirt road.

CSH: Yes, ok.

MI: That's why I showed that as a dirt road. And then the stream ran in and then there was a big mango tree and we'd go up in the mango tree and Willie Keola was a little bit older than us. He used to go catch doves. The way he catch doves two ways: the old style and Indian way where you get the—you know the wire. You make the wire da kine and make the entrance and then they go in and cannot come out. And the other stuff, I really remember clearly, clearly, clearly was an Indian type. See all of that area had koa bushes. You know what koa bushes look like ah? You know the koa bean ah?

CSH: Yeah.

MI: They grow so high.

CSH: You're talking about haole koa?

MI: Haole koa, yeah. So he goes and bends it down.

CSH: Hah yeah!

MI: He bends the haole koa branch down and makes it...ties a string on it. Make a loop. Make a platform and build a platform like that—put sticks on it. And then he put his corn down and we sitting in the tree now! The dove pick it up, pick it up, pick it up. As soon as he stepped on that platform it unhooks the da kine the thing and the da kine snaps up and catches the thing by the leg and we run down from the tree, we pick it up, put it in the cage. He had at one time six mountain doves. You know mountain doves? The big ones. You know the big ones we see out here.

CSH: Yeah.

MI: And then we barbeque 'um.

CSH: And you'd just pick off all the feathers and boil it?

MI: Yeah, you gotta make hot water and make it like chicken. You only...

CSH: So that was like your outside play snack? Or you guys would camp in the pasture land?

MI: No, we wouldn't camp in the pasture land. We were still only like...1946....I was about seventh, eighth grade. No, not even seventh grade about sixth grade. Fifth, sixth grade.

CSH: Ok, would you guys eat the mangoes too in the mango...

MI: Oh yeah, mango, guava, all kinds of stuff.

CSH: Would you guys go far mauka? Far up towards where Kamehameha Heights. No?

MI: No, the farthest we would go was on Houghtailing. On Houghtailing both sides of the streets, before Bishop Museum was developed, both side of the street was kuahiwi.

CSH: Kuahiwi?

MI: BUSHES!

CSH: OH, BUSHES!

MI: [laughing]

CSH: What kind of bush? Was it haole koa too?

MI: Oh all kinds, koa trees, kukus.

MI2: Kiawe?

MI: Yeah, kiawe, kiawe too.

CSH: It's kind of hard to imagine Kapālama like that now.

MI: Ok, this thing says culturally etc. Now let me give you background. Now I said Chinese, Hawaiian, Japanese, and Filipino. And which reminds me, next to that McGregor Lane right there the Filipino guys had fighting chickens over there.

CSH: So regularly had gambling?

MI: Yeah. And they had Mao Lane and all that. Now Farrington High School was here but in 1941, 1942, 43, 44, 45—it was a hospital. Farrington High School was. Next to the high school they had these barracks-like. Warehouses.

CSH: Was that for the war?

MI: Yeah. They had barracks like. Ok. So there was a separation between Farrington and the Kamehameha property, you know Bishop Museum? But it was not anything that was barb wire or anything like that. You know? Just separated and we knew we couldn't go over there and they couldn't come over. Had a gymnasium right inside the gate—nice gymnasium—we used to use it. And then the museum. You know the big building that's up there? The main one?

MI2: The museum?

MI: The museum. Bishop Museum.

CSH: Yeah.

MI: That's the original one. No more the new ones on the side. But that's how the Bishop Museum was. So they had all that property and this is all Bishop Estate from here. And then there's a park across the street—the park is still there. Ok. But there's a temple there. There's a temple here. There's a temple there—where I told you grandma and Uncle Bob is. And right on the corner there is Palama Settlement. See that Palama Settlement?

CSH: Were you just confined to this area? You just kind of stayed in this area during this time?

MI: Well, we used to go to Palama Settlement.

CSH: No, but from Liliha Street to Kalihi Street, you kind of just stayed in...

MI: Yeah, yeah, yeah, yeah, yeah. And by the way, you can go—see I told you this pasture land went to Dillingham Boulevard. Beyond Dillingham Boulevard was like had gardens and da kine—taro patches.

CSH: Ahhh.

MI: There was no Nimitz Highway.

CSH: So did anybody live there?

MI: Yeah, guys that would take care of the place.

CSH: So tell me about this rubbish incinerator.

MI: Ok, that was—that was a—see....they had it there kind of long because they used to burn the rubbish you know from the rubbish truck? And then they got rid of it because—the syndicate used to throw guys inside there [laughing].

CSH: So they would find bodies or they would....

MI: Riiiiight [laughing]. You know if you didn't get along with the syndicate that's where you'd end up. At one time the syndicate was really, really bad. Really bad. They would not hesitate to wipe guys out. They'd go to Maunalua Bay.

MI2: They'd leave bodies in cars.

MI: Maunalua Bay they kill the two Korean guys—the Hong Brothers. Or they go up to Camp Erdman side and bury them in the sand over there.

CSH: Right. So they were the gang of Honolulu?

MI: They called them the syndicate. And they—the guy who headed it ended up in jail. You know?

CSH: So those guys don't exist out on the streets anymore?

MI2: No.

CSH: They're grandpas? [laughing]

MI: Oh yeah, definitely. Now Grandpa Ishihara, after he got out of the Army and then we moved to airport side, by the way, we moved to John Rogers.

CSH: Right. By the airport.

MI; He went to work for the prison and two of the guys he had to watch all the time was Majors and Palakiko.

MI2: Oh.

MI: [laughing]

CSH: I don't know who that is.

MI: Ok, James Major and the other guy Palakiko murdered—what the wahines name? Up in Nu'uuanu. She was a rich wahine.

CSH: Massey?

MI2: I heard about that one. No, not Massey. No, Wilder.

MI: Anyways, they murdered her and she was an old lady. But they caught them because they were escapees at that time so they were looking for them. But Grandpa Ishihara was a guard and he became friends with them two guys. One guy could never get straightened out. The other guy served his time and he got out.

MI2: There was no death penalty?

MI: No, death penalty. There was, but they never got the death penalty—the time they came out never got the death penalty. Because he said they—he didn't like the job because he didn't want

to be the guy who had to pull the lever for hanging. It was hanging. The death penalty was hanging. And that was something he would not do.

CSH: So the rubbish incinerator—that would be where KCC is? HCC!

MI: No, it's middle of the da kine....

MI2: It's right across the canal from HCC side.

CSH: Yeah.

MI2: Middle of the block.

MI: Commercial stuff—bars and stuff like that.

MI2: It's on the opposite side where HCC is? The incinerator was?

MI: Yeah, it's on the mauka side.

MI2: Is it on the HCC side of the canal?

MI: Yeah, because ok—I never had this map drawn by scale because along here—

MI2: She has a big map over here!

MI: Pua Lane, ok, Palama Theater. Right? And then there's Robello Lane. And Kai'ulani School was about there. Kai'ulani School is just before the incinerator because it's what is by Austin Lane.

CSH: That's kind of like by Kaumakapili, right?

MI: Yeah, right. You see this banyan? Between here and here—you see the church? There's a church there? That's Kaumakapili Church.

CSH: Uh huh.

MI: And on this corner is Tamashiro Market. Ok, there's a park right in the—at the end of the lane because it was not too far from Palama Settlement. Which reminds me, you know Vineyard Boulevard?

CSH: Uh huh.

MI: It was not four lanes. It was only two lanes on the downside. The upside was part of Palama Settlement and the houses. Because they took some of the property of the Chinese church and everything. You know if you go down past Pua Lane there's a Chinese church right before you get to Liliha, eh? So that mauka side lane on Vineyard didn't exist. It was only a two lane road.

CSH: Ok. So going back to cultural stuff....you said this whole area was lo'i. Was there anywhere else that was lo'i in this area? Or even above.

MI: No, my recollection is only this area was.

CSH: And they were all Hawaiian families that took care of that area?

MI: Yeah, probably.

CSH: Do you remember any heiau or anything?

MI: No, that's one thing...ok up here is a cemetery. You know going up Kamehameha?

CSH: Oh yeah, by the bus terminal.

MI: There's a big cemetery there. Three. Three different cemeteries in the same area. Yeah, right over here.

CSH: And what about the cemetery?

MI: No, it's just that it was an open area now they get fence up. But before it was just overgrown.

CSH: Uh huh.

MI: They had to watch for...because opposite, right opposite that on Houghtailing—this side. Is a bus terminal, right? Because Tatsuku lives over here. On Kalihi Street going up was just bushes. Never had any development there.

CSH: So you would...so going back to when you catch stuff in the streams...you said you catch crayfish? Was there any other fish?

MI: 'Ōpae. 'Ōpae.

CSH: How would you make that? Would you use it part of your Japanese cooking too?

MI: 'Ōpae, your Uncle Jay them would catch them out by Waikāne and eat them just like that.

CSH: Yeah, but how would you eat it?

MI: Oh, just boil it.

MI2: They not like the Hawaiians.

CSH: What kind of fish? That would be it? Just crayfish and 'ōpae? Never had like...

MI: Well, inside there. Inside here had mullet.

CSH: So that's the canal....

MI: No tilapias. The canal was clean. It has Samoan crab.

CSH: Ok.

MI: We used to catch crab inside there.

CSH: Samoan crab, mullet. Tilapia?

MI: No tilapia.

MI2: Oh, tilapia did not exist.

MI: Did not exist at that time [laughing].

MI2: About the 60s it came.

CSH: So what kind of fish? That was it?

MI: Basically it.

CSH: And it was clean the water?

MI: Clean. Yeah, cause it was just drainage canal that would take the rainwater and stuff like that.

CSH: Would you swim in it?

MI: Yeah, we used to ride in it and made tin boats. Do you know what tin boats are?

CSH: I have an idea.

MI: Totong. You know what totong is?

CSH: Uhhh no.

MI: Corrugated roofing?

CSH: Oh yeah. Corrugated roofing!

MI: We'd bend it and we'd nail it on both ends and it becomes a boat. We put outriggers on it.

CSH: Oh fancy.

MI: Cover it up with tar from the road. We chew the tar after we dig um out from the road. Heat it up. I used to literally chew it.

CSH: Like gum?

MI: Yeah, like gum. That was our past time.

CSH: How deep was the canal?

MI: Oh, the canal was kind of deep. Maybe about seven, eight feet.

CSH: But there would be no sharks that swam up?

MI: None. None. See actually it's a fresh water stream to begin with so you cannot have anything like that. Only swim in salt water. Fishes cannot survive in that kind of water. Anyway, the area of that temple—that was our grounds, ok? We used to call it Kompira. For many years while we were growing up we called it Kompira. K-O-M-P-I-R-A. And that is the wrong name. It's Koto Hira. K-O-T-O-H-I-R-A.

CSH: We have it over here. Jinsha. Kotohira Jinsha.

MI: Yeah, but we used to call it Kompira cause that's what we thought we heard. That was one.

CSH: And you'd hang out there?

MI: Oh yeah, because you know why? They had sumo there. They had a martial arts training hall and they had kendo. Kendo and all that other kind stuff. And then they showed Japanese movies in the temple. And then during the war, in that hall, what Grandma them used to do—the old Japanese ladies was make slippers for Tripler Hospital. I mean, literally—slippers—you know how they cut it to pattern and sew it and everything? That's what their volunteer was. Yeah, behind that da kine—where Vineyard is—you see that open area? That was quite a big area you know? It was just open field. Could play softball and what have you. But they had sumo too. They put up a sumo ring. So if you go to that temple at the end of that road before you enter that property—there is literally a gate way. I mean if it's still is there but there used to be a gate way that they decorate because they had bon dances this time of the year. Today what they do is at the new year they bless the animals.

CSH: I didn't know they did that.

MI2: Yeah!

MI: Oh yeah it's a big deal!

MI2: I've seen it. I mean, it's in the newspapers.

MI: In the old days they didn't have that but in the new days they do.

MI2: Now a days they have that.

MI: They went so far as to really.... Promote and sell some of these things. Guys was stealing that. You supposed to make a donation.

MI2: Supposed to make a donation.

CSH: Did you ever go past Nimitz? Where the harbor is?

MI: No, that's why I said...we never went below that. Because you were already at the harbor. We used to swim in that harbor. I used to swim down there when we were on Kukui. We used to go all the way down to Pier 19. That's where we saw the...mom knows the....the so-called tsunami coming up.

CSH: Oh.

MI2: By River Street.

MI: Down by River Street.

CSH: What year was this? 1946?

MI: 1946, I was going to school. Ok, we live right next to the canal so I was going to school about 7:30 in the morning. Everybody was yelling, "TIGER WAVE! TIGER WAVE!" I was like, "What kind of wave? Tiger wave?!"

MI2: They were yelling tidal wave.

MI: They said tidal wave but I thought they said "Tiger Wave" because we never used the term tsunami until 1946. No, 19—the one that hit Hilo.

CSH: Was that '48? Or 52?

MI: 60-something ah?

MI2: They still called it a tidal wave.

MI: Anyway, that's what we saw. The thing would recede and all of the mullet—cause all the mullet inside that river—and papio—'cause it was a mixture of salt water and fresh water coming from Waiakalulu Falls.

CSH: That was at River Street? Brackish.

MI: Yeah, it was brackish. Because used to wash cars further up on School Street you know? You drive down this parkway and mom's classmate was there too. The Kawahara Nursery. You go down, park it down in the, in the stream and they wash their car. Had 'o'opu.

MI2: I didn't know they wash cars. In our neighborhood nobody wash cars like that.

MI: You know 'o'opu?

CSH: Yeah.

MI: That was loaded with 'o'opu, 'ōpae, crab.

CSH: At the River Street?

MI: At Nu'uaniu Stream, what they call Nu'uaniu Stream.

CSH: Nu'uaniu Stream?

MI2: Yeah, way up School Street.

MI: It runs from Kuakini actually. Cause there's a waterfall up there. You go up inside there there's a waterfall park.

MI2: It's not that big is it the waterfall?

MI: It's a big waterfall!

MI2: Oh yeah?

MI: Yeah because you gotta take all the water from Nu'uaniu.

CSH: Are you talking about...what's that one?

MI: Waikalulu Falls, Waikalulu Falls, I think.

CSH: Oh, is that what it's called? Not the kine ah...Kapena Falls? Not that one.

MI/MI2: Oh no. Nu'uaniu area.

MI: This one would come from...Nu'uaniu and...Sacred Hearts Convent.

MI2: What's the place they call Lili'uokalani or something?

MI: You know the rehab center? You know where the rehab center is?

CSH: You talking about Lana...no.

MI2: Talking about Kuakini Street just before...

CSH: Lanakila? Here, hold this for Papa. Anyways, 'o'opu and what else had?

MI: 'O'opu, 'ōpae....

CSH: What kind of fish? No more fish. Besides the 'o'opu?

MI2: I don't even know....I heard of 'o'opu fish but I never seen those things.

CSH: [laughing] So, so what happened? You saw the water recede and you saw all the fish in the wa—in the bottom of the river.

MI: Yeah and the guys go all run down and pick um up.

CSH: Chinese guys?

MI: No, all local guys. Young guys.

CSH: And then how long did it take until the water came back up?

MI: [laughing] Because you can see it coming---come down the ocean. You know on Beretania Street?

CSH: Yeah.

MI: Where Beretania Street and Aala Park is? Right over used to have an arch...over the bridge, over the bridge—one concrete arch. The water was that high.

CSH: [gasps]

MI: That's when they know they had to get out of there quick [laughing].

MI2: You know the bridge has that wall-like, yeah?

CSH: Yeah.

MI2: The arch went over that way—like that. Yeah, like that.

CSH: So it wasn't coming fast? It was coming kinda of slow...

MI: Oh it comes! Because it's a surge, ah?

CSH: Yeah, yeah. So what? Chinatown was all inundated?

MI: No. It never went over the wall. It never went over the wall.

MI2: Over the sides, you mean.

MI: There's a wall you know. If you look at that river today there's a wall on both sides.

MI2: It never came that high.

MI: No more the name of the the spring.

MI2: What spring?

MI: The one in [inaudible].

CSH: I can go look it up at work.

MI2: What spring are you talking about?

MI: The one by the Sacred Hearts Convent.

MI2: Oh, there's a river there.

MI: Yeah, you know Sacred Hearts Convent?

MI2: Yeah, there's a river there. Right along the side of that street.

MI: Yeah, because that river runs, runs right into that stream.

MI2: What I find interesting there is the Kunawai Springs.

CSH: Oh, I've been there.

MI2: Oh yeah?

CSH: That's really interesting.

MI2: Uncle Herbert's them side—their grandpa—they lived on Kunawai Lane. That is Fatty and he had a lo'i.

CSH: Well...

MI2: They had spring waters, yeah?

CSH: Actually...

MI2: So I heard about it. Fatty had their lo'i.

CSH: Yeah, so Kunawai is....[looking at map]....

MI2: I saw Pu'u Nui is up here.

MI: Liliha Street. It's off of Liliha Street.

CSH: So this is where the spring is, yeah? And then what's really interesting is that there's three or four springs over here. Jan took me over here.

MI: Oh?!

MI2: Oh yeah? Ok.

CSH: And right down, you know where Mistuken is?

MI/MI2: Yeah.

MI2: Because...

MI: That's School Street.

CSH: There's a park. There's a park. By Mitsuken. And there's still lo'i there and they have a banana patch.

MI2: Oh yeah? Ok, because this is Kunawai. Kunawai Lane. And this is Kuakini Street. When I was very young, I lived in this area. I was only about two and I left there when I was four, but I do remember a stream way on one side. You know? But um, so, but I never knew where the stream went. Cause when we went outside to School Street—there was a road and the bus turn around across.

CSH: Yeah.

MI: Where the Liliha Theater used to be.

CSH: Cause what was happening, Jan was telling me that when we went to Kunawai. There's a pool there and there's ducks.

MI2: Oh so interesting!

CSH: And then on the right side of the pond, it drains down and there's an apartment building there.

MI: Yeah.

CSH: Then it goes to the back of these homes and what was happening was...

MI: You know who lives there, ah? Bob Kuwahara....

MI2: Bob Kuwahara's parents used to have a property back there—they sold it though.

CSH: What was happening was all those people who lived—what is that—Kunawai was draining out, the people were siphoning the water and using it for their gardens.

MI2: Fresh water.

CSH: It's fresh water...not like...

MI: You know what the misnomer is? It didn't start at Kunawai Lane. If you look at Kunawai Lane and go straight up Liliha to Saint Francis Hospital.

MI2: Is there a hospital you have marked?

MI: Further up. I mean, further up. That's where the springs were. Cause you know why? Aunty Florence's mother them used to live outside Saint Francis. They had a lo'i there.

CSH: What year was this?

MI2: They had a lo'i?

CSH: Who is this person? Aunty Florence?

MI2: Aunty Florence.

CSH: Aunty Flo? Shimokawa?

MI/MI2: Kochiyama.

MI2: Uncle Bob's...she married ah....

CSH: Oh, what year was this?

MI: Sheesh. I was a little boy maybe.

MI2: In the 40s?

MI: Yeah. Must've been in the 40s.

MI2: Late 40s.

MI: I was there in about '47, '48. Because it was before I went to Farrington.

CSH: So she lived in....

MI: Liliha. Almost Pu'u Nui. When you go that far up, it's almost Pu'u Nui.

CSH: And she had a lo'i?

MI: Yeah, because...

CSH: And would she use it though?

MI: Yeah, they were like farmers. Because where they used to live...you won't believe where they used to live before that. They used to live at the quarry. You know University of Hawai'i quarry?

MI2: In Moilili?

MI: Yeah, above looking down into the quarry.

MI2: When you take the old road...

CSH: I don't even know where the quarry is.

MI2: Oh, ok.

MI: Stan Sheriff? Stan Sheriff Center?

MI2: That used to be a quarry before.

CSH: Quarry, like Kapa'a Quarry—that kine?

MI: Yeah.

CSH: Like cement?

MI: Yeah, because they used to crush rocks inside there.

MI2: I always thought for some reason it was a vineyard.

MI: You know why?

MI2: They had these great round tanks there.

MI: They were gas tanks. Gas tanks.

MI2: Gas tanks.

MI: On the Diamond Head side of the quarry there was the Japanese tea house.

MI2: Oh, my friend's tea house.

MI: Up on that plateau, on that side, the Shimokawa's had their rose garden. They literally sold roses in Mō'ili'ili.

CSH: So did they live—their compound—the Shimokawa compound—was it by the haunted condo?

MI: What condo?

MI2: Oh, oh, oh! On King Street.

MI: No, it was across the street.

MI2: That's the old Hawaiian church and graveyard.

MI: That was a graveyard.

MI2: That's what happens when they dig up the iwi.

MI: You know who still have it and still there? Right next to it is the Furuya Lumber Company. Clarence Furuya.

MI2: By the river.

MI: Next to the river. See the river was right behind the Shimokawa property. You know, we used to go down into that river to catch 'ōpae. But yeah, they had a big piece of property because Uncle Jimmy, Dado's father—Takeshi, the family, the family's big house had all the daughters living in the back. One of the bungalows on the side, we used to stay there.

MI2: I don't know what it looked like way back then.

MI: They had bungalows adjacent to Uncle Jimmy's house.

MI2: All I know is the bus used to pass.

MI: On old Waialae Road.

MI2: Once I went there with Verna. I told you Verna and her boyfriend were going to take me home. But Verna wanted to stop at the house. But by then we had the freeway so there wasn't much property.

MI: Ok, you know Mom talking about the freeway and then the spring water?

CSH: Where? Over here?

MI: Yeah, in Liliha.

CSH: Yeah.

MI: If you go there today...

CSH: At Kunawai? Or Pu'u Nui?

MI/MI2: No, on School Street.

MI2: You looking at school Street.

MI: No, at School Street. You go over there and you see how deep they had to dig to get the freeway down below.

CSH: I know.

MI: Because where you standing is where the land used to go parallel across the street.

CSH: Yeah.

MI: Because across the street was Liliha Theater.

MI2: No, directly across from where we lived, yeah? Because we lived on School street side, there was the bus turnaround but the theater was on Liliha Street.

MI: Liliha Street.

CSH: I didn't know you lived there too!

MI2: Only when I was two but I moved out when I was four.

MI: But that shows you the topography that freeway.

MI2: But I have a memory of that area.

MI: The question is where did all that dirt go?

MI2: I don't know.

MI: Because you know remember where I told you where School street and Kukui Gardens is? They dug that land too.

CSH: I know, that's why I asked if anyone lived there.

MI2: Kukui Street.

CSH: 'Cause it's supposed to go straight and now there's this huge chunk missing—so did people live over there?

MI2: You have to remember...a lot of people must've lived in that area?

MI: Not really cause right where they dug—between that and Kukui—yeah, there was some houses on, on the makai side. But right across School Street from School Street to the width of the freeway down below was a park.

CSH: Ok.

MI: There was a park. Literally a park. Big park.

CSH: Seems there was plenty parks in that area.

MI: But you know what? They took a part...you keep going Nu'uaniu...

CSH: Uh huh.

MI: They took a part of Foster Gardens.

CSH: Oh really?

MI: Yeah.

CSH: So it used to be larger then?

MI2: Foster Garden is not what it was before. The entrance has changed.

MI2: [laughing]

MI: Entrance used to be on Nu'uaniu Avenue.

MI: That's where the entrance was—Nu'uaniu Avenue. And next to that entrance was one church! [laughing]

CSH: Here it is right here. Looks like there's a church there and a church there. So Nu'uaniu would be more down?

MI: Where's School Street?

CSH: School Street is right here.

MI: Yeah, see that's why they took that corner. See, this map....this map with all the buildings is from the United States Geographic Survey, yeah?

CSH: Yeah, this is USGS. But this is a 1998 map. If you want, I can get one from 1939? And where it doesn't have the freeway and stuff so....

MI: Yeah!

CSH: So let me get another map then!

MI: That's why, yeah.

CSH: Would you like it earlier than that? 1918? Or you think 1925?

MI: No, no, no.

CSH: Or is 1939 better?

MI: This map really shows you what it is because this is Vineyard right here. Right? But you see, you get down here just before that bridge? They made that curve. Oh no, this is Vineyard. This is Vineyard! So you see the line, the dotted red line. That's Halona. That's where Vineyard used to

be. So then they made this curve to come this way and on this side they call it Olomea. But never used to have an Olomea Street! Like I told you was all open grounds. Open fields. No such animal as Olomea.

MI2: All I remember is cause we lived on School Street—right off School Street, you know? So Saint Theresa's was down the street from us.

CSH: Uh hm. Hmm. Let's see. What else? I think that's kind of it!

MI: Culturally, like I said, the general history and past and present land use—land use hasn't been that much in Kalihi-Pālama. Never made any rezoning other than down by the waterfront, you know?

CSH: Right.

MI: Because there was no Nimitz Highway. Admiral Nimitz came during the war years.

CSH: Yeah.

MI: Knowledge of cultural sites?

CSH: Yeah, well we talked about lo'i but you said you don't remember heiau.

MI: I don't think there's any heiau there.

MI2: Who's that? Uncle Kekoa used to live Makaanani Drive. Makaanani Drive used to go right into the back gate of Kamehameha, right?

CSH: Yeah. [Pause]. And what?

MI2: No, they lived there for a while.

CSH: [laughing] I thought you were going to tell me something show stopping here!

MI2: But I think our insurance man used to live on Makaanani before, yeah? We had an insurance man and he lived on Makaanani.

CSH: Trying to think of anything else that maybe....we talked about your family home. OH! I don't have your birthdate. I know it's July 24th—

MI: 1933.

CSH: 1933. Thought it was that!

MI: Ok, there's some interesting facts that you should know.

CSH: Ok.

MI: Ok, you see right at this corner of Waiakamilo and King Street...

CSH: Uh hm.

MI: Right on the corner there is the pumping station.

CSH: Yeah, the Board of Water Supply.

MI: Yeah, that's been like forever...in the back of that, however, used to be the royal Hawaiian band practice. That's where they used to practice their music. Royal Hawaiian Band.

MI2: In back of the Board of Water Supply pumping station.

MI: Yeah.

MI2: That area has changed a lot because it's a wide boulevard there now.

MI: Ok. The other thing is...at the same spot.

CSH: Uh hm.

MI: There's a street. It's an itty bitty little street. Kamakani Street, I think. Try look at it next to Waiakamailo and King Street. That goes to Au's Garden.

CSH: I don't think it's labeled.

MI: Ok, it's inside here. Anyway, that street is still there. But the point that I'm trying to make is on that corner, on that corner if you look at it closely you will see, you will see an old building right on the corner.

CSH: Ok.

MI: That building still exists there. It's a two story building. In the back of that, on that corner is another old building that was also there from day one. From the time that I remember.

MI2: Ok, I found King and Waiakamilo but King according to this map is running back of Farrington High School. It runs in the front of Farrington High School.

CSH: That's North King.

MI: It doesn't matter it cannot run behind Farrington High School.

MI2: Yeah, North King runs actually in front of Farrington High School. They have it in the back here. So it would run actually, it would run here.

MI: Oh no, no, no, no.

MI2: This is Waiakamilo. This is Farrington.

CSH: No, no, no. No, that's just the label.

MI: Often times you get the [inaudible].

CSH: You have to look at the buildings.

MI2: Ok, this is where the chop suey house is.

CSH: So what's the significance of those buildings?

MI: It was before my time.

MI2: Oh yeah, across the pumping station...there is a tiny little side street, yeah? And on the—across the tiny street from the pumping station are these two very old buildings.

MI: Wooden buildings. Wooden buildings. One is if I can recall correctly...

MI2: I don't know if people live in there...

MI: Well they did, because if I can recall correctly the bottom portion is a furniture store and the upper portion the family lived in it.

MI2: Really? Those were there when you lived there.

MI: Because I told you the next building, the next building before Diners...Diners Drive Inn...that building had a row of...well, not row, but a slight row and then the driveway went down. Then there was another...another bunch of buildings. The first building was Coin Mattress.

MI2: Oh.

MI: The guys who make mattresses?

MI2: Yeah.

MI: They still in business today. They still make mattresses. Chinese family. Anyway, you go down that alley way, you go down on that corner. King Street went like that but you kept going—but the funny part is that building that we lived in was off. You know when the bus used to come, he never stopped on the street you know? He would stop on this—like a parking area. Because the thing...because at the end of this building, it kind of jogged in. The sidewalk kind of jogged in and the sidewalk was right in the front of the stores all the way down into that alleyway. I told you that alleyway we used to play with the tires, ah?

MI2: I knew you guys played with tires but I didn't know you...

MI: But I didn't tell you HOW we played with it?

MI2: You went inside the tire, right?

MI: But you know what, the guys on the bottom of the hill would try to knock us off.

CSH: That's safe.

MI/CSH: [laughing]

MI2: Well, bottom line is I lived in Kaimuki. I never saw boys doing that.

MI: Cause there was a slight hill.

CSH: That's kind of fun. But dangerous. I'm kind of curious—how was it during the war. After the war? Did you guys have to do the black out?

MI2: Yes.

MI: Oh yeah, yeah. Ok, now during the war. You see Kama Lane? You see that lane right there? Right on the corner there, there's a delicatessen that's where we used to eat lunch during my high school year. But before my high school year, they always was there. One old family. And it was a furniture store then it was another store then there was a big market. Where the corner was, there was a two story building.

CSH: Meems, can you check Kasen?

MI2: Yeah, he's very quiet.

MI: It was a two story building. Upstairs was a house of prostitution. Why?! Because Farrington High School was a hospital.

CSH: That's right. Yeah.

MI: And this part was a military supply area. See this area?

CSH: Yeah.

MI: It used to be barracks. But they used to store da kine—a lot of materials there.

CSH: Was it scary living at that time because you were Japanese? And....

MI: No. Because I told you grandma them and all the Japanese ladies used to work to....

CSH: So they knew you were not an enemy.

MI:do things for da kine. Because no one that I knew in that area was put in a....

CSH: A camp.

MI: Relocation camp. You know at Honouliuli?

CSH: Did you have to do the rations thing too? I know grandma talks about going to catch the bus.

MI: Oh yeah, that lasted a long time. Even when we went to Kukui Street. Even when you buy liquor you gotta have a ration card or they limit you to so much. Ok, when I moved to Kukui Street in 1946—'45, '46—Mamie Stover was in operation.

CSH: What is that?

MI: [laughing]. Ok, you know where 'A'ala Park is?

CSH: Yes.

MI: Right across the street was all the food distribution—oh not food distribution. Used to the vegetable distributors and stuff like that. My friend's mother had a barber shop on the corner of the Yamashiro Produce was. Yamashiro Produce. Upstairs was a house of prostitution. The biggest name was Mamie Stover.

CSH: So you have a house of prosecution down the street? And the house of prostitution there? Or you're talking about....

MI: No, this is in Kalihi. The other was in 'A'ala Park.

CSH: So there's two houses of prostitution?

MI: Oh yeah! More than that probably! That was the only two that I knew of. You know? It was legal. It was legal.

CSH: Oh this all for the Army. The military....

MI: Yeah, so the guys went upstairs. So every time I went to visit my friend's mother—the mother run the barber shop, I go play with my friend downstairs. There's a line, literally a line going down the block.

CSH: Was it all military guys?

MI: All military guys.

CSH: Mimi Stover....

MI: M-A-M-I-E.

CSH: MAMI.

MI: I call it Mamie. Mamie Stover.

CSH: She was....

MI: She was the biggest thing in Hawai'i.

CSH: Was she like—the person or was she the madam?

MI: She was the person. She take 'um all.

CSH: Geez.

MI: She take um all!

CSH: Ok.

MI: There's always a joke I tell everybody: She had a room in the center, ok?

CSH: Uh hm.

MI: There was one room door that open, there was one room that goes out. The joke was—how do you—do you know what nationality the three guys are?

CSH: What?

MI: Him-a-layin. The guy that was inside. Him-a-coming. And the other was Him-finnish. [laughing]

CSH: Horrible.

MI: Perfect, right? Him-a-layin. Him-a-coming. Him-a-finnish.

CSH: Oh God. Ok.

MI: But yes, she was the biggest. The police would just let it go.

CSH: Well, they probably had other things.

MI: They probably had cumshaw on it. You know what cumshaw is?

CSH: No. They were probably the very ones?

MI: Cumshaw is payoff for looking the other way. And that's what the guys at the hotels did. You know when the tourists come out? The guy would blow his whistle and he signal the taxi guy to come out. And that's a cumshaw. Because the guy who comes up, gotta pay off the guy that's getting the business.

CSH: Interesting. I don't know all these terms.

MI: Cumshaw. [laughing]. Anyway, that's basically the—da kine. Basically I did this to show what it looks like without the freeway.

CSH: Ok. You know what I didn't get? I didn't get your occupation and all that. So what happened after you moved out of this area?

MI: I went to school at Kaluwela School. My sixth, seventh—my fifth, sixth grade I went to Kaluwela School. Seventh, eighth, ninth grade I went to Central Intermediate School. Tenth, eleventh grade I went to Farrington High School. Why? Because I went into the service the end of my junior year. 1950. 1951.

CSH: Ok.

MI: I'm sorry, 1950. Because in 1950 when I joined the Marine Corps reserve I was only 16 years old and I lied, I told them I Was 17. So when I went to—the war broke out in June of 1950. So when I went to Camp Pendleton in June, one week later the Korean War broke out. The guys says, he gets up and said, “Ok, you guys are now in the Marine Corps. You will go back to Hawai'i and you will be reactivated and be back here in one month.” And sure to their word, flew back to California in 1950.

CSH: Ok. And then you served in the Korean War?

MI: From 1950 to 1952—September. I went to Korea in 19—51, September.

CSH: So you were there for a year?

MI: Yeah and that's why the military says if you're in the front line for one year, you must get out and go home. So they had to fly me home. Within that time otherwise they would be violating ah?

CSH: Ok.

MI: So I came home. But in the meantime, in 195—early 1951—I took the GED test. Which is a high school test.

CSH: Right.

MI: And I passed and they sent the results to Farrington High School says, “Oh, you passed. We'll give you your diploma in 1951!” So I have my diploma from Farrington High School in 1951 by passing the one year test on my GED, which is a one day test.

CSH: And then...

MI: And it was so good—this is the proudest time of my life—I applied to San Jose State and they accepted me without any probation—just on my high school diploma. Which means I must've had better than a B+ average.

CSH: So you went to San Jose State?

MI: Yeah. For four years.

CSH: On the GI Bill?

MI: Four years, on the GI Bill. And the reason is, on the GI Bill you get every month, you know, every month and a half for every month of service. So I was in for 28 months. So that meant I would have 36—a little better than 36—38 months of school. I graduated in 36 months. Right? Nine months out of the year?

CSH: Uh hm.

MI: So I went four years, I had two more years. I was gonna go to Stanford. When I applied Stanford said, “You have to have a B average. I had a C+ average.” [laughing] So I said, THE HECK WITH IT! I DON'T NEED MY MASTERS! I wanted to go to Stanford for my Masters at least. At least for the two years.

CSH: Uh hm. And then you came home?

MI: Yep and I went to work for Castle and Cooke.

CSH: What did you do there?

MI: I was a freight cashier. And a rate analyst. Then the State says, "Come work for us under contract." And I had a contract with the Attorney General's office. The reason is because they wanted to send me to Washington to figure out what Aloha Airlines was doing with their service. And at the same time, keep an eye on Matson.

CSH: On who?

MI: MATSON. Because they were raising their rates. But they just wanted to know how they go about doing these things.

CSH: So you're kind of like—investigating?

MI: Yeah. Well not really investigating but getting an update on them. You know? What they have to know. So in a way was good 'cause the guy I was working with—he eventually became a circuit court judge.

CSH: Who was it?

MI: Arthur Fong.

CSH: Ok, then what happened after the AG's office?

MI: Then Matson called me back.

CSH: And you worked there?

MI: Ohhhh—only little while. Then I went to the PUC.

CSH: What did you do at Matson?

MI: I was the rates and records handler.

CSH: Rates and rackets?

MI: Records.

CSH: And then you worked at the Public Utilities Commission?

MI: Yeah.

CSH: In what year?

MI: 1964.

CSH: To what?

MI: Only one year, I guess. Then I went back to Matson [laughing].

CSH: Oh.

MI: Then the State wanted me back [laughing]. But by that time, I decided to take the job as an Executive Director. Until 1988. But I had like almost 25 years of service because by the time I went to the State in 1962—all of that time counted.

CSH: Oh yeah. So what did you do at the PUC as the Executive Director?

MI: I was in charge of the division. Regulating the electric, gas, telephone, motor carriers, and the sewer companies [laughing].

CSH: Ok.

MI: Transportation too.

CSH: And then you got married to grandma.

MI: Oh yeah, I got married to grandma in 1957.

CSH: 1957. And then you guys had five kids?

MI: Yeah.

CSH: Debra, Lance, Vance, Jay, Chris. Ok!

MI: So I don't know if that's enough information on that Kapālama area?

CSH: Well, I'm going to transcribe all of this and then I'm going to have you look at the transcription, read it, if you don't like it, you can make changes. And then from when you...OK it...then....

MI: The main thing is that there's a change in the area.

CSH: I'll make a summary.

MI: Actually for the purpose of your bridge work, it's significant.

CSH: Yeah, that is!

MI: Because they realigned Vineyard Boulevard.

CSH: Uh hm.

MI: To put that freeway in. And that...see the question is....that canal is very small but yet did they do a good a job on structure support and design?

CSH: Is it because you have a personal investment in it because your dad you're asking about that?

MI: Yeah! Because that bridge was always there!

CSH: I can see about Nu'uaniu Stream and bridge.

MI: By the way, T.H. Richards built that.

CSH: We have a catalog on it.

MI: 1930s. 1920s maybe.

CSH: We have a catalog of when the bridges were built and what kind of structure it is. And I think the State—they're trying to figure out—obviously, what needs to get repaired. This one was built in 1938 and it's structurally deficient. That's why they're gonna...

MI: 1938?

CSH: Uh hmm that's when this bridge was built. Halona.

MI: NO, I don't think so.

CSH: That's what it says. We have a catalog, I'll go look at it at work.

MI: Hmmm [thinking]. I can't, I can't visualize that bridge being built over the canal at that time. Other than having Vineyard Boulevard go over it. Not the freeway! The freeway wasn't built till later!

CSH: Maybe they started construction at that time?

MI: 1938?

CSH: I don't know. It says here it was built in 1938, but....

MI2: What was built?

CSH: That bridge.

MI: It could've been built in 1938. Just like that Theodore H Richards was built in 1920-something but it doesn't mean it's structurally sound for freeway use.

CSH: I know! That's why they're re-evaluation all these bridges because even—what is the one in Wahiawa—Karsten Thot?

MI2: Oh that one! Wahiawa....

CSH: Yeah.

MI: It's only a two lane bridge!

CSH: Yeah, but if it's built in whatever year and you never make repairs and you get one big rig go over it and it's in bad shape it's gonna go—BLOOP!

MI: Theodore H. Richards Bridge was only a two lane bridge, you know? Vineyard at that time in 1945—was only two lane. Now to put that into a four lane bridge for the H-1....you talking a big improvement.

CSH: Ok. So you have any other concerns about the bridge? I'll check on the Nu'uaniu one for you.

MI: Yeah because the way it, the da kine is—the explanation that they have—inside there is that they gonna strengthen it from what it was when they first put it up. They put it up in 1938—it was only to take care of a two lane highway.

MI2: What areas did you want to know about?

CSH: Oh, are you pau then?

MI: Yeah.

CSH: I'm gonna stop this...um....

[END INTERVIEW 1:40:13.4]