DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

Project No. H1HI-01-09

December 2021

Submitted Pursuant to
Hawaii Revised Statutes, Chapter 343

State of Hawaii, Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, HI 96813

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B Natural Resources Assessment of Kalihi Stream for a Project to Widen Interstate H-1, Honolulu, Oahu (AECOS, May 8, 2020)
C Acoustic Study for the Interstate Route H-1 (EB) Improvements, Ola Lane Overpass to Likelike Highway Off-ramp; Oahu, Hawaii (Y. Ebisu & Associates, November 2020)
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Acronyms and Abbreviations

°F	degree(s) Fahrenheit
μg/m^3	microgram(s) per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
ACM	asbestos-containing material
ACS	American Community Survey
AECOS	AECOS Inc.
ahupuaa	traditional land division
AM	morning [peak hour]
APE	Area of Potential Effects
BMP	best management practice
BWS	Board of Water Supply
CAA	Clean Air Act
CCH	City and County of Honolulu
CCTV	closed-circuit television
CE	Categorical Exclusion
CEQ	Council of Environmental Quality
CER	computerized environmental report
CFR	*Code of Federal Regulations*
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
COVID-19	2019 novel coronavirus
CRM	concrete-rubble masonry
CSH	Cultural Surveys Hawaii, Inc.
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dBA	A-weighted decibel(s)
DLNR	State of Hawaii Department of Land and Natural Resources
DPP	City and County of Honolulu Department of Planning and Permitting
DTS	City and County of Honolulu Department of Transportation Services
EA	Environmental Assessment
EaC	Ewa Silty Clay Loam
EB	eastbound

EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	environmental justice
EJSCREEN	USEPA Environmental Justice Screening and Mapping Tool
EO	Executive Order
ESA	Endangered Species Act
FAST	Fixing America's Surface Transportation Act
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FRP	fiber-reinforced polymer
FWCA	Fish and Wildlife Coordination Act
FWPCA	Federal Water Pollution Control Act
GHG	greenhouse gas
Green Book	*A Policy on Geometric Design for Highways and Streets*
H1	Interstate H-1
H_2S	hydrogen sulfide
HAR	Hawaii Administrative Rules
HCS	Highway Capacity Software
HDOH	State of Hawaii Department of Health
HDOT	State of Hawaii Department of Transportation
HECO	Hawaiian Electric Company
HFC	hydrofluorocarbon
HRS	Hawaii Revised Statutes
HRTP	Honolulu Rail Transit Project
HxA	Honouliuli Clay
ISATe	Enhanced Interchange Safety Analysis Tool
ITS	Intelligent Transportation System
KaB	Kaena Clay
LBP	lead-based paint
LCA	Land Commission Awards
Leq	equivalent continuous sound level
LOS	level of service
makai	oceanward
MAP-21	Moving Ahead for Progress in the 21st Century Act

mauka	mountainward
MBTA	Migratory Bird Treaty Act
MIA	Makiki Stony Clay Loam
MOVES	Motor Vehicle Emissions Simulator
mph	miles per hour
MSAT	mobile source air toxics
N/A	not applicable
N_2O	nitrous oxide
NEPA	National Environmental Policy Act
NFA	No Further Action
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
OahuMPO	Oahu Metropolitan Planning Organization
OEQC	State of Hawaii Office of Environmental Quality Control
OHWM	ordinary high water mark
ORTP	Oahu Regional Transportation Plan
P.L.	Public Law
PFC	perfluorocarbon
PM	afternoon [peak hour]
PM_{10}	particulate matter <10 microns
$PM_{2.5}$	particulate matter <2.5 microns
ppm	parts per million
RLS	reconnaissance level survey
SF_6	sulfur hexafluoride
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
SLR	sea level rise
SLR Report	*Hawai'i Sea Level Rise Vulnerability and Adaptation Report*
SMA	Special Management Area
SO_2	sulfur dioxide
SOEST	School of Ocean and Earth Science and Technology
STIP	Statewide Transportation Improvement Program
TIP	transportation improvement program
TMDL	Total Maximum Daily Load

TMK	Tax Map Key
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VHT	vehicle hours traveled
VMT	vehicle miles traveled
VPI	vertical point of intersection
WQC	water quality certification

Project Summary

Table PS-1 contains a description of the project and applicable land use designations.

Table PS-1. Project Summary

Project Name	Interstate H1 Eastbound Improvements, Ola Lane to Likelike Highway Off-ramp, Island of Oahu
Proposing/ Determination Agency	State of Hawaii Department of Transportation
Anticipated Determination	Finding of No Significant Impact under Chapter 343, Hawaii Revised Statutes
Tax Map Key(s)	Interstate H1 Right-of-Way TMK: [1] 1-3
Existing Uses of the Project Corridor	Regional transportation corridor through the Honolulu primary urban center
State Land Use	Urban District
Special Management Area	No
Primary Urban Center Development Plan	Lower-Density Residential; Mid-Density Residential; Major Parks and Open Space
Zoning	R-3.5 Residential A-2 Apartments P-2 Parks
Proposed Project	Interstate H1 eastbound from the Ola Lane overpass to the Likelike Highway off-ramp would be widened to accommodate an auxiliary lane. The change is intended to improve safety, in part by eliminating the merge between traffic on H1 and H201, the Moanalua Freeway. To accommodate the widened freeway, modifications and improvements would be made to slopes, retaining walls, and fencing; signs and striping; and traffic monitoring equipment. The Gulick Avenue bridge would be lengthened and modifications made to the intersection of Gulick Avenue and Beckley Street and adjacent sidewalks and driveways. The Kalihi Stream bridge would be widened on the south (oceanward, or *makai*) side of the freeway. Detour routes would be provided for vehicular traffic, bicycles, and pedestrians, as needed, throughout the construction period. The project would also include adjustments to drainage lines and structures to accommodate altered stormwater flows, utility relocations, and temporary staging and laydown areas.
Anticipated Impacts	The proposed action was evaluated under 36 *Code of Federal Regulations* 800.5 and Hawaii Administrative Rule 13-13-275-7. Basalt rock walls lining Kalihi Stream downstream from the H1 freeway are eligible for listing on the National Register of Historic Places and the Hawaii Register of Historic Places. Removal, and reconstruction of existing bridge features could result in some minor, isolated damage to the lava rock walls on the *makai* side of the freeway. The alteration of less than 12 square feet of the western wall below the bridge deck to accommodate the new corbel for the bridge support column does not meet criteria for adverse effect. The balance of the west embankment wall and the masonry wall at the east embankment will be reconstructed with existing stone in accordance with the Secretary of the Interior's Standards for rehabilitation. Kalihi Union Church, a property eligible for listing, will be affected by the project; however, minor alteration of less than 40 feet at the edge of the parcel boundary does not meet the criteria for adverse effect. Temporary occupancy of a portion of Kalihi Waena Neighborhood Park would be needed for a temporary pedestrian bridge while construction is performed on the Gulick Avenue bridge and during the associated relocation of utility lines, and for temporary access to reconstruct the freeway

Table PS-1. Project Summary

	retaining wall. Access to park recreational facilities will not be affected and disturbed areas will be restored upon completion of the construction phase. Noise impacts associated with the proposed reconfiguration is not anticipated to exceed the State of Hawaii Department of Transportation's greater-than-15-dBA [A-weighted decibel] increase criteria for substantial change in traffic noise levels at any receptor location on the *makai* or mountainward (*mauka*) sides of the freeway. Overall, no significant long-term environmental or cultural impacts are anticipated from the construction and operation of the proposed project. Construction activities are anticipated to result in short-term noise, traffic, and air quality impacts, but the implementation of best management practices would minimize the potential effects.

Preface

The proposed project involves improvements of Interstate 1 (H1) eastbound between Ola Lane and the Likelike Highway off-ramp, together with improvements to the Gulick Avenue bridge and Kalihi Stream bridge in the Kalihi area of Oahu. As the proposed project would involve the use of state funds and state lands (comprising H1 rights-of-way, under the jurisdiction of the State of Hawaii Department of Transportation), compliance with Hawaii Revised Statutes (HRS) Chapter 343 is required. This Draft Environmental Assessment (EA) has been prepared pursuant to HRS Chapter 343 (as amended) and Hawaii Administrative Rules Title 11, Chapter 200.

The project is also anticipated to use federal funding provided by the U.S. Department of Transportation Federal Highway Administration (FHWA). Use of federal funds subjects the project to environmental documentation requirements set forth under the National Environmental Policy Act (NEPA) of 1969, (42 United States Code Section 4321), the Council of Environmental Quality Regulations, 40 *Code of Federal Regulations* (CFR) Parts 1500-1508, and 23 CFR Parts 625, 640, 712, 771, and 790, Environmental Impact and Related Procedures. If federal funds are used, NEPA environmental documentation consistent with the findings of this EA will be prepared.

1 Introduction

1.1 Proposing Agency and Action

The State of Hawaii Department of Transportation (HDOT) Highways Division proposes to improve approximately 0.7 mile of eastbound Interstate Highway 1 (H1, also known as H-1 or the Lunalilo Freeway) in Honolulu, Oahu, Hawaii under the Interstate Route H1 (EB) Improvements, Ola Lane Overpass to Likelike Highway Off-ramp Project. The project limits extend from just east of the Ola Lane overpass over H1 (approximately Milepost 18.9) to the off-ramp to Likelike Highway, Exit 20A (approximately Milepost 19.6) (see Figure 1-1). The project would eliminate the need for vehicles in the left lane exiting the Middle Street tunnel to merge with traffic from Moanalua Freeway (H201, also known as H-201), increase travel lane and outside shoulder widths, and increase the height of the Gulick Avenue overpass.

Figures 1-2 and 1-3 show the tax map key parcels in and around the proposed project area. Figures 1-4a through 1-4d show photographs in and around the proposed project area.

This Draft Environmental Assessment (EA) has been prepared in compliance with Chapter 343 of the Hawaii Revised Statutes (HRS).

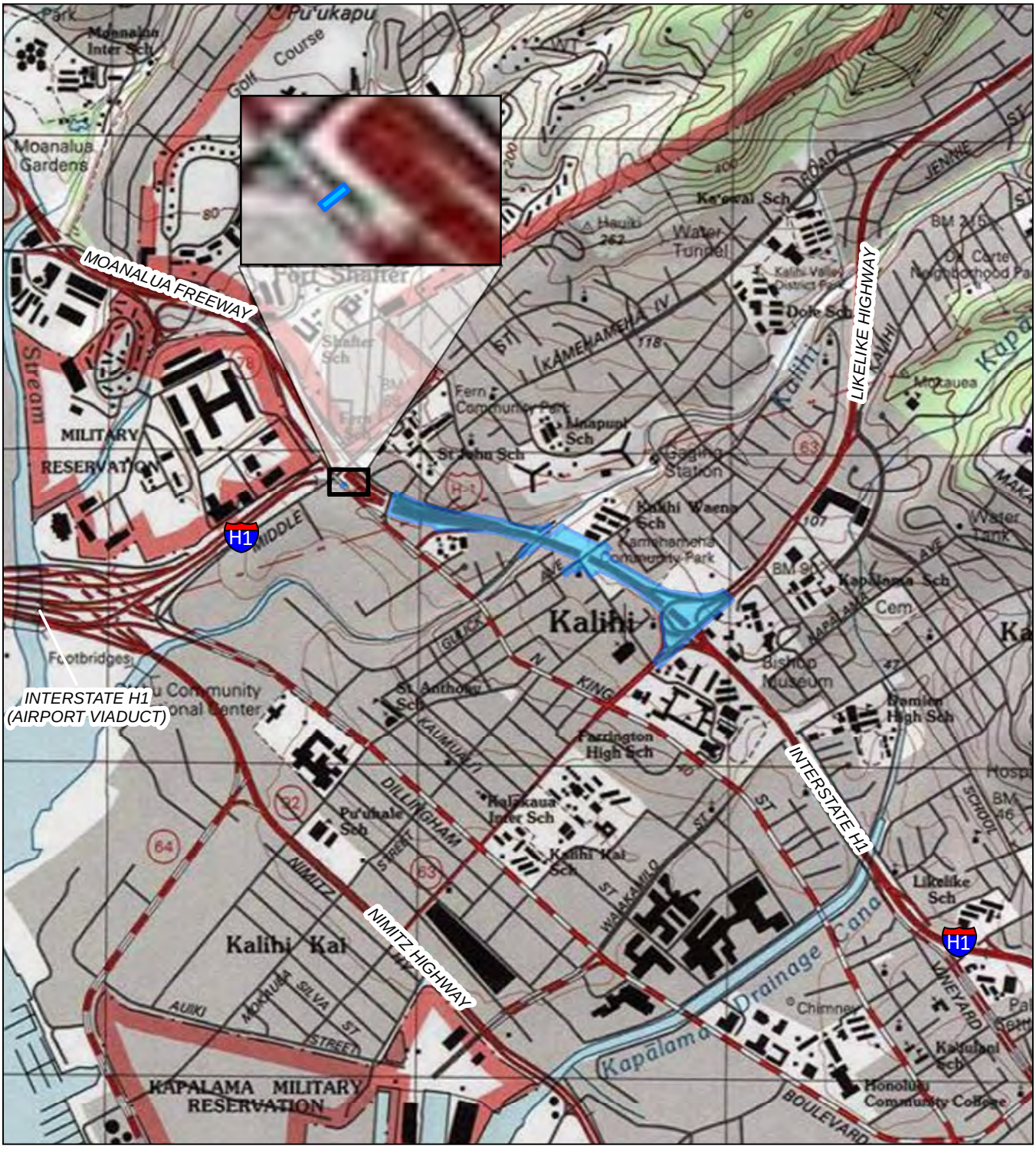
1.2 Background

H1 is a limited-access divided freeway that stretches roughly east-west across the southern coastal plain on the island of Oahu. The freeway is approximately 27 miles long, beginning at Route 93 (Farrington Highway) in Kapolei and terminating at Route 72 (Kalanianaole Highway) in eastern Honolulu. The H1 freeway is the main access route for people and freight into downtown Honolulu from much of the island, including the Daniel K. Inouye International Airport and military installations such as Joint Base Pearl Harbor/Hickam, Tripler Medical Center, and Fort Shafter.

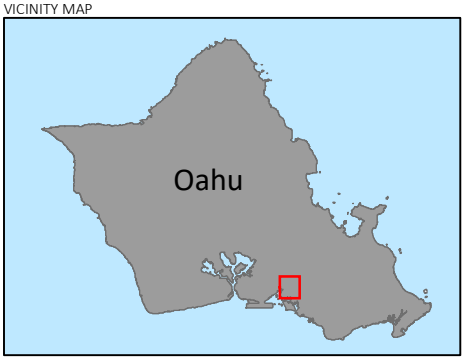
The H1 freeway in the Honolulu area is regularly congested during the morning and afternoon commute periods and frequently congested during the middle of the day. Average daily volume within the project limits was approximately 212,400 in 2007 and is expected to increase to approximately 234,000 in 2035 (HDOT, 2016).

In 2016, HDOT completed the *H-1 Corridor Study, Kapolei to Waialae/Kahala* (H-1 Corridor Study) to identify potential projects for the H1 corridor that would serve current and future mobility, reduce congestion, improve safety, and ensure the efficient movement of people and goods. The study was meant to guide investment and programming directions for the H1 freeway, described as the most critical roadway in the HDOT system. The study also helped HDOT conform to federal policy guidance embodied in the legislation known as Moving Ahead for Progress in the 21st Century (MAP-21) and the Fixing America's Surface Transportation (FAST) Act.

The corridor study began with a review of 27 previous studies and extensive data gathering and analysis, including traffic volumes and vehicle mix, collision information, bridge inspection reports, land use changes (especially planned growth in the western Ewa plain), and the effects of rail operations. Findings and conclusions were arrived at with input from an advisory committee composed of internal HDOT experts and a second advisory group that included officials at all levels of government with technical expertise in regional transportation issues.



VICINITY MAP



LEGEND

Project Location

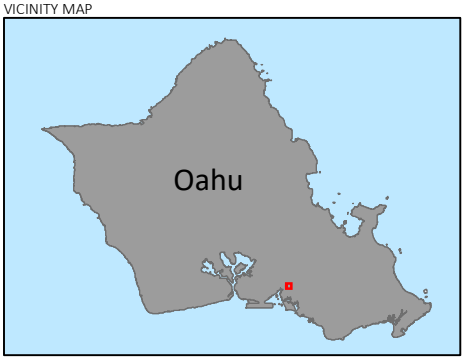
N

0 0.25 0.5 Miles

FIGURE 1-1
Project Location
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike
Highway Off-Ramp

Jacobs

VICINITY MAP



LEGEND

Project Location

Tax Map Key Parcel

N

0 250 500

Approximate Scale in Feet

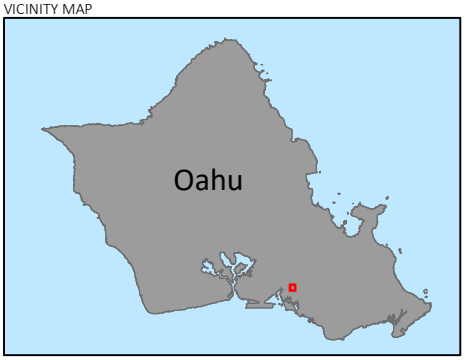
FIGURE 1-2

Tax Map Key (Western Section)

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike
Highway Off-Ramp

Jacobs

VICINITY MAP



LEGEND

Project Location

Tax Map Key Parcel

N

0 250 500

Approximate Scale in Feet

FIGURE 1-3

Tax Map Key (Eastern Section)

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike
Highway Off-Ramp

Jacobs

H1 Eastbound at Middle Street Tunnel, looking west

H1 Eastbound at Middle Street Tunnel, looking east

FIGURE 1-4a
Project Area Photos
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

Kalihi Stream looking upstream toward H1 overcrossing

Gulick Avenue Bridge, from H1 looking east

FIGURE 1-4b
Project Area Photos
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike
Highway Off-Ramp

H1 Eastbound approaching Likelike Highway off-ramp

H1 Eastbound at Likelike Highway off-ramp

FIGURE 1-4c
Project Area Photos
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Intersection of Beckley Street and Gulick Avenue from Beckley Street looking west

H1 Eastbound from Gulick Avenue Bridge looking west

FIGURE 1-4d
Project Area Photos
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike
Highway Off-Ramp

1.3 Project Purpose and Need

Based in part on the H-1 Corridor Study, HDOT recognized the following needs to be addressed by this project:

- Substantial eastbound congestion occurring during the morning and afternoon commute periods, where congestion levels are expected to worsen in the future. A notable bottleneck is the merge of two freeways—H1 and H201—where two lanes from H1 and three lanes from H201 are reduced to four through-lanes. An auxiliary lane allows for exit at the Kalihi interchange. This bottleneck is a major contributing factor to eastbound congestion on H1, backing up traffic beyond the Middle Street tunnel to the Airport Viaduct, and on Moanalua Freeway through the Fort Shafter Flats to Red Hill.
- Poor traffic safety conditions ensuing from congestion (a factor in rear-end and sideswipe collisions), the short merge area, differential traffic speeds, and narrow lane and shoulder widths that limit space available for maneuvering and disabled vehicles.
- Functional obsolescence of the Gulick Avenue bridge, which has a low clearance over the freeway. The U.S. Department of Transportation requires bridges to be inspected every 2 years. The Gulick Avenue bridge was inspected most recently in 2019, at which time it was noted that numerous oversize impact strikes are evident along the girder soffit edges and severe damages are occurring constantly, requiring ongoing repairs.

To address the needs cited above, HDOT has proposed the Interstate Route H1 (EB) Improvements, Ola Lane Overpass to Kalihi Interchange Project. The project's purpose is to relieve eastbound congestion on the H1 freeway at a key bottleneck, improve roadway design for traffic flow and safety, and maintain this section as a functional component of the urban transportation system for highway users.

1.4 Purpose of the Environmental Assessment

This Draft EA discloses the environmental and socio-cultural impacts that may result from the project's implementation and commits to specific mitigation measures that would be implemented to avoid and/or minimize potential impacts. The Draft EA has been prepared to satisfy the requirements of HRS Chapter 343 and Hawaii Administrative Rules (HAR) Title 11, Chapter 200, Environmental Impact Statement (EIS), and other environmental compliance requirements. The proposed project triggered the rules and regulations for environmental review because the project would use state lands and state funds.

1.5 Public Comment on the Environmental Assessment

1.5.1 Comment Requirements

The State of Hawaii Office of Environmental Quality Control (OEQC) notifies the public when a Draft EA is available for review in its bimonthly bulletin, the OEQC *Environmental Notice*. Official announcement by the OEQC will initiate a 30-day review and comment period.

1.5.2 Request for Comments

Interested members of the public are invited to submit written comments on the Draft EA to:

Name:	Ms. Holly Yuen, Project Manager
Address:	Department of Transportation, Highways Division Technical Design Branch 601 Kamokila Boulevard, Room 688 Kapolei, Hawaii 96707
Email Address:	holly.yuen@hawaii.gov

1.6 Permits, Approvals, and Compliance Required or Potentially Required

The following sections describe the requirements that must be met to implement the proposed project.

1.6.1 Federal

- Department of the Army Permit (Section 404 of the Clean Water Act [CWA]), U.S. Army Corps of Engineers (USACE).
- Section 106 Consultation (National Historic Preservation Act [NHPA]), State of Hawaii Department of Land and Natural Resources (DLNR) State Historic Preservation Officer (SHPO).
- Section 7 Consultation (Endangered Species Act [ESA]), U.S. Fish and Wildlife Service (USFWS).

1.6.2 State

- CWA Section 401 Water Quality Certification, State of Hawaii Department of Health (HDOH).
- National Pollutant Discharge Elimination System (NPDES) Permit, HDOH.
- Stream Channel Alteration Permit, DLNR Commission on Water Resource Management.
- Historic Preservation Review (HRS Chapter 6E), DLNR State Historic Preservation Division (SHPD).
- Americans with Disabilities Act compliance (HRS 103-50), HDOH, Disability and Communication Access Board.
- Community Noise Permit/Variance, HDOH.

1.6.3 County

- Street Use Permit, City and County of Honolulu Department of Transportation Services (DTS).
- Demolition, grading, grubbing, and stockpiling permits, City and County of Honolulu Department of Planning and Permitting (DPP).

1.7 References

State of Hawaii Department of Transportation (HDOT). 2016. *H-1 Corridor Study, Kapolei to Waialae/Kahala*. August.

2 Project Description

2.1 Project Location

The proposed project will improve approximately 0.7 mile of eastbound Interstate H1 in Honolulu. The project limits extend from just east of the Ola Lane overpass over H1 (at approximately Milepost 18.9) to H1 Exit 20A, the off-ramp to Likelike Highway (at approximately Milepost 19.6). Figure 2-1 shows the limits of the proposed project.

2.1.1 Surrounding Land Uses

The proposed project is located approximately 1.5 miles west of downtown Honolulu in the southern part of Oahu. Land within and adjacent to the project limits is characterized by urban residential development on the mountainward (*mauka*) and oceanward (*makai*) sides of the freeway. Gulick Avenue, an urban arterial that crosses over the freeway, is a County street; however, the Gulick Avenue bridge is under HDOT jurisdiction. Kalihi Stream is owned and maintained by the County. The State of Hawaii Land Use Commission has classified land within and adjacent to the project in the Urban District, and it is zoned by the County as R-3.5 Residential and Apartment A-2. Several schools, small parks, businesses, and other community resources are also located along H1 and within 500 feet of the project limits. Land uses surrounding the project area are shown on Figure 2-2.

2.1.2 Other Nearby State and County Projects

Other than routine repair and maintenance, no state transportation capital improvement projects are currently planned in the immediate vicinity of the subject project. City and County of Honolulu projects in the area include ongoing construction of the Honolulu Rail Transit Project (HRTP). The rail alignment along Dillingham Boulevard is generally parallel to the H1 freeway; although the HRTP is approximately 0.5 mile *makai* of the freeway, traffic control measures implemented for utility relocations and guideway construction may increase traffic on detour routes identified for the H1 eastbound improvements. At the time the subject EA was prepared, utility relocation in the Dillingham Boulevard section of the rail project was expected to begin in October 2022 and extend through 2025, when guideway and station construction would commence. The H1 eastbound improvements project has a preliminary start date at the end of 2022, which could mean both projects are under construction during 2023.

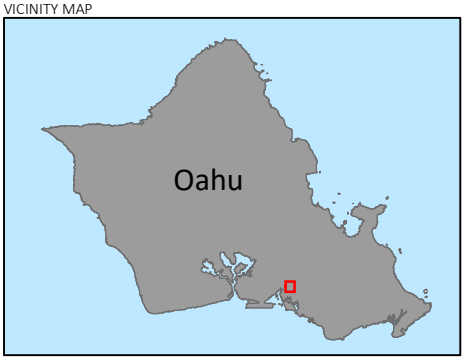
Overlap between these projects would be coordinated to minimize logistical and traffic routing impacts.

The Department of Environmental Services is starting the Kalihi Area Sewer Rehabilitation/Improvements project in the area of the H1 eastbound improvements project, which will evaluate the potential relocation and/or upsizing of sewers. The project's planning phase will start in 2021, with construction funds currently scheduled for Fiscal Year 2025. HDOT will coordinate with Department of Environmental Services staff to avoid conflicts as plans to upgrade sewer facilities materialize.

There is an upcoming City project to rehabilitate Kalihi Waena Neighborhood Park that will be funded under the Community Development Block Grant program. Rehabilitation is expected to include the comfort station improvements, irrigation system replacement, parking lot reconstruction, and removal of architectural barriers that restrict accessibility or mobility of elderly or handicapped persons. This project is targeted for completion in June 2023.

The proposed H1 improvement project is not expected to conflict with any other major state or City and County project during the construction period.

VICINITY MAP



LEGEND

Project Location

Stream and Flow Direction

N

0 250 500

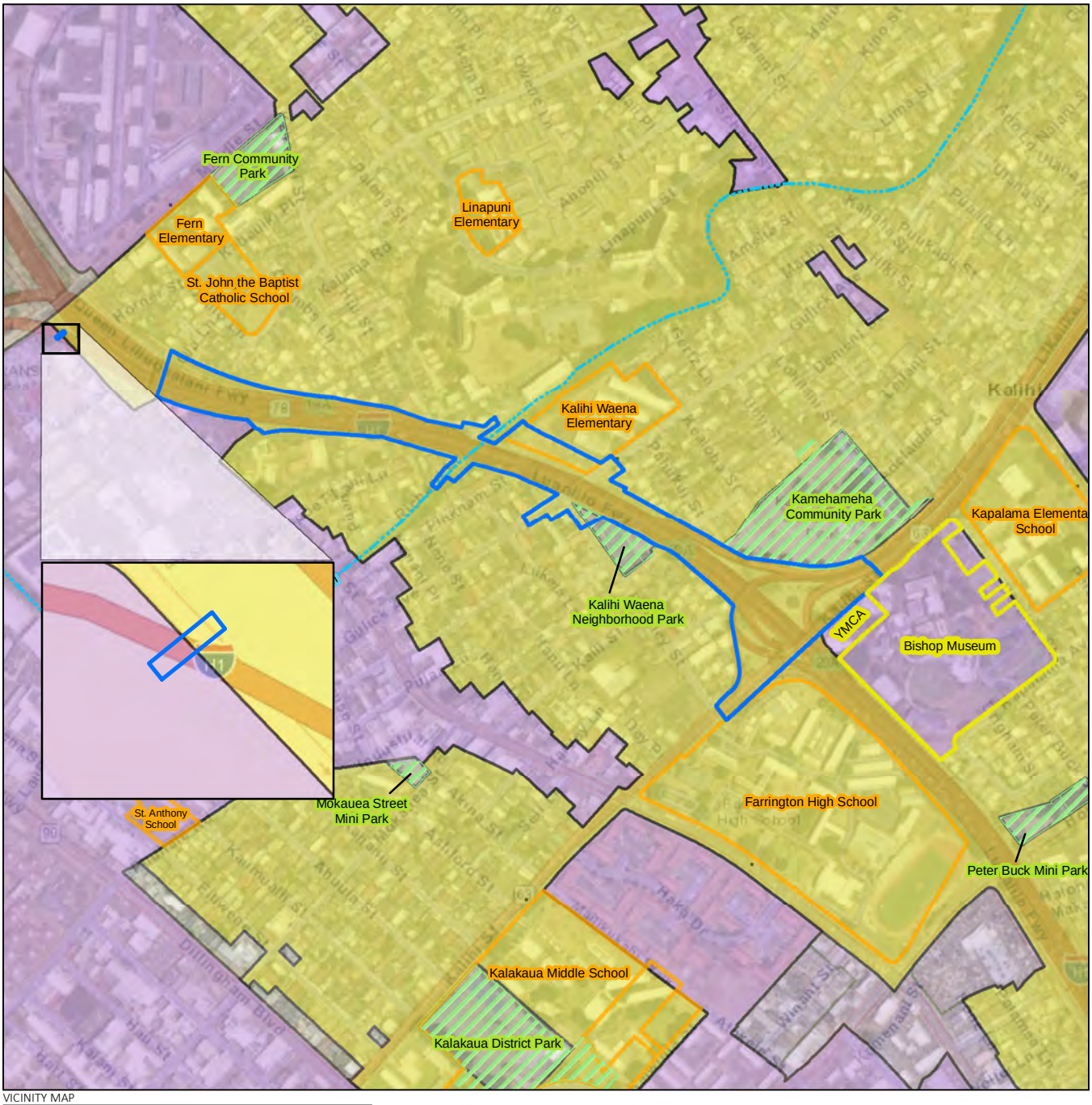
Approximate Scale in Feet

FIGURE 2-1

Project Limits

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs



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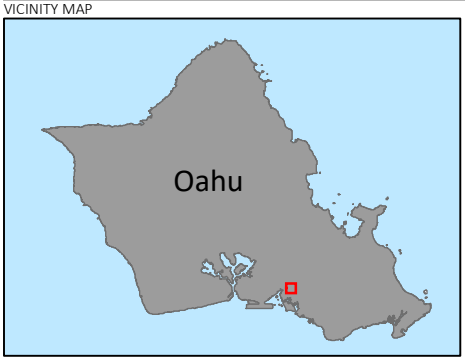


LEGEND

- Project Location
- Schools
- Parks
- Other
- Residential
- Mixed Residential, Business, Industrial
- Stream

N

0 500 1,000

Approximate Scale in Feet

FIGURE 2-2
Surrounding Land Use
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

2.2 Existing Conditions along the Project Corridor

2.2.1 Right-of-way and Surrounding Elevations

The right-of-way on the H1 freeway varies in width between 250 and 300 feet from Ola Lane to just east of the Gulick Avenue overpass, then narrows to between 150 and 230 feet further eastward. The multilane freeway is slightly depressed into the surrounding terrain. Retaining walls are present along most of the *makai* freeway edge to support sloped earthwork for the grade change to the lower roadbed. These retaining walls vary in height to a maximum of 10 to 12 feet.

2.2.2 Roadway and Bridge Structure

Interstate H1 is the primary regional access through downtown Honolulu. Within the study area, H1 (also known as Lunalilo Freeway) is classified as an Urban Principal Arterial – Interstate by HDOT. In the eastbound direction between Middle Street and the Likelike Highway off-ramp, the freeway has four general purpose lanes and a posted speed limit of 45 miles per hour (mph). The eastbound travel lanes within this section of freeway are 10 feet wide. The 2-lane on-ramp from H1 eastbound (Queen Liliuokalani Freeway) currently meets the 3-lane H201 (Moanalua Freeway) under the Ola Lane overpass. The left-side lane of the H1 on-ramp merges with the right-side lane from H201, resulting in four 10-foot-wide through-travel lanes across Kalihi Stream, under the Gulick Avenue bridge, and under the Likelike Highway interchange. An off-ramp lane to Likelike Highway northbound diverges from the freeway mainline prior to the interchange.

Gulick Avenue is a 2-lane, undivided roadway under the jurisdiction of the City and County of Honolulu. It has a posted speed of 25 mph and directly serves residential properties, Kalihi Waena Elementary, and businesses along the roughly 0.5-mile segment between North King Street and North School Street. On-street parallel parking is allowed in both directions of travel and sidewalks are provided on at least one side of the street for most of its length. Gulick Avenue provides a vehicular and nonmotorized crossing of H1 and is therefore used by regional traffic as an alternative to Middle Street and Kalihi Street.

2.2.3 Utilities

Utilities or services within the project area include the following:

- Hawaiian Electric Company (HECO) – Electric/Power
  - 138-kilovolt (kV) aerial transmission line along Gulick Avenue and Beckley Street.
  - 46-kV aerial sub-transmission lines along Gulick Avenue, Beckley Street, and Kalihi Street.
  - 4.16-kV aerial distribution lines along Gulick Avenue and Beckley Street and through the Gulick Avenue overpass.
  - 46-kV to 4.16-kV Kalihi Substation at the *makai*-Ewa (southwest) corner of Gulick Avenue and Beckley Street.
- Honolulu Board of Water Supply – Water Distribution and Service
  - 6-inch and 12-inch pipelines in a covered utility trench on the Gulick Avenue overpass.
  - 36-inch pipeline crossing under H1 near the east side of the Gulick Avenue overpass.
  - 42-inch pipeline on Gulick Avenue and Beckley Street *makai* of H1.
  - 2-inch pipeline on Richard Lane crossing under H1.
  - 24-inch pipeline crossing under H1 from Kamehameha IV Road.
  - 6-inch pipeline crossing under H1 at Nakuina Street.

- Hawaii Gas – Gas
  - 2-inch pipeline in a covered utility trench on the Gulick Avenue overpass.
  - 2-inch pipeline on Richard Lane crossing under H1; 1-inch pipeline branch dead-end on the *makai* side of H1.
  - 5/8-inch pipeline dead-end on Pinkham Street on the *makai* side of H1.
- Department of Environmental Services – Sewer
  - 6-inch and 8-inch pipelines *mauka* and *makai* of the Gulick Avenue overpass, but not crossing over H1.
  - 15-inch pipeline on Richard Lane crossing under H1.
  - 8-inch pipeline crossing under H1 starting from approximately Kamehameha IV Road toward Kalihi Union Church.
  - 8-inch pipeline dead-end on Pinkham Street *makai* of H1.
- Department of Transportation Services – Traffic Signal
  - Traffic signal at Beckley Street.
- Department of Design and Construction/Department of Facility Maintenance – City Street Lighting
  - Street Lighting along Gulick Avenue and Beckley Street.
- HDOT – Street Lighting
  - Approximately 25 light poles between Ola Lane and the Kalihi interchange.
- Spectrum - Wired Cable Television Service
  - Aerial lines over the Gulick Avenue overpass.
  - Aerial lines over the Kalihi interchange.
- Honolulu Authority for Rapid Transit – Intelligent Transportation System Closed-circuit Television (ITS-CCTV)
  - CCTV camera and hub at the Gulick Avenue/Beckley Street traffic signal.
- Hawaiian Telcom - Landline Telecommunications Service
  - Ductlines embedded in overpass.
  - Aerial line along Kalihi Street across the Kalihi interchange.

2.3 Proposed Project

The project will improve approximately 0.7 mile of eastbound H1 from just east of the Ola Lane overpass over H1 (approximately Milepost 18.9) to the off-ramp to Likelike Highway, Exit 20A (approximately Milepost 19.6). The widened, 5-lane section would eliminate the need for vehicles in the left lane exiting the Middle Street tunnel to merge with traffic from H201 (Moanalua Freeway). The improvements work includes pavement markings and signing, full-depth paving as needed to widen the roadway, retaining walls, lighting, utility relocations, drainage improvements, and installation of Intelligent Transportation System (ITS) equipment. The Gulick Avenue bridge will be lengthened and modified by removing a 6-inch reveal lip on the undersides of the bridge, increasing the vertical clearance by 6 inches. The Kalihi Stream overcrossing will be widened by approximately 12 feet.

2.3.1 Project Design

Figures 2-3 and 2-4 show the site plan for proposed project and can be referenced for details related to project design.

2.3.1.1 Project Design Criteria

The new freeway configuration would result in improved operations compared to existing conditions, but would not fully conform with national or HDOT standards design criteria (Table 2-1).

Table 2-1. Project Design Criteria

Design Criteria	Existing Conditions	Standards		Proposed
		AASHTO	State	
Highway Design Speed	Posted speed =45 mph	60 mph	50 mph	Design speed = 50 mph Posted speed = 45 mph
Travel Way Width (feet)	10	12	12	11
Left Shoulder Width (feet)	3	10	10	4
Right Shoulder Width (feet)	6 to 12	10	10	8 feet typical (varies from 2 to 8 feet)
Bridge Vertical Clearance (feet)	14.25		16	14.75

Sources: AASHTO, 2011; HDOT, 1980; HDOT, 2014

Notes:

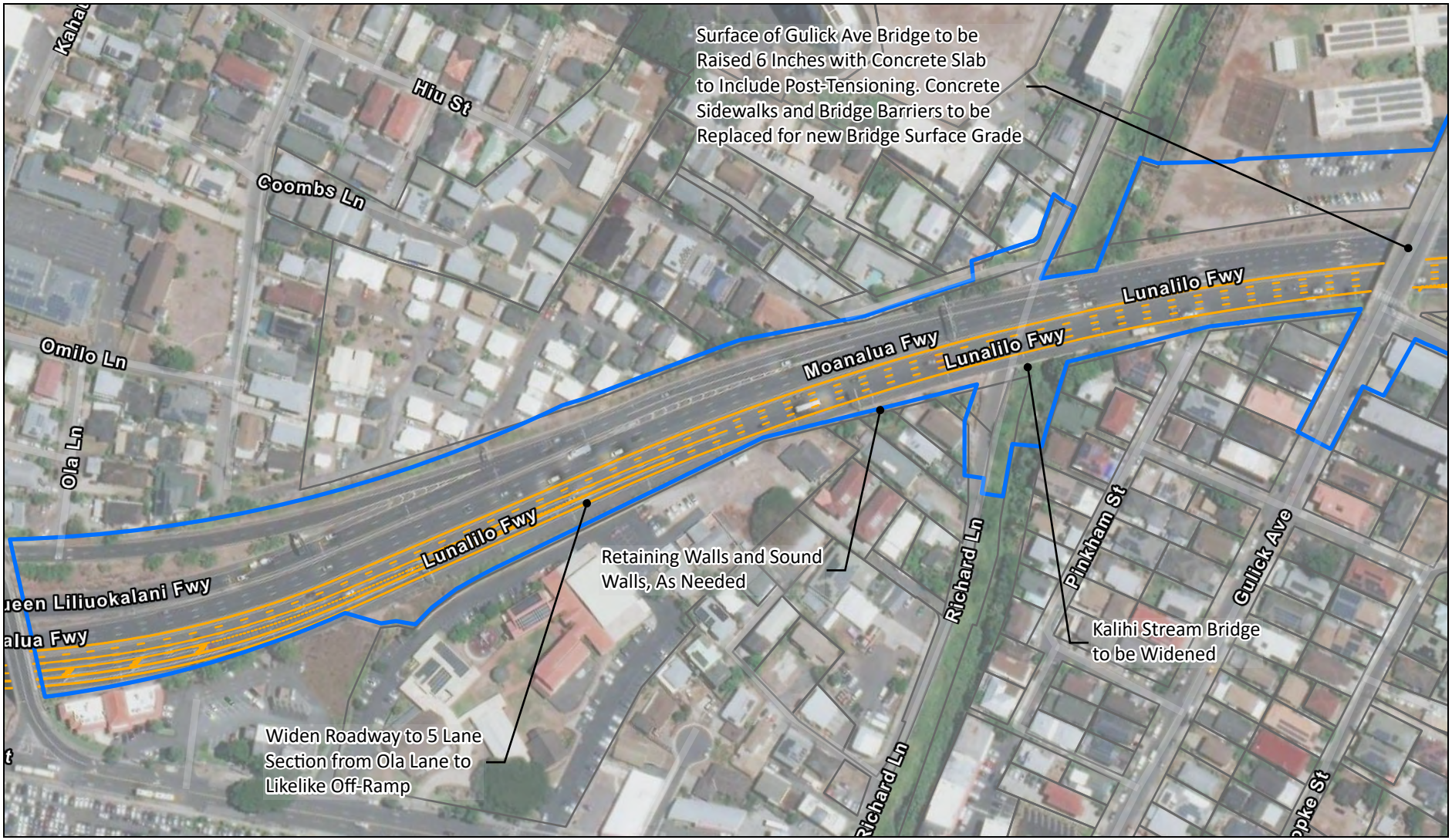
AASHTO = American Association of State Highway and Transportation Officials

N/A = not applicable

2.3.1.2 Design Exceptions

The proposed nonconforming features are as follows:

1. Lane Width: Lane width on H1 should be at least 12 feet wide, according to Section 8.2.4 of *A Policy on Geometric Design for Highways and Streets*, referred to as the Green Book (AASHTO, 2011). The project will increase the width of the existing lanes from 10 to 11 feet within project limits, transitioning from/to existing lane widths at the beginning and end of work.
2. Left Shoulder Width: Shoulder width on H1 should be a minimum of 10 feet on the left side as required for freeways with six lanes or more, according to Section 8.2.4 of the Green Book (AASHTO, 2011). The project will increase the width of the current inside shoulder from 3 to 4 feet on the left side.
3. Right Shoulder Width: Shoulder width on H1 should be a minimum of 10 feet on the right side as required for freeways with six lanes or more, according to Section 8.2.4 of the Green Book (AASHTO, 2011). To avoid acquisition of private residences, the project will provide a shoulder width varying from a minimum 2-foot width to a maximum 8-foot width. The typical shoulder width provided by the project will be 8 feet.
4. Vertical Clearance: The vertical clearance to structures passing over freeways should be at least 16 feet over the roadway, according to Section 8.2.9 of the Green Book (AASHTO, 2011). The project will remove the 6-inch reveal lip on both edges of the underside of the Gulick Avenue bridge to increase the vertical clearance from 14 feet, 3 inches to 14 feet, 9 inches over the roadway.



VICINITY MAP

LEGEND

Proposed Project Area

Section of Roadway to be Widened to 5 Lanes from Ola Lane to Likelike

N

0 80 160

Approximate Scale in Feet

FIGURE 2-3

Site Plan (Western Section)

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

VICINITY MAP

LEGEND

Proposed Project Area

Temporary Pedestrian Bridge

Bridge and Walkway

Section of Roadway to be Widened to 5 Lanes from Ola Lane to Likelike

N

0 80 160

Approximate Scale in Feet

FIGURE 2-3

Site Plan (Eastern Section)

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

An exemption from meeting lane and shoulder width criteria is requested to minimize community impacts, reduce project cost, and maintain schedule. Additional widening to meet the design criteria for lane widths and shoulder widths has significant right-of-way acquisition impacts. Nine residential homes would be impacted, and acquisition of those parcels would require relocation of families. In addition, this would increase the cost of the project substantially. The lane and shoulder widths exemption request is to minimize right-of-way impacts to the surrounding community and homes adjacent to the project limits, reducing the overall cost of the project.

To meet vertical clearance standards on H1 would require fully reconstructing the Gulick Avenue bridge, resulting in major disruptions to the surrounding community. In particular, students walking to Farrington High School would be affected for a substantially greater period of time. An increased height of 1 foot, 9 inches to meet standards would require significant impacts to the properties on the *mauka* and *makai* sides of H1. Conforms and grade transitions would be needed on either side of the Gulick Avenue bridge, resulting in impacts to driveway accesses for properties on either side. Access may not be able to be maintained for all existing properties, including the Hawaiian Electric substation on the *makai*/Ewa side of H1 and Gulick Avenue. In addition, the increase in height would trigger the relocation of three 46-kilovolt and two 138-kilovolt electric transmission poles, a significant cost increase that would require the project to go before the Public Utility Commission for a review process expected to add at least 1 year to the schedule.

No design exceptions for hydraulics are required for this project. Flow widths, catch basin locations and sag points in gutter profile are designed to meet HDOT requirements.

No design exceptions for design speed are required for this project. The speed limit on H1 within the project limits is 45 mph. All design elements meet requirements for 60 mph design speed except for stopping sight distance, which is reduced at the location of the 2-foot-wide right shoulder as detailed in Section 3.1. The stopping sight distance at this location meets requirements for a 50-mph design speed, which exceeds the posted speed of the section of highway being improved.

2.3.1.3 Reasons for Design Exceptions

A primary reason for obtaining design exceptions for lane widths and shoulder widths is to minimize the right-of-way impacts to the surrounding community and homes adjacent to the project limits. Additional widening to meet design criteria for lane widths and shoulder widths would require acquisition of nine residential properties and associated household relocation. Project costs would increase concomitantly.

Meeting the 16-foot vertical clearance standard on H1 would result in major disruptions to users of the Gulick Avenue bridge, including students walking to Farrington High School from *mauka* residential areas. Increasing the height of the existing bridge by 1 foot, 9 inches would require reconstructing the approaches to the bridge with new grade transitions. The modifications would have a ripple effect on nearby driveways and access to the HECO substation and nearby residences.

2.3.2 Gulick Avenue Bridge Improvements

The Gulick Avenue bridge design involves proposed *mauka* and *makai* extensions. To address vertical clearance concerns, the 6-inch reveal lip on the underside of both sides of the bridge will be removed to increase the minimum vertical clearance from 14 feet, 3 inches to 14 feet, 9 inches. In addition, a protective bumper will be placed above the H1 eastbound lanes on the west side of the bridge to reduce the impact energy to the concrete bridge. Fiber-reinforced polymer (FRP) will also be placed on the edges of the bridge.

The intersection at the south end of the Gulick Avenue bridge (at Beckley Street) will consist of full-depth paving and roadway regrading as need to accommodate the 4-inch increase of bridge roadway surface

elevation. The proposed roadway profile of Gulick Avenue includes minor angle points (that is, vertical point of intersection, or VPI) to minimize roadway reconstruction outside of the bridge limits. Sidewalks, curb ramps, and driveways will be reconstructed within the paving limits.

The proposed lengthening of the Gulick Avenue bridge will provide additional width to the H1 corridor below the structure. Drilled shafts will be installed behind the existing abutments, and the existing reinforced concrete slab superstructure will then be trenched to install post-tensioning ducts. The existing asphalt concrete paving on the bridge will be removed and 6 inches of concrete overlay will be added to the roadway surface and within the existing utility trenches under the sidewalk. After the superstructure extension is cast on both *mauka* and *makai* ends of the existing bridge, the structure will be post-tensioned and connected to the substructure. The existing abutments will be removed, and the concrete facing will be constructed at the new abutments. In addition, walls between the existing columns will be installed to address vehicular collision requirements along H1. New sidewalk and bridge railings will be added because of the new bridge roadway surface. A new wall will be added beyond the wingwall on the *mauka*/west side to bridge the HECO ducts over drain and sewer lines.

A temporary pedestrian bridge will be constructed for nonmotorized access during construction of the Gulick bridge. Figure 2-5 shows the proposed location of the temporary pedestrian bridge in relation to Kalihi Waena Neighborhood Park. Both cut and fill retaining walls will be needed due to roadway improvements.

2.3.3 Kalihi Stream Overcrossing

The Kalihi Stream overcrossing bridge will be widened approximately 12 feet on the *makai* side of the freeway, which will require the existing abutments under the freeway to be extended. The extended abutments will be supported by drilled shafts (5-foot diameter) that will be installed outside of the existing concrete-rubble masonry (CRM) walls on both the east and west sides of the stream. The adjacent cast-in-place slab bridge over Richard Lane will be widened at the same time.

Limited portions of the CRM walls on both sides of Kalihi Stream will need to be demolished for construction access. After the drilled shaft and support structures have been installed, the walls will be reconstructed from salvaged lava rocks and will match the existing conditions to the extent practicable. Portions of the affected CRM wall that are below grade will be strengthened as needed to maintain structurally integrity.

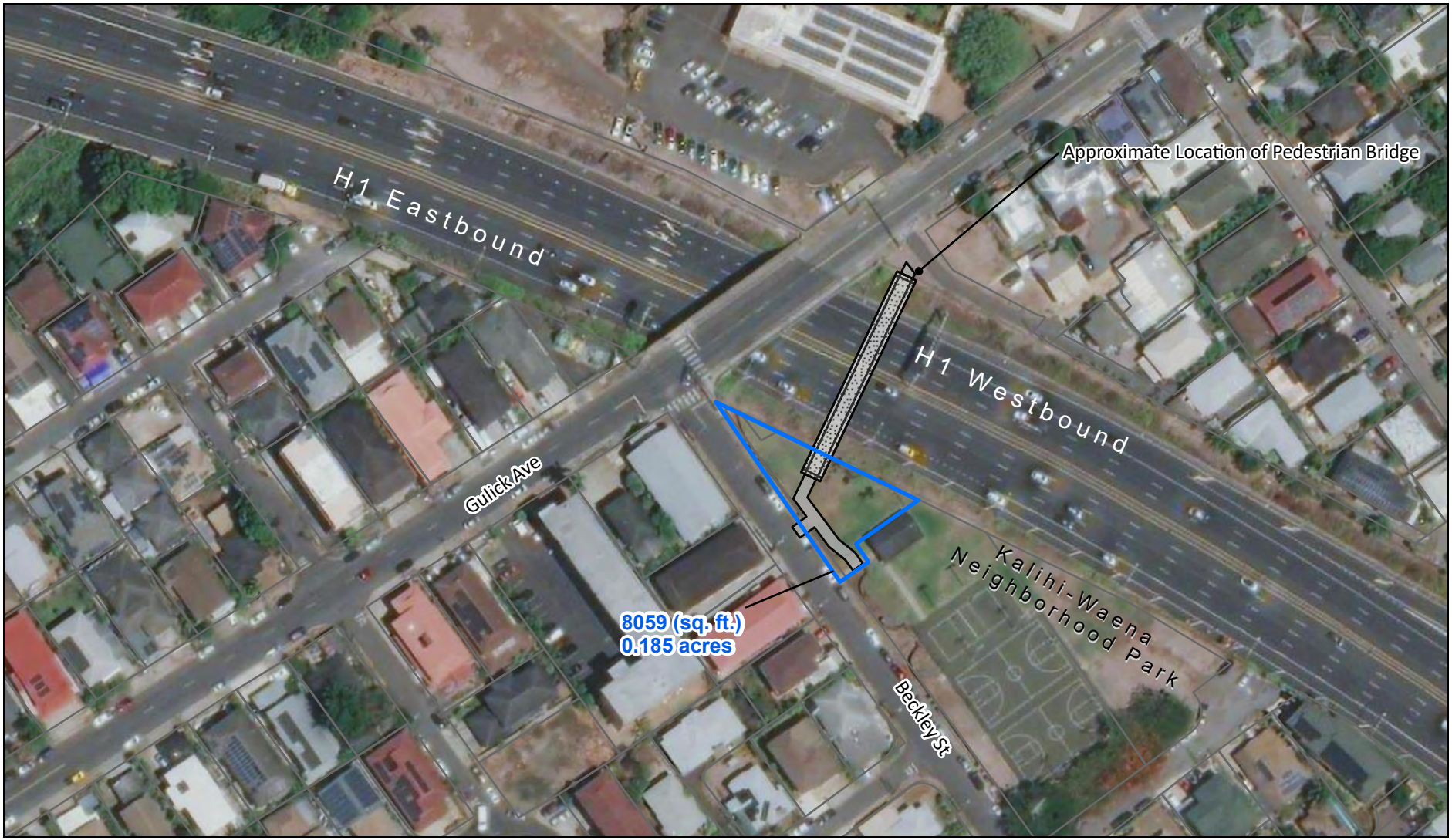
Following the extension of the bridge abutments, two prestressed girders with a concrete deck will be added over Kalihi Stream. This will be accomplished by pouring concrete within set forms to tie the new extension bridge to the existing structure.

2.3.4 Construction Activities

Staging of personnel and equipment would occur within the project limits. Potential staging areas include a portion of the Kalihi Waena Elementary School parking lot adjacent to Kalihi Stream, portions of Kalihi Waena Neighborhood Park west of the comfort station and *mauka* of the play courts, and a section of Richard Lane below the freeway. All work areas would be partitioned with safety barriers.

Construction would last approximately 13 months and would occur during normal work hours and on weekends. To minimize impacts to the surrounding residential areas, night work would be performed on a limited basis and after evaluating maintenance of traffic needs.

The project would maintain a corridor along the existing Gulick Avenue bridge when HDOT-approved safety standards can be met. Pedestrians and bicyclists would have access around the Gulick Avenue construction area via a temporary modular bridge across the freeway.



VICINITY MAP

LEGEND

Project Area within Kalihi-Waena Neighborhood Park

Bridge

Walkway Bridge

N

0 50 100

Approximate Scale in Feet

FIGURE 2-5

Temporary Pedestrian Bridge During Construction

Interstate H1 (EB) Improvements Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

2.3.5 Construction Sequence

Improvements to the H1 freeway and project bridges are planned to occur in the following five phases:

- Phase 1 (H1 Eastbound): Close existing shoulders on H1 and demolish the existing retaining walls within the project area. Relocate highway lighting and install temporary lighting. Install new drainage structures along H1, construct new retaining walls, widen roadway pavement on H1, and install new cantilever sign structures and ITS equipment.
- Phase 2 (Temporary Pedestrian Bridge and Temporary Relocation of Utilities): Close the east side of the Gulick Avenue bridge to vehicular traffic as necessary to implement a staging area. Install temporary lighting and a temporary pedestrian bridge with connections to existing sidewalks/access across H1. For safety reasons, full closure of H1 is anticipated when pedestrian bridge construction occurs over travel lanes. Relocate existing utilities to the temporary pedestrian bridge, if possible. Shut off and relocate water, gas, and sewer. Install temporary traffic signal at the Gulick Avenue/Beckley Street intersection.
- Phase 3 (Gulick Avenue Bridge): Close Gulick Avenue bridge to all vehicular and nonmotorized traffic. Relocate pedestrian crossings for safe access to the temporary pedestrian bridge. Demolish or remove existing bridge components and construct new bridge extension, sidewalks, and railings. Remove existing abutments and wingwalls on the *mauka* and *makai* sides of H1, and construct concrete facing at the new abutments. Install permanent traffic signal at the Gulick Avenue/Beckley Street intersection. Remove temporary pedestrian bridge and restore disturbed areas.
- Phase 4 (Kalihi Stream Bridge): Relocate utilities on Richard Lane and along the outside of H1 traffic barrier at Kalihi Stream bridge prior to bridge pier construction. Install temporary in-stream isolation and containment barriers. Close outside lanes on H1 and install new Kalihi Stream bridge components. Demolish existing freeway bridge railing and connect the new bridge to the existing superstructure. Remove temporary in-stream barriers.
- Phase 5 (H1 Eastbound Paving and Striping): Pave final lift of H1 pavement section. Remove existing striping and install final striping and pavement markings to match improvements. Restore driveways, sidewalks, school property (including landscaping and parking lot paving), and private properties within the work zone.

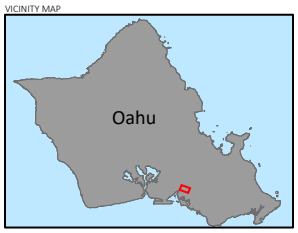
2.3.6 Traffic Control during Construction

Construction of the proposed H1 eastbound freeway improvements between Middle Street and the Likelike Highway off-ramp is anticipated to begin in 2022. Prior to construction activities on the freeway mainline, the existing Gulick Avenue bridge structure must be reconstructed and the abutment at the south end of the bridge modified to allow for additional freeway lane capacity.

For approximately 2 months during the summer, the current Gulick Avenue bridge will be closed to all vehicular traffic and nonmotorized users across H1. The intersection of Gulick Avenue and Beckley Street will also be closed to all but local residential traffic. A temporary pedestrian bridge will be constructed to the east of the existing bridge to allow nonmotorized users to cross H1 in approximately the same location they do today, but vehicular traffic will be directed to alternate crossings.

Vehicle trips that currently use Gulick Avenue to cross H1 are likely to use either Middle Street/Ola Lane or Kalihi Street/Likelike Highway during construction. Intersections and streets that could experience a temporary increase or decrease in traffic volumes due to the Gulick Avenue closure are shown on Figure 2-6. Without the Gulick Avenue crossing, traffic on Middle Street, School Street, and Kalihi Street/Likelike Highway would likely increase. Traffic volumes on Gulick Avenue and potentially Beckley Street would likely decrease.

VICINITY MAP



Study Intersection

Potential Traffic Volume Increase

Potential Traffic Volume Decrease

Closure Area

N

0 295 590

Approximate Scale in Feet

FIGURE 2-6
Potential Traffic Volume Changes with Gulick Avenue Closure (2022)
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

Diagrams of recommended alternate routes between the Gulick Avenue closure area and regional freeways are provided in Attachment C of the traffic impact assessment report for the project (Appendix A).

2.3.6.1 Without Gulick Avenue Closure

By the year 2022, traffic volumes are expected to increase slightly compared to the existing condition, even without the Gulick Avenue closure or the H1 eastbound improvements, as a result of in-progress developments and background traffic growth. Intersection volumes for 2022 were estimated from the existing volumes using a conservative annual growth rate of 1 percent per year. Intersection lane channelization at each of the study intersections is expected to remain the same as existing. Table 2-2 provides a comparison of the AM and PM peak hour levels of service (LOS) and delay under the existing conditions and anticipated 2022 conditions without the Gulick Avenue closure. Compared to the existing AM peak hour conditions, operations in 2022 would generally remain the same with the exception of North King Street at North Kalihi Street. This location would likely operate at LOS E in 2022 because of a slight increase in traffic. During the PM peak hour, this intersection could worsen to LOS F, with background traffic increases.

In the PM peak hour, the intersection of Middle Street and Kaua Street would worsen slightly, from LOS E under existing conditions to LOS F with increased background traffic in 2022, even without the Gulick Avenue closure.

Table 2-2. Peak Hour Intersection Summary (2022) – Conditions Without Gulick Avenue Closure

Peak	Int.	Signalized Intersections	Existing (2020)		Without Closure (2022)	
			Delay(s)	LOS	Delay(s)	LOS
AM PEAK	1	North Kalihi Street at North King Street	53.0	D	55.2	E
	2	North Kalihi Street at North School Street	104.7	F	108.0	F
	3	Gulick Avenue at North King Street	16.2	B	16.2	B
	4	Gulick Avenue at Beckley Street	6.2	A	6.2	A
	5	Gulick Avenue at North School Street	15.5	B	15.5	B
	6	Middle Street at North King Street	34.5	C	35.3	C
	7	Middle Street at Kaua Street	42.0	D	43.5	D
PM PEAK	1	North Kalihi Street at North King Street	78.8	E	86.7	F
	2	North Kalihi Street at North School Street	70.1	E	72.0	E
	3	Gulick Avenue at North King Street	13.8	B	14.2	B
	4	Gulick Avenue at Beckley Street	11.6	B	11.5	B
	5	Gulick Avenue at North School Street	16.9	B	17.0	B
	6	Middle Street at North King Street	124.5	F	136.6	F
	7	Middle Street at Kaua Street	71.9	E	80.6	F

Notes:

Shaded cells indicate intersections operating at LOS E or worse.

int. = intersection number

s = second(s)

2.3.6.2 With Gulick Avenue Closure

With the temporary closure of Gulick Avenue, the majority of traffic would be prohibited from using the bridge and the Gulick Avenue and Beckley Street intersection. Detoured vehicles are not expected to significantly affect study intersections during the AM or PM peak hours, compared to conditions without construction. Certain intersections would experience some additional vehicle delay as vehicles detour to nearby streets and surrounding intersections, but LOS is not expected to degrade during the 2-month closure of Gulick Avenue for construction of the eastbound H1 freeway improvements.

Table 2-3 shows the expected intersection LOS and average vehicle delay, without and with the Gulick Avenue closure. During the PM peak hour, vehicles at the North Kalihi Street and North King Street intersection could experience approximately 1 minute of additional delay, on average. This temporary change does not worsen the intersection LOS and would likely affect isolated turning movements associated with the Gulick Avenue closure detour, such as the southbound right turn and the eastbound left turn. SYNCHRO model output reports are provided in Attachment B of the traffic impact assessment report (Appendix A).

Table 2-3. Peak Hour Intersection Summary (2022) – Conditions Without and With Gulick Avenue Closure

Peak	Int.	Signalized Intersections	Without Closure (2022)		With Closure (2022)	
			Delay (s)	LOS	Delay (s)	LOS
AM PEAK	1	North Kalihi Street at North King Street	55.2	E	56.9	E
	2	North Kalihi Street at North School Street	108.0	F	118.8	F
	3	Gulick Avenue at North King Street	16.2	B	16.0	B
	4	Gulick Avenue at Beckley Street	6.2	A	N/A	N/A
	5	Gulick Avenue at North School Street	15.5	B	17.5	B
	6	Middle Street at North King Street	35.3	C	35.7	D
	7	Middle Street at Kaua Street	43.5	D	54.5	D
PM PEAK	1	North Kalihi Street at North King Street	86.7	F	150.4	F
	2	North Kalihi Street at North School Street	72.0	E	79.8	E
	3	Gulick Avenue at North King Street	14.2	B	14.6	B
	4	Gulick Avenue at Beckley Street	11.5	B	N/A	N/A
	5	Gulick Avenue at North School Street	17.0	B	17.8	B
	6	Middle Street at North King Street	136.6	F	162.9	F
	7	Middle Street at Kaua Street	80.6	F	116.0	F

Note: Shaded cells indicate intersections operating at LOS E or worse.

During the Gulick Avenue closure, no mitigation is recommended at the local street intersections as they are expected to operate similarly, with or without detoured traffic. Once the construction of the H1 eastbound freeway improvements are complete and the Gulick Avenue bridge and the intersection of Gulick Avenue and Beckley Street reopen, local street traffic would resume typical operations.

As part of the analysis in the traffic impact assessment conducted for the project, vehicle trips were rerouted from Gulick Avenue to detour paths based on assumed trip origins and destinations. Actual trip patterns during construction will likely vary as drivers actively adjust to these temporary peak hour operations and change their trip path or trip start time to avoid congestion.

2.3.7 Pedestrian and Bicycle Access

There is heavy foot traffic on Gulick Avenue throughout the day. Many school children living in residential areas on the *mauka* side of the H1 freeway walk to Kalihi Waena Elementary School, and older youth cross the freeway to get to Farrington High School. Gulick Avenue also serves as a pedestrian and bicycle corridor for people traveling between commercial districts on King Street and School Street. To maintain safe pedestrian access, a temporary bridge is proposed on the Diamond Head (east) side of the existing bridge (Figure 2-5).

2.3.8 Properties Affected by the Project

The proposed project will require the permanent acquisition of approximately 40 square feet of private property outside of the existing right-of-way. The acquisition would affect a portion of the parcel containing Kalihi Union Church, adjacent to H1. The area is currently an open lawn and no structures would be affected.

As shown in Table 2-4, temporary easements are needed from approximately 16 properties to accommodate construction of retaining walls, bridge abutments, and utility relocations. Construction parcels would be coordinated through HDOT. No additional permanent easements for maintenance and operation are needed.

Table 2-4. Affected Properties

TMK/Address	Land Use	Estimate of Area Needed (square feet)	Project Requirement
Permanent Acquisition			
1-3-002:036 2214 N. King Street	Kalihi Union Church	40	Increase right-of-way for shoulder widening
Total—Permanent Acquisition		40	
Construction Parcel (Temporary Construction Easement)			
1-3-002:036 2214 N. King Street	Kalihi Union Church	3,400	Access to construct retaining wall
1-3-002:033 1136 Richard Lane	Residence	530	Access to construct retaining wall
1-3-002:034 1142 Richard Lane	Residence	440	Access to construct retaining wall
1-3-002:035 1148 Richard Lane	Residence	70	Access to construct retaining wall
1-3-002:042	Empty Lot	NA	Access to construct retaining wall
1-3-002:044	Stream	NA	Access to widen Kalihi Stream overcrossing

Table 2-4. Affected Properties

TMK/Address	Land Use	Estimate of Area Needed (square feet)	Project Requirement
1-3-003:066 1140 Pinkham Street	Residence	730	Access to construct retaining wall
1-3-003:036 1146 Pinkham Street	Residence	20	Access to construct retaining wall
1-3-0003:068 1153 Pinkham Street	Residence	415	Access to construct retaining wall
1-3-003:069 1148 Gulick Avenue	Residence	115	Access to construct conform grading
1-3-003:004 1154 Gulick Avenue	Residence	235	Access to construct conform grading
1-3-003:003 1158 Gulick Avenue	Electrical Substation	155	Access to construct bridge abutment and conform grading
1-3-004:123, 124, 126	Park	7,750	Access to construct bridge abutment; temporary pedestrian bridge (*makai* landing), and relocate utilities
1-3-007:067 1231 Gulick Avenue	Residence	730	Access to construct bridge abutment; temporary pedestrian bridge (*mauka* landing), and relocate utilities
1-3-008:004 1240 Gulick Avenue	School	37,700	Construction access for utility work, sidewalk, and conform grading and staging area
1-3-004:065 1159 Gulick Avenue	Church	20	Construction access for utility work, sidewalk, and conform grading
Total—Temporary Construction Easements		**52,310**	

NA - Land area for State and City owned parcels with existing use agreements not calculated.

2.4 No Action Alternative

The No Action Alternative would retain the existing freeway and lane configuration. The Gulick Avenue bridge would not be lengthened and the height of the bridge deck would not be increased.

Under the No Action Alternative, environmental impacts resulting from construction activities would be averted and improvement costs would not be incurred by HDOT. However, benefits associated with the proposed improvements would be foregone.

The Middle Street merge would continue to operate and remain a congestion bottleneck. As reported in the traffic impact assessment report (Appendix A), daily traffic volume on H1 eastbound between Middle Street and Likelike Highway is anticipated to be approximately 95,500 vehicles in 2023, representing the opening year for the subject freeway improvements. By 2035, representing a longer-term forecast that accounts for rail operations between Kapolei and downtown Honolulu, daily traffic volume on H1

eastbound is expected to be 96,800. Traffic volumes are anticipated to increase, while modestly, in the future.

The proposed improvements are expected to increase travel speeds through the project area due to greater capacity and removal of the inside-lane merge. The morning commute is typically the worst operating peak period on H1 eastbound. Compared to the stop-and-go traffic flow experienced today, vehicles would be able to travel with a more consistent and uniform flow. Average travel speeds approaching Middle Street and through the Likelike Highway off-ramp could increase from 15 to 20 mph with the current eastbound configuration to approximately 20 to 25 mph with the proposed freeway improvements. Motorists would consequently experience a travel time savings of approximately 2.5 to 3.5 minutes per trip (through the 1.5-mile project area). Based on an average travel time savings of 3.0 minutes per trip and the forecast AM peak volume traffic of 6,870 approaching the Likelike Highway interchange in 2035, the cumulative travel time savings during the AM peak period would be approximately 344 hours. Over a typical year with 260 workdays, the cumulative travel time savings for the AM peak would amount to nearly 90,000 hours. Annual travel time savings for the midday peak and PM peak are estimated at approximately 20,000 and 65,000 hours, respectively. Beneficial impacts for freeway users would not be realized without the proposed project improvements.

2.5 Alternatives Considered and Dismissed

2.5.1 Reconfigure the Freeway Layout to Full Standards

This alternative would reconfigure the freeway layout to full standards, including 12-foot-wide lanes, a 10-foot-wide left shoulder and a 10-foot-wide right shoulder. In comparison to the proposed action, which requires the fee acquisition of 172 square feet, additional widening to meet the design criteria for lane and shoulder widths would require the acquisition of nine residential properties and relocation of the displaced families. This alternative was dismissed because of large community impacts and the substantially higher project cost and lengthened project schedule associated with additional right-of-way acquisitions.

2.5.2 Raise Gulick Avenue Bridge

The alternative to raise Gulick Avenue bridge to meet the 16-foot vertical clearance standard on H1 would require full reconstruction or replacement of the bridge, resulting in greater disruptions to the surrounding community than the proposed action. Increasing the bridge height by 1 foot, 9 inches to meet the standard would affect properties located on the approaches to the bridge on the *mauka* and *makai* sides of H1. Grade transitions needed for a higher bridge would require adjustments to driveway accesses. In some cases, for example, to the HECO substation on the *makai*/Ewa side of the Gulick Avenue bridge, it might not be possible to maintain serviceable access. Further, increasing the bridge height would require relocation of three 46-kV and two 138-kV electric transmission poles, actions that would trigger review and approval by the Public Utility Commission and is expected to add at least 1 year to the project schedule.

Grade transition is also constrained by sidewalk slope requirements prescribed by the Americans with Disabilities Act. An accessible slope might require lengthening the bridge approaches, thereby expanding the construction work area and impacting additional properties on Gulick Avenue. This alternative was dismissed because of a larger area of impact, potential loss or impairment of access to private properties, substantially higher cost, and longer project schedule. Proposed removal of the 6-inch lip from the bridge will yield a measure of additional clearance for Gulick Avenue bridge that exceeds the height clearances of overpass bridges to the west and east.

2.5.3 Non-Construction Alternatives

The H-1 Corridor Study, completed in 2016, was a comprehensive effort to develop a long-term investment strategy and program to protect the existing 27-mile freeway infrastructure (HDOT 2016). The study identified 127 candidate projects separated into corridor-wide projects, multisegment projects, and individual projects. Of these, corridor-wide projects generally involve non-construction approaches and include the following: transportation demand management, ramp metering, partial-day access restrictions, ITS real time traveler information, wayfinding signage, express buses, dynamic speed limits, truck/terminal facilities, extension of the Freeway Service Patrol, construction management, driver and truck education and enforcement, median screens, lighting, and toll facilities. The proposed action does not preclude any of the corridor-wide initiatives evaluated in the H-1 Corridor Study. However, these initiatives do not provide a viable alternative to physical improvements needed to achieve the purpose of this project to eliminate the Middle Street merge for congestion relief and safety and to correct the functional obsolescence of the Gulick Avenue bridge.

2.6 Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) provides a multiyear listing of state and county transportation projects and identifies those projects slated for federal funding. It is a multimodal transportation improvement program (TIP) that is developed using existing transportation plans and policies, as well as current highway, transit, and transportation programming processes. The STIP delineates the funding categories and the federal and local share required for each project. Even if a project does not receive Federal-aid funds, it can be listed in the STIP as a regionally significant project, which is the case with the subject project. Inclusion in the STIP does not necessarily mean projects will be planned, designed, or constructed within the fiscal period because of unforeseen occurrences such as project readiness or project priorities.

The current STIP, covering the period from Federal Fiscal Year (FFY) 2019 to FFY 2022 (and FFY 2023 to FFY 2024, for information purposes only), is effective as of June 16, 2020. The H1 eastbound improvements project is listed in the STIP as Modernization Project OS82.

2.7 Preliminary Cost and Schedule

An engineer's estimate was developed in July 2020 for the 30% design layout. Total cost was estimated at approximately $42.5 million with project delivery through a design-bid-build process.

Construction of this project would occur after completion of the project's design and obtaining necessary permits, approvals, and entitlements. The current schedule anticipates construction to last 13 months and end in 2023.

2.8 References

American Association of State Highway and Transportation Officials (AASHTO). 2011. *A Policy on Geometric Design for Highways and Streets.*

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State of Hawaii Department of Transportation (HDOT). 2010. *Design Criteria for Highway Drainage*. October 1.

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State of Hawaii Department of Transportation (HDOT). 2016. *H-1 Corridor Study, Kapolei to Waialae-Kahala, Oahu Hawaii*, Final Report. August.

State of Hawaii Department of Transportation (HDOT). 2014. *Design Criteria for Bridge and Structures*. January 7.

3 Affected Environment, Impacts, and Mitigation

3.1 Topography, Geology, and Soils

3.1.1 Existing Conditions

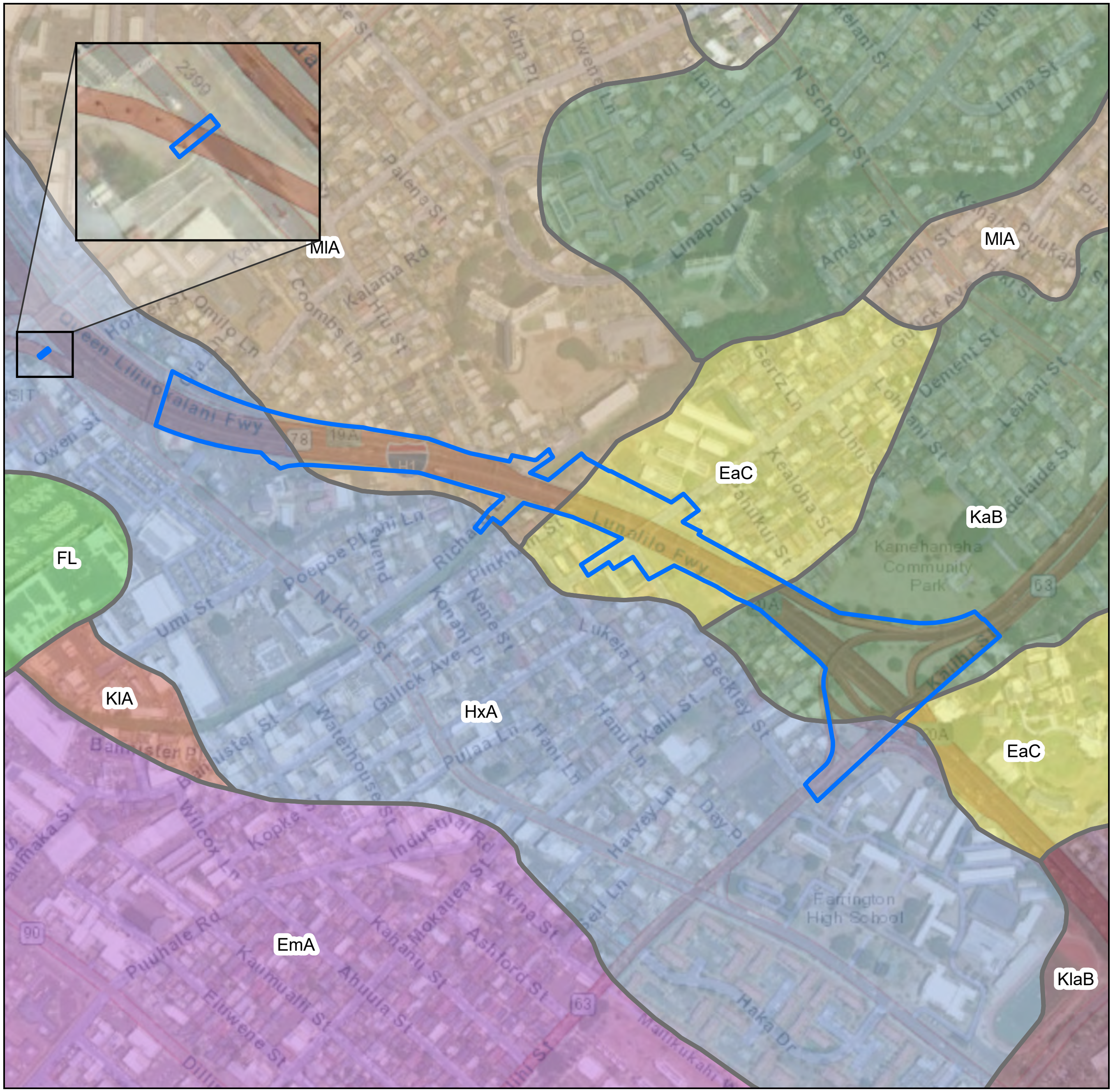
The proposed project is located approximately 2 miles northwest of downtown Honolulu in the southern part of Oahu. Land within and adjacent to the project limits is characterized by relatively level terrain ranging from approximately 52 feet to 82 feet above mean sea level. The highest elevations are on the western end of the project area past Gulick Avenue.

The island of Oahu is composed largely of the weathered remnants of the Waianae and Koolau shield volcanoes. The older Waianae Volcano forms the bulk of the western third of the island, while the younger Koolau Volcano forms the majority of the eastern two-thirds of the island. It is believed that Waianae Volcano became extinct while Koolau Volcano was still active, and its eastern flank is partially below Koolau lavas in central Oahu.

The project area lies within the coastal plain of Oahu and is to the southwest of the Koolau Mountain Range. As a result, much of the generally flat land area is underlain by unconsolidated coastal sediments (coralline silts and sands) with pockets of hard, cemented sand dunes (sandstone) and coral/limestone rock formation. Progressing toward the hills of the Koolau Mountains, the subsurface conditions gradually change to reflect an increase in thickness of terrestrial sediments, such as the alluvial soils derived from the hills and valleys located to the southwest of the coastline. The alluvial soils overlie the buried coral and sand deposits in the subsurface.

The Natural Resources Conservation Service identifies four soil types in the project area (Figure 3-1):

- **Honouliuli Clay, 0 to 2 percent slopes (HxA):** The Honouliuli series consists of deep, well drained soils that formed in alluvium weathered from basic igneous rock. Honouliuli soils are on lowlands at elevations of 15 to 125 feet. The soils are considered well drained with slow runoff and moderately slow permeability.
- **Makiki Stony Clay Loam, 0 to 3 percent slopes (MIA):** The Makiki series consists of deep, well drained soils that formed in material weathered from alluvium mixed with ash and cinders. Makiki soils are on alluvial fans and terraces at elevations of 20 to 200 feet. The soils are considered well drained with slow runoff and moderately rapid permeability.
- **Ewa Silty Clay Loam, 6 to 12 percent slopes (EaC):** The Ewa series consists of deep, well drained soils that formed in alluvium weathered from basaltic rock. Ewa soils are on alluvial fans and terraces at elevations ranging from sea level to 365 feet. The soils are considered well drained with slow to medium runoff and moderately high hydraulic conductivity.
- **Kaena Clay, 2 to 6 percent slopes (KaB):** The Kaena series consists of deep, poorly drained soils that formed in alluvium and colluvium. Kaena soils are on alluvial fans on steep colluvial slopes at elevations of 50 to 150 feet. The soils are considered poorly drained with slow to rapid runoff and slow permeability.



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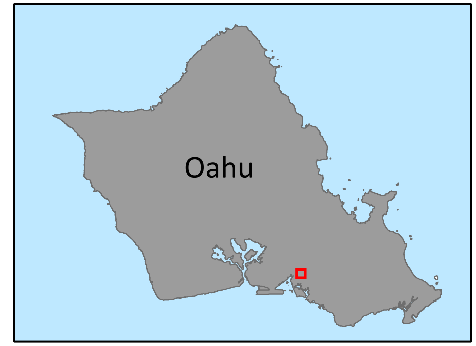
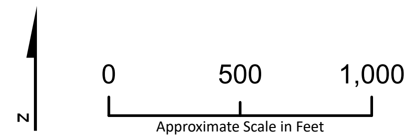




LEGEND

Project Location

Soil Classification

- EaC - Estherville loam and sandy loam 6-12% slopes
- EmA - Ewa silty clay loam, moderately shallow, 0 to 2 % slopes
- FL - Fill land, mixed
- HxA - Honouliuli clay, 0-2% slopes
- KaB - Kaena clay, 2-6% slopes
- KlA - Kawaihapai clay loam, 0-2% slopes
- KlaB - Kawaihapai stony clay, 2-6% slopes
- MlA - Makiki stony clay loam, 0-3% slopes

FIGURE 3-1
Soils
Interstate H1 (EB) Improvements
Ola Lane Overpass to
Likelike Highway Off-Ramp

Jacobs

3.1.2 Potential Impacts and Mitigation Measures

The proposed project is not constrained by geological and topographic site conditions, nor would it affect any unique geological formations. The proposed project would involve short-term land disturbance that may result in waterborne and airborne soil erosion. The erosion potential is relatively low given the limited area of disturbance.

To minimize the potential for construction-related erosion impacts, best management practices (BMPs) would be developed as part of the project's engineering and design and implemented during construction. These are expected to include, but are not limited to, the following:

- Using temporary silt fencing and screens.
- Regular watering of graded areas to reduce the amount of fugitive dust in the air.
- Sodding or planting of slopes immediately after grading work has been completed.
- Restricting the stockpiling of construction material and properly disposing construction debris.

All erosion control measures would comply with the Honolulu County Code for erosion and sedimentation control (Honolulu County Code, Chapter 14, Article 13). Other applicable measures would be specified as part of the NPDES permit obtained from HDOH.

3.2 Climate and Air Quality

3.2.1 Existing Conditions

Climate on Oahu is heavily influenced by terrain and tradewinds. The island consists of two parallel mountain ranges running in the northwestern to southeastern direction, which is perpendicular to the prevailing northeastern trade winds. As a result, the western (leeward) sides of Oahu (including the project area), are drier and warmer than the windward sides of the island. The average maximum daily temperature is approximately 80 degrees Fahrenheit (°F), with an average minimum of 66°F. Mean annual rainfall for this area is approximately 35 inches. Rainfall is typically highest in November and December and lowest from June through August (Giambelluca et al., 2013).

To protect public health and welfare, federal and state ambient air quality standards were developed for the following criteria pollutants: ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) and particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$),[1] sulfur dioxide (SO_2), lead, and hydrogen sulfide (H_2S).[2] The ambient air quality standards represent pollutant concentration levels deemed by the United States Environmental Protection Agency (USEPA) and HDOH to be protective of human health and the environment.

Oahu, like the rest of the state, meets the federal and state ambient air quality standards and is classified as in attainment for all pollutants.[3] HDOH operates a network of air quality monitoring stations around the state to confirm that criteria pollutant levels remain below the ambient air quality standards. Stations typically do not monitor the full complement criteria pollutants. HDOH validates the collected air pollutant data, compares it to the ambient air quality standards, and publishes an annual report confirming that the state remains in attainment.

There are four air quality monitoring stations on the island of Oahu, with the nearest air quality monitoring station to the project area located in downtown Honolulu at 1250 Punchbowl Street, on the roof of the

[1] Federal standards only.
[2] State standard only.
[3] Exceedances of SO_2 and $PM_{2.5}$ have been reported on Hawaii Island, but these are associated with the volcano, which is considered a natural, uncontrollable event.

HDOH building. This station was established in 1971 to monitor air quality in Honolulu, which is primarily affected by commercial, industrial, and transportation activities. Criteria pollutants sampled at this station include CO, SO_2, PM_{10} and $PM_{2.5}$. Table 3-1 presents maximum monitored pollutant concentrations at this location in 2018, all of which were well below the state and federal ambient air quality standards.

Table 3-1. Island of Oahu Honolulu Air Monitoring Station Readings (2018)

Pollutant	Maximum Monitored Concentration	Federal Air Quality Standard (Primary)	State Air Quality Standard
$PM_{2.5}$ (24-hour)	12.1 µg/m^3	35 µg/m^3	None
PM_{10} (24-hour)	29 µg/m^3	150 µg/m^3	150 µg/m^3
SO_2 (1-hour)	0.012 ppm	0.075 ppm	None
SO_2 (3-hour)	0.009 ppm	0.5 ppm [a]	0.5 ppm
SO_2 (24-hour)	0.002 ppm	None	0.14 ppm
CO (1-hour)	1.0 ppm	35 ppm	9 ppm

Source: HDOH, 2018

[a] Federal secondary standard

Notes:

µg/m^3 = microgram(s) per cubic meter
ppm = part(s) per million

In addition to criteria pollutants, emissions of greenhouse gases (GHGs) are regulated to protect public health and welfare. GHGs trap heat in the earth's atmosphere and can occur naturally or originate from human activity. The accumulation of GHGs in the atmosphere influences average atmospheric temperatures over time. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions.

On December 7, 2009, the USEPA signed the Final Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act (CAA). The endangerment finding states that "current and projected concentrations of the six key well-mixed GHGs—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations" and the cause or contribute finding states that "the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare" (USEPA, 2020). The USEPA subsequently implemented GHG standards for vehicles to reduce future GHG emissions from mobile sources.

The USEPA also regulates mobile source air toxics (MSATs). MSATs are compounds known or suspected to cause cancer or other serious health and environmental effects, including but not limited to acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter, formaldehyde, and naphthalene. The USEPA has set standards on fuel composition, vehicle exhaust emissions, and evaporative losses from portable containers with the aim of reducing the total emissions of MSATs.

Air quality in the project area is currently affected primarily by emissions from mobile sources (traffic on H1) and commercial and industrial activities. The primary mobile sources of emissions are all types of vehicles, which generate criteria pollutant, GHG, and MSAT emissions when traveling or idling on roadways within and adjacent to the project limits.

3.2.2 Potential Impacts and Mitigation Measures

3.2.2.1 Short-term, Construction-related Emissions

Short-term impacts on air quality may result from project construction. Impacts could be associated with two common types of pollutants: fugitive dust emissions from vehicular movement and soil excavation, and exhaust emissions from onsite motor vehicles and construction equipment. Overall, air quality impacts are expected to be negligible because the construction period is of limited duration and impacts would be minimized with the implementation of BMPs for dust control and exhaust emissions. In addition, Oahu is in attainment for all criteria pollutants, and maximum pollutant concentrations measured at the nearest air quality monitoring station to the project location are well below the ambient air quality standards (Table 3-1).

Fugitive Dust. BMPs for dust control would be implemented to minimize air quality impacts during the project construction phase. Construction activities would incorporate fugitive dust emission control measures in compliance with provisions of HAR Chapter 11-60.1, Air Pollution Control, Section 11-60.1-33 on fugitive dust. The following measures are expected to be used to control airborne emissions:

- Cover stockpiles with appropriate material; dispose of debris properly.
- Use water, dust fences, disturbance area limitations, and revegetation to minimize dust emissions, as appropriate.
- Keep adjacent paved roads clean.
- Cover open-bodied trucks whenever hauling material that can be blown away.
- Limit the amount of disturbed areas at any given time and stabilize inactive areas that have been exposed.
- Revegetate disturbed areas as soon as practical after construction.
- Stabilize construction entrances to avoid offsite tracking of sediment.

Exhaust Emissions. Engine exhaust emissions from operation of onsite mobile and stationary construction equipment would also affect air quality. Emission impacts would be minimized by requiring the contractor to use vehicles that are properly maintained.

3.2.2.2 Long-term Impacts on Air Quality

Long-term impacts on air quality may result from future freeway operations. Motorized vehicles affect air quality by emitting airborne criteria pollutants, GHGs, and MSATs. Changes in traffic volumes, travel patterns, vehicle mix, and roadway locations affect air quality by changing the number of vehicles and the congestion levels in a given area. The proposed project would widen travel lanes and add an additional through-lane to a 0.7-mile stretch of the H1 eastbound, eliminating a 2-lane merge. These actions are expected to decrease travel times, reduce localized congestion, and shorten vehicle queues, resulting in reduced vehicle idling, lower total vehicle hours traveled, and reduced fuel use. The proposed project would not result in changes to the vehicle mix or freeway location.

According to the transportation impact assessment completed for the proposed project, traffic volumes on the H1 eastbound are expected to grow very modestly through the 2035 long-term analysis year (Appendix A). Capacity constraints from the current freeway configuration would limit potential future traffic growth despite expected increases in future vehicle demand associated with regional land use developments. Low anticipated freeway traffic growth rates also account for the introduction of rail service between Kapolei and downtown Honolulu through the HRTP and the expected corresponding shift from driving on H1 to riding rail between these locations. The proposed project would not affect overall freeway

capacity; therefore, it is expected that long-term impacts on air quality from small increases in traffic volumes over time would be the same with or without the proposed project.

While it would not significantly impact overall freeway congestion, the proposed project would decrease localized congestion. Reduced congestion in the project area would result in improvements to travel time, increased vehicle speeds, and decreased idling time. Vehicle exhaust emissions are higher at low speeds and while idling; therefore, the proposed project would result in decreased emissions of criteria pollutants, GHGs, and MSATs. This conclusion is supported by the estimate of vehicle emission reductions calculated based on the region-wide travel demand model as part of the transportation impact assessment. With the improvements, vehicles would emit nearly 4 percent less CO_2 during the morning commute peak in 2023 as a result of less time spent idling, and an estimated 2.5 percent less by 2035. Even with small increases in traffic volumes over time, the proposed project is expected to reduce overall emissions.

Moreover, USEPA regulations for vehicle engines and fuels will cause overall emissions of criteria pollutants, GHGs, and MSATs to decline significantly over the next several decades. This will reduce background levels of vehicle emissions from surrounding roadways and further reduce the likelihood of even minor, temporary increases in emissions from the proposed project.

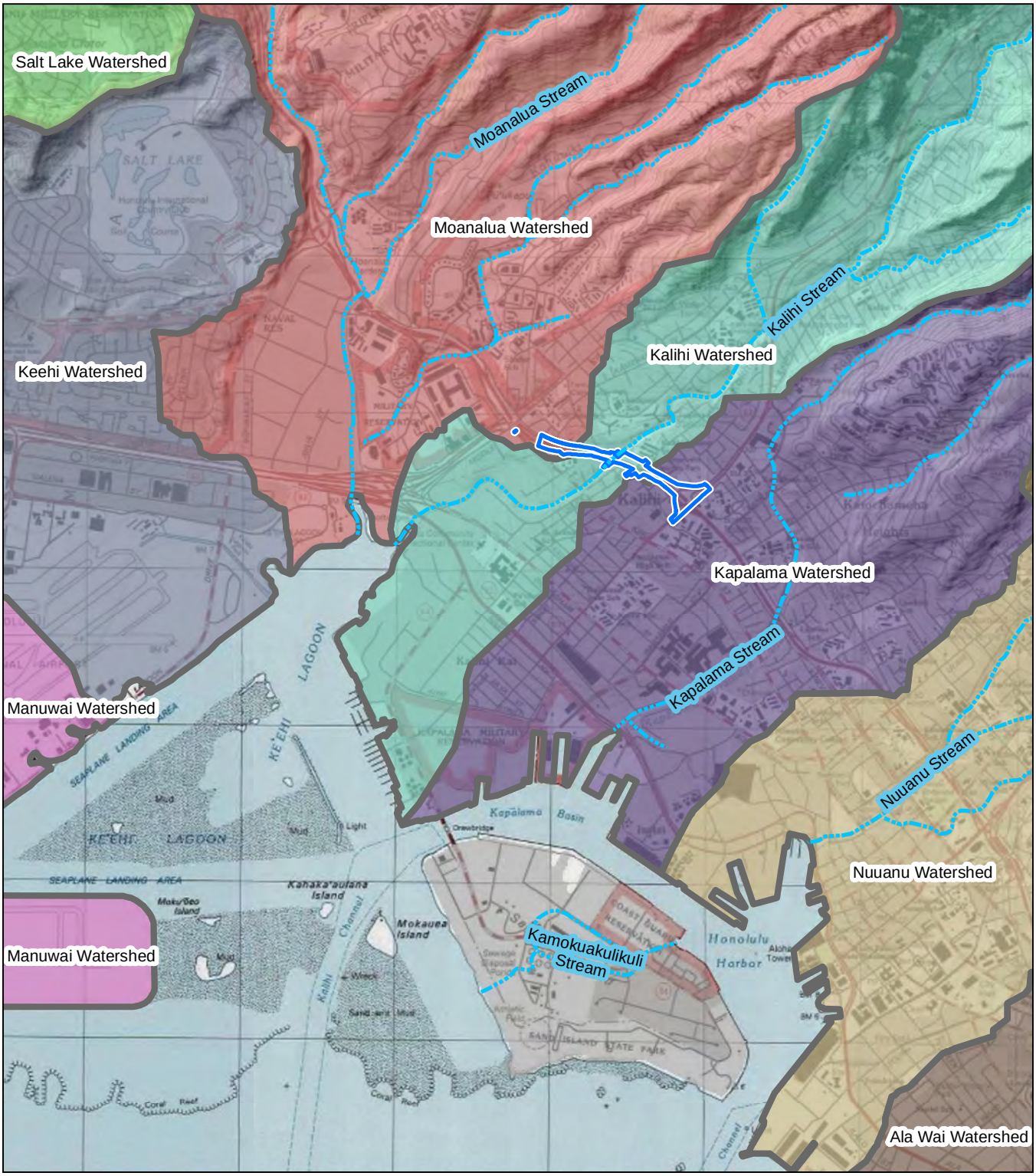
This project would not result in any significant changes in traffic volumes, travel patterns, vehicle mix, roadway locations, or any other factor that would cause an increase in emissions. As such, this project would generate minimal air quality impacts for the CAA criteria pollutants and GHGs, and would not be linked with any special MSAT concerns.

3.3 Hydrology, and Water Quality

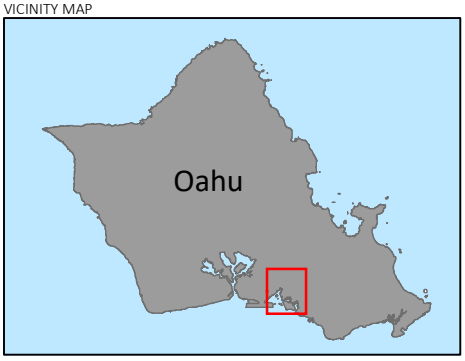
3.3.1 Waters of the United States

Biologists with AECOS Inc. (AECOS) conducted a delineation of waters of the U.S. on April 9, 2020 (Appendix B). Waters of the U.S. or federal jurisdictional waters include tributaries to territorial seas and tidal waters (USACE & USEPA, 2020). The field survey confirmed that Kalihi Stream discharges into Keehi Lagoon, which is a traditional navigable water and therefore jurisdictional by rule. Tributaries (such as Kalihi Stream) are jurisdictional up to the ordinary high water mark (OHWM) of the stream. No other jurisdictional waters, such as wetlands, are present in the project area. The OHWM extends the full width of the channel, out to the concrete and CRM walls that constrain stream flow through the urban corridor. As such, the entire channel within the project area is jurisdictional. Figure 3-2 shows the Waters of the U.S. in and around the proposed project area.

The segment of Kalihi Stream within the project area has a natural bottom that consists of silt-covered boulders and gravel. Stream features within the project area include point bars and built-up sediment deposits that restrict base flow to a narrowed channel within the larger channel in some places. In segments upstream and downstream of the H1 viaduct, base flow is restricted to as much as one-third of the total channel width. Vegetation within the stream channel is characterized by herbaceous species or small shrubs including the giant reed, primrose willow, ung-choi, and California grass. Physical characteristics of flow include litter and debris and matted vegetation along the edges of flowing water.



VICINITY MAP



LEGEND

- Project Location
- Stream
- Watershed Boundary

N

0 0.5 1

Approximate Scale in Miles

FIGURE 3-2

Waters of the United States

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

3.3.2 Clean Water Act, Section 303(d)

HAR Chapters 11-54 and 11-55 outline a number of requirements related to water quality in the state of Hawaii. These include, but are not limited to, an antidegradation policy; designated uses of waters, which must be maintained; water quality criteria, which must be met during construction and operation; and permitting requirements.

The middle reach of Kalihi Stream within the project area is classified as Inland Class 2 (HDOH, 2014a). Use categories classify waters for the purpose of applying the water quality standards, as well as the selection or definition of quality parameters and uses to be protected. Class 2 waters are to be protected for uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. In addition, Class 2 waters are to be protected for agricultural and industrial water supply, shipping, and navigation use (HDOH, 2014b).

The federal CWA requires states to collect and review surface water quality data and related information, and to prepare and submit to the USEPA biennial lists of waterbodies that are impaired (that is, not expected to meet state water quality standards) or threatened. The states identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. The current list, which is included in the 2018 *State of Hawaii Water Quality Monitoring and Assessment Report* (HDOH, 2018), lists Kalihi Stream as impaired and indicates that the stream is in non-attainment for turbidity, nitrate+nitrite-nitrogen (NO_3+NO_2), total nitrogen, and trash.

For all impaired waters, HDOH is required to develop the Total Maximum Daily Load (TMDL), which is the maximum amount of a pollutant (from point and nonpoint sources) that a waterbody can receive and still meet water quality standards, and to establish an allocation of that amount to the pollutant's sources. Because there is a large demand for TMDL calculations, the HDOH has assigned a priority of low, medium, or high to each of the impaired waters listed based on the severity of pollution and how the water is used. Kalihi Stream has been assigned a medium priority.

3.3.3 Potential Impacts and Mitigation Measures

3.3.3.1 Short-term Construction Impacts

3.3.3.1.1 Project-wide Improvements

The project would involve demolition, excavation, grading, and construction. Short-term land disturbance may result in waterborne and airborne soil erosion, but the erosion potential is relatively low given that relatively small areas will be disturbed at a time. To minimize the potential for construction-related erosion impacts, BMPs will be developed and implemented in accordance with Honolulu County Code for erosion and sedimentation control (CCH, 2015) and the City and County of Honolulu *Storm Water Best Management Practice Manual* (CCH, 2011).

If the total construction area disturbance exceeds 1 acre, an NPDES permit will be obtained for discharge of storm water during construction. An approved Storm Water Pollution Prevention Plan will be prepared and held onsite in conjunction with the NPDES permit.

Construction BMPs that will be implemented to protect water quality include the following:

- Manage onsite drainage to minimize sedimentation or other pollution discharges.
- Stabilize all disturbed areas with erosion control measures.
- Revegetate disturbed area, including streambanks, as soon as practicable after construction.

- Stabilize construction entrances to avoid offsite tracking of sediment.
- Fuel land-based vehicles and equipment at least 50 feet away from water bodies, preferably over an impervious surface.
- Develop a spill response plan, maintain spill response equipment and supplies onsite, and train construction personnel in spill response procedures.

3.3.3.1.2 Widening of Kalihi Stream Bridge

BMPs will be developed and employed during construction activities to prevent degradation of water quality in Kalihi Stream. Federal and state permits would be needed for discharges of fill material in regulated waters. The implemented project BMPs will be monitored closely during project construction to ensure that native stream fauna are not adversely impacted by impairments to water quality. Stream flow will be maintained at all times during construction so that migration of native amphidromous species through the area is not impeded.

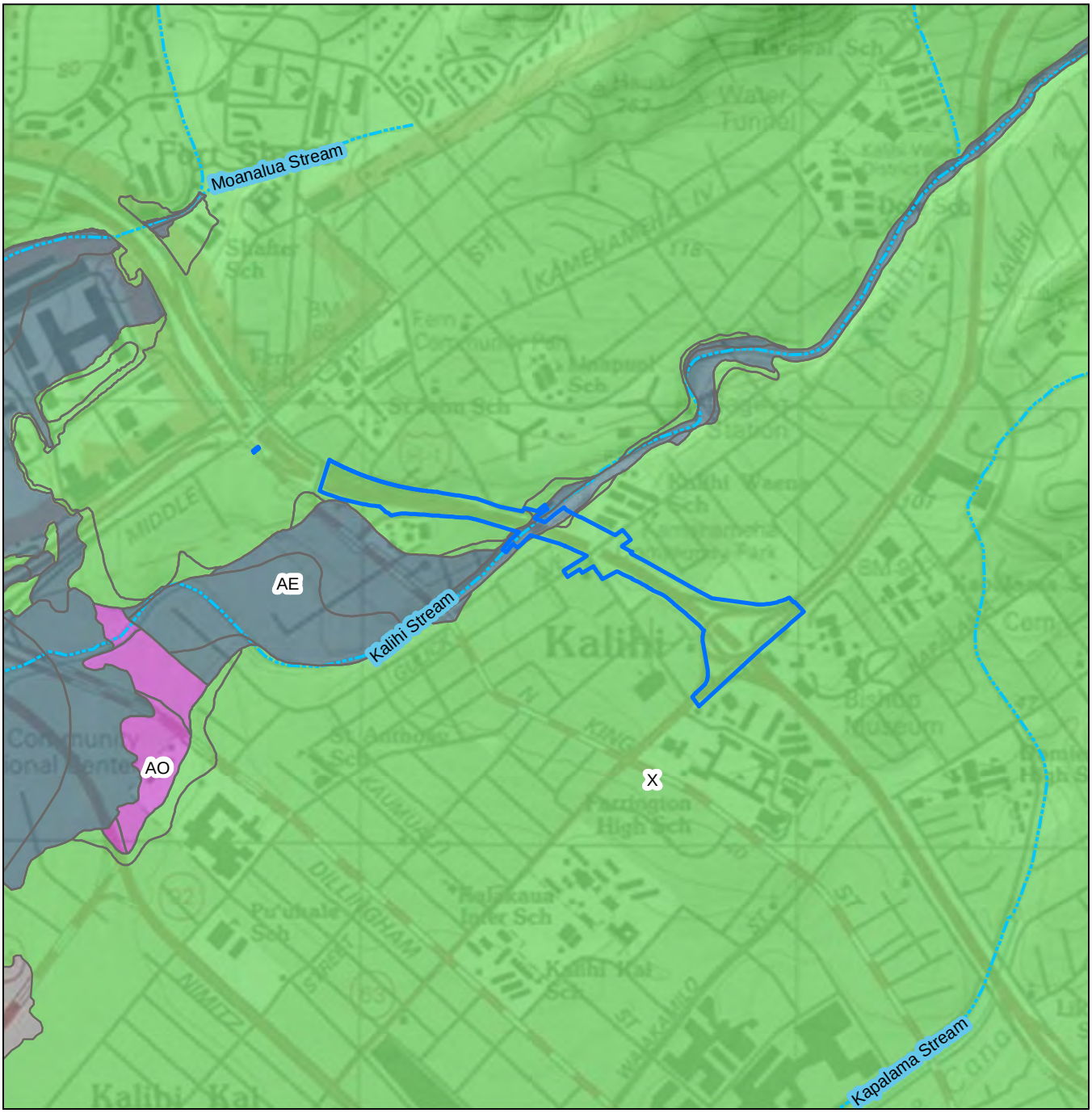
3.3.3.2 Long-term Impacts on Water Quality

All excavated areas during construction would be restored to original conditions; therefore, no permanent changes to the current surface water flow or adverse impacts to water quality associated with storm water runoff is anticipated. Impacts as a result of widening the Kalihi Stream overcrossing would be included as part of the request for the federal and state authorization for discharge in regulated waters. The proposed improvements at Kalihi Stream would not change the existing stream flow pattern or cause any additional erosion to the existing stream channel.

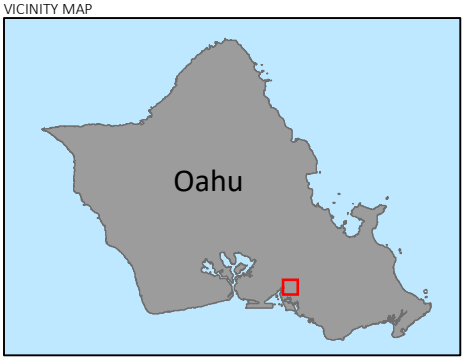
3.4 Natural Hazards

3.4.1 Flooding

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 15003C0353G (effective January 19, 2011), the Kalihi Stream overcrossing is located within the 1 percent annual chance floodplain (Zone AE), where the area must be kept free of encroachment and obstruction so that the 100-year flood can be carried without substantial increases in flood heights. The remaining project area is located in Zone X, which is defined as an area determined to be outside the 0.2 percent annual chance floodplain. The design of the Kalihi Stream overcrossing portion of the project will be required to comply with the National Flood Insurance Program's regulations and requirements. The City and County of Honolulu regulates development within flood hazard districts under Section 21-9.10 of the Revised Ordinances of Honolulu. Figure 3-3 shows the FIRM zones in and around the proposed project area.



VICINITY MAP



LEGEND

Project Location

Flood Hazard Designation Zones

AE - 1% Annual Chance of Flood

AO - 1% Annual Chance of Shallow Flooding Between 1-3 Feet

X - Area of Minimal Flood Hazard

Stream

N

0 1,000 2,000

Approximate Scale in Feet

FIGURE 3-3

Flood Insurance Rate Map

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

3.4.2 Sea Level Rise

HDOT currently does not evaluate the future threat of sea level rise (SLR) when constructing within the coastal zone. The School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii is studying the potential threat of SLR on the islands. SOEST has projected a schedule of global mean SLR based on published best- and worst-case scenarios that SOEST suggests could be adopted in Hawaii in lieu of a local analysis (Table 3-2). Figure 4-2 shows the proposed project area in relation to the state's 3.2-foot SLR exposure area.

Table 3-2. Schedule of Sea Level Rise 2011 to 2100

Sea Level Rise	Worst Case	Best Case
1 foot	2040	2050
2 feet	2050	2070
3 feet	2070	2090

Source: University of Hawaii, n.d.

3.4.3 Tsunami Hazard

The State of Hawaii Emergency Management Agency (Civil Defense) establishes tsunami inundation zones and maps for all coastal areas in Hawaii. The project is not located within a tsunami evacuation zone; the boundaries of the nearest evacuation zone end approximately 0.5 mile southwest of the project area (Pacific Disaster Center, 2010).

3.4.4 Seismic Activity

Oahu is designated Seismic Zone 2A, indicating a location that has a low potential for ground motion created by seismic activity.

3.4.5 Potential Impacts and Mitigation Measures

The design of the Kalihi Stream bridge portion of the project will comply with the National Flood Insurance Program's regulations and requirements and conform to the City no-rise requirement for development within a floodway. The remaining portion of the proposed project would not result in a rise in the 100-year water surface elevations and would meet the requirements for development within a floodway from FEMA and the City and County of Honolulu.

Because of the inland location of the project, no significant impacts relative to or from SLR or tsunamis are anticipated.

The proposed project would be designed to conform to specifications and recommendations for seismic design. Therefore, no significant impacts relative to seismic activity are anticipated with implementation of the proposed project.

3.5 Noise

Because the proposed project would add an auxiliary lane to eastbound H1, it meets the classification of a Type I project as defined in 23 *Code of Federal Regulations* (CFR) 772.5. Therefore, HDOT conducted a quantitative noise analysis in October 2020 (see Appendix C), and the findings of the analysis are summarized in this section.

3.5.1 Existing Conditions

Existing noise sources in the area include vehicular noise associated with transportation on H1 and adjacent streets. Traffic noise levels currently exceed Federal Highway Administration (FHWA) and HDOT noise abatement criteria. Land surrounding the project limits is zoned for apartments and urban residential development. Existing land uses directly adjacent to the project limits contain multiple noise-sensitive receptors, including residences, churches, schools, parks, and a public library. The closest noise-sensitive receptors are residences and a park located about 20 feet *makai* from the nearest H1 eastbound travel lane.

Highway traffic noise is regulated by FHWA's *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR 772) and HDOT's *Highway Noise Policy and Abatement Guidelines* (HDOT 2016). HDOT's noise policy and guidelines were developed to implement the requirements of 23 CFR 772, as well as the noise-related requirements of the National Environmental Policy Act (NEPA). Abatement measures are to be considered if (1) noise levels reach an equivalent continuous sound level (L_{eq}) of 66 L_{eq} (hourly A weighted decibels [dBA]) or higher at noise-sensitive properties or (2) predicted traffic noise exceeds existing noise levels by 15 dBA or more.

The HDOH also regulates noise exposure in the following statutes and rules:

- HRS Section 342F, Noise Pollution.
- HAR Chapter 11-46, Community Noise Control.
- HAR Chapter 12-60.50 part C, State specific standards for Occupational Noise Exposure.

Per HAR Chapter 11-46-4, the maximum daytime permissible sound levels within areas zoned for apartments and urban residential development (Zones A-1 and R-5) are 60 dBA. Construction activities may not exceed the maximum permissible sound levels for more than 10 percent of the time within any 20-minute period, except by permit or variance issued. Per HAR Section 12-60.50, the permissible occupational noise exposure is set at 90 dBA for a continuous 8-hour exposure. Permissible noise exposures for shorter periods are higher, with a maximum exposure of 115 dBA permissible for a duration of 15 minutes or less.

3.5.2 Potential Impacts and Mitigation Measures

3.5.2.1 Construction-related Noise

HDOT's traffic noise analysis did not evaluate noise impacts from the potential detours because HDOT only conducts noise assessments of permanent improvements. Construction noise impacts would be unavoidable, but would be temporary. Noise levels would be a function of the methods employed during each stage of construction. Equipment likely to be used includes a drill rig, crane, excavator, backhoe, front-end loader, grader, forklift, semi-trucks, dump trucks, concrete trucks, compactors, paving equipment, and compressors. Construction equipment noise typically ranges from 70 to 95 dBA, which would exceed permissible levels.

Minimizing these types of noise impacts is possible using standard curfew periods, properly muffled equipment, administrative controls, and construction barriers as required. If nighttime work is required to minimize traffic congestion during the day, noise impacts would be possible at existing residences located adjacent to H1.

In cases where construction noise would exceed or is expected to exceed the state's maximum permissible property line noise levels, a Community Noise Permit would be obtained from HDOH under HAR Chapter 11-46, Community Noise Control. For HDOH to issue a noise permit, the application would describe construction activities for the project. Before issuing the permit, HDOH may require noise

mitigation measures to be incorporated into the construction plans. HDOH may also require the contractor to conduct noise monitoring.

Specific permit restrictions would include the following:

- No construction activities creating excessive noise before 7 a.m. and after 6 p.m. of the same day.
- No construction activities that emit noise in excess of 95 dBA except between 9 a.m. and 5:30 p.m. of the same day.
- No construction activities that exceed the allowable noise levels on Sundays and on certain holidays. Pile driving and other activities exceeding 95 dBA would also be prohibited on Saturdays.

The HDOH noise permit does not limit the noise level generated at the construction site, but rather the times at which high-volume construction can take place.

In addition to the noise permit, a noise variance may be requested from HDOH for specific occasions when work hours would need to be extended into either evenings, weekends, or both to implement the overall construction schedule.

Additional BMPs to minimize construction-related noise would include, but are not limited to, the following:

- The project engineer would coordinate with local residents and businesses to let them know the construction schedule and when high noise producing construction activities can be expected.
- Enforcement of HDOH occupational noise exposure regulations would be the responsibility of the construction contractor. If workers experience noise exceeding HDOH standards, administrative or engineering controls would be implemented. Use of personal protective equipment such as earplugs or muffs may also be required.
- To reduce nearby residential noise exposure, construction activities would be conducted during normal working hours to the extent possible. For any work that would occur after normal working hours (that is, on evenings or weekends), or if permissible noise levels are exceeded, appropriate permitting and monitoring as well as development and implementation of administrative and engineering controls would be employed.
- The contractor is responsible for minimizing noise by properly maintaining noise mufflers and other noise-attenuating equipment, and maintaining noise levels within regulatory limits.

3.5.2.2 Long-term Noise Impacts

HDOT evaluated current and future (2035) traffic noise levels to determine the potential for noise impacts from the proposed H1 project and the need for noise abatement measures. As mentioned in Section 3.5.1, ambient traffic noise levels currently exceed FHWA and HDOT noise abatement criteria. With construction of the new auxiliary lane, traffic noise levels are expected to exceed 66 L_{eq} at over 140 residences and at 2 churches, and 2 parks within 250 feet of H1 by 2035. The maximum estimated noise increase would be about 2.8 dBA; therefore, none of the noise-sensitive receptors would experience an increase of 15 dBA or more. HDOT considers a 3-dBA increase barely perceptible by the human ear.

Because the 2035 noise level analysis indicated that noise-sensitive receptors would be affected by increased traffic noise levels, HDOT subsequently considered the feasibility and reasonableness[4] of noise

[4] Feasibility is defined as a 5-dBA traffic noise reduction for affected noise-sensitive receptors in addition to the determination that each barrier is constructable with respect to safety, height, topography, drainage, utilities, maintenance, and property access. Reasonableness includes two-thirds support of property owners and residents, a maximum barrier cost of $60,000 per benefitted receptor, and a 7-dBA traffic noise reduction for 75 percent of the benefitted front-row receptors.

abatement measures. Construction of noise barriers was found to be unreasonable because only 49 percent of the benefitted front-row receptors would experience a 7-dBA traffic noise reduction.

3.6 Hazardous Materials

3.6.1 Existing Conditions

A regulatory database computerized environmental report (CER) was acquired in the form of an EDR Radius Map Report with GeoCheck. The CER is an evaluation of select federal and state standard source environmental databases to identify sites within a search radius of up to 1 mile. A total of 153 sites were identified within the 1-mile search radius. The review focused on sites with documented releases that either had contamination left in place or that had not been determined to be protective of human health and the environment with regulatory concurrence of no further action required. Three areas (two single sites and one cluster of sites) were identified within one-eighth mile of the proposed project site.

The two single sites appear to be upgradient or crossgradient of the project area. One of the up- or crossgradient sites is the Queen Liliuokalani Hospital, which is a conditionally exempt small quantity generator of hazardous waste. The second up- or crossgradient site was identified as a historical auto station. No release of hazardous substances or regulatory violations has been reported at either site. The third area is a cluster of four sites, two of which are greater than one-eighth mile from the project area. No release of hazardous substances or regulatory violations has been reported for two of the four clustered sites. The remaining two sites in the cluster are identified in several databases, including leaking underground storage tank and institutional and engineering controls databases (that is, sites having restrictions related to contamination that provide protections to health and the environment). One is listed with a regulatory concurrence of No Further Action (NFA) indicating the environmental activities to date are protective of human health and the environment and contamination is likely not migrating off the properties. The last site is also listed NFA but with institutional and engineering controls, and is greater than one-eight mile from the project area. Both NFA sites are downgradient of the project area and are not likely to present a material negative environmental impact for the proposed action. The CER is included in its entirety in Appendix D.

The CER also identified eight orphan sites (that is, sites without adequate location information to identify on a map). NFA letters have been issued for six of the sites, two of which have institutional or engineering controls. The other two sites have ongoing assessments or actions. Based on the status or location of these sites they are not likely to present a material negative environmental impact for the proposed action (HDOH, 2014e).

There is potential for the Gulick Avenue bridge to contain asbestos-containing material (ACM) and lead-based paint (LBP). Potential ACM on bridge structures includes abutment forms, waterproof membranes between the deck and the paving, geo-textiles, asbestos cement pipes and conduits, textured surfaces, and asbestos concrete. LBP may be present in paint chips or waste generated during removal of paint from bulk material, including striping paint grindings from asphalt pavement.

3.6.2 Potential Impacts and Mitigation Measures

Project construction would require the removal, demolition, and rehabilitation of the existing bridge structures. Construction-related activities would also require use of hazardous materials, including lubricants of various weights and viscosities, hydraulic fluid for transportation and construction equipment, cleaning products, and materials used for corrosion protection such as paint or other coatings on exposed steel. Based on the results of the CER, no hazardous materials are anticipated to be encountered within the proposed project site. In addition, the proposed project would not impact the identified sites of potential

concern. However, based on the number of sites identified in the CER, the following measures would be implemented to address potential encounter of hazardous materials during construction:

- A construction management plan will be prepared and implemented that prescribes activities for workers to follow in the event that soil or groundwater contamination is encountered based on visual observation or smell.

Sites identified as having engineering or institutional controls were identified in the CER within 0.125 mile of the project area. The following measure will be implemented to avoid impacts related to these controls:

- If determined applicable, construction would comply with restrictions and requirements related to engineering and institutional controls on nearby sites.

A hazardous materials spill plan would be developed that describes spill prevention measures regarding the location of refueling and storage facilities and the handling of hazardous materials. The hazardous materials spill plan would describe actions to be taken in case of a spill. The contents and requirements of the hazardous materials spill plan include the following:

- The project manager and heavy equipment operators would perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations would be postponed or halted if a leak is detected, and they would not proceed until the leak is repaired and the equipment is cleaned.
- Absorbent material manufactured for containment and cleanup of small hazardous materials spills would be kept at the project site.
- In the event of a large hazardous materials spill or if unanticipated hazardous materials were to be encountered within the project site, the HDOH Hazard Evaluation and Emergency Response Office and HDOT Hazard Evaluation and Environmental Response Office would be contacted immediately.

Hazardous waste generated as a result of removal, demolition, and rehabilitation activities would be managed to the highest and best end use, and in a manner to ensure the protection of human health (that is, of workers, visitors to the site, and the general public) and the environment in accordance with applicable laws, rules, and regulations.

A hazardous waste determination for all anticipated waste would be prepared to determine whether the waste is classified as hazardous waste, universal waste, excluded waste, waste water, or solid waste. Prior to commencement of removal, demolition and rehabilitation activities related to ACM or LBP, all applicable permits will be obtained from and notifications be provided to the federal, state and local permitting and regulatory agencies with jurisdiction over this work. These permits and notifications will be documented in the project files.

A survey would be performed to determine whether ACM, LBP, or both are present. If asbestos is present or suspected, an Asbestos Abatement Plan would be prepared to establish the appropriate protocols for abatement. If LBP is identified, work practices (in accordance with applicable state and federal regulations) would be implemented before LBP removal to contain debris, control airborne dust, and properly dispose of materials with LBP.

3.7 Flora

The entire project area is within a dense urban area where the H-1 improvements and use of detours would occur in previously disturbed and/or developed areas.[5] As such, no significant biological resources are expected to be present in the urbanized areas. The only exceptions are the existing flora and fauna along Kalihi Stream that may be affected by widening the highway bridge over the stream on the *makai*

[5] The plant names used in this assessment follow Wagner, Herbst, and Sohmer (1990), Wagner and Herbst (1999), and Palmer (2003).

side of H1. The following sections on flora and fauna summarize the findings of a natural resources assessment of Kalihi Stream conducted by AECOS (Appendix B). Biologists with AECOS conducted a field reconnaissance survey of Kalihi Stream in the project area on April 9, 2020.

3.7.1 Existing Conditions

Vegetation within the Kalihi Stream channel consists mostly of herbaceous plants dominated by giant reed (*Arundo donax* L.). Within the survey area, including the channel and immediately adjacent upland areas, a total of 55 plant species were observed (see Appendix B for a full list). Most of the plant species (85 percent) are common, naturalized (non-native) species. The remaining plants are native to the Hawaiian Islands. Three indigenous (native to Hawaii and elsewhere) species present include *ʻōali* (*Pteris cretica*), *naio* (*Myoporum sandwicense*), and *pōpolo* (*Solanum americanum*). Five species that are Polynesian or likely Polynesian introductions ("canoe plants") include primrose willow (*Ludwigia octovalvis*), *niu* (*Cocos nucifera*), *ʻape* (*Alocasia macrorhiza*), *kalo* (*Calocasia esculenta*), and banana (*Musa Xparadisiaca*).

The vegetative environment observed in the survey area is not pristine or unique. No native species of concern are present. No plant species proposed for listing or listed as endangered or threatened under either federal or state endangered species statutes were found.

3.7.2 Potential Impacts and Mitigation Measures

Small areas of landscaping or ruderal vegetation may be temporarily disturbed during construction but would be restored following construction to their prior topography and condition. Vegetation disturbed during construction would be replaced as part of the project to the extent practicable.

There are two large mango trees *(Mangifer indica)* located on the *makai* side of the freeway near Kalihi Stream. The trees have an approximate canopy height of 50 feet and canopy width of 20 to 25 feet. The tree canopies may require pruning for construction access to the drilled shafts and abutment on the east side of Kalihi Stream. Additional coordination with the property owner will occur if pruning is required.

The spread of noxious weeds would be managed through the implementation of BMPs. Section 3.8.5 presents requirements for vegetation management to protect wildlife habitat, such as seasonal restrictions for vegetation removal. Because of these mitigation measures, the proposed project is not expected to have a significant adverse impact on botanical resources.

3.8 Fauna

AECOS biologists also investigated the fauna within the project area during the April 9, 2020, field survey, including the presence of known or suspected threatened, endangered, or candidate wildlife species (Appendix B).

3.8.1 Avifauna

A total of 15 species were observed during the survey: chicken (*Gallus gallus*), spotted dove (*Streptopelia chinensis*), zebra dove (*Geopelia striata*), Pacific golden-plover or *kōlea* (*Pluvialis fulva*), cattle egret (*Bubulcus ibis*), rose-ringed parakeet (*Psittacula krameria*), red-vented bulbul (*Pycnonotus cafer*), red-whiskered bulbul (*Pycnonotus jocosus*), Japanese white-eye (*Zosterops japonicas*), common myna (*Acridotheres tristis*), northern cardinal (*Cardinalis cardinalis*), house finch (*Haemorhous mexicanus*), yellow-fronted canary (*Crithagra mozambicus*), house sparrow (*Passer domesticus*), and common waxbill (*Estrilda astrild*).

None of the 15 avian species recorded at the project site from this survey is listed as threatened or endangered under federal or state endangered species statutes. Except for the Pacific golden-plover, the species observed are common, non-native species established in the Hawaiian Islands. The Pacific golden-plover is an indigenous migratory species protected by the Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code [U.S.C.] 703-712), as amended.

Waterbirds species typically associated with a flowing stream were not observed during the survey. However, the stream channel appears to have conditions potentially suitable for waterbird species. While not observed during the field survey, waterbird species which are most likely to use the area include the indigenous *ʻaukuʻu* or black-crowned night-heron (*Nycticorax nycticorax*) and non-native mallard duck (*Anas platyrhynchos*), neither of which is protected.

3.8.2 Mammalian Species

3.8.2.1 Hawaiian Hoary Bat

The Hawaiian hoary bat or ʻōpeʻapeʻa (*Lasiurus cinereus semotus*), which is federally and state listed as endangered, is the only native terrestrial mammal species that still exists within the Hawaiian Islands. A survey specifically for Hawaiian hoary bats was not conducted, but suitable habitat for roosting and foraging was noted during the biological survey. The bats forage in open, wooded, and linear habitats with a wide range of vegetation types. These animals are insectivores and are regularly observed foraging over streams, reservoirs, and wetlands, and up to 300 feet offshore. Hawaiian hoary bats typically roost in dense canopy foliage or in the subcanopy when canopy is sparse, with open access for launching into flight. Hawaiian hoary bats could overfly or use tree species within the vicinity of the project for foraging and roosting on a seasonal basis.

3.8.2.2 Other Terrestrial Mammals

Domestic cat (*Felis catus*), dog (*Canis lupis familiaris*), and small Indian mongoose (*Herpestes javanicus*) were observed during the field survey. No other mammals were observed, but one or more of the four alien *Muridae* species (rats and mice) currently established on Oahu potentially use the area to some extent.

3.8.3 Aquatic Biota

Suckermouth catfish (*Hypostomus cf. watwata*) is the most abundant of the fishes observed in the project area. Poecilids such as liberty/Mexican molly (*Poecilia sp*. hybrid complex [*salvatoris/mexicana* group]) and rainbow guppy (*Poecilia reticulata*) inhabit the shallow waters of the stream. Convict cichlid (*Archocentrus nigrofasciatus*) and koi (*Cyprinus carpio*), which are newly reported species for Kalihi Stream, were also observed during the field survey.

Small (less than 8 centimeters or 3 inches) *ʻoʻopu nākea* (*Awaous stamineus*), an endemic, amphidromous goby, were plentiful at the time of the survey. A single *ʻōpaeʻoehaʻa* (*Machrobrachium grandimanus*), also an endemic species, and several Pacific prawn (*Macrobrachium lar*) were observed in the stream. The endemic *ʻŌpae kalaʻole* (*Atyoida bisulcata*) have been reported from the middle reach of Kalihi Stream (Parham et al., 2008).

3.8.4 Marine Species

Three marine species — the endangered Hawaiian monk seal, threatened green sea turtle, and endangered Hawksbill sea turtle — are unlikely to occur in the project area because suitable habitat does not exist. Therefore, these species are not discussed further.

3.8.5 Potential Impacts and Conservation Measures

3.8.5.1 State and Federally Listed Species

3.8.5.1.1 Seabirds

The protected seabirds Hawaiian Petrel (*Pterodroma sandwichensis*) and Newell's Shearwater (*Puffinus newelli*) nest in upland mountainous habitat and have been recently detected on Oahu (Young et al., 2019). Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, these birds may collide with constructed structures and be either killed outright or injured to become easy prey for feral mammals. If nighttime construction is anticipated, lights would be properly shielded and aimed towards the ground. Outdoor lighting guidelines to avoid deleterious impacts to transiting seabirds will be provided by the DLNR Division of Forestry and Wildlife.

AECOS also surveyed the Kalihi Stream area for white tern (*Gygis alba*), an indigenous seabird listed as threatened under the state endangered species statute. No individuals of this species were observed. The H1 project is outside of the species' known range and nesting occurs in large trees. Therefore, the white term is not likely to nest in the project area.

3.8.5.1.2 Waterbirds

The three ESA-listed waterbird species on Oahu include the Hawaiian common gallinule or *'alae 'ula* (*Gallinula galeata sandvicensis*), Hawaiian coot or *'alae ke'oke'o* (*Fulica alai*), and the Hawaiian endemic sub-species of the blacknecked stilt or *ae'o* (*Himantopus mexicanus knudseni*). These species are rare in the Kalihi Stream area and are unlikely to occur in the project area; however, should an endangered waterbird appear on the project site during construction, work in that area must cease until the animal voluntarily leaves the area.

3.8.5.1.3 Hawaiian Hoary Bats

Insect populations around Kalihi Stream may attract this species. Some tall trees within the stream channel such as gunpowder trees have the potential to serve as roosting sites. Because the species is known to use multiple roosts within a home territory (Bonaccorso, 2015), direct impacts would occur only if juvenile bats too small to fly but too large to be carried by a parent were present in a tree that is trimmed or cut down. The possibility of adversely affecting Hawaiian hoary bats as a result of the proposed project is likely small; however, the following measures would be taken to avoid impacts:

- Any fences erected as part of the project would have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire.
- In general, no trees taller than 15 feet (4.6 meters) would be trimmed or removed 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 need to be cleared during that time period, a qualified biologist would use appropriate protocols to survey for bats before trimming or cutting.

3.8.5.2 Migratory Bird Treaty Act

The Pacific golden-plover or *kōlea* (*Pluvialis fulva)* observed during the field survey at the project site is a bird species federally protected under the MBTA. Construction may temporarily displace the golden plovers, but long-term impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat in nearby areas. The temporary displacement of these individuals at the project site is not expected to affect their survival or the overall species' populations.

3.8.5.3 Aquatic Biota

The lifecycle of the three native amphidromous species observed within the project area or known to occur either downstream or upstream (or both) of the project area requires an unimpeded pathway at the time of their migrations between suitable breeding habitat (usually in the upper reaches of the stream) and the ocean. Kalihi Stream may not provide suitable habitat for these species; however, the project area serves as passageway to more suitable habitats upstream at the least. Construction of the project is not anticipated to permanently alter the stream flow and stream flow will be maintained during construction activities. In addition, BMPs to prevent degradation of water quality in Kalihi Stream will be developed and employed during construction. Implemented BMPs will be monitored closely to ensure that impairments to water quality are prevented to avoid potential adverse impacts to aquatic resources. As such, no impacts to the native amphidromous species are anticipated.

3.9 Archaeological Resources

3.9.1 Existing Conditions

Cultural Surveys Hawaii, Inc. (CSH) conducted a historical, cultural, and archaeological background literature research and a field inspection of the proposed project area, as shown on Figure 3-4. The CSH report is included in Appendix E.

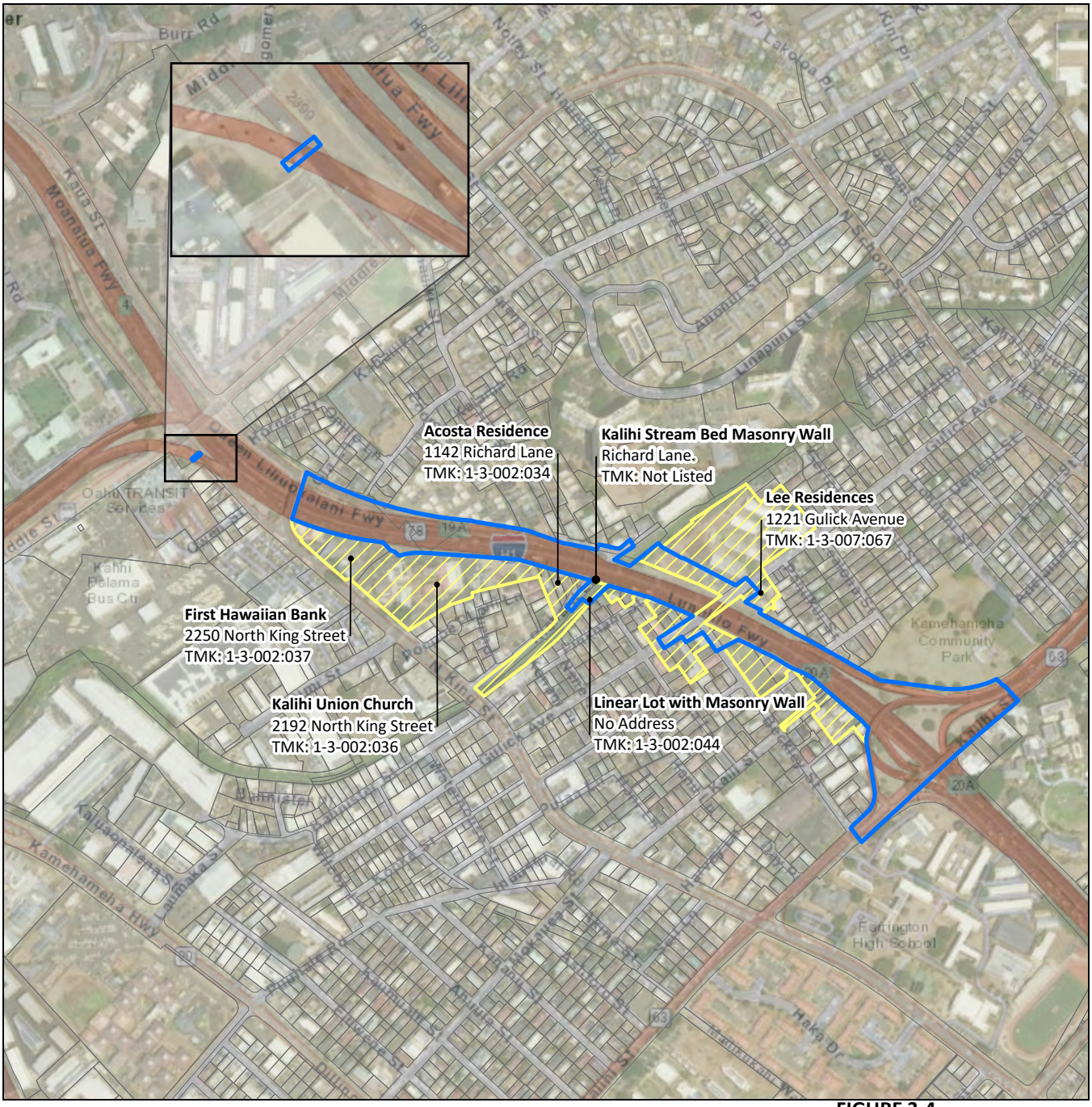
The project area is within the *ahupua'a* (traditional Hawaiian land unit) of Kalihi, which has traditionally been divided into three sections: Kalihi Kai (seaward Kalihi), Kalihi Waena (middle Kalihi), and Kalihi Uka (upland Kalihi). The project is located in Kalihi Waena, which is the area between King Street and School Street. Land Commission Awards (LCAs) records indicate that the majority of Hawaiians in the *ahupua'a* were living relatively close to Kalihi Stream, *mauka* of present-day Dillingham Boulevard and *makai* of the confluence of Kalihi and Kamanaiki streams. Most Kalihi LCAs consisted of several *lo'i* (irrigated taro patches), *kula* (dry fields for pastures and dry-land crops), and a house lot.

Background research and review of previous archaeological studies conducted in the vicinity of the project area indicate that although the Kalihi *ahupua'a* contained areas used for Hawaiian agriculture and habitation during pre-Contact and early post-Contact periods, no archaeological properties have been documented in close proximity to the project. The project area is evaluated as having been very extensively altered by excavation in the process of prior road construction—particularly for the construction of the H1 ca. 1959. Subsurface historic properties, however, including cultural layers related to wetland agriculture and Hawaiian habitation and trash pits related to historic residence and commerce in Kalihi, may be present in some areas where past excavation activities for the freeway construction have been minimal.

3.9.2 Potential Impacts and Mitigation Measures

As no archaeological resources were identified within the project area, no impacts to archaeological resources are anticipated as a result of project implementation. Section 3.10 discusses the historic architectural resources within the project area. No further archaeological fieldwork is proposed for this project.

Although the field inspection showed that the project area is largely within a graded and filled area due to earlier freeway construction, some portions of the project area may warrant archaeological monitoring where excavations for bridge footings or piers and retaining walls have the potential to disturb the original ground surface below the fill. Monitoring may also be warranted in areas where the freeway improvements will encroach on the Kalihi Union Church property and will require soil removal from the original ground surface.



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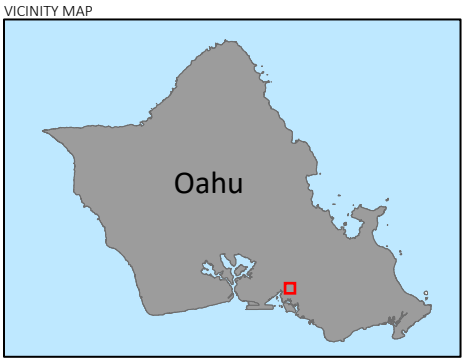


LEGEND

Proposed Project Area (25.01 acres)

Historic Architecture Study Area

FIGURE 3-4
Cultural Resources
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

N

0 500 1,000

Approximate Scale in Feet

Jacobs

If required, an archaeological monitoring plan will be prepared and submitted to the SHPD for approval prior to commencement of project construction. If cultural resources or human remains are inadvertently discovered during construction, the contractor would comply with state law and administrative rules for handling them.

3.10 Historic Architectural Resources

3.10.1 Existing Conditions

Properties within the project's Area of Potential Effect were evaluated for their eligibility to the Hawaii Register of Historic Places and the National Register of Historic Places by Mason Architects in June 2020; a copy of the reconnaissance level survey (RLS) form is contained in Appendix F. Of the 34 properties evaluated, 6 properties were identified as eligible for the Hawaii Register of Historic Places (Table 3-3 and Figure 3-4).

Table 3-3. Historic Properties within the Project Area

TMK	Resource Name	Street Address	Year Built
[1] 1-3-002:037	First Hawaiian Bank	2250 North King Street	1960
[1] 1-3-002:036	Kalihi Union Church	2192 North King Street	1957
[1] 1-3-002:034	Acosta Residence	1142 Richard Lane	1900
[1] 1-3-002:044	Linear Lot with Masonry Wall	Richard Lane	Unknown (ca. 1930s)
Not Listed	Kalihi Stream Bed Masonry Wall	Richard Lane	Unknown (ca. 1930s)
[1] 1-3-007:067	Lee Residences	1221 Gulick Avenue	1923

Note: ca. = circa

First Hawaiian Bank, Kalihi Union Church, and the Acosta and Lee residences were determined to be eligible for listing on the Hawaii Register of Historic Places under Criterion C for their distinctive design or physical characteristics (that is, architecture, landscape architecture and/or engineering). In addition to being eligible for listing on the Hawaii Register of Historic Places under Criterion C, the masonry wall along the linear lot and along the Kalihi Stream bed were determined to be eligible under Criterion A for their association with historic events or activities.

As part of the archaeological literature research and field inspection of the project area conducted by CSH (Appendix E), the conditions of the masonry walls along the linear lot and along the Kalihi Stream bed were documented. The masonry wall along the linear lot corresponds to the channelization wall on the west side of Kalihi Stream, whereas the wall described as the 'Kalihi Stream bed masonry wall' is the channelization wall on the east side of the stream.

Both walls are typically constructed of split, dressed, basalt rocks set in cement matrix showing quality workmanship and understood to be more than 50 years old. The channelization wall on the east side of the stream was documented to be in good condition with little recent alteration. The exception is a 2- to 3-foot section where the wall abuts the existing freeway footing; this section of the wall was observed to have been reworked at the time of the H1 freeway construction.

The wall on the west side of Kalihi Stream was observed to have been altered to a much greater extent to accommodate the existing freeway footing. Other additional alterations on the wall were observed with section of the wall cemented over or completely replaced by cement wall. The integrity of the wall near the H1 freeway has been lost on this side.

3.10.2 Potential Impacts and Mitigation Measures

Two (2) of the six (6) historic properties are located within the proposed project area: (1) the Masonry Wall, located between Richard Lane and the ʻEwa bank of Kalihi Stream (TMK: 1-3-002:044), and; (2) the Kalihi Stream Bed Masonry wall along the Diamond Head bank of the stream (no TMK number available). The project will remove approximately 15 linear feet of each masonry wall to accommodate the proposed concrete overpass abutments and foundations. The top of the masonry wall on the west embankment adjacent to Richard Lane will require a notch of 2′-0″ high by 6″-0″ long to accommodate the new corbel for the bridge support column. The balance of the west embankment wall and the masonry wall on the east embankment will be reconstructed with the existing stone in accordance with the Secretary of the Interior's Standards for Rehabilitation. According to Mason Architects, the minor alteration of less than 12 square feet of west masonry wall below the bridge deck does not meet the criteria for adverse effect.

The parcel of land (TMK 1-3-002:036) containing one (1) of these six (6) properties, the Kalihi Union Church, Sanctuary Building, located at 2192 N. King Street will be affected by the proposed project, but according to Mason Architects, the proposed minor alteration of less than 40 square feet of the parcel boundary does not meet the criteria for adverse effect.

Three (3) properties eligible for listing are not within the proposed project area and would not be affected by the project. These three properties are the First Hawaiian Building, Acosta Residence, Lee Residences.

3.11 Cultural Resources

3.11.1 Existing Conditions

The archaeological literature review (Appendix E) conducted by CSH included historical and cultural background research to consider the effect of the proposed project on cultural beliefs, practices, and resources. The assessment included archival research of relevant background history, *kaaoʻ* (legends), traditional *moolelo*ʻ (stories), *wahi pana* (storied places), *ʻōlelo noʻeau* (proverbs), *oli* (chants), and traditional cultural practices.

3.11.2 Potential Impacts and Mitigation Measures

Cultural resources and practices are not expected to be affected because of the project location. For safety reasons, pedestrian access is prohibited within the freeway corridor. If cultural resources or human remains were inadvertently discovered during construction, the contractor would comply with state law and administrative rules for handling them.

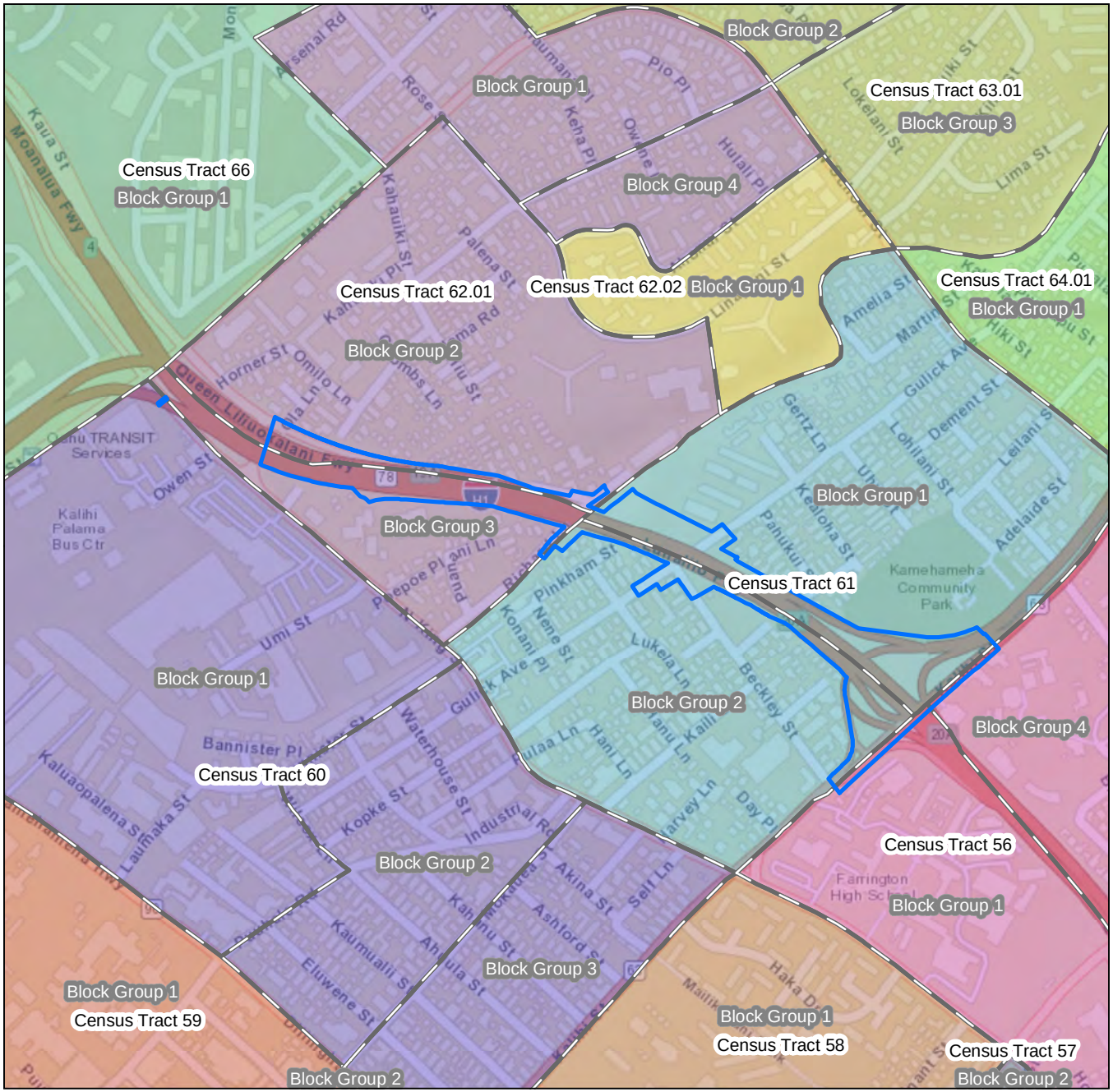
3.12 Population and Demographic Factors

3.12.1 Existing Conditions

The proposed project is in the northern part of Kalihi, which includes the following census-defined geographies from the 2015 U.S. Census, as shown on Figure 3-5:

- Census Tract 62.01 (Block Groups 2 and 3).
- Census Tract 62.02 (Block Group 1).
- Census Tract 61 (Block Groups 1 and 2).
- Census Tract 56 (Block Groups 1 and 4).

The areas around the project are characterized by residential neighborhoods, including multi-family complexes, smaller single-family and duplex residences, and associated public services and institutions.



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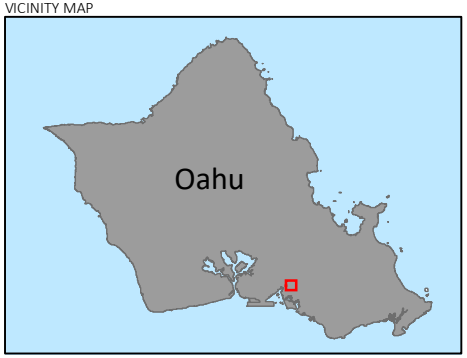


N

0 500 1,000

Approximate Scale in Feet

LEGEND

Project Location

2015 Census Block Boundary

FIGURE 3-5

Census Block and Tract Area Boundaries

Interstate H1 (EB) Improvements
Ola Lane Overpass to
Likelike Highway Off-Ramp

Jacobs

Table 3-4 summarizes the demographic characteristics, including minority and low-income populations of the census block groups surrounding the project area. Data were obtained from the USEPA (2019) EJSCREEN, an environmental justice mapping and screening tool that provides a nationally consistent dataset and approach for combining environmental and demographic indicators. The source of all demographic data used in EJSCREEN is the American Community Survey (ACS) 5-year summary file compiled yearly by the U.S. Census Bureau. The latest available version, EJSCREEN 2019, uses the 2013-2017 ACS 5-year summary file data (U.S. Census Bureau, 2018).

Table 3-4. Demographic Characteristics, Selected Census Block Groups

Block Group	Area	Total Population	Minority Population	Low-Income Population	Demographic Index [a]
Census Tract 62.01, Block Group 2	Kalihi	2,544	98%	53%	76%
Census Tract 62.01, Block Group 3	Kalihi	375	100%	1%	51%
Census Tract 62.02, Block Group 1	Kalihi	1,578	96%	80%	88%
Census Tract 61, Block Group 1	Kalihi	1,912	97%	37%	67%
Census Tract 61, Block Group 2	Kalihi	2,654	99%	7%	53%
Census Tract 56, Block Group 1	Kalihi	2,961	99%	38%	68%
Census Tract 56, Block Group 4	Kalihi	1,059	91%	20%	56%
State Average	-	-	78%	24%	51%
National Average	-	-	39%	33%	36%

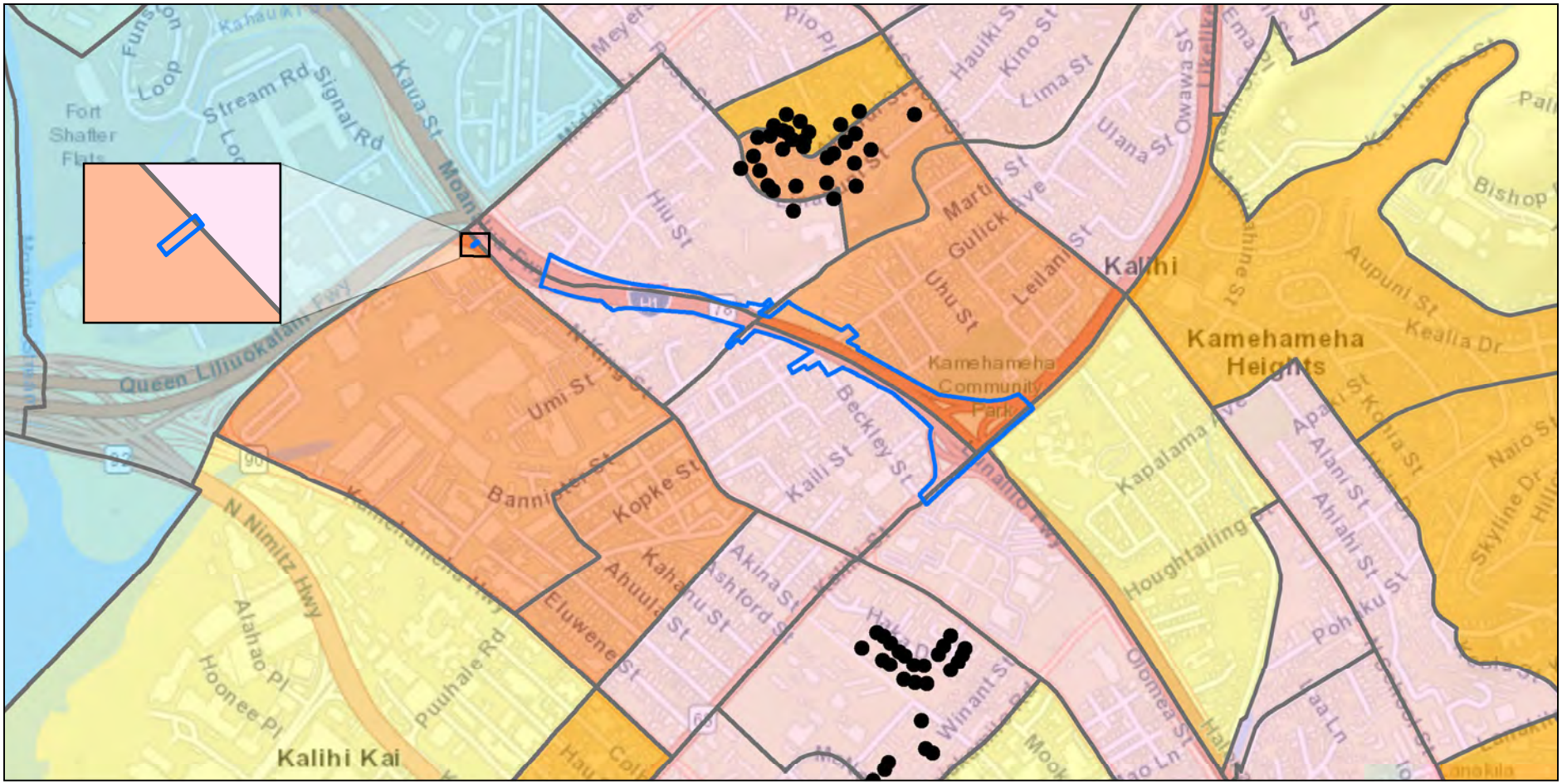
Source: USEPA EJSCREEN, Environmental Justice Screening and Mapping Tool (Version 2019). Data used in the screening tool is based on the U.S. Census Bureau, 2013-2017 American Community Survey 5-year Summary file data.
[a] Demographic index is the average of the minority and low-income population percentages.

Minority and low-income populations are defined as the following per Executive Order (EO) 12898, which addresses environmental justice issues:

- Low-Income: The number or percentage of a block group's population in households where the household income is less than or equal to twice the federal poverty level.
- Minority: The number or percentage of individuals in a block group who list their racial status as a race other than White alone and/or list their ethnicity as Hispanic or Latino; that is, all people other than non-Hispanic White-alone individuals. The word "alone" in this case indicates that the person is of a single race, because multiracial individuals are tabulated in another category. A non-Hispanic individual who is half White and half American Indian, for example, would be counted as a minority by this definition.

Much of the population in areas surrounding the project are minority populations, with the percentage of minority populations above the state and national averages. The percentage of low-income populations varies among the census block groups, with Census Tract 62.01, Block Group 2, and Census Tract 62.02, Block Group 1, having the highest percentage of low-income populations. These areas include publicly subsidized apartments (such as Kuhio Park Terrace), possibly contributing to the high rate of low-income populations.

The EJSCREEN mapping tool reports or maps percent minority and low-income populations as percentiles to allow data to be viewed in perspective and to identify areas with relatively high or low values compared to the rest of the nation or within the state. Figure 3-6 and Figure 3-7 show the state percentiles of minority population and low-income population, respectively, by census block groups in areas surrounding the proposed project. Consistent with the findings from Table 3-4, Figure 3-6 shows that areas surrounding the proposed project have high rates of minority populations. Figure 3-7 shows that areas with high rates of low-income population correspond with areas where public housing are located.



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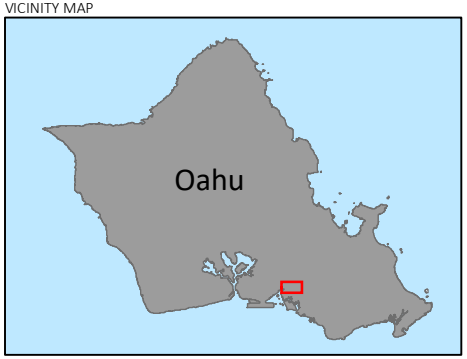

LEGEND

- Project Location
- **Minority Populations**
- 50-60 percentile
- 60-70 percentile
- 70-80 percentile
- 80-90 percentile
- 90-95 percentile
- 95-100 percentile
- Public Housing

N

0 500 1,000

Approximate Scale in Feet

FIGURE 3-6
Minority Populations
Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

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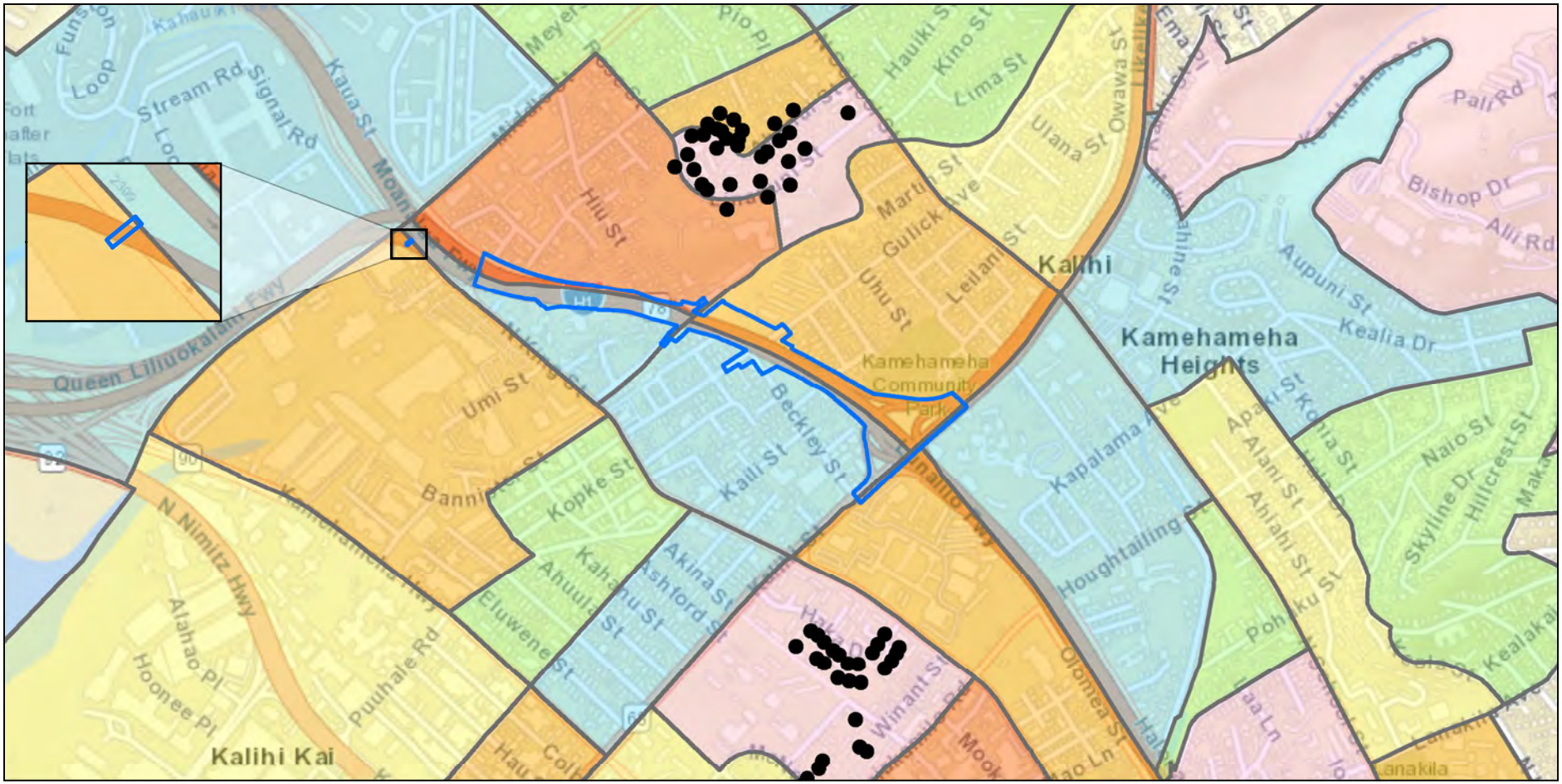

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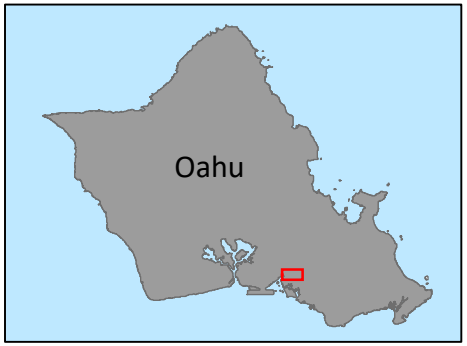

LEGEND

- Project Location
- **Low Income Populations**
- 50-60 percentile
- 60-70 percentile
- 70-80 percentile
- 80-90 percentile
- 90-95 percentile
- 95-100 percentile
- Public Housing

N

0 500 1,000

Approximate Scale in Feet

FIGURE 3-7

Low-Income Populations

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

3.12.2 Potential Impacts and Mitigation Measures

The proposed project would widen a portion of the H1 freeway to alleviate eastbound congestion during morning and afternoon commute periods and to address worsening congestion levels in the future. Therefore, the project is not expected to affect the number of area residents or demographic characteristics.

Construction impacts (for example, fugitive dust, noise, and temporary detours and traffic delays), would be unavoidable but would be temporary and will be minimized with the implementation of the mitigation measures and BMPs described in Section 3.2, Climate and Air Quality, Section 3.5, Noise, and Section 3.16, Roads and Traffic. Access to residences and businesses would be maintained throughout construction. Section 3.16, Roads and Traffic, details detour routes for highway, local, and bicycle and pedestrian traffic.

The proposed project is not expected to result in disproportionately high and adverse effects to minority or low-income populations surrounding the project area. The project would not result in the displacement of any residences, businesses, or community resources.

Although construction-related impacts (for example, detour routes, noise, and fugitive dust) would gave a nuisance effect on neighboring land uses, including minority and low-income neighborhoods adjacent to the project limits, impacts would be short-term in duration and would be minimized with the implementation of the BMPs described in Section 3.2, Climate and Air Quality, Section 3.5, Noise, and Section 3.16, Roads and Traffic. Construction impacts would also be offset by the long-term benefits associated with the project improvements, such as improved traffic delays and congestion within the subject portion of the H1 freeway. Right-of-way acquisitions required for the project would not require relocation of current residents or existing businesses. In addition, no substantial visual effects would occur once the project is completed.

Based on the above discussion and analysis, the proposed project would not cause disproportionately high and adverse effects on the social, cultural, health, and well-being of the identified minority or low-income populations in accordance with the provisions of EO 12898 and FHWA Order 6640.23. No further environmental justice analysis is required.

3.13 Economic and Fiscal Resources

3.13.1 Existing Conditions

Honolulu serves as the major business and trading center for the Hawaiian Islands; Honolulu Harbor handles cargo for several international steamship companies and is within a successful Foreign Trade Zone. Other elements of Honolulu's economic base include tourism, military defense, research and development, and manufacturing. Pearl Harbor Naval Shipyard, Marine Corps Base Hawaii in Kaneohe, and the U.S. Army’s Schofield Barracks provide continuous revenue to the region. As the home of the University of Hawaii at Manoa, Honolulu is a center for research and development, especially in the areas of oceanography, astrophysics, geophysics, and biomedicine. Urban Honolulu also contains many commercial, industrial, and retail properties. Diversified agriculture (for example, aquaculture) has grown in recent years as the closure of sugar plantations has opened up land for productive use as well as conversion to residential and commercial development.

The proposed project is located in the Kalihi-Palama community, one of the first areas to be developed on Oahu. In 2004, the City and County of Honolulu adopted an Action Plan for the revitalization of the area (DPP, 2004). The Kalihi-Palama area has a diverse economic base, from large industrial areas and Honolulu Harbor to many small businesses. The area also has institutions such as the Oahu Community

Correctional Center, the Honolulu Community College, Lanakila Health Center, and the Bishop Museum. Approximately 50 percent of Oahu's public housing stock is located in Kalihi-Palama.

According to the U.S. Bureau of Labor Statistics' Honolulu Area Economic Summary (2020), the largest industries in terms of jobs are government (89,700); trade, transportation, and utilities (74,200); leisure and hospitality (33,600); professional and business services (52,900); and education and health services (62,600). The number of jobs in the leisure and hospitality sector declined by 55.4 percent between April 2019 and April 2020, reflecting the effects of the COVID-19 pandemic that caused a halt in the tourism and hospitality industry in Honolulu. Similarly, the overall employment rate dropped by 18 percent between the same period, with the unemployment rate in Honolulu in April 2020 at 20 percent (U.S. Bureau of Labor Statistics, 2020). Median household income for the period 2014 and 2018 was $60,293 (U.S. Census Bureau, 2019).

3.13.2 Potential Impacts and Mitigation Measures

3.13.2.1 Economic Impacts

The proposed project is anticipated to have several types of economic impacts. One type is construction-related employment and income. With a preliminary estimated cost of $42.5 million, the project is expected to support a number of construction workers for the duration of the project (approximately 13 months). Unless the economy expands significantly and existing firms are working at full capacity, this project is more likely to help sustain existing employment and income levels than to create new jobs. However, because a portion of project funds are coming from (federal) sources outside the region, wages paid to workers on this project (direct income), payments to suppliers (indirect income), and their subsequent expenditures (induced income) would have positive cumulative impact as monies circulate through the local economy.

3.13.2.2 Fiscal Impacts

- The project is expected to be constructed with a combination of federal and state funds. The project is part of the STIP.
- Ongoing maintenance will be performed through HDOT's asset management plan and operations and maintenance budget. The improvements and modernization of the Gulick Avenue bridge and the Kalihi Stream overcrossing will extend the life of these structures, with reduced near-term maintenance costs.

3.14 Visual and Aesthetic Resources

3.14.1 Existing Conditions

The viewshed along the project alignment is mostly limited by the high retaining wall or vegetated slope that lines the H1 freeway. Some openings exist where the retaining walls are low enough to view the residential properties from the freeway; however, no significant landmarks or scenic views exist along the project alignment.

3.14.2 Potential Impacts and Mitigation Measures

The project would result in visual changes for drivers traveling along the subject portion of the H1 freeway; however, the features of the widened freeway would be substantially similar in character to the existing structures as the retaining walls, and vegetated slopes would be restored once the improvements of the freeway has been completed. The features of the widened Gulick Avenue bridge and the Kalihi Stream overpass would also match the existing structures; as such, no significant changes to the visual appearance

of these structures are anticipated. The project site is also not highly visible from areas outside the project site's immediate vicinity; therefore, the project would not result in any impacts to the overall view of the H1 freeway from outside areas.

The project could result in temporary visual impacts during the construction period as a result of heavy equipment and machinery at the project site and additional vehicles traveling throughout construction areas. However, these impacts would be considered less than significant because they would be minimal and temporary.

3.15 Land Use and Right-of-way

3.15.1 Existing Conditions

The State of Hawaii Land Use Commission has classified land within and adjacent to the project in the Urban District, and it is zoned R-3.5 and R-5 Residential by the City and County of Honolulu. Kalihi Waena Neighborhood Park, where the temporary pedestrian bridge will touch down and where a temporary construction easement will be required, is zoned P-2 General Preservation. Several other small parks and schools, businesses, and other community resources are also located along H1 within 0.5 mile of the project limits. Land uses surrounding the project limits are shown on Figure 2-2.

3.15.2 Potential Impacts and Mitigation Measures

The project involves improvements the H1 freeway within the existing HDOT right-of-way; no change to land use or zoning designations would be required. Permanent acquisition of approximately 40 square feet is required from the northern section of the Kalihi Union Church Property (TMK: 1-3-002:036) to expand a pinch point in the right-of-way. In addition, approximately 52,310 square feet (1.20 acres) of land would be needed from for temporary easements throughout the project area for access to construction areas.

3.16 Roads and Traffic

3.16.1 Vehicular Traffic

Interstate H1 is the primary regional access through downtown Honolulu. The H1 freeway within the project area (also known as Lunalilo Freeway) is classified as an Urban Principal Arterial – Interstate by HDOT. With the current lane configuration, a 2-lane on-ramp from H1 eastbound (Queen Liliuokalani Freeway) meets a 3-lane H201 (Moanalua Freeway) under the Ola Lane overpass. Vehicle friction occurs as drivers from the left-side lane of the H1 on-ramp must merge with the right-side lane from H201. Vehicles continue eastbound on four 10-foot-wide lanes. Between Middle Street and the Likelike Highway off-ramp, the freeway has four general purpose lanes and a posted speed limit of 45 mph.

3.16.2 Bicycle and Pedestrian Traffic

The Gulick Avenue bridge is currently used by bicyclists and pedestrians crossing over the H1 freeway (in addition to vehicular traffic). Many students walking to and from homes on the *mauka* side of the freeway use the bridge to commute to Farrington High School on the *makai* side of the freeway and approximately 0.3 mile east of the bridge. Students on the *makai* side of the freeway also use the bridge to commute to Kalihi Waena Elementary on the *mauka* side of H1, just north of the Gulick Avenue bridge.

3.16.3 Public Transit

Public transit services on Oahu are provided by the City and County of Honolulu Department of Transportation Services. The Department operates TheBus, which offers fixed-route transit service island wide, and TheHandi-Van, a public service for persons who are unable to use TheBus. TheBus provides fixed-route transit service and paratransit service between designated park-and-ride lots and transit stops on Oahu.

Within the study area, Bus Route A – CityExpress operates along Middle Street and North King Street with stops at the Kalihi Transit Center, Gulick Avenue, and Kalihi Street. This route provides regional service between Waipahu and the University of Hawaii at Manoa with trips running from approximately 5 a.m. to 10 p.m in both directions, with varying headways.

Bus Route 1 and Bus Route 1L also provide local weekday and weekend/holiday service along Middle Street and North King Street. These routes operate between the Kalihi Transit Center and Hawaii Kai from approximately 4 a.m. to 1 a.m. in both directions, with varying headways. Bus Route 1L operates with limited stops and roughly 10 minute headways in both directions on weekdays only.

Along Middle Street and North School Street, Bus Route 2 and Bus Route W3 provide local weekday and weekend/holiday service around the clock with varying headways. Bus Route 2 travels between Kalihi Transit Center and Kapiolani Community College with stops in downtown Honolulu and Waikiki. On weekdays between 6 a.m. and 6 p.m. headways in both directions are roughly 10 minutes. Bus Route W3 provides express service between the same destinations but travels on H1 east of Liliha Street. Express service includes two runs eastbound in the morning and two runs westbound in the afternoon.

Bus Route 7 provides local service in Kalihi Valley between Kalihi Uka and Kalihi Valley Homes. The route travels south from Kalihi Valley Homes on Kamehameha IV Road to North School Street, Middle Street, and North King Street. It continues east on North King Street with a short diversion to Nimitz Highway before continuing north on Kalihi Street, across H1, to Iwaho Street in the upper valley. This route provides local weekday and weekend/holiday service from approximately 5 a.m. to midnight in both directions, with varying headways.

Transit service is not provided on Gulick Avenue between North King Street and North School Street.

3.16.4 Potential Impacts and Mitigation Measures

A transportation impact assessment was conducted to describe existing vehicular traffic conditions and evaluate anticipated future traffic operations. Future analysis included traffic operations on the H1 freeway following completion of the project, as well as on local streets within the vicinity of the project during construction (Appendix A). The following sections summarize the findings of the assessment.

3.16.4.1 Short-term Construction-related Impacts

Short-term impacts during freeway improvements include minor changes to traffic patterns, traffic volume, and travel times during construction. The arrival and departure of construction crews and the periodic movement of construction vehicles and materials for staging may cause short-term increases in traffic volume and the traffic delays on the H1 freeway. Effects on transit are anticipated to be similar to the effects on general purpose traffic described here.

Work proposed on the Gulick Avenue bridge structure will be completed prior to construction activities on the H1 freeway mainline. For approximately 2 months during the summer, the current Gulick Avenue bridge will be closed to all vehicle traffic and nonmotorized users in both directions. The intersection of

Gulick Avenue and Beckley Street will also be closed to all but local residential traffic. A temporary pedestrian bridge will be constructed to the east of the existing bridge to allow nonmotorized users to cross the freeway, but vehicular traffic will be directed to alternate detour routes via Kalihi Street or Middle Street. Detour routes have been developed to address access needs for local traffic. Detour routes are presented in detail in the traffic impact assessment (Appendix A).

To assess potential changes in peak hour traffic operations from project construction activities, seven study intersections on Kalihi Street, Middle Street, and Gulick Avenue were analyzed during the anticipated construction year (2022), both with and without the Gulick Avenue bridge closure. Even without the bridge closure or the H1 eastbound improvements, traffic volumes are expected to increase slightly compared to the existing condition by the year 2022 as a result of in-progress developments and background traffic growth.

With the bridge closure, the majority of traffic would be prohibited from using the bridge as well as the Gulick Avenue and Beckley Street intersection. The results of the traffic impact assessment show that detoured vehicles during the temporary closure are not expected to significantly affect study intersections during the AM or PM peak hours compared to conditions without construction in 2022. Certain intersections would experience some additional vehicle delay as vehicles detour to nearby streets and surrounding intersections. The average vehicle delays at the seven intersections studied range from 0.2 second to 11 seconds during the AM peak hours and from 0.4 second to 63.7 seconds during the PM peak hours. These temporary changes in traffic conditions do not worsen the LOS at any of the study intersections. LOS is a qualitative measure used to describe the operating conditions of a roadway, ranging from A (excellent) to F (failure). As part of the analysis conducted in the assessment, vehicle trips were rerouted from Gulick Avenue to detour paths based on assumed trip origins and destinations. Actual trip patterns during the temporary closure will likely vary as drivers actively adjust to the temporary peak hour operations and change their trip path or trip start time to avoid congestion.

No mitigation is recommended at the local street intersections during the Gulick Avenue bridge closure, as effects would be temporary and intersections are expected to operate similarly with or without detoured traffic. Once the construction activities are complete and the Gulick Avenue bridge and the intersection of Gulick Avenue and Beckley Street reopen, local street traffic would resume typical operations.

3.16.4.2 Traffic Control

A traffic management plan would be developed by the contractor before construction and would be submitted to HDOT and FHWA for review and approval. Components of the traffic plan may include public notices and electronic signboards to inform motorists about the work schedule and to help with travel planning. All temporary signs, signals, and pavement markings would conform to standards contained in the 2009 FHWA *Manual on Uniform Traffic Control Devices*.

3.16.4.3 Long-term Transportation and Circulation Impacts

To assess the project's long-term impacts, traffic conditions with the current lane configuration and with the improvements to the H1 eastbound between the Middle Street overpass and the Likelike Highway off-ramp were evaluated in the traffic impact assessment. Two future years were analyzed: the anticipated opening year of the freeway improvements (2023) and a future horizon year (2035) that represents a longer-term analysis that accounts for benefits with HRTP operations between Kapolei and downtown Honolulu.

The proposed improvements would eliminate the existing inside-lane merge between H1 eastbound and H201 eastbound. Lanes from both major freeways would be allowed to continue alongside one another under Ola Lane and under Gulick Avenue for a total of five 11-foot-wide travel lanes to the Likelike

Highway interchange. At the Likelike Highway interchange, the right lane would exit to northbound Likelike Highway. Four remaining through-lanes would continue under the Kalihi Street overpass.

By eliminating a major merge and widening the travel lanes, the project is expected to result in various benefits, including the following:

- Faster travel times.
- Less congestion and shorter vehicle queues.
- Increased lane capacity and lane change maneuver area.
- Reduction in crash types.
- Reduced vehicle hours traveled.
- Reduced fuel emissions.

The following sections briefly describe the project's benefits based on the full analyses presented in the transportation impact assessment report (Appendix A).

3.16.4.3.1 Travel Times

With the proposed freeway improvements, eastbound travel times on the approximately 1.5-mile-long path between the Fort Shafter on-ramp and the Vineyard Boulevard off-ramp could be expected to improve by up to 30 percent compared to conditions without improvements.[6] Table 3-5 summarizes forecasted travel times based on methodologies presented in the Highway Capacity Manual, 6th Edition (Transportation Research Board, 2016) and modeling of the freeway improvements during the peak periods with and without the project improvements.

Table 3-5. Travel Time Benefits Summary

Peak Period	2023 Travel Time			2035 Travel Time		
	Current Configuration	With Improvements	Benefit	Current Configuration	With Improvements	Benefit
Morning (6 a.m. to 9 a.m.)	8 – 10	5.5 – 7	2.5 – 3	8.5 – 10.5	6 – 7	2.5 – 3.5
Midday (9 a.m. to 3 p.m.)	2 – 3	1.5 – 2	0.5 – 1	2 – 3	1.5 – 2	0.5 – 1
Afternoon (3 p.m. to 7 p.m.)	8 – 10	5.5 – 7	2.5 – 3	8.5 – 10.5	6 – 7	2.5 – 3.5

Note: Travel time ranges are reported in minutes.

When the proposed H1 eastbound improvements are completed in 2023, morning and afternoon travel times could be reduced by roughly 2.5 to 3 minutes. By 2035, the improvements could result in travel time savings of approximately 2.5 to 3.5 minutes during the most congested peak periods.

3.16.4.3.2 Congestion and Vehicle Queues

With the current lane configuration, the inside-lane merge acts as a bottleneck and results in heavy upstream queues and high lane density, as vehicles have very little room to make lane changes or achieve constant travel speeds. With the additional lane through Middle Street to Likelike Highway, lane density through the subject segment would decrease, resulting in improved flow as vehicles would be able to move or change lanes with fewer restrictions.

[6] Forecasted travel times do not account for possible congestion originating downstream of the area studied, east of Vineyard Boulevard. In the future, congestion occurring outside of the study area could spill back into the Likelike Highway interchange as it does today and significantly affect the reported results.

Operational benefits with the proposed improvements are expected to be similar at the year of opening (2023) and future horizon year (2035). Lane density on the H1 freeway segment between Middle Street and Likelike Highway are expected to improve during both future years. Improved lane density would enhance upstream operations but potentially worsen downstream operations as vehicles are able to pass through the improved segment of the freeway more efficiently. Improved traffic flow and the removal of the bottleneck through the improved segment of the freeway would result in more vehicles being able to reach the downstream segment between Likelike Highway and Vineyard Boulevard, which may result in higher lane density and slightly more congestion downstream of the project, compared to the scenario without improvements.

The lane improvements between Middle Street and Likelike Highway would result in one additional required lane change maneuver for eastbound vehicles originating on H201 and destined for northbound Likelike Highway. These vehicles would need to merge from the far-right lane of H201, across the left lane from the H1 viaduct ramp, to arrive in the far-right lane that exits at the Likelike Highway interchange. While the freeway improvements introduce an additional lane change maneuver for some vehicles, the additional lane capacity, wider lane widths, and relatively low percentage of vehicles making this movement are not anticipated to result in adverse impacts.

3.16.4.3.3 Safety Conditions

Based on historical crash data provided by the HDOT Traffic Safety Section, 47 total crashes occurred on H1 eastbound between the Middle Street overpass (Milepost 19.1) and the Likelike Highway northbound overpass (Milepost 19.9) between January 1, 2014, and December 31, 2018 (HDOT, 2019). While no fatality crashes were reported, 38 percent of the crashes (18 crashes) involved a personal injury. The remaining 62 percent (29 crashes) involved property damage only. The most common types of collisions involved a vehicle rear-ending or sideswiping another vehicle.

Safety benefits in terms of reductions to crashes and severity based on the proposed design modifications were analyzed using the National Cooperative Highway Research Program Enhanced Interchange Safety Analysis Tool (ISATe), which is a spreadsheet tool commonly used to estimate the potential change in crashes due to geometric modifications to freeway segments. The tool takes into account that forecasted traffic volumes within the project area in 2023 and 2035 would be similar to current traffic volumes. Although future vehicle demand is anticipated to increase due to regional land use developments, the current freeway configuration presents capacity constraints that limit potential freeway traffic growth. Introduction of the HRTP service between Kapolei and downtown Honolulu is also expected to result in a significant shift from driving on H1 to riding the rail between these locations, contributing to the low anticipated freeway traffic growth rates.

By eliminating the inside-lane merge and adding a full auxiliary lane between the H1 on-ramp and the Likelike Highway off-ramp, the ISATe tool predicts that up to 10 percent fewer total crashes would occur compared to operations with the current lane configuration. Crash severity could be expected to reduce at the same rate, resulting in 10 percent fewer crashes involving a personal injury and 10 percent fewer crashes involving property damage only.

3.16.4.3.4 Vehicles Miles and Hours Traveled

A region-wide travel demand model was used to assess vehicle miles traveled (VMT) and vehicle hours traveled (VHT) in the eastbound direction between Fort Shafter and the Vineyard Boulevard off-ramp, with and without the proposed improvements. Forecasted operations for the freeway network account for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040.

During both the opening year and future horizon year, the VMT during the morning commute peak period and through the average day with the proposed improvements is anticipated to increase, indicating that more vehicles may be traveling through the analysis segment as a result of improved lane density and vehicle capacity, and potentially less congestion.

VHT represents time spent on the transportation network and can be a reasonable indicator of relative congestion through the project area. During both analysis years with the proposed improvements, VHT during the morning commute peak could be reduced by roughly 7 to 8 percent compared to operations with the current freeway configuration.

3.17 Parks and Recreation Facilities

3.17.1 Existing Conditions

There are six parks within 0.25 mile of the proposed H1 improvements and/or one of the five detours (Figure 2-2). These parks, all under the jurisdiction of City and County Department of Parks and Recreation, provide a range of recreation facilities and amenities such as tennis and basketball courts, ball fields, playgrounds, benches, and restrooms. Kalihi Waena Neighborhood Park and Kamehameha Community Park are adjacent to the H1 improvements; the remainder of the following parks are either adjacent to or within 0.25 mile of at least one of the detours:

- Fern Community Park.
- Kalihi Waena Neighborhood Park.
- Kamehameha Community Park.
- Peter Buck Mini Park.
- Mokauea Mini Park.
- Kalakaua District Park.

3.17.2 Potential Impacts and Mitigation Measures

Temporary impacts to approximately 0.20 acre of the 1.25-acre Kalihi Waena Neighborhood Park would occur during project construction for widening of the Gulick Avenue bridge. A temporary access pathway between Beckley Street and the temporary pedestrian bridge would be constructed across approximately 6,755 square feet (0.16 acre) in the northwestern portion of the park (Figure 2-5), and two existing benches would be removed from the same area and salvaged for use after the project is complete. The temporary pathway, however, is not anticipated to prevent use of the adjacent grassy areas, and would not affect the restrooms and basketball courts. Construction access to the freeway retaining wall located *mauka* of the park would temporarily impact an additional 720 square feet (0.02 acre). Access to the park would be maintained throughout construction. As such, impacts are not anticipated to be significant. No direct impacts to Kamehameha Community Park would occur, as construction activities would not occur in the park.

Kamehameha Community Park, Fern Community Park, and Kalakaua District Park are each adjacent to at least one detour. Park visitors may experience slightly increased traffic volumes and traffic noise. However, these temporary impacts are anticipated to be negligible and would not prevent visitors from using and enjoying park facilities. The Mokauea and Peter Buck mini parks are about 300 feet and 1,300 feet, respectively, away from at least one detour. These two parks are sufficiently separated from the detours that visitors are not anticipated to experience the detours' slightly increased traffic volumes and traffic noise.

3.18 Public Facilities and Services

3.18.1 Police Services

The Honolulu Police Department's jurisdiction encompasses the entire island of Oahu and is divided into eight patrol districts. The project area is located within the Kalihi District (District 5), which covers the area from Aliamanu to the Pali Highway (west to east) and from the rim of the Koolau Range to the central southeastern shoreline of Oahu (north to south). The district station is located at 1865 Kamehameha IV Road, approximately 0.8 mile from the project site.

3.18.2 Fire and Emergency Medical Services

The Honolulu Fire Department is divided into five battalions containing 45 fire stations across the entire island of Oahu. The Kalihi Kai Station is located the closest to the project area at 1334 Hawaii 92 (approximately 1 mile away) in Honolulu.

Emergency medical services are provided by the Honolulu Emergency Services Department. The City and County of Honolulu has 20 ambulance units and 2 rapid response vehicles under three districts. Nearby ambulance services for the project area is provided from The Queen's Medical Center (1301 Punchbowl Street) and Kuakini Medical Center (347 North Kuakini Street) in Honolulu.

3.18.3 Schools

There are several public schools located within the project vicinity. These include Fern Elementary School, Linapuni Elementary School, Kalihi Waena Elementary School, Kapalama Elementary School, Farrington High School, Kalakaua Middle School, and Kalihi Kai Elementary School.

3.18.4 Potential Impacts and Mitigation Measures

The H1 freeway serves as a primary route for emergency service providers. Complete closure of the H1 freeway would not occur as a result of project construction. During construction activities at the Kalihi Stream bridge and Gulick Avenue bridge, access to all adjacent properties would be maintained during construction, and detour routes would be put in place that would accommodate emergency service providers, thereby resulting in no adverse impact to public health and safety. The contractor would be required to make provisions for emergency access. Emergency services, including police, fire, and ambulance services, would be notified before implementation of any required roadway closures or detours. The proposed project would be constructed to current AASHTO and HDOT guidelines, increasing reliability for emergency service providers.

No direct or long-term impacts to the public schools in the project vicinity are anticipated as they are located outside of the project construction areas. Temporary impacts during construction may occur at Kalihi Waena Elementary School, a portion of which may be used as a staging area. In addition, construction activities at the Gulick Avenue overpass bridge may temporarily impact students who use the bridge to walk to and from Farrington High School and Kalihi Waena Elementary School. Impacts to the students would be minimized by constructing a temporary pedestrian bridge adjacent to the existing bridge and by scheduling the construction on the Gulick Avenue bridge during the summer months, when schools are closed (see Section 3.16).

3.19 Public Utilities and Services

3.19.1 Existing Conditions

3.19.1.1 Water and Wastewater Systems

The Honolulu Board of Water Supply provides water service throughout the island. Water lines are generally located in rights-of-way and distribute potable water for domestic, industrial, and commercial consumption and for fire protection. 6-inch and 12-inch pipelines are in a covered utility trench on the Gulick Avenue overpass. There is also a 36-inch pipeline that crosses under the H1 freeway near the east side of the overpass. *Makai* of the freeway, there is a 42-inch pipeline on Gulick Avenue and Beckley Street. Water lines in various sizes cross under the H1 freeway also on Richard Lane and Nakuina Street, and from Kamehameha IV Road (see Section 2.2.3 for a detailed description).

The City's wastewater management system is managed by the Department of Environmental Services. Wastewater generated on Oahu is processed by one of nine wastewater treatment plants, which are spread over the island and either owned or operated by the City and County of Honolulu. Sewer lines in the project area include 6-inch and 8-inch pipelines *mauka* and *makai* of the Gulick Avenue overpass, but not crossing over the H1 freeway; a 15-inch pipeline on Richard Lane crossing under the H1 freeway; an 8-inch pipeline crossing under the H1 freeway from approximately Kamehameha IV Road toward Kalihi Union Church; and an 8-inch pipeline dead-end on Pinkham Street *makai* of the H1 freeway.

3.19.1.2 Solid Waste Management

The City's solid waste management system is also managed by the Department of Environmental Services. There is one municipal landfill on Oahu, Waimanalo Gulch Landfill in Kapolei. The City and County of Honolulu owns the landfill but contracts the management and operation of the site with Waste Management of Hawaii. The City is currently evaluating options for supplementing or replacing the only municipal landfill on Oahu. One additional landfill is privately owned by PVT Land Company, Ltd., and is designated specifically for construction and demolition waste.

3.19.1.3 Gas, Electrical and Telecommunications Systems

Hawaii Gas operates several gas lines through the project limits. These include a 2-inch gas line in a covered utility trench on the Gulick Avenue overpass, a 2-inch pipeline on Richard Lane crossing under the H1 freeway, and a 5/8-inch pipeline dead-end on Pinkham Street on the *makai* side of the H1 freeway.

HECO overhead power lines run along Gulick Avenue, the Gulick Avenue overpass, Beckley Street, and Kalihi Street (see Section 2.2.3 for a detailed description). Kalihi Substation is located within a triangular area adjacent to and on the *makai* side of the H1 freeway at the Gulick Avenue and Beckley Street intersection.

Hawaiian Telcom provides landline telecommunications service to customers on the island. There are ductlines embedded in the Gulick Avenue overpass and aerial lines along Kalihi Street across the Kalihi interchange.

3.19.2 Potential Impacts and Mitigation Measures

Solid waste impacts are expected to be short-term and related to construction activities. Waste generated during construction would primarily consist of removed concrete, concrete slabs, asphalt pavement, excavated dirt, removed vegetation, and general construction debris. The contractor will be required to dispose of or recycle all materials at approved sites and with proper handling during transport. The

contractor will be required to have a waste disposal plan that specifies proper removal and disposal of all debris from the project area. Project-related waste material would be a small proportion of the island-wide total and is not expected to have a significant impact on the City's solid waste facilities.

The proposed project would not generate any demand for water or wastewater disposal once completed. Water, gas, and telecommunication lines that run along the Gulick Avenue overpass would need to be relocated during work on the overpass. The project sponsor and designers are coordinating with affected utility companies for temporary relocation and long-term disposition of utility lines. This project would not adversely impact utilities, as service for all utilities would be maintained during and after construction.

3.20 Secondary and Cumulative Impacts

3.20.1 Secondary Impacts

Secondary impacts, or indirect effects, are effects that are caused by an action and are later in time or farther removed from distance, but are still reasonably foreseeable. Such efforts may include growth-inducing impacts and other effects related to changes in land use patterns, population density, or growth rate, and related effects on air, water, and other natural systems. The proposed project is expected to have minimal secondary impacts on resident population, land use patterns, public facilities and infrastructure, and the natural environment.

Construction of the proposed project is expected to generate only minor short-term impacts. Creation of short-term construction jobs is not expected to generate a substantial number of workers. It is anticipated that local contractors on Oahu or within the state of Hawaii would likely be used for construction of the proposed project. These workers would thus have minimal, if any, effect on the City's residential population or housing demand.

The proposed improvements are needed to ease existing congestion and bottlenecks experienced at the subject portion of the H1 freeway. The improvements would not result in substantial increases in users of the freeway and would not generate substantial secondary effects increasing infrastructure demands, necessitating offsite improvements, constraining public facilities, or influencing population growth.

3.20.2 Cumulative Impacts

Cumulative impacts are effects on the environment that result from the incremental impact of a project when added to past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

As described in Section 2.1.2, Other Nearby State and County Projects, existing and planned transportation projects in the vicinity of the project include construction of the HRTP, which may result in temporary, higher-than-normal traffic volumes on streets that serve as designated or informal detour routes. Compounded traffic impacts are expected to be elevated during the 1- to 2-month period when the new Gulick Avenue bridge is under construction and a section of the street is closed to through traffic.

The project area is highly urbanized and has been for over 50 years. Improvements of the proposed portion of the existing H1 freeway would not result in any changes to land use patterns or redevelopment activities. The proposed project is not expected to measurably impact water quality, biological resources, or cultural resources. There are no negative long-term socioeconomic impacts anticipated, as access to residences or businesses would be maintained during construction and there would be no property displacements.

Short-term construction impacts (that is, dust, erosion, and noise impacts) would be minimized with the implementation of BMPs during construction. In conjunction with other planned projects (Section 2.1.2), the proposed project could result in minor, localized, cumulative short-term construction impacts. The construction period for the proposed work on the Gulick Avenue overpass is likely to overlap with ongoing construction activities on Dillingham Boulevard for the HRTP that requires temporary road closures and detours to other local streets in the area. Detours required to reroute traffic during work on the Gulick Avenue overpass may exacerbate traffic congestion experienced in the area. Although the surrounding communities would experience delays and inconveniences, the construction duration would be relatively short, with traffic conditions returning to normal following completion of the proposed work at the Gulick Avenue overpass.

Overall, the project would benefit the general population (including minority and low-income residents) by improving traffic conditions and maintaining the H1 freeway as a safe and reliable element of the transportation system.

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4 Relationships to Plans, Policies, and Controls

The plans and policies related to the proposed project range from broad program guidance to land use controls governing the project site. Construction of the proposed improvements is consistent with the various plans, policies, and regulatory controls discussed here.

4.1 Federal

The proposed project would involve the use of federal funds through FHWA. As a result, the proposed project needs to be consistent with various federal statutory and regulatory requirements as presented in the following sections.

4.1.1 National Environmental Policy Act of 1970

The proposed project would be partially funded by FHWA; this federal funding subjects the project to the environmental review requirements of NEPA, prescribed under 40 CFR Parts 1500-1508 (Council on Environmental Quality [CEQ] regulations). FHWA serves as the lead federal agency, or administrator, responsible for the project's compliance with NEPA documentation and processing requirements, as provided in 23 CFR 771, Environmental Impact and Related Procedures.

The NEPA determination of impact significance is related to the type of document and process required to comply with NEPA for a proposed project. There are three types of environmental documents under NEPA: (1) Categorical Exclusion (CE), (2) EA, and (3) EIS. A CE is appropriate where there are no significant impacts on the environment, an EA when the significance of the effects are not clearly established, and an EIS when the action would have a significant impact on the environment.

Significance is defined in the CEQ regulations (40 CFR 1508.27); a "significant impact" is assessed in terms of an impact's "context" and "intensity." Context refers to the environment and the level of relative abundance of resources in the project area. Intensity refers to the severity of impact, or how much of the resource(s) would be used or affected by the project.

The FHWA Regulations for Environmental Impact and Related Procedures (23 CFR 771.117(a)) specify that CEs are actions that meet the definition contained in 40 CFR 1508.4 and act as follows:

- Do not induce significant impacts to planned growth or land use for the area.
- Do not require the relocation of significant numbers of people.
- Do not have a significant impact on any natural, cultural, recreational, historic, or other resources.
- Do not involve significant air, noise, or water quality impacts.
- Do not have significant impacts on travel patterns.
- Do not otherwise, either individually or cumulatively, have any significant impacts.

Specific actions that meet these criteria are listed in 23 CFR 771.117(c) and include the following:

- "[M]odernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (including parking, weaving, turning, and climbing lanes)" (23 CFR 771.117(c)(26)); and
- "[B]ridge rehabilitation, construction or replacement or construction of grade separation to replace existing at-grade railroad crossings" (23 CFR 771.117(c)(28)).

Consistent with its regulations for NEPA compliance and as further justified by the findings of this EA, FHWA anticipates issuing a CE for this project.

4.1.2 Section 106 of the National Historic Preservation Act of 1966

The NHPA of 1966 (P.L. 89-665, codified as 16 U.S.C. 470), as amended, recognizes the nation's historic heritage and establishes a national policy for the preservation of historic properties as well as the National Register of Historic Places. Section 106 of the NHPA (16 U.S.C. 470f) requires that federal agencies consider the effects of their projects on historic properties. Use of federal funds sets forth the need for Section 106 consultation. The purpose of the Section 106 consultation process is to evaluate the potential for effects on existing historic sites, if any, resulting from the project. Findings relating to historic properties are discussed in Sections 3.9 and 3.10 of this document.

The Section 106 review process encompasses "good faith effort" in ascertaining the existence and location of historic properties near and within the project site, establishing an Area of Potential Effect (APE) of the project, identifying whether a potential for "adverse effects" on historic properties by the project exists, and developing a reasonable and acceptable resolution in the monitoring and treatment of any historic sites that is agreed upon by the agency, the SHPO, and consulting government agencies, community associations, and Native Hawaiian Organizations and families.

A letter formally initiating the Section 106 consultation process is pending submittal to SHPD. Once available, copies of the documents related to the Section 106 consultation process will be included as an appendix to the EA.

4.1.3 Section 4(f) of the Department of Transportation Act of 1966

Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303 and 23 U.S.C. 138) permits the use of publicly-owned park land, recreational area, wildlife and waterfowl refuge, or land of an historic site of national, state, or local significance for a transportation project only if (1) there is no prudent and feasible alternative to using that land and (2) the project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use. The purpose of Section 4(f) requirements is to preserve significant parkland recreation areas, refuges, and historic and archaeological sites by limiting the circumstances where such land can be used for transportation projects.

Portions of Kalihi Waena Neighborhood Park will be needed for temporary pedestrian access, temporary utility relocation, and temporary construction access during reconstruction of the Gulick Avenue bridge and freeway retaining wall. HDOT is coordinating with the City and County of Honolulu Department of Parks and Recreation to obtain permission to temporarily occupy park land. The area required for pedestrian access is an open grassy area on the northwestern end of the park that is not used for active recreational purpose. Two benches will be removed temporarily and reinstalled when construction is completed. Lighted play courts, including two basketball courts and a volleyball court, are located in the southeastern portion of the park. Temporary access to reconstruct the retaining wall along the freeway will affect an open grassy area along the fence line abutting the right-of-way. Construction activities will not affect use of or access to the courts. Temporary construction access for retaining wall reconstruction may affect an unpaved parking area that can accommodate approximately six vehicles. Temporary reconfiguration of the parking area may be possible. All areas disturbed by the project will be restored to preconstruction conditions.

A total of six properties within the proposed project area and surrounding study area were determined to be eligible for listing under the Hawaii Register of Historic Places. As discussed in Section 3.10, the proposed project will not have any adverse effects on these six (6) properties.

4.1.4 Uniform Relocation Assistance and Real Property Acquisition Act of 1970

The Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (42 U.S.C. 4601 et seq. and 49 CFR 24), as amended by the Uniform Relocation Act Amendments of 1987 is commonly referred to as the Uniform Act. The Uniform Act provides important protection and assistance for people affected by federally funded projects. The law was enacted by Congress to ensure that people whose real property is acquired, or who move as a result of projects receiving federal funds, will be treated equitably and will receive assistance in moving from the property they occupy.

Affected properties are discussed in Section 2.3 and shown in detail in Table 2-4, above.

4.1.5 Endangered Species Act of 1973

The ESA of 1973 (16 U.S.C. 1531-1544) establishes a process for identifying and listing threatened and endangered species. It requires federal agencies to carry out programs for the conservation of federally listed endangered and threatened plants and wildlife and designated critical habitats for such species, and prohibits actions by federal agencies that would likely jeopardize the continued existence of those species or result in the destruction or adverse modification of designated critical habitat. Section 7 of the ESA requires consultation with federal wildlife management agencies, such as USFWS and the National Marine Fisheries Service (NMFS).

The entire project area is within a dense urban area where the H1 improvements and use of detours would occur in previously disturbed and/or developed areas. As such, no significant biological resources are expected to be present in the urbanized areas. The only exceptions are the existing flora and fauna along Kalihi Stream that may be affected by widening the highway bridge over the stream on the *makai* side of H1. Therefore, a natural resources assessment of Kalihi Stream was conducted to document existing biological resources in the area (see Appendix B). No plant or animal species proposed for listing or listed as endangered or threatened under the ESA were found within the project area. In addition, no federally designated critical habitat occurs in the project area.

Several ESA-listed species could transit or otherwise use the project area, and conservation measures have been developed to minimize impacts to these species.

- Three ESA-listed seabird species have recently been detected on Oahu. While no suitable nesting habitat occurs in the project area, seabirds may transit the project area at night when flying from inland locations to the sea. Nocturnally flying seabirds can become disoriented by exterior lighting and can die directly from collisions or indirectly by becoming injured and easy prey for feral mammals. If nighttime construction work is anticipated, lights would be properly shielded and aimed towards the ground. Outdoor lighting guidelines to avoid deleterious impacts to transiting seabirds will be provided by the DLNR Division of Forestry and Wildlife.
- The three ESA-listed waterbird species on Oahu could use some of the Kalihi Stream habitat, but these species are rare (and unlikely to nest) in the project area. Should an endangered waterbird appear on the project site during construction, work in that area must cease until the animal voluntarily leaves the area.
- The endangered Hawaiian hoary bat may transit or otherwise use the project area on a seasonal basis. The primary impact to this species would occur during vegetation removal if trees used for roosting are removed. In general, no trees taller than 15 feet (4.6 meters) would be trimmed or removed 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 need to be cleared during that time period, a qualified biologist would use appropriate protocols to survey for bats before trimming or cutting. In addition, any fences erected as part of the project would have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire.

Because Kalihi Stream is not tidally influenced, coordination and Section 7 consultation with NMFS is not required. Based on the natural resources assessment and proposed conservation measures, HDOT and FHWA have determined that the H1 project would have "no effect" to ESA-listed species. Therefore, Section 7 consultation with USFWS is not required.

4.1.6 Migratory Bird Treaty Act

The MBTA protects migratory wild birds found in the United Stated by making it unlawful to pursue, hunt, take, capture, possess, sell, purchase, barter, import, export, or transport any migratory bird or any part, nest, or egg of any such bird, unless authorized under a permit issued by the Secretary of the U.S. Department of the Interior.

The proposed project is not expected to affect migratory birds. The Pacific golden-plover, an indigenous migratory species protected under the MBTA, was observed during the biological field survey as described in Section 3.8. Construction may temporarily displace foraging for some of these bird species, but long-term impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat in nearby areas. The temporary displacement of these individuals at the project site is not expected to affect their survival or the overall species' populations. The possibility of adversely affecting migratory birds, including the Pacific golden-plover, as a result of the proposed project is likely small. With the implementation of mitigation described throughout Section 3.8, impacts to MBTA-protected species would be avoided.

4.1.7 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e) calls for conservation of wildlife resources related to projects where the "waters of any stream or other body of water" are impounded, diverted, or modified by any agency under a federal permit or license. The law requires consultation with USFWS and state fish and wildlife agencies for the purpose of "preventing loss of and damage to wildlife resources."

Consultation related to the FWCA would occur as part of coordination with resource agencies (Section 4.1.5).

4.1.8 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801), as amended, establishes provisions relative to Essential Fish Habitat (EFH), to identify and protect important habitats for federally managed marine and anadromous fish species. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, and/or growth to maturity. "Waters" include aquatic areas and their associated physical, chemical, and biological properties used by fish and may include areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, and structures underlying the waters and associated biological communities. Federal agencies which fund, permit, or undertake activities that may adversely affect EFH (including actions outside EFH, such as upstream/upslope activities) are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond to NMFS recommendations. An adverse effect is defined as any impact that reduces quality or quantity of EFH, including direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, species and their habitat, and other ecosystem components.

The extent of potential impacts to affect EFH associated with the proposed project are limited to the transport of sediment or pollutants via live water. BMPs and other methods (as described in Section 3.3.3) would reduce the extent to which sediment disturbed as a result of construction would be transferred to

live water. As a result, water quality impacts would be minimized such that they would not be expected to adversely affect downstream waters. Designated EFH in the project vicinity is well downstream of the extent that any sediment impacts are anticipated to reach. As such, the proposed project would have no effect on EFH waters. Furthermore, no groundbreaking disturbance would occur in areas designated as EFH and hence no EFH substrate would be affected.

4.1.9 Clean Water Act of 1972

The Federal Water Pollution Control Act (FWPCA) (33 U.S.C. 1251 et seq.) is the federal statute regulating the discharge of water pollution. Congress revised the FWPCA into the CWA in 1972. The goals of the CWA include the following (CWA 101a and 33 U.S.C. 1251a):

(1) "[T]he discharge of pollution into the navigable waters be eliminated by 1985".

(2) " [T]he discharge of toxic pollutants in toxic amounts be prohibited".

(3) An "interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983".

Section 404 of the CWA regulates discharge of dredge and fill material in the waters of the U.S., including wetlands, and requires a Department of the Army permit from the USACE. Section 401 of the CWA directs states to establish water quality certification (WQC) programs. In Hawaii, the Section 401 WQC is administered by the HDOH Clean Water Branch. The project would result in a small quantity of discharge to waters of the U.S. ([Stream]) regulated under Section 404. As such, the project will require a Section 404 Department of Army Permit and Section 401 WQC. The project is anticipated to meet criteria for permitting under a Department of the Army Nationwide Permit and blanket 401 WQC.

Section 402 of the CWA requires an NPDES permit for point source discharges, including storm water discharges associated with construction activities. The permit is required for construction activities that disturb 1 acre or more and discharge storm water from the project site to waters of the U.S. The project is expected to require an NPDES permit.

4.1.10 Clean Air Act of 1970

The CAA and amendments (42 U.S.C. 7401 et seq.) is the comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the USEPA to establish National Ambient Air Quality Standards to protect public health and the environment. Pursuant to the CAA and amendments, state-operated permit programs serve to control emissions. In Hawaii, the operating permit program is implemented by HDOH, and emissions of regulated air pollutants within the state may be subject to permitting as required under HAR 11-60.1.

The purpose of this project is to relieve eastbound congestion on the H1 freeway at a key bottleneck and improve roadway design for traffic flow and safety. The proposed improvements of the H1 freeway within the project limits would generate minimal air quality impacts for CAA criteria pollutants (as discussed in Section 3.6) and has not been linked with any special MSAT concerns. This project would not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, the USEPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline over the next several decades. Based on regulations now in effect, an analysis of national trends with the USEPA's Motor Vehicle Emissions Simulator (MOVES) model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while VMT is

projected to increase by over 100 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project (FHWA, 2012).

4.1.11 Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 (33 U.S.C. 401 et. seq.) requires that the Secretary of the Army issue permits for various activities to protect navigable and tidally influenced waterways.

Section 10 of the Act requires authorization from USACE before construction of any structure over, excavation from, or disposal of materials into navigable waters. Structures or work outside the limits defined for navigable waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The reach of the Kalihi Stream within the project area is not tidally influenced, such that Section 10 authorization would not be required.

4.1.12 Floodplain Management, Executive Orders 11988 and 12148

EO 11988, Floodplain Management, dated May 24, 1977, requires federal agencies to take action to reduce the risk of flood loss, restore the natural and beneficial values of floodplains, and minimize the impacts of floods on human safety, health, and welfare. EO 12148, Federal Emergency Management, dated July 20, 1979, amended EO 11988. The main feature of the amendment added that agencies with responsibilities for federal real estate properties and facilities will, at a minimum, require the construction of federal structures and facilities to be in accordance with the criteria of the National Flood Insurance Program.

The proposed project crosses Kalihi Stream. According to FIRM Community Panel Number 15003C0353G (effective January 19, 2011), the Kalihi Stream overcrossing is located within the 1 percent annual chance floodplain (Zone AE), where the area must be kept free of encroachment and obstruction so that the 100-year flood can be carried without substantial increases in flood heights. The remaining project area is located in Zone X, which is defined as an area determined to be outside the 0.2 percent annual chance floodplain. The proposed project is being designed to comply with the National Flood Insurance Program's regulations and requirements.

4.1.13 Protection of Wetlands, Executive Order 11990

EO 11990, Protection of Wetlands (1977), requires federal agencies to avoid, preserve, or mitigate effects of new construction projects on lands that have been designated wetlands.

No wetlands were identified within the survey area; therefore, the proposed project would not impact wetlands.

4.1.14 Invasive Species, Executive Order 13112

EO 13112 (64 *Federal Register* 6183), issued in 1999, requires federal agencies to implement policies to minimize the spread of invasive species. Federal agencies cannot authorize, fund, or carry out actions likely to cause or promote the introduction of spread of invasive species unless all reasonable measures to minimize risk have been analyzed or considered.

Vegetation disturbed during construction would be replaced as part of the project and the spread of noxious weeds would be managed through the implementation of BMPs as part of the project.

4.1.15 Coastal Zone Management Act (16 U.S.C. §1456(C)(1))

In 1972, the U.S. Congress enacted the federal Coastal Zone Management Act (CZMA) to ensure that federal actions (including activities performed by a nonfederal entity requiring federal permits, licenses, or other form of federal authorization) within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone are carried out in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs. Each federal agency carrying out or permitting an activity subject to the Act will provide a consistency determination to the relevant state agency designated under Section 1455(d)(6) of this title at the earliest practicable time.

The State administers the enforcement of this Act under the Hawaii Coastal Zone Management (CZM) Program (HRS Chapter 205A). Discussion of the project's consistency with the CZM objectives is discussed in Section 4.2.4.

4.1.16 Environmental Justice, Executive Order 12898

EO 12898, Environmental Justice, was signed on February 11, 1994. The intent of EO 12898 (whose full title is Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) is to avoid disproportionately high adverse human health or environmental effects of projects on minority and low-income populations. EO 12898 also requires federal agencies ensure that minority and low-income communities have adequate access to public information related to health and the environment.

Data from the U.S. Census (2013-2017 ACS 5-Year Summary File Data [U.S. Census Bureau, 2018]) indicates that both minority and low-income populations surround the project limits. Much of the population in areas surrounding the project are minority populations with concentrations exceeding the state and national averages. The percentage of low-income populations varies among the census block groups surrounding the project with the highest concentrations corresponding with areas where public housing and low-income housing apartments are located. As such, for the purpose of compliance with EO 12898 on Environmental Justice, both minority and low-income populations are determined to be present (see Section 3.12 for additional information).

Although construction-related impacts (for example, detour routes, noise, and fugitive dust) would affect the minority and low-income neighborhoods adjacent to the project limits, impacts would be short-term in duration and would be minimized with the implementation of the BMPs described in Section 3.2, Climate and Air Quality, Section 3.5, Noise, and Section 3.16, Roads and Traffic. Construction impacts would also be offset by the long-term benefits associated with the project improvements, such as improved traffic delays and congestion within the subject portion of the H1 freeway. Right-of-way acquisitions required for the project would not require relocation of current residents or existing businesses. In addition, no substantial visual effects would occur once the project is completed. As such, the proposed project would not cause disproportionately high and adverse effects on the social, cultural, health, and well-being of the identified minority or low-income populations surrounding the project area.

4.1.17 Title VI, Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d and 49 CFR 21) establishes that no person shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance.

The project complies with Title VI through coordination with, and outreach to, Native Hawaiian communities required under Section 106, HRS 343, and Act 50 on cultural practices.

4.1.18 Protection of Children from Environmental Health Risks and Safety Risks, Executive Order 13045

EO 13045 of April 21, 1997, requires federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

Factors of the proposed project that raise concerns about children's health and safety include the following:

- The project area is next to Kalihi Waena Elementary and Farrington High Schools.
- Kalihi Waena Neighborhood Park and Kamehameha Community Park are both adjacent to the project area.
- Kalihi Union Church runs a preschool for children 3 to 5 years old at its facility adjacent to the project area.
- Residential housing on both the *mauka* and *makai* sides of the project area is home to many children.
- Proposed routes where detoured traffic may increase come within 0.25 miles of the following parks and schools:
  - Kalakaua District Park.
  - Fern Community Park.
  - Mokauea Mini Park.
  - Peter Buck Mini Park.
  - Puuhale Elementary School.
  - Kalihi Kai Elementary School.
  - King David Kalakaua Middle School.
  - Governor Wallace Rider Farrington High School.
  - Kapalama Elementary.
  - Saint John the Baptist Catholic School.
  - Kalihi Waena Elementary School.
  - Linapuni Elementary School.
  - Sanford B. Dole Middle School.

Construction activities associated with the project would temporarily increase ambient noise and fugitive dust but would be controlled following BMPs. Traffic disruptions from the construction activities would be managed by the implementation of an approved traffic control plan. When completed, the project will include reinstallation of barriers and safety features that will prevent children (and adults) from entering H1 facilities. These features are expected to reduce safety risks for children along the route.

4.1.19 United States Environmental Protection Agency Sole Source Aquifer

USEPA's Sole Source Aquifer Program was established under Section 1424(e) of the Safe Drinking Water Act. This program, which allows for USEPA environmental review, has been used by communities since 1977 to help prevent contamination of groundwater by federally funded or aided projects.

The proposed H1(EB) Improvements, Ola Lane Overpass to Likelike Highway Off-ramp Project is located in the Southern Oahu Basal Aquifer (per 52 *Federal Register* 45496) designated sole source aquifer that extends from the Ewa Plains to Manoa and Wahiawa on the island of Oahu. Ground-disturbing activities are expected to extend to a maximum depth of approximately 40 feet deep for drilled shafts and to an approximate maximum depth of 11 feet below the surface for certain utility relocations.

This EA will be sent to the USEPA for review as provided by Section 1424(e) of the Safe Drinking Water Act.

4.1.20 American Association of State Highways and Transportation Officials (AASHTO) Guidelines

AASHTO is a professional nonprofit organization that works to develop design guidelines for roads and bridges in United States cities, towns, and countrysides. Part of the purpose of these guidelines is the desire to ensure uniform safety throughout the nation, to have some standardization.

Design exceptions are documented approvals allowing a legal divergence from standard road designs and management policies thereby reducing claims of liability. These exceptions apply to specific features, such as a lane width or shoulder dimension, and are not a blanket exception for the whole road. A design exception is reviewed by the associated state department of transportation and approved by the FHWA.

A design exception would be required for the proposed H1 improvements project for lane width, left shoulder width, right shoulder width, and vertical clearance, as discussed in detail in Section 2.3.1.2.

Without a design exception approved by the FHWA, the federal agency would not participate in the construction funding for the project.

4.2 State of Hawaii

4.2.1 Hawaii State Plan

The Hawaii State Plan, HRS Chapter 226, is the umbrella document in the statewide planning system. It serves as a written guide for the long-range development of the state by describing a desired future for the residents of Hawaii and providing a set of goals, objectives, and policies that are intended to shape the general direction of public and private development. The proposed project supports and is consistent with the following State Plan objectives and policies:

> *Facility Systems – Transportation*
>
> *(a)(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.*
>
> *(a)(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.*
>
> *(b)(2) Coordinate state, county, Federal, and private transportation activities and programs toward the achievement of statewide objectives.*
>
> *(b)(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties.*
>
> *(b)(6) Encourage transportation systems that serve to accommodate present and future development needs of communities.*
>
> *(b)(10) Encourage the design and the development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment.*
>
> *Facility systems – in general*

(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

(b)(1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

Discussion: As the facility owner, it is HDOT's mission to provide a safe, efficient, and accessible transportation system for the public. HDOT recognizes the need to address congestion and safety issues on the H1 freeway within the project limits. The proposed improvements will be designed using current AASHTO guidelines that have been adopted by HDOT for planning and engineering for highway projects in Hawaii.

4.2.2 State Functional Plans

The State Plan directs appropriate State agencies to prepare functional plans for their respective program areas. There are 12 State Functional Plans that serve as the primary implementing vehicle for the goals, objectives, and policies of the State Plan. Of those, the State Transportation Functional Plan is of particular relevance to the project.

The State Transportation Functional Plan identified the four most critical issues of transportation: congestion, economic development, funding, and education (HDOT, 1991). Objectives, policies, and implementing actions were identified for each issue. The following objectives and policies apply to the project:

Objective I.A. Expansion of the transportation system.

Policy I.A.1. Increase transportation capacity and modernize transportation infrastructure in accordance with existing master plans and laws requiring accessibility for people with disabilities.

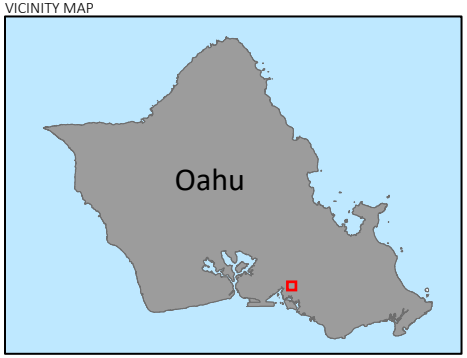
Policy I.A.2. Improve regional mobility in areas of the State experiencing rapid urban growth and road congestion.

Discussion: The mission of HDOT is to provide a safe, efficient, and accessible transportation system for the public. HDOT recognizes the need to address congestion and safety issues on the H-1 freeway within the project limits. The proposed improvements will be designed using current AASHTO guidelines that have been adopted by HDOT for planning and engineering for highway projects in Hawaii.

4.2.3 State Land Use Law

The State Land Use Commission, pursuant to HRS Chapter 205 and 205A and HAR Chapter 15-15, is empowered to classify all lands in the state into one of four land use districts: Urban, Rural, Agricultural, and Conservation. As shown on Figure 4-1, the lands surrounding the project limits are classified in the Urban District. Roadways are a permitted use in the Urban District. No change in land use classification will be needed.

VICINITY MAP



N

0 500 1,000

Approximate Scale in Feet

LEGEND

Project Location

State Land Use

U - Urban

FIGURE 4-1

State Land Use District Boundary

Interstate H1 (EB) Improvements
Ola Lane Overpass to
Likelike Highway Off-Ramp

Jacobs

4.2.4 Coastal Zone Management Program

In 1977, Hawaii enacted HRS Chapter 205A, Hawaii CZM Program, to carry out the state's CZM policies and regulations under the federal CZMA (see Section 4.1.15). Hawaii's coastal zone includes the waters from the shoreline to the *makai* limit of the State's jurisdiction and all lands excluding those lands designated as forest reserves. As a result, the project is within the CZM area and is subject to consistency with the objectives and policies of the Hawaii CZM Program. The CZM Federal Consistency Certification is reviewed by the State Office of Planning.

The Hawaii CZM Program focuses on the following ten policy objectives:

1. **Recreational Resources**. To provide coastal recreational opportunities accessible to the public and protect coastal resources uniquely suited for recreational activities that cannot be provided elsewhere.

   Discussion: The project area does not contain coastal recreation resources, nor will it affect access to coastal recreational opportunities.

2. **Historic Resources**. To protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

   Discussion: Studies focusing on archaeology, historic architecture, and cultural perspectives were conducted for this project, but no historic resources were found within the APE that would be adversely affected by the proposed construction.

   The masonry walls adjacent to the Kalihi Stream bank are eligible for listing under the Hawaii Register of Historic Places because of their distinct style and age (over 50 years old). Widening of the Kalihi Stream overpass would require partial demolition of the walls on both sides of the stream. Only a limited portion of the existing masonry walls is anticipated to be impacted. Following completion of activities to widen the overpass, lava rocks from the existing walls will be salvaged and used to reconstruct the impacted portion to match existing conditions.

   The parcel of land containing the Kalihi Union Church, Sanctuary Building will be affected by the proposed project, but the proposed minor alteration of less than 40 square feet of the parcel boundary does not meet the criteria for adverse effect.

3. **Scenic and Open Space Resources**. To protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

   Discussion: The project would be developed to ensure visual compatibility with the surrounding environment. The project is not located along the shoreline and is not anticipated to negatively impact coastal scenic or open space resources.

4. **Coastal Ecosystems**. To protect valuable coastal ecosystems, including reefs, from disruption and to minimize adverse impacts on all coastal ecosystems.

   Discussion: Because of its inland location and with the implementation of mitigation measures and BMPs during construction, the project will not affect coastal ecosystems.

5. **Economic Uses**. To provide public or private facilities and improvements important to the State's economy in suitable locations; and ensure that coastal-dependent development such as harbors and ports, energy facilities, and visitor facilities are located, designed, and constructed to minimize adverse impacts in the coastal zone area.

   Discussion: The project is not a coastal-dependent development.

6. **Coastal Hazards**. To reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Discussion: The project area is located outside of the tsunami evacuation zone. The proposed project would be designed to comply with the National Flood Insurance Program's regulations and requirements, as applicable, and would not result in an increased risk of coastal flooding.

7. **Managing Development**. To improve the development review process, communication, and public participation in the management of coastal resources and hazards.

   Discussion: This project is unrelated to the management of coastal resources and hazards; however, there will be an opportunity for public review of the project through the EA public comment process.

8. **Public Participation**. To stimulate public awareness, education, and participation in coastal management; and maintain a public advisory body to identify coastal management problems and provide policy advice and assistance to the CZM Program.

   Discussion: This project does not contain a public participation component for programmatic coastal management issues. Project-specific input is being elicited through the HRS Chapter 343 EA process.

9. **Beach Protection**. To protect beaches for public use and recreation and locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements because of erosion.

   Discussion: This project is not located in a beach environment and is outside the Shoreline Setback Area.

10. **Marine Resources**. To implement the State's ocean resources management plan.

    Discussion: The proposed project would not involve or impact the use or development of marine or coastal resources. BMPs will be implemented to prevent degradation of the aquatic environment, including the quality of state waters.

Other key areas of the CZM Program include (1) a permit system to control development within the Special Management Areas (SMAs) managed by each county and the Office of Planning (Section 4.3.4), (2) a Shoreline Setback Area that serves as a buffer against coastal hazards and erosion and protects view planes, and (3) administration of marine and coastal resources. Finally, a federal consistency provision requires that federal activities, permits, and financial assistance be consistent with the Hawaii CZM Program.

The proposed project is not located within the City and County of Honolulu SMA, nor does it occur within the Shoreline Setback Area. The proposed project does not involve the placement, construction, or removal of materials near the coastline and does not have the potential to substantially affect coastal resources. The proposed project is consistent with the CZM objectives that are relevant to this type of project. A Federal Consistency determination will be submitted to the Office of Planning for concurrence.

4.2.5 HRS, Chapter 6E, Historic Preservation Review

HRS Chapter 6E and HAR 13-275 through 284 lay out the state's historic preservation review process. HRS 6E8 requires that the SHPD be given an opportunity to review the effect that a state or county project may have on historic properties. The proposed project may not commence until the SHPD has given written concurrence.

4.2.6 Hawaii Act 50, Cultural Practices

Hawaii Act 50 (2000) sought to "promote and protect cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups" and requires the proposing agency/applicant under Chapter 343 HRS to consider cultural practices in a cultural impact assessment. An assessment was therefore completed for the project in compliance with this requirement, as discussed in Section 3.11 and in Appendix E.

4.2.7 Hawaii Climate Change Initiative, Act 286 of 2012 (HRS 226-109)

The State of Hawaii recognizes the importance of climate change. Act 286 of 2012 amended the State Planning Law (HRS Chapter 226) to include climate change adaptation as one of seven areas of statewide concern crucial to the quality of life. Ten priority guidelines were adopted. These deal with outreach, stewardship, monitoring, and development of knowledge and strategies that integrate climate change adaptation into state activities.

Conformance with Act 286: SLR is one aspect of climate change that is of concern to the State of Hawaii. H1 runs inland of the SMAs and Shoreline Setback Areas (Figure 4-2), and may provide an alternative route if Nimitz Highway and/or Ala Moana Boulevard (which are closer to the shoreline) experience issues with flooding due to SLR and climate change. The proposed project area is also outside of the 2017 *Hawai'i Sea Level Rise Vulnerability and Adaptation Report* (SLR Report) 3.2-foot SLR exposure area (Figure 4-2).[7]

In the event that coastal roadways are less reliably available than now, provision of alternative inland routes is a strategy for accommodating climate change adaptation.

4.2.8 Hawaii 2050 Sustainability Plan (HRS 226-108)

The Hawaii State Legislature in 2005 sought answers to the long-term future of our state and the pressing issues facing our people. Under the Special Session Laws of Hawaii 2005, the Legislature enacted Act 8, which provides for the development of a sustainability plan to address the vital needs of Hawaii through the year 2050 and the establishment of the Hawaii Sustainability Task Force under the guidance of the Office of the State Auditor.

The 2050 Plan called for a quality transportation system that links people to places and provides opportunities for social interaction, recreation, and community engagement. A system that enables the flow of commerce would ensure that businesses could transport their goods and services to their destination in a timely and cost-effective way.

Key elements of the plan have been incorporated into the State Planning Act as a Priority Guideline (HRS 226-108).

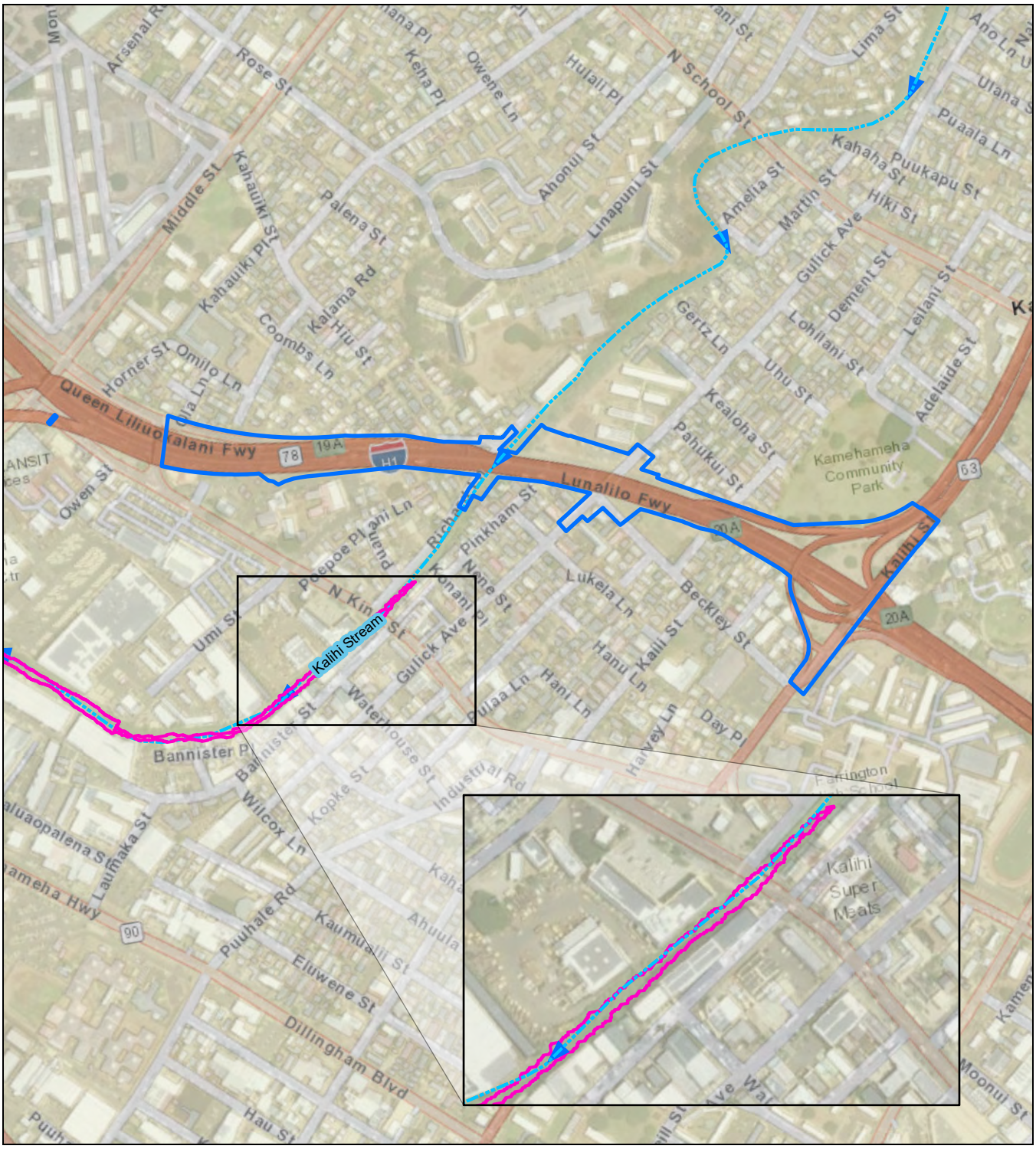
Conformance with the Plan: The proposed action alternatives directly contribute to improving transportation infrastructure, helping move people and goods in a timely and cost-effective way.

4.2.9 State of Hawaii Environmental Policy (HRS 344 and 195D)

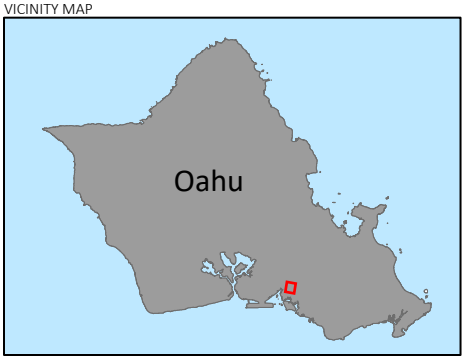
The State Environmental Policy under HRS Chapter 344 established a policy that does the following :

- Encourages productive and enjoyable harmony between people and their environment.
- Promotes efforts that would prevent or eliminate damage to the environment and biosphere.
- Stimulates the health and welfare of humanity.
- Enriches the understanding of the ecological systems and natural resources important to the people of Hawaii.

[7] SLR exposure mapping in the 2017 SLR Report is based on an upper-end projection of 3.2 feet of sea level rise by 2100 in the 5th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), the United Nations body of leading climate scientists and governmental representatives.



VICINITY MAP



LEGEND

- Project Location
- Stream and Flow Direction
- 3.2 feet Sea Level Rise Exposure Area

N

0 250 500

Approximate Scale in Feet

FIGURE 4-2
Sea Level Rise - 3.2 ft. Exposure Area
Interstate H1 (EB) Improvements Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

HRS 344-3(2)(C) states that it shall be the policy of the state, through its programs, authorities, and resources, to establish communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment, which is uniquely Hawaiian.

The proposed H1 improvements project is designed to meet the needs of the community. It would reduce traffic congestion to provide a safe and efficient transportation system for freight and people.

HRS Chapter 195D identifies the protection of endangered species and control over invasive species as a State responsibility. Consultation with the DLNR Division of Forestry and Wildlife and USFWS will occur, as described in Sections 1.5, 1.6, 4.1, 7.1, and 7.4.

4.3 City and County of Honolulu

4.3.1 City and County of Honolulu General Plan

The City and County of Honolulu General Plan is a policy document for the long-range comprehensive development of the island of Oahu and also provides the direction for future growth of the city and county. The current General Plan was amended in October 2002 as Resolution 02-205, CD1, and outlines objectives and policies that address the social, economic, physical, environmental, and design objectives for the general welfare and prosperity of the people of Oahu (DPP, 2002). The project is consistent with the objective for transportation in the General Plan, which states the following:

> *"To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel."*

4.3.2 Community Development Plans

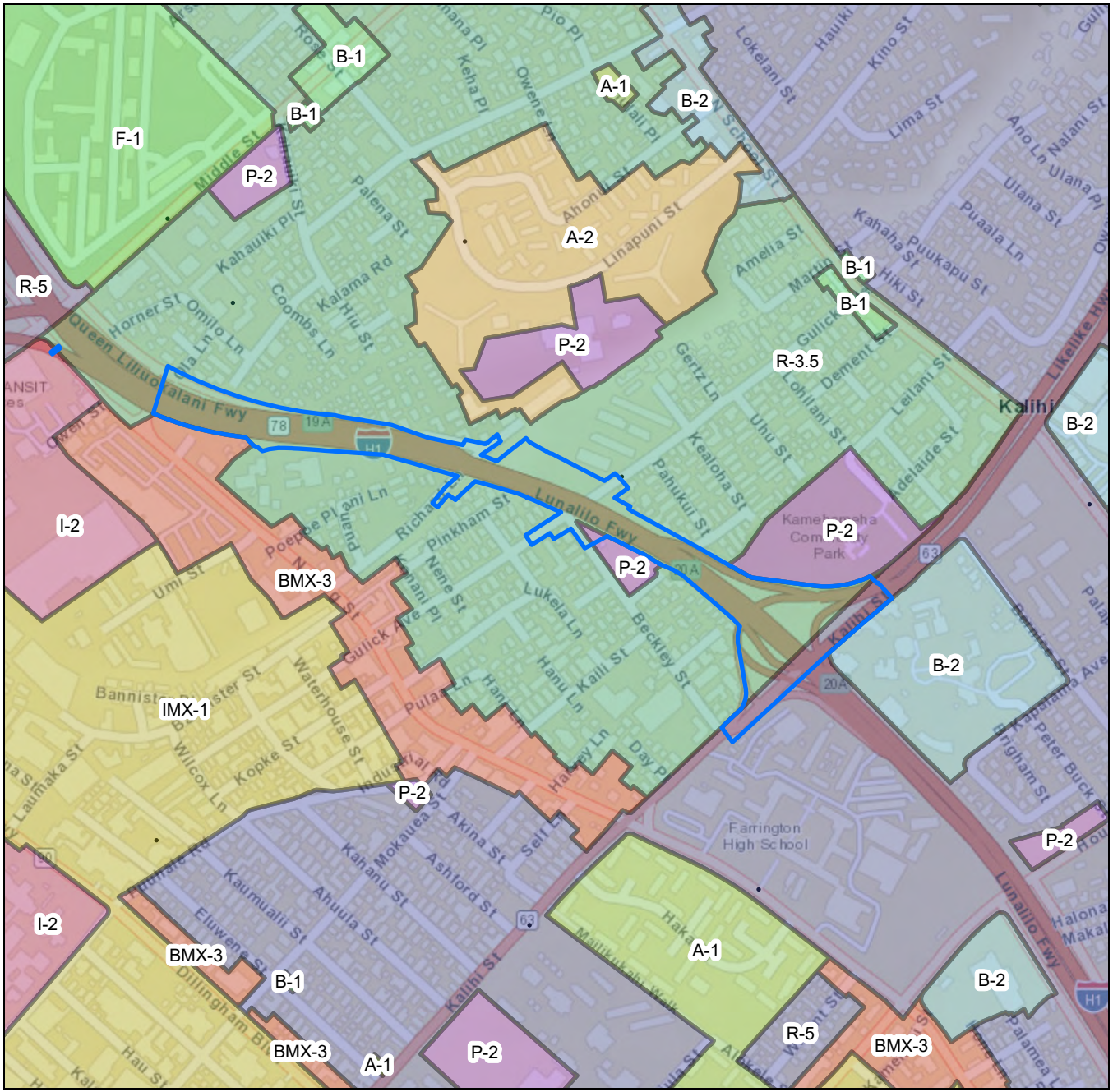
The Primary Urban Center Development Plan, adopted in May 2004 (DPP, 2004a), is a general framework for more detailed planning at the neighborhood level and includes the area extending from Kahala to Pearl City across the valleys and coastline plains of Oahu's southern coastline.

The Kalihi-Palama Action Plan, adopted in 2004 (DPP, 2004b), identifies projects and actions designed to achieve the vision of a visually, economically, and socially successful Kalihi-Palama. Widening of the H1 freeway by one lane between Middle Street and North School Street (eastbound) is one of the projects listed in the plan.

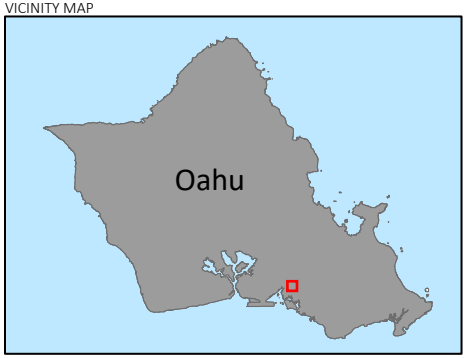
The proposed project is consistent with the land use vision and meets the objectives of both the Primary Urban Center Development Plan and the Kalihi-Palama Action Plan, which encourages the development of infrastructure to support existing land uses surrounding H1.

4.3.3 Zoning

County zoning provides the most detailed set of regulations affecting land development before actual construction. Zoning is typically limited to lands classified in the Urban District under the state land use system. The project area is zoned as R-3.5 and R-5 (Residential) (Figure 4-3). In addition, the Kalihi Waena Neighborhood Park is zoned P-2 (General Preservation). The proposed project would not require a change in the existing county zoning designations.



VICINITY MAP



N

0 500 1,000

Approximate Scale in Feet

LEGEND

Project Location

Zoning Classification

- A-1 Low-density Apartment District
- A-2 Medium-density Apartment District
- B-1 Neighborhood Business District
- B-2 Community Business District
- BMX-3 Community Business Mixed Use District
- F-1 Federal and Military Preservation District
- I-2 Intensive Industrial District
- IMX-1 Industrial Mixed Use District
- P-2 General Preservation District
- R-3.5 Residential District
- R-5 Residential District

FIGURE 4-3
Zoning
Interstate H1 (EB) Improvements
Ola Lane Overpass to
Likelike Highway Off-Ramp

Jacobs

4.3.4 Special Management Area

CZM objectives and policies (HRS 205A-2) were developed to preserve, protect and, where possible, restore the natural resources of Hawaii's coastal zone. Any development within the SMA boundary requires an SMA permit administered by the City and County. The permitting process provides a heightened level of public scrutiny to ensure consistency with SMA objectives. The project area is not located within the SMA boundary; therefore, it does not require an SMA permit. Figure 4-4 shows the proposed project area in relation to the Oahu SMA area.

4.4 Transportation Plans

4.4.1 Statewide Federal-aid Highways 2035 Transportation Plan

The 2035 Transportation Plan was developed as the state's first long-range multimodal transportation for Federal-aid highways (HDOT, 2014). The plan is intended to guide transportation decisions by identifying goals and solutions within a context of limited resources. It addresses future land transportation needs for motorists, freight, transit, bicyclists, and pedestrians based on land use and socioeconomic projections through 2035.

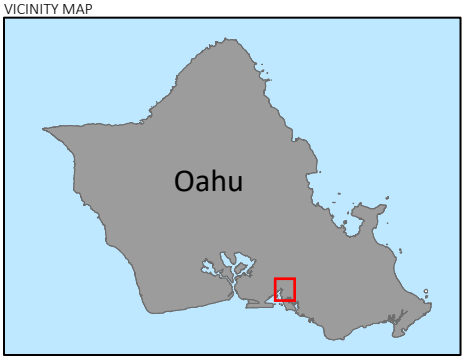
The long-range plan was developed with participation from a wide spectrum of community members and stakeholders. A series of meetings were held to develop and refine the goal statements. Specifically relevant to this project are the goals provided in Table 4-1, which focus on system efficiency and safety.

Table 4-1. Statewide Land Transportation Goals and Objectives

Goals	Objectives	Federal Planning Factor
6.1 Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit	Improve consistency and predictability of travel time along existing corridors. Preserve the functional classification system hierarchical operating characteristics.	System Efficiency Management and Operations Aligns to MAP-21 [a] Performance Goals: • Congestion Reduction—reduce congestion on the National Highway System • System Reliability—improve the efficiency of the surface transportation system
8.1 Maintain a safe transportation system for all land transportation modes	Address transportation safety through a mixture of education, enforcement, and engineering solutions. Reduce the number of traffic related fatalities. Reduce the number of collisions and crashes involving serious injuries and fatalities for all land transportation modes.	Safety Aligns to MAP-21 [a] Performance Goals: • Safety—reduce fatalities and serious injuries on all public roads

[a] MAP-21, signed into law on July 6, 2012 (P.L. 112-141) is the current federal authorization for surface transportation. The full title of MAP-21 is the Moving Ahead for Progress in the 21st Century Act.

VICINITY MAP



LEGEND

Project Location

Special Management Area (SMA)

N

0 1,000 2,000

Approximate Scale in Feet

FIGURE 4-4

Special Management Area (SMA)

Interstate H1 (EB) Improvements
Ola Lane Overpass to Likelike Highway Off-Ramp

Jacobs

4.4.2 Oahu Regional Transportation Plan 2040

Each district in the state has a Regional Federal-aid Highways Transportation Plan or regional long-range land transportation plan. The purpose of the plan is to provide a basis for making multimodal land transportation decisions over a 20-year time frame. As a regional plan, it serves as an interface between overarching state transportation issues and island-specific needs and funding priorities.

The ORTP considers a nearly 25-year planning horizon that incorporates forecasted population, housing, employment, environmental, land use, and technology changes (OahuMPO, 2016). Based upon projected transportation needs, financial resources, and community input, the ORTP identifies strategies and actions to promote the development of an integrated, inter-modal, surface transportation system that facilitates the safe, efficient, and economic movement of people and goods. It also identifies specific highway, transit, freight, bicycle, and pedestrian projects that are designed to improve safety, mitigate congestion, and increase mobility for Oahu's residents and visitors. Projects that appear in the ORTP are eligible for federal transportation funding assistance. The ORTP is updated every 5 years.

The proposed project is identified in the 2040 ORTP (OahuMPO, 2016) as part of a list of existing and fully funded committed short-range projects involving widening of H1 in both directions from Middle Street to Punahou Street.

4.4.3 Oahu Bike Plan

The Oahu Bike Plan, adopted in August 2012, guides the Department of Transportation Services bikeway planning for the entire island of Oahu (DTS, 2012). The plan contains objectives and implementing actions, an inventory of existing facilities, and proposals to expand the network of bicycle facilities.

As a freeway improvement project, the scope of the project does not include construction of new bike facilities. At the same time, there would be no impacts to existing bike facilities and the proposed improvements would not preclude development of bicycle facilities on City streets.

4.4.4 Statewide Pedestrian Master Plan

The Statewide Pedestrian Master Plan, completed in May 2013, provides a comprehensive strategy for improving pedestrian safety, mobility, and accessibility along State highways. The plan identifies and prioritizes pedestrian infrastructure projects throughout the state (HDOT, 2013).

The pedestrian plan does not identify pedestrian infrastructure projects in the vicinity of the proposed project. As a freeway project, the proposed project would not have any impacts on pedestrian safety or mobility.

4.5 References

City and County of Honolulu Department of Transportation Services (DTS). 2012. *Oahu Bike Plan*. August. https://www.honolulu.gov/rep/site/dts/bike_docs/Bicycle-OahuBikePlan-8G-August2012.pdf.

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Oahu Metropolitan Planning Organization (OahuMPO). 2016. *Oahu Regional Transportation Plan 2040.* April 13. https://www.oahumpo.org/wp-content/uploads/2013/01/ORTP-2040-APPROVED-160502.pdf.

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State of Hawaii Department of Transportation (HDOT). 2013. *Statewide Pedestrian Master Plan.* http://hidot.hawaii.gov/highways/files/2013/07/Pedest-Plan-PedMP.pdf

State of Hawaii Department of Transportation (HDOT). 2014. *Statewide Federal-Aid Highways 2035 Transportation Plan*. July. https://hidot.hawaii.gov/highways/files/2014/09/Statewide-Federal-Aid-Highways-2035-Transportation-Plan_Yong.pdf.

U.S. Census Bureau. 2018. 2013-2017 Survey 5-Year Summary File Data. American Community Survey.

5 Findings and Reasons Supporting the Anticipated Determination

This EA found that the potential impacts associated with the proposed project will not be significant or will be mitigated to less than significant levels. Potential environmental impacts are generally temporary, occur during construction, and would not be expected to adversely impact the long-term environmental quality of the project area. This section summarizes the significance criteria used to determine whether the proposed project would have a significant effect on the environment

5.1 Significance Criteria

The potential effects of the proposed project were evaluated based on the significance criteria specified in HAR 11-200-12 (revised in 1996). Discussion of the project's conformance to the criteria is presented as follows.

Involves an irrevocable commitment to, loss or destruction of any natural or cultural resources. The proposed project would not cause significant adverse impacts to biological resources, cultural resources, soils and geology, or water resources and therefore does not involve irrevocable commitment to, loss or destruction of any natural or cultural resource. All project components will be constructed within the existing public rights-of-way or immediately adjacent to established travel corridors.

Curtails the range of beneficial uses of the environment. The proposed project would modernize existing transportation facilities that are functionally deficient and would have no impact on the beneficial uses of the environment within the project area. The project area is highly urbanized and would not change the existing land use pattern. There are no unique habitats in the area.

Conflicts with the State's long-term environmental policies or goals and guidelines, as expressed in HRS Chapter 344, and any revisions thereof and amendments thereto, court decisions, or executive orders. The proposed project is consistent with the environmental policies, goals, and guidelines defined in HRS Chapter 344. In particular, the project is consistent with transportation guidelines by improving the region's transportation infrastructure. As discussed in Section 3, the potential impacts related to the proposed project are associated with short-term construction-related activities that can be minimized through implementation of mitigation measures described in this EA.

Substantially affects the economic or social welfare of the community or state. The proposed project would not result in significant socioeconomic impacts on the community or state, as it would not cause an increase in population or change the demographic characteristics of the local area. The proposed project would create short-term employment opportunities consisting primarily of construction-related jobs generated by the proposed project. The proposed project would also have a positive impact on the economic and social welfare of the community by improving the long-term functionality of the highway system.

Substantially affects public health. With the exception of short-term, construction-related impacts to ambient air and noise levels, no long-term significant impacts to the public's health and welfare are anticipated. The incorporation of recommended mitigation measures and BMPs during the construction period would minimize these temporary impacts to surrounding communities.

Involves substantial secondary impacts, such as population changes or effects on public facilities. No adverse secondary impacts on the environment, such as population growth or the need to expand public facilities, would be anticipated with the implementation of the proposed project.

Involves a substantial degradation of environmental quality. The proposed project would not cause any impacts that would substantially degrade environmental quality. Construction activities associated with the proposed project are anticipated to result in relatively insignificant short-term impacts to noise, air quality, and traffic in the immediate project vicinity. The incorporation of mitigation measures during the construction period would prevent adverse impacts to the environmental quality.

Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions. The proposed project is a self-contained action and is not part of additional and/or related actions. Land use in the project area consists primarily of residential and commercial uses. No other past, present, or future actions associated with these land uses have been identified that would contribute to significant cumulative impacts for any of the resources considered in this EA.

Substantially affects rare, threatened, or endangered species or its habitat. No rare, threatened, or endangered species, or associated habitat were observed in the project limits. However, the Hawaiian hoary bat, which is federally and state listed as endangered, has the potential to occur in the project area. Potential impacts from the proposed project to this species are expected to be discountable and temporary and BMPs would be implemented during construction to ensure the protection of the species. BMPs and protocols will be implemented to avoid and minimize contact with individual members of protected migratory birds that may be encountered in the project area.

Detrimentally affects air or water quality or ambient noise levels. Only minimal construction-related, short-term impacts on air quality and noise levels are anticipated. Mitigation measures will be implemented to minimize construction-related noise and dust impacts. Adverse impacts to water resources would be prevented through BMPs and adherence to permit requirements. No long-term, direct or indirect, adverse impacts to these resources are anticipated from implementation of the proposed project.

Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a floodplain, tsunami zone, beach, erosion prone area, geologically hazardous land, estuary, freshwater, or coastal waters. This project is not located in an environmentally sensitive area. The project traverses a FEMA-designated floodplain and will comply with flood hazard regulations. The project is being designed in accordance with standards appropriate to the geologic, hydrologic, and seismic setting.

Substantially affects scenic vistas and view planes identified in county or state plans or studies. The overall visual quality of the project area would not change as a result of project improvements. While roadway and bridge dimensions will change slightly, the visible functional characteristics will remain the same. The proposed project would not obstruct any view planes or scenic vistas.

Requires substantial energy consumption. Construction of the proposed project would not require substantial energy consumption. Fuel will be consumed by construction vehicles and equipment, but this use will be comparable to other construction projects.

5.2 Conclusion

Through civil and structural design, impact avoidance and minimization actions, proposed BMPs and mitigation measures, and consultation with agencies and the public, the analysis contained in this EA has determined that project-related impacts would be mitigated to less than significant levels, such that the proposed project would not result in significant adverse impacts.

6 Anticipated Determination

Based on the information presented and examined in this document, the proposed project is not expected to produce significant adverse social, economic, cultural, or environmental impacts. Consequently, a finding of no significant impact is anticipated, pursuant to HRS Chapter 343 and the provisions of HAR Subchapter 6 of Chapter 200, Title 11.

7 Consultation and Coordination

7.1 Organizations Consulted During Preparation of the Draft Environmental Assessment

The following agencies and organizations were contacted in August 2020 during preparation of the Draft EA. They received preliminary project information and were asked to provide comments relative to specific environmental compliance (such as NHPA Section 106 and ESA Section 7) or for general assistance in preparing the Draft EA. A sample of the consultation letter is included at the end of this chapter.

Consultation with Native Hawaiian Organizations regarding historic preservation is required as part of compliance with NHPA Section 106 and HRS Chapter 6E. Consultation is also occurring with the DLNR SHPD.

7.1.1 Federal

- USACE, Honolulu District.
- USFWS, Pacific Islands Fish and Wildlife Office.
- USEPA, Region 9, Pacific Islands Office.
- United States Department of Transportation, FHWA.
- The Honorable Mazie Hirono, U.S. Senator.
- The Honorable Brian Schatz, U.S. Senator.

7.1.2 State of Hawaii

- Department of Accounting and General Services.
- Department of Business, Economic Development & Tourism.
- Department of Education.
- Department of Education, Farrington High School.
- Department of Education, Kalakaua Middle School.
- HDOH.
- Department of Hawaiian Home Lands.
- Department of Human Services.
- Department of Labor and Industrial Relations.
- DLNR and SHPO.
- Hawaii Emergency Management Agency.
- Hawaii Public Housing Authority.
- OahuMPO.
- Office of the Governor.
- Office of Hawaiian Affairs.
- Office of Planning.
- SHPD.
- The Honorable Lorraine Inouye, Hawaii State Senator District , Senate Transportation and Energy Committee.
- The Honorable Karl Rhoads, Hawaii State Senator District 13.
- The Honorable Donna Mercado Kim, Hawaii State Senator District 14.
- The Honorable Glenn Wakai, Hawaii State Senator District 15.
- The Honorable Breene Harimoto, Hawaii State Senator District 16.
- The Honorable Henry J. C. Aquino, Hawaii State Representative District 38, House Committee on Transportation.
- The Honorable Troy N. Hashimoto, Hawaii State Representative District 8.
- The Honorable John M. Mizuno, Hawaii State Representative, District 28.
- The Honorable Daniel Holt, Hawaii State Representative District 29.
- The Honorable Romy Cachola, Hawaii State Representative District 30.

7.1.3 City and County of Honolulu

- Honolulu Board of Water Supply.
- Department of Design and Construction.
- Department of Transportation Services.
- Honolulu Fire Department.
- Honolulu Police Department.
- Department of Facility Maintenance.
- Department of Environmental Services.
- Department of Emergency Services.
- Department of Emergency Management.
- Department of Parks and Recreation.
- Department of Planning and Permitting.
- Office of the Mayor.
- The Honorable Carol Fukunaga, Councilmember District 6.
- The Honorable Joey Manahan, Councilmember District 7.
- The Honorable Brandon J. C. Elefante, Councilmember District 8.

7.1.4 Utilities

- AT&T.
- HECO.
- Hawaii Gas.
- Hawaiian Telcom.
- Spectrum.

7.1.5 Neighborhood Boards

- Hawaii Kai Neighborhood Board No. 1.
- Kuliouou-Kalani Iki Neighborhood Board No. 2.
- Waialae-Kahala Neighborhood Board No. 3.
- Kaimuki Neighborhood Board No. 4.
- Diamond Head/Kapahulu/Saint Louis Heights Neighborhood Board No. 5.
- Palolo Neighborhood Board No. 6.
- Manoa Neighborhood Board No. 7.
- McCully/Moiliili Neighborhood Board No. 8.
- Waikiki Neighborhood Board No. 9.
- Makiki/Lower Punchbowl/Tantalus Neighborhood Board No. 10.
- Ala Moana/Kakaako Neighborhood Board No. 11.
- Nuuanu/Punchbowl Neighborhood Board No. 12.
- Downtown-Chinatown Neighborhood Board No. 13.
- Liliha/Puunui/Alewa/Kamehameha Heights Neighborhood Board No. 14.
- Kalihi-Palama Neigborhood Board No. 15.
- Klihi Valley Neighborhood Board No. 16.
- Aliamanu/Salt Lake/Foster Village Neighborhood Board No. 18.
- Aiea Neighborhood Board No. 20.
- Pearl City Neighborhood Board No. 21.
- Waipahu Neighborhood Board No. 22.
- Ewa Neighborhood Board No. 23.
- Waianae Coast Neighborhood Board No. 24.
- Mililani/Waipio/Melemanu Neighborhood Board No. 25.
- Wahiawa Neighborhood Board No. 26.
- North Shore Neighborhood Board No. 27.

- Koolauloa Neighborhood Board No. 28.
- Kaneohe Neighborhood Board No. 30.
- Kahaluu Neighborhood Board No. 29.
- Kailua Neighborhood Board No. 31.
- Waimanalo Neighborhood Board No. 32.
- Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34.
- Mililani Mauka/Launani Valley Neighborhood Board No. 35.
- Nanakuli-Maili Neighborhood Board No. 36.

7.1.6 Community and Other Organizations

- Hawaii Transportation Association.
- *Honolulu Star-Advertiser.*
- Kalihi Business Association.
- Tamashiro Market.

7.2 Early Consultation Comment Letters Received

Six agencies responded to requests for comments during the Draft EA preparation period. Of these, substantive comments from five agencies are summarized herein and are incorporated into relevant sections of the Draft EA. Comment letters and responses are reproduced in full at the end of this chapter.

7.2.1 City and County of Honolulu, Department of Design and Construction; Letter dated September 21, 2020

Comments:

- Impacts on two City parks—Kalihi Waena Park and Kamehameha Community Park—are unclear.
- More information is requested when available.
- Request that the design minimize impacts to park facilities.

7.2.2 City and County of Honolulu, Department of Environmental Services; Letter dated October 2, 2020

Comments:

- There are existing sewer lines and manholes in the proposed project area. When working in areas with existing sewer lines, open access to sewer manholes should be maintained for sewer maintenance.
- Work should be done in accordance with the current *Wastewater System Design Standards* (City and County of Honolulu, 2017).
- [The Department of Environmental Services] is starting a project called "Kalihi Area Sewer Rehabilitation/Improvements" in the area of the proposed project. This project will evaluate potential relocation and/or upsizing of sewers. The project's planning phase will start in 2021. Construction funds are currently scheduled for Fiscal Year 2025.

7.2.3 City and County of Honolulu, Department of Facility Maintenance; Letter dated September 24, 2020

Comments:

- No comments at this time as [Department of Facility Maintenance] does not have facilities or easements within the project area.
- Recommend that the Department of Transportation Services have the opportunity to review and evaluate project impacts to City roads.

7.2.4 City and County of Honolulu, Fire Department; Letter dated September 15, 2020

Comments:

- Determination of no significant impact to fire department services.
- Request that fire apparatus access be maintained throughout the duration of the project.

7.2.5 City and County of Honolulu, Department of Parks and Recreation; Letter dated November 30, 2020

Comments:

- Project has potential to negatively impact park facilities.
- Meeting requested to discuss department concerns and measures needed for concurrence with Section 4(f) determination of *de minimis* impact.

7.3 Public Involvement

A virtual public information meeting will be held during the Draft EA review period to provide an overview of the project and obtain feedback from the community.

7.4 Agencies, Organizations, and Individuals to Be Contacted During the Draft EA Review Period

The following agencies, organizations, and individuals will be included on the distribution list for notification of the Draft EA public review and comment period.

7.4.1 Federal

- USACE.
- USFWS.
- USEPA.

7.4.2 State of Hawaii

- Department of Accounting and General Services.
- Department of Hawaiian Home Lands.
- HDOH.
- DLNR.
- Hawaii Emergency Management Agency.
- Office of Hawaiian Affairs.
- Office of Planning.
- SHPO.

7.4.3 City and County of Honolulu

- Honolulu Board of Water Supply.
- Department of Transportation Services.
- Department of Design and Construction.
- Department of Planning and Permitting.
- Department of Facility Maintenance.
- Department of Environmental Services.
- Department of Emergency Services.
- Department of Emergency Management.

- Department of Parks and Recreation.
- Honolulu Fire Department.
- Honolulu Police Department.

7.4.4 Utilities

- AT&T.
- HECO.
- Hawaii Gas.
- Hawaiian Telcom.
- Spectrum.

7.4.5 Neighborhood Boards and Community Organizations

- Downtown-Chinatown No. 13
- Liliha/ Puunui/ Alewa/ Kamehameha Heights No. 14
- Kalihi-Palama No. 15
- Kalihi Valley No. 16

7.4.6 Media

- *Honolulu Star-Advertiser.*

7.4.7 Public Library

- Kalihi-Palama Public Library (hardcopy will be available for public review).

7.5 References

City and County of Honolulu. 2017. *Wastewater System Design Standards*. Department of Environmental Services July.

REQUEST FOR PRE-ASSESSMENT COMMENTS

Sample Letter Requesting Pre-assessment Comments

Comments Received and Responses

- CCH Department of Design and Construction Letter and HDOT Response
- CCH Department of Environmental Services Letter and HDOT Response
- CCH Department of Facility Maintenance Letter and HDOT Response
- CCH Honolulu Fire Department Letter and HDOT Response
- CCH Department of Parks and Recreation Letter and HDOT Response

DAVID Y. IGE
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
LANDSCAPING DESIGN SECTION, ROOM 688A
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

JADE T. BUTAY
DIRECTOR

Deputy Directors
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

IN REPLY REFER TO:
HWY-DS 2.3940

September 4, 2020

VIA EMAIL: wes.frysztacki@honolulu.gov

Mr. Wes Frysztacki, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, Third Floor
Honolulu, Hawaii 96813-3017

Dear Mr. Frysztacki:

Subject: Interstate Route H-1 East Bound Improvements,
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu
Request for Consultation on Proposed Project and Environmental Assessment

CH2M HILL/ Jacobs Engineering Group, Inc. is working on a State of Hawaii, Department of Transportation, Highways Division project that proposes to improve approximately 0.7 miles of East Bound (EB) Interstate H-1 in Honolulu to help relieve congestion and improve safety. The project is called the Interstate Route H-1 East Bound Improvements, Ola Lane Overpass to Likelike Highway Off-Ramp Project. The project limits extend from just East of the Ola Lane overpass on Interstate H-1 to the Likelike Highway off-ramp. The project would eliminate the Interstate H-1/H-201 merge, increase the shoulder and lane widths on EB Interstate H-1, and install safety measures for the Gulick Overcrossing. The enclosed project information sheet provides additional information on the project, including a map that displays the approximate project limits, and a brief discussion of the project's purpose and need, goals, and overall schedule.

Since the project will occur in a well-developed area and involves improvements to the existing Freeway, mostly within the established Right-of-Way, adverse impacts on elements of the built and natural environment are anticipated to be minor, if any. The project's proposed use of State of Hawaii Lands and funding triggers compliance with Chapter 343, Hawaii Revised Statutes (HRS). Thus, an Environmental Assessment (EA) is being prepared with an anticipated Finding of No Significant Impact. Potential use of federal funds may require environmental documentation consistent with the National Environmental Policy Act.

At this early stage in project development, we would like to familiarize resource agencies and the public with the details of the project. We seek your input as to whether the proposed project may have an impact on any of your existing or proposed projects, plans, policies, or programs that we should consider when preparing the Chapter 343, HRS EA.

It would be greatly appreciated if all feedback can be provided by September 25, 2020, so that all comments can be appropriately addressed while meeting the established project schedule.

Should you have any questions, please contact our Contract Manager, Mr. Ka Chun Wat, at (808) 692-7545, Technical Design Services Section, Design Branch, Highways Division or by email at kachun.e.wat@hawaii.gov.

Sincerely,

Karen Chun

KAREN CHUN
Engineering Program Manager
Design Branch, Highways Division

Enclosure

KCW: mr

bc: HWY-DS (KCW)

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

MARK YONAMINE, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

September 21, 2020

RECEIVED
20 SEP 25 P2:53
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

State of Hawaii
Department of Transportation
ATTN: Karen Chun
601 Kamokila Blvd.
Kapolei, Hawaii 96707

Dear Ms. Chun,

Subject: Interstate Route H-1 Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1H1-01-09
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for the opportunity to review and comment. The Department of Design and Construction has the following comments:

It is not clear in the materials provided if there will be an impact on two City parks (Kalihi Waena Neighborhood Park and Kamehameha Community Park).

We request that when more information is available, it be shared with the City for input. At this time, we would request that the HDOT engineers' design minimize any impact to these facilities.

Should you have any further questions, please contact me at 768-8480.

Sincerely,

FOR Mark Yonamine, P.E
Director

MY:ms (825096)

DAVID Y. IGE
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

JADE T. BUTAY
DIRECTOR

Deputy Directors
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:
HWY-DS 2.6720

November 18, 2021

VIA EMAIL: ddc@honolulu.gov

Mr. Alex Kozlov, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Kozlov:

Subject: Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for sending your early consultation comments by letter dated September 21, 2020.

The proposed project is anticipated to have temporary construction impacts to Kalihi Waena Neighborhood Park. During work on the Gulick Overcrossing, a temporary access pathway to a temporary pedestrian bridge will be constructed across the western portion of the park. No permanent impacts to the park are anticipated. In addition, no temporary or permanent impacts to Kamehameha Community Park are anticipated.

Your office will be notified when the Draft Environmental Assessment with additional detailed project information is available for review and comment. Additionally, the project design team is consulting with the Department of Parks and Recreation to minimize temporary impacts on park facilities and provide for public safety.

Should you have any questions, please contact our Project Manager, Mr. Ka Chun Wat, at (808) 692-7545, Technical Design Services Section, Design Branch, Highways Division or by email at kachun.e.wat@hawaii.gov.

Sincerely,

Karen Chun

KAREN CHUN
Engineering Program Manager
Design Branch, Highways Division

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3486 • FAX: (808) 768-3487 • WEBSITE: http://envhonolulu.org

KIRK CALDWELL
MAYOR

LORI M.K. KAHIKINA, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO
PRO 20-110

October 2, 2020

VIA EMAIL: kachun.e.wat@hawaii.gov

Ms. Karen Chun, Engineering Program Manager
State of Hawaii, Department of Transportation
Design Branch, Highways Division
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Mr. Ka Chun Wat, Contract Manager Technical Design Services Section
State of Hawaii, Department of Transportation
Design Branch, Highways Division
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Ms. Chun and Mr. Wat:

SUBJECT: Request for Consultation on Proposed Project and Environmental Assessment
Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu

We have reviewed your letter dated September 4, 2020. We have the following comments on the subject project:

1. We have existing sewer lines and manholes in the area of the proposed project (see enclosed figure). Work done in the area of the existing sewer lines, especially over the existing sewer manholes, should maintain open access to the existing sewer manholes for sewer maintenance.

2. Work should be done in accordance with the current "Wastewater System Design Standards, July 2017".

3. We are starting a project titled, "Kalihi Area Sewer Rehabilitation/ Improvements" in the area of the proposed project. This project will be starting the planning phase in 2021, and includes evaluating potential relocation and/or upsize of sewers in the area of the proposed project (see enclosed figure). Construction funds are currently scheduled for Fiscal Year 2025.

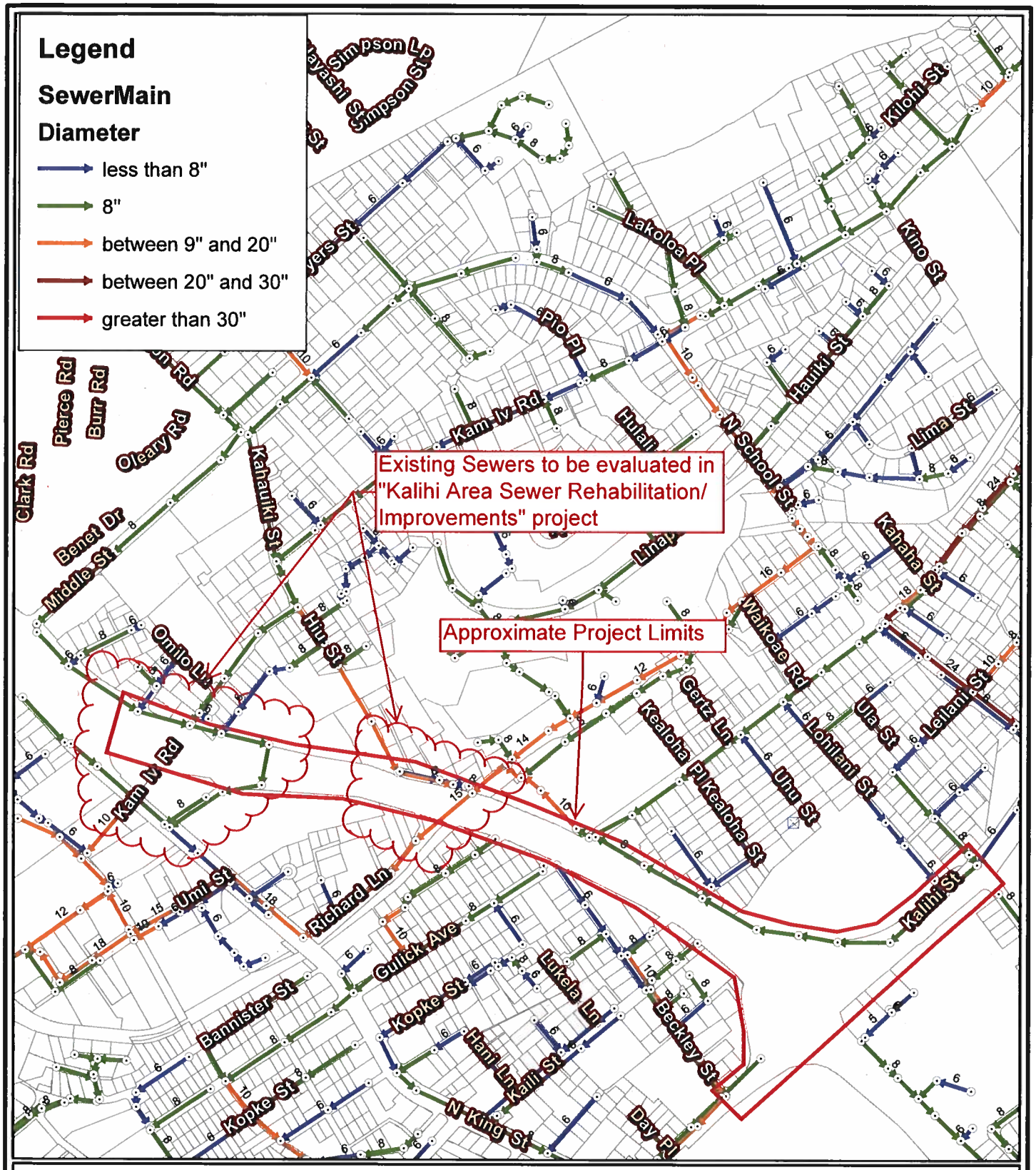
Should you have any questions, please call Lisa Kimura, Civil Engineer V, at (808) 768-3455 or email lkimura1@honolulu.gov.

Sincerely,

Lori M.K. Kahikina, P.E.
Director

Attachment

cc: DPP, SDD, Wastewater Branch
ENV, WEC, Collection System Engineering Branch



Ola Lane Overpass to Likelike Off-Ramp Project
Sewer Location Map

Prepared by: Dept. of Environmental Services
City & County of Honolulu
1000 Uluohia Street
Kapolei, Hawaii 96707

Copyright: City & County of Honolulu
All Rights Reserved 2011

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DAVID Y. IGE
GOVERNOR

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BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

JADE T. BUTAY
DIRECTOR

Deputy Directors
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:
HWY-DS 2.6729

November 18, 2021

VIA EMAIL: wyokoyama@honolulu.gov

Mr. Wesley T. Yokoyama, P.E., Director
Department of Environmental Services
City and County of Honolulu
1000 Uluohia Street, Suite 308
Kapolei, Hawaii 96707

Dear Mr. Yokoyama:

Subject: Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for sending your early consultation comments by letter dated October 2, 2020.

We acknowledge your comments and provide the following responses:

1. Access to existing sewer manholes within the project area will be maintained during construction.

2. The project will be designed and implemented in compliance with the Wastewater System Design Standards, dated July 2017.

3. The proposed project will widen the Kalihi Stream overcrossing with construction occurring within the stream channel and adjacent Richard Lane. The project team will coordinate with Department of Environmental Services regarding design of the upcoming Kalihi Area Sewer Rehabilitation/Improvements project.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, should you have any questions, please contact our Project Manager, Mr. Ka Chun Wat, at (808) 692-7545, Technical Design Services Section, Design Branch, Highways Division or by email at kachun.e.wat@hawaii.gov.

Sincerely,

Karen Chun

KAREN CHUN
Engineering Program Manager
Design Branch, Highways Division

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu`ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 20-499

RECEIVED
SEP 30 2020
TECHNICAL DESIGN SVCS OFC
DEPT. OF TRANSPORTATION

September 24, 2020

RECEIVED
20 SEP 29 P4:05
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

Ms. Karen Chun, Engineering Program Manager
State of Hawaii
Department of Transportation
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Ms. Chun:

Subject: Interstate Route H-1 East Bound Improvements,
Ola Lane Overpass to Likelike Off-Ramp Project
Project NO. H1H1-01-09, Honolulu
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for the opportunity to review and comment on the subject project.

We have no comments at this time, as we do not have any facilities or easements on the subject property. However, we would recommend that the Department of Transportation Services have the opportunity to review and evaluate the project's impact to our City roads.

If you have any questions, please call Mr. Kyle Oyasato of the Department of Facility Maintenance, at 768-3697.

Sincerely,

Ross S. Sasamura, P.E.
Director and Chief Engineer

cc: Department of Transportation Services

DAVID Y. IGE
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

JADE T. BUTAY
DIRECTOR

Deputy Directors
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:
HWY-DS 2.6728

November 18, 2021

VIA EMAIL: roger.babcock@honolulu.gov

Mr. Roger Babcock, Jr., Ph.D., P.E.
Director and Chief Engineer Designate
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

Dear Mr. Babcock:

Subject: Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for sending your early consultation comments by letter dated September 24, 2020. The project team will coordinate with the Department of Transportation Services regarding construction impacts on City roads during project implementation.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, should you have any questions, please contact our Project Manager, Mr. Ka Chun Wat, at (808) 692-7545, Technical Design Services Section, Design Branch, Highways Division or by email at kachun.e.wat@hawaii.gov.

Sincerely,

Karen Chun

KAREN CHUN
Engineering Program Manager
Design Branch, Highways Division

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

September 15, 2020

Ms. Karen Chun
Engineering Program Manager
Design Branch, Highways Division
Department of Transportation
State of Hawaii
601 Kamokila Boulevard
Kapolei, Hawaii 96707

RECEIVED
20 SEP 18 P3:49
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

Dear Ms. Chun:

Subject: Request for Consultation on Proposed Project and Environmental Assessment
Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Hawaii

In response to your letter dated September 4, 2020, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and determined that there will be no significant impact to fire department services.

The HFD requests that fire apparatus access be maintained throughout the duration of the project.

Should you have questions, please contact Battalion Chief Wayne Masuda of our Fire Prevention Bureau at 723-7151 or wmasuda@honolulu.gov.

Sincerely,

JASON SAMALA
Assistant Chief

RECEIVED
SEP 2 2020
TECHNICAL DESIGN SVCS OFC
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MPN/KB:bh

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Directors
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:
HWY-DS 2.6731

November 23, 2021

VIA EMAIL: wmasuda@honolulu.gov

Mr. Jason Samala
Assistant Fire Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawaii 96813

Attn: Battalion Chief Wayne Masuda, Fire Prevention Bureau

Dear Mr. Samala:

Subject: Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for sending your early consultation comments by letter dated September 15, 2020. We acknowledge that the proposed project will not have significant impacts to fire department services. Access for fire apparatus will be maintained during project construction. The Honolulu Fire Department will be notified in advance if temporary bypass routes are needed.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, should you have any questions, please contact our Project Manager, Mr. Ka Chun Wat, at (808) 692-7545, Technical Design Services Section, Design Branch, Highways Division or by email at kachun.e.wat@hawaii.gov.

Sincerely,

Karen Chun

KAREN CHUN
Engineering Program Manager
Design Branch, Highways Division

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

November 30, 2020

Ms. Karen Chun, Engineering Program Manager
Department of Transportation
Design Branch, Design Section
601 Kamokila Boulevard
Kapolei, Hawaii 96813

Dear Ms. Chun:

SUBJECT: Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp
Project No. H1H1-01-09, Honolulu, Island of Oahu
Request for Consultation on Proposed Project and
Environmental Assessment

Thank you for the opportunity to review and comment at the Pre-Consultation Stage of the subject Environmental Assessment.

The Department of Parks and Recreation is of the opinion that this project has the potential to negatively impact park facilities.

Please schedule a meeting with the Department staff as soon as you can to discuss our concerns as this project will require the Department to concur with a Section 4(f) determination of de minimus impact. The sooner we meet to address our concerns the sooner the Department will be able to concur.

To schedule a meeting or if you have any questions please contact Mr. John Reid, Planner, at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(825117)

cc: Mr. Ka Chun Wat, State of Hawaii, Department of Transportation
Mr. Stan Malama, Department of Parks and Recreation

DAVID Y. IGE
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

JADE T. BUTAY
DIRECTOR

Deputy Directors
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:
HWY-DS 2.6730

November 18, 2021

VIA EMAIL: parks@honolulu.gov

Ms. Laura H. Thielen, Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

Dear Ms. Thielen:

Subject: Interstate Route H-1 East Bound Improvements
Ola Lane Overpass to Likelike Off-Ramp Project
Project No. H1HI-01-09
Honolulu, Island of Oahu
Request for Consultation on Proposed Project and Environmental Assessment

Thank you for sending your early consultation comments by letter dated November 30, 2020. We acknowledge that the proposed project will temporarily impact park facilities. A meeting is being scheduled with you and your staff and we look forward to discussing the scope of the project and the concerns of the Department of Parks and Recreation.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, should you have any questions, please contact our Project Manager, Mr. Ka Chun Wat, at (808) 692-7545, Technical Design Services Section, Design Branch, Highways Division or by email at kachun.e.wat@hawaii.gov.

Sincerely,

Karen Chun

KAREN CHUN
Engineering Program Manager
Design Branch, Highways Division

Appendix A

DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

Traffic Impact Assessment

Interstate H1 (EB) Improvements from Ola Lane Overpass to Likelike Highway Off-Ramp

Honolulu, Hawaii

Prepared for

State of Hawaii Department of Transportation

November 2020

Prepared by

JACOBS

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2 Existing (2020) Eastbound H1 Freeway Configuration and Traffic Volumes
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Appendices

A Historic Crash Data
B Existing (2020) and Construction (2022) SYNCHRO Reports
C Detour Routes with Gulick Avenue Closure

SECTION 1

Introduction

This traffic impact assessment (TIA) describes the existing (2020) and anticipated future (2023, 2035) traffic operations on Interstate H1 (H1) in the eastbound direction between the Middle Street overpass and the Likelike Highway off-ramp. The existing traffic conditions assess recent traffic counts collected by the Hawaii Department of Transportation (HDOT) on the current freeway lane channelization. Existing conditions are also based on field observations of vehicle queueing and travel times.

Future year freeway operations assess traffic conditions with the current lane configuration and with a potential improvement to H1 eastbound between the Middle Street overpass and the Likelike Highway off-ramp. Two future years are analyzed; the anticipated opening year of the improvement (2023) and a future horizon year (2035).

With the current lane configuration, a two-lane on-ramp from H1 eastbound (Queen Liliuokalani Freeway) meets a three-lane H201 (Moanalua Freeway) under the Ola Lane overpass. Vehicle friction occurs as drivers from the left-side lane of the H1 on-ramp must merge with the right-side lane from H201. Vehicles continue eastbound on four 10-foot wide lanes.

With the potential improvement, this merge would be eliminated. Both lanes from the eastbound H1 on-ramp would continue alongside the three lanes from eastbound H201 and vehicles would travel in five 11-foot wide lanes to the Likelike Highway interchange. At the Likelike Highway interchange, the far right lane would exit to northbound Likelike Highway, and the four remaining eastbound through lanes would continue under the Kalihi Street overpass as they do today. The potential improvement includes an increase in lane capacity as well as safety benefits for vehicles because the area in which lane maneuvers can be made is lengthened.

As part of the improvement, the Gulick Avenue bridge would require temporary closures (to vehicle and nonmotorized traffic in both directions) to allow for construction of lane improvements on H1 eastbound. During freeway construction, local street traffic on Gulick Avenue will be detoured to alternate routes, most likely Kalihi Street or Middle Street, to cross H1. Study intersections on Kalihi Street, Middle Street, and Gulick Avenue are analyzed during the anticipated construction year (2022), with and without Gulick Avenue closures, to assess potential changes in peak hour traffic operations due to freeway construction activities.

Future year traffic analysis volumes are based on travel demand model forecasts that account for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040. In the future year 2035 analysis, forecasted traffic volumes on H1 eastbound account for the availability of rail transportation between Kapolei and downtown Honolulu.

Figure 1 depicts the freeway analysis network, including the location of the potential freeway improvement, and surrounding local street analysis intersections.

Figure 1. Study Area Map

SECTION 2

Existing Conditions (2020)

This section describes the existing transportation conditions (2020) within the study area.

Freeway Operations

Interstate H1 is the primary regional access through downtown Honolulu. Within the study area, H1 (also known as Lunalilo Freeway) is classified as an Urban Principal Arterial – Interstate by the Hawaii Department of Transportation. In the eastbound direction between Middle Street and the Likelike Highway off-ramp, the freeway has four general purpose lanes and a posted speed limit of 45 miles per hour (mph). Currently, the eastbound travel lanes within this section of freeway are 10-feet wide.

Traffic Volumes

Daily traffic volumes on H1 eastbound between Middle Street and Likelike Highway are in the range of approximately 95,000 vehicles. Heavy vehicles make up roughly 3 percent of daily traffic volumes.

During the morning commute period (6:00 a.m. to 9:00 a.m.), existing eastbound traffic volumes peak at about 6,700 vehicles per hour. Traffic volumes decrease slightly through the midday period (9:00 a.m. to 3:00 p.m.) to approximately 6,300 vehicles per hour. By the afternoon commute period (3:00 p.m. to 7:00 p.m.), traffic volumes decrease further to roughly 4,800 vehicles per hour between Middle Street and the Likelike Highway off-ramp. Heavy vehicles account for approximately 2 to 3 percent of peak period traffic volumes. Figure 2 depicts the current lane configuration on H1 eastbound within the study area along with the peak hour and daily freeway traffic analysis volumes.

	H201 Eastbound	On-ramp	H1 EB Mainline	On-ramp	H1 EB Mainline	Off-ramp	H1 EB Mainline	On-ramp	H1 EB Mainline	Off-ramp	H1 EB Mainline
Daily Volume	47,475	10,315	57,790	37,325	95,115	11,150	83,965	26,375	110,340	17,425	92,915
AM Peak Volume	3,510	695	4,205	2,520	6,725	845	5,880	2,050	7,930	1,095	6,835
Midday Peak Volume	3,160	665	3,825	2,450	6,275	670	5,605	1,925	7,530	1,235	6,295
PM Peak Volume	2,370	705	3,075	1,735	4,810	620	4,190	1,585	5,775	860	4,915

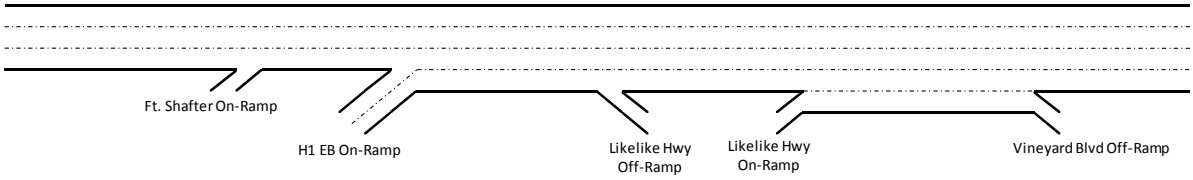


Figure 2. Existing (2020) Eastbound H1 Freeway Configuration and Traffic Volumes

Existing traffic volume counts are likely affected by downstream congestion that originates beyond the Vineyard Boulevard off-ramp. This congestion often spills back past Vineyard Boulevard, constraining the number of vehicles that are able to move through the study area, and affecting eastbound traffic on both H1 (from the airport) and Moanalua Freeway.

Travel Times and Congestion

Eastbound travel times through the study area were collected in the field on typical days in November 2019. Travel times were collected between the Fort Shafter/Funston Road on-ramp merge gore and the Vineyard Boulevard off-ramp diverge gore. The gore represents the point where the painted lines between the mainline and the ramp converge (for on-ramps) or diverge (for off-ramps). The travel time path is approximately 1.5 miles long.

Travel times were collected at various times during the day and varied depending on the selected travel lane and downstream congestion conditions. In general, vehicles in the far left lane tended to move at more consistent travel speeds through the study area. This is likely due to fewer vehicle interactions caused by merging or

diverging vehicles. Vehicles traveling in the far right lane tended to be most impacted by lane changing maneuvers, and therefore were more likely to experience irregular flow with 'stop-and-go' conditions.

Travel speeds between Fort Shafter and Vineyard Boulevard were generally in the range of 15-20 miles per hour (mph) in the morning peak period. Downstream congestion originating beyond Vineyard Boulevard often affected traffic through the study area. The H1 eastbound merge with Moanalua Freeway also contributed to congestion resulting in vehicle queues that extended back through Fort Shafter to Moanalua Stream. Morning commute peak period travel times ranged between approximately 8 and 10 minutes.

Midday travel times were generally shorter compared to the morning peak period. Drivers faced slightly less congestion and were able to travel at higher speeds reaching 40-45 mph. Average travel times between Fort Shafter and Vineyard Boulevard during the midday were in the range of approximately 2 to 3 minutes.

The afternoon commute period was affected by downstream congestion, similar to the morning commute peak period. Eastbound travel times were in the range of approximately 8 to 10 minutes from Fort Shafter to the Vineyard Boulevard off-ramp. Travel speeds were approximately 20 mph on average through the study area.

Safety Conditions

Historical crash data along the H1 study corridor was collected from the State of Hawaii Department of Transportation, Traffic Safety Section for the time period between January 1, 2014 and December 31, 2018. This time period represents the most recent 5 years of available data. The crash data includes major traffic accidents that occurred on H1 eastbound from the Middle Street overpass to the eastbound off-ramp to Vineyard Boulevard (Milepost 19.1 to Milepost 20.5). Crash data statistics are provided in Appendix A.

The crash data information is provided through the Highway Safety Improvement Program of Title 23, United States Code (U.S.C.), Section 148. This data is protected under Title 23, U.S.C., Section 409, and is intended for highway safety and educational purposes only.

A total of 93 crashes occurred within the data collection time period. Sixty-six percent of recorded crashes (61 crashes) resulted in property damage only, while the remaining 34 percent of crashes (32 crashes) involved personal injury. None of the reported freeway crashes resulted in a fatality. See Table 2-1 for a summary of crash severity by year.

TABLE 2-1
Summary of Crashes by Severity, 2014-2018

Crash Severity	2014	2015	2016	2017	2018	Total
Property Damage Only	13	15	15	10	8	**61**
Injury	13	5	1	7	6	**32**
Fatality	0	0	0	0	0	**0**
Total	***26***	***20***	***16***	***17***	***14***	***93***

Nearly half of the reported crashes (44 of 93) were rear end collisions. This was the most common type of crash reported in each of the study years. One quarter of the total reported crashes were categorized as sideswipe collisions. The most common reported crash types are summarized in Table 2-2.

TABLE 2-2
Summary of Crashes by Type, 2014-2018

Crash Type	2014	2015	2016	2017	2018	Total
Bridge/Overhead Structure	0	1	2	0	0	**3**
Concrete Traffic Barrier	1	0	1	0	1	**3**
Guardrail	1	3	0	1	0	**5**
Rear End	11	7	7	11	8	**44**
Sideswipe	8	5	3	3	3	**22**
Thrown/Falling Objects	0	3	0	0	0	**3**
Other	5	1	3	2	2	**13**
Total	***26***	***20***	***16***	***17***	***14***	***93***

Along the H1 eastbound study corridor, the majority of crashes occurred at or near interchanges. Of the 93 total crashes recorded, 43 of them (roughly 46 percent) appear to be influenced by vehicle movements at the Kalihi Street interchange. These crashes occurred on the mainline from just upstream of the eastbound off-ramp (milepost 19.7) to the Kalihi Street on-ramp merge point (milepost 20.0). A total of 21 crashes (roughly 23 percent of the total) occurred near the eastbound off-ramp to Vineyard Boulevard (milepost 20.5), and five crashes occurred at the H201 merge with H1 eastbound.

Intersection Operations

Local streets within the study area may be affected during construction of the H1 freeway improvements. Seven study intersections were selected for analysis to establish a baseline condition for operations during the morning and afternoon peak hours of traffic. The seven study intersections are all signalized and are listed below:

- #1 – North Kalihi Street at North King Street
- #2 – North Kalihi Street at North School Street
- #3 – Gulick Avenue at North King Street
- #4 – Gulick Avenue at Beckley Street
- #5 – Gulick Avenue at North School Street
- #6 – Middle Street at North King Street
- #7 – Middle Street at Kaua Street

Morning and afternoon peak period intersection traffic volumes were collected by HDOT on typical weekdays in November and December 2019. Morning traffic counts were collected between 6:00 a.m. and 9:00 a.m., while afternoon traffic counts were collected between 3:00 p.m. and 6:00 p.m. Traffic volumes were collected in 15-minute intervals. Turning movement data was supplemented with traffic tube counts on adjacent roadways. Traffic signal timing and phasing was collected during peak period field observations in March 2020.

Intersection operations are reported in terms of level of service (LOS) using a letter grade scale where LOS A indicates near optimal operations with little vehicle delay or congestion and LOS F indicates heavy congestion with long vehicle delays. The LOS grade designations are based on the average vehicle delay at each intersection. Within the City and County of Honolulu, LOS D is generally considered the acceptable level of mobility. Traffic that operates at LOS E or LOS F is considered to be less than desirable, and may be considered for examination of potential improvements to maintain acceptable operations.

Peak hour traffic volumes were analyzed using the SYNCHRO software, version 10. This software tool, based on the methodology adopted in the latest Highway Capacity Manual, analyzes intersections controlled by traffic signals and produces an overall intersection LOS.

Table 2-3 summarizes the existing operational results, by peak hour. During the a.m. peak hour (7:15 a.m to 8:15 a.m.) of local street traffic, the intersection of North Kalihi Street and North School Street operates at LOS F. Each of the approaches typically experience long delays and vehicle queues are present through multiple traffic signal cycles. The remaining study intersections operate with acceptable levels of delay in the morning.

In the afternoon peak hour (4:30 p.m. to 5:30 p.m.), the intersection at Middle Street and North King Street operates at LOS F. Vehicles on the eastbound approach to the intersection (which is the off-ramp from Moanalua Freeway) can experience long delays, and while eastbound queues were observed to extend through multiple traffic cycles, they did not affect mainline freeway operations. Three additional study intersections operate at LOS E during the afternoon peak, with average delays of more than one minute per vehicle. Existing conditions SYNCHRO model output reports are provided in Appendix B.

TABLE 2-3
Existing Weekday Conditions (2020)—Peak-Hour Intersection Analysis Summary

		A.M. Peak		P.M. Peak	
Int. #	**Signalized Intersections**	**Delay (s)**	**LOS**	**Delay (s)**	**LOS**
1	North Kalihi St. at North King St.	53.0	D	78.8	E
2	North Kalihi St. at North School St.	104.7	F	70.1	E
3	Gulick Ave. at North King St.	16.2	B	13.8	B
4	Gulick Ave. at Beckley St.	6.2	A	11.6	B
5	Gulick Ave. at North School St.	15.5	B	16.9	B
6	Middle Street at North King St.	34.5	C	124.5	F
7	Middle Street at Kaua St.	42.0	D	71.9	E

Shaded cells indicate intersections operate at ‘LOS E’ or worse.

SECTION 3

Construction Conditions (2022)

Construction of the proposed H1 eastbound freeway improvements between Middle Street and the Likelike Highway off-ramp is anticipated to begin in 2022. Prior to construction activities on the freeway mainline, the existing Gulick Avenue bridge structure must be reconstructed and the abutment at the south end of the bridge must be modified to allow for additional freeway lane capacity.

For approximately two months during the summer, the current Gulick Avenue bridge will be closed to all vehicle traffic and nonmotorized users across H1. The intersection of Gulick Avenue and Beckley Street will also be closed to all but local residential traffic. A temporary pedestrian bridge will be constructed to the east of the existing bridge to allow nonmotorized users to cross H1 in approximately the same location they do today, but vehicular traffic will be directed to alternate crossings.

Vehicle trips that currently use Gulick Avenue to cross H1 are likely to use either Middle Street/Ola Lane or Kalihi Street/Likelike Hwy during construction. Intersections and streets that could experience a temporary increase or decrease in traffic volumes due to the Gulick Avenue closure are shown in Figure 3. Without the Gulick Avenue crossing, traffic on Middle Street, School Street, and Kalihi Street/Likelike Highway would likely increase. Traffic volumes on Gulick Avenue and potentially Beckley Street would likely decrease.

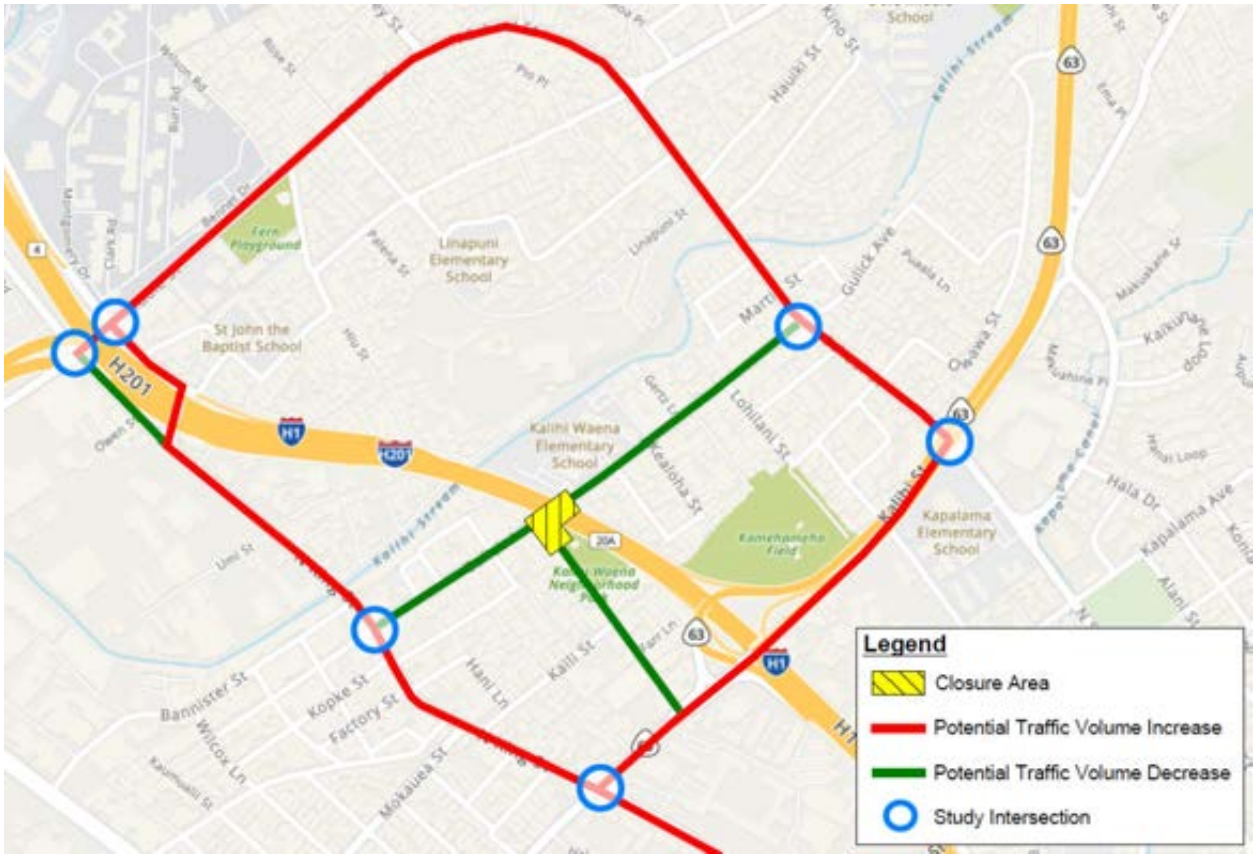


Figure 3. Potential Traffic Volume Changes with Gulick Avenue Closure (2022)

Diagrams of recommended alternate routes between the Gulick Avenue closure area and regional freeways are provided in Appendix C.

Without Gulick Avenue Closure

Traffic volumes are expected to increase slightly compared to the existing condition, even without the Gulick Avenue closure or the H1 eastbound improvements, by the year 2022 due to in-progress developments and

background traffic growth. Intersection volumes for 2022 were estimated from the existing volumes using a conservative annual growth rate of one percent per year. Intersection lane channelization at each of the study intersections is expected to remain the same as existing. Table 3-1 provides a comparison of the a.m. and p.m. peak hour levels of service and delay under existing conditions and anticipated 2022 conditions without the Gulick Avenue closure. Compared to existing a.m. peak hour conditions, operations in 2022 would generally remain the same with the exception of North King Street at North Kalihi Street. This location would likely operate at LOS E in 2022 due to a slight increase in traffic. During the p.m. peak hour, this intersection could worsen to LOS F with background traffic increases.

In the p.m. peak hour, the intersection of Middle Street and Kaua Street would worsen slightly, from LOS E under existing conditions to LOS F with increased background traffic in 2022, even without the Gulick Avenue closure.

TABLE 3-1
Peak Hour Intersection Summary (2022) – Conditions Without Gulick Avenue Closure

			Existing (2020)		Without Closure (2022)	
Peak	**Int. #**	**Signalized Intersections**	**Delay (s)**	**LOS**	**Delay (s)**	**LOS**
AM PEAK	1	North Kalihi St. at North King St.	53.0	D	55.2	E
	2	North Kalihi St. at North School St.	104.7	F	108.0	F
	3	Gulick Ave. at North King St.	16.2	B	16.2	B
	4	Gulick Ave. at Beckley St.	6.2	A	6.2	A
	5	Gulick Ave. at North School St.	15.5	B	15.5	B
	6	Middle Street at North King St.	34.5	C	35.3	C
	7	Middle Street at Kaua St.	42.0	D	43.5	D
PM PEAK	1	North Kalihi St. at North King St.	78.8	E	86.7	F
	2	North Kalihi St. at North School St.	70.1	E	72.0	E
	3	Gulick Ave. at North King St.	13.8	B	14.2	B
	4	Gulick Ave. at Beckley St.	11.6	B	11.5	B
	5	Gulick Ave. at North School St.	16.9	B	17.0	B
	6	Middle Street at North King St.	124.5	F	136.6	F
	7	Middle Street at Kaua St.	71.9	E	80.6	F

Shaded cells indicate intersections operate at 'LOS E' or worse.

With Gulick Avenue Closure

With the temporary closure of Gulick Avenue, the majority of traffic would be prohibited from using the bridge as well as the Gulick Avenue and Beckley Street intersection. Detoured vehicles are not expected to significantly affect study intersections during the a.m. or p.m. peak hours, compared to conditions without construction. Certain intersections would experience some additional vehicle delay as vehicles detour to nearby streets and surrounding intersections, but LOS is not expected to degrade during the two month closure of Gulick Avenue for construction of H1 eastbound freeway improvements.

Table 3-2 shows the expected intersection LOS and average vehicle delay, without and with the Gulick Avenue closure. During the p.m. peak hour, vehicles at the North Kalihi Street and North King Street intersection could experience approximately one minute of additional delay, on average. This temporary change does not worsen the intersection LOS, and would likely affect isolated turning movements associated with the Gulick Avenue

closure detour, such as the northbound left-turn and the eastbound right-turn. SYNCHRO model output reports are provided in Appendix B.

TABLE 3-2
Peak Hour Intersection Summary (2022) – Conditions Without and With Gulick Avenue Closure

			Without Closure (2022)		With Closure (2022)	
Peak	**Int. #**	**Signalized Intersections**	**Delay (s)**	**LOS**	**Delay (s)**	**LOS**
AM PEAK	1	North Kalihi St. at North King St.	55.2	E	56.9	E
	2	North Kalihi St. at North School St.	108.0	F	118.8	F
	3	Gulick Ave. at North King St.	16.2	B	16.0	B
	4	Gulick Ave. at Beckley St.	6.2	A	n/a	n/a
	5	Gulick Ave. at North School St.	15.5	B	17.5	B
	6	Middle Street at North King St.	35.3	C	35.7	D
	7	Middle Street at Kaua St.	43.5	D	54.5	D
PM PEAK	1	North Kalihi St. at North King St.	86.7	F	150.4	F
	2	North Kalihi St. at North School St.	72.0	E	79.8	E
	3	Gulick Ave. at North King St.	14.2	B	14.6	B
	4	Gulick Ave. at Beckley St.	11.5	B	n/a	n/a
	5	Gulick Ave. at North School St.	17.0	B	17.8	B
	6	Middle Street at North King St.	136.6	F	162.9	F
	7	Middle Street at Kaua St.	80.6	F	116.0	F

Shaded cells indicate intersections operate at 'LOS E' or worse.

During the Gulick Avenue closure, no mitigation is recommended at the local street intersections as they are expected to operate similarly, with or without detoured traffic. Also, once the construction of the H1 eastbound freeway improvements are complete, and the Gulick Avenue bridge and the intersection of Gulick Avenue and Beckley Street reopen, local street traffic would resume typical operations.

Also as part of this analysis, vehicle trips were rerouted from Gulick Avenue to detour paths based on assumed trip origins and destinations. Actual trip patterns during construction will likely vary as drivers actively adjust to these temporary peak hour operations and change their trip path or trip start time to avoid congestion.

SECTION 4

Future Operating Conditions (2023, 2035)

An analysis of future year operations in 2023 and in 2035 are included in this study to evaluate potential traffic benefits that could result from the H1 eastbound freeway improvements. The year 2023 represents the anticipated opening year of the freeway improvements, and the year 2035 represents a longer term analysis that accounts for benefits with rail operations between Kapolei and downtown Honolulu.

Forecasted Traffic Volumes

Traffic volumes are expected to grow on H1 eastbound very modestly through the year 2035. The travel demand forecast model predicts that average traffic growth rates on H1 eastbound between Middle Street and the Likelike Highway off-ramp are between 0.1 and 0.2 percent annually, for daily and peak period traffic volumes.

Figure 4 depicts the forecasted traffic analysis volumes on H1 eastbound for 2023 and 2035. Daily and peak hour traffic volumes are shown within the freeway study area.

Year 2023 Traffic Volumes

	H201 Eastbound	H1 EB On-ramp	H1 EB Mainline	H1 EB On-ramp	H1 EB Mainline	Off-ramp	H1 EB Mainline	H1 EB On-ramp	H1 EB Mainline	Off-ramp	H1 EB Mainline
Daily Volume	47,690	10,360	58,050	37,495	95,545	11,200	84,345	26,495	110,840	17,505	93,335
AM Peak Volume	3,525	700	4,225	2,530	6,755	850	5,905	2,060	7,965	1,100	6,865
Midday Peak Volume	3,175	670	3,845	2,460	6,305	675	5,630	1,935	7,565	1,240	6,325
PM Peak Volume	2,385	710	3,095	1,745	4,840	625	4,215	1,595	5,810	865	4,945

Year 2035 Traffic Volumes

	H201 Eastbound	H1 EB On-ramp	H1 EB Mainline	H1 EB On-ramp	H1 EB Mainline	Off-ramp	H1 EB Mainline	H1 EB On-ramp	H1 EB Mainline	Off-ramp	H1 EB Mainline
Daily Volume	48,335	10,500	58,835	38,000	96,835	11,350	85,485	26,855	112,340	17,740	94,600
AM Peak Volume	3,585	710	4,295	2,575	6,870	865	6,005	2,095	8,100	1,120	6,980
Midday Peak Volume	3,225	680	3,905	2,500	6,405	685	5,720	1,965	7,685	1,260	6,425
PM Peak Volume	2,435	725	3,160	1,780	4,940	635	4,305	1,630	5,935	885	5,050

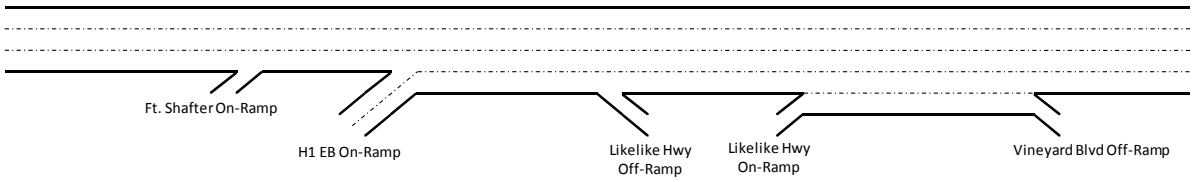


Figure 4. Future (2023, 2035) H1 Eastbound Traffic Analysis Volumes

Although future vehicle demand is anticipated to increase due to regional land use developments, the current freeway configuration presents capacity constraints that limit potential freeway traffic growth. Also, the introduction of rail service between Kapolei and downtown Honolulu provides an alternative travel mode, and is expected to result in a significant shift from driving on H1 to riding rail between these locations. This mode shift contributes to the low anticipated freeway traffic growth rates.

Freeway Improvements and Benefits

The H1 eastbound freeway improvements would eliminate the existing inside lane merge between H1 eastbound and H201 eastbound. Lanes from both major freeways would be allowed to continue alongside one another under Ola Lane and under Gulick Avenue for a total of five 11-foot wide travel lanes to the Likelike Highway interchange. At the Likelike Highway interchange, the right lane would exit to northbound Likelike Highway. Vehicles from H201 eastbound would need to make two lane changes to the right in order to exit at the Likelike Highway interchange. Four remaining through lanes would continue under the Kalihi Street overpass. Proposed lane configuration improvements to H1 eastbound, compared to existing conditions, are shown in Figure 5.

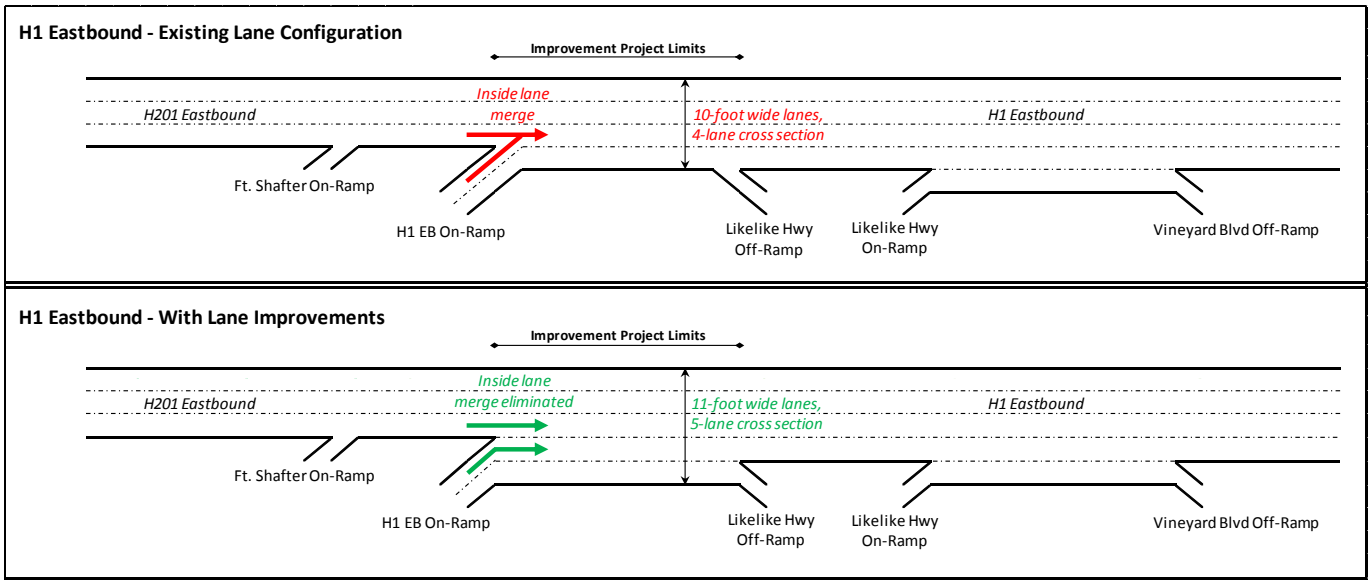


Figure 5. Proposed H1 Eastbound Freeway Improvements

By eliminating a major merge and widening the travel lanes, the improvement project is expected to result in various benefits including:

- Faster travel times
- Less congestion and shorter vehicle queues
- Increased lane capacity and lane change maneuver area
- Reduction in crash types
- Reduced vehicle-hours traveled
- Reduced fuel emissions

Travel Times

With the proposed freeway improvements, eastbound travel times could be expected to improve by up to 30 percent compared to conditions without improvements. In 2023 with the current freeway lane configuration, travel times on the approximately 1.5 mile long path between the Fort Shafter on-ramp and the Vineyard Boulevard off-ramp would likely be very similar to existing. Morning and afternoon commute peak period travel times would be in the range of 8 to 10 minutes on average, while midday peak period travel times would be closer to 2 to 3 minutes. By 2035, without significant traffic volume growth, travel times would be similar to the 2023 conditions.

Table 4-1 presents a summary of anticipated travel times during each of the peak periods with and without freeway improvements.

TABLE 4-1
Travel Time Benefits Summary

	2023 Travel Time			2035 Travel Time		
Peak Period	**Current Configuration**	**With Improvements**	**Benefit**	**Current Configuration**	**With Improvements**	**Benefit**
Morning (6 a.m. to 9 a.m.)	8 – 10 min.	5.5 – 7 min.	**2.5 – 3 min.**	8.5 – 10.5 min.	6 – 7 min.	**2.5 – 3.5 min.**
Midday (9 a.m. to 3 p.m.)	2 – 3 min.	1.5 – 2 min.	**0.5 – 1 min.**	2 – 3 min.	1.5 – 2 min.	**0.5 – 1 min.**
Afternoon (3 p.m. to 7 p.m.)	8 – 10 min.	5.5 – 7 min.	**2.5 – 3 min.**	8.5 – 10.5 min.	6 – 7 min.	**2.5 – 3.5 min.**

Travel time ranges are reported in minutes.

Based on Highway Capacity Software (HCS) modeling of the freeway improvements, morning and afternoon travel times could be reduced by roughly 2.5 to 3 minutes when the H1 eastbound improvements are constructed. The removal of the inside lane merge and the additional capacity to make lane change maneuvers between the H1 eastbound on-ramp and the Likelike Highway off-ramp contribute to anticipated travel times of between 5.5 to 7 minutes in 2023. Drivers traveling during the midday peak period, with less congestion than during the commute peaks, would experience travel time savings of approximately 0.5 to 1 minute. By 2035, the H1 eastbound freeway improvements could result in travel time savings of approximately 2.5 to 3.5 minutes during the most congested peak periods.

Forecasted travel times and travel time benefits shown in Table 4-1 do not account for possible congestion originating downstream of the study area, east of Vineyard Boulevard. In the future, congestion occurring outside of the study area could spill back into the Likelike Highway interchange as it does today and significantly affect the reported results.

Also, with the improved freeway lane configuration, vehicles traveling on H201 eastbound destined to the Likelike Highway off-ramp would be required to make two lane change maneuvers, compared to one lane change under existing conditions. This could initially affect vehicle operations as drivers may reduce their speed to navigate these lane changes.

Vehicle Queues

With the H1 eastbound improvements, travel speeds would likely increase through the study area due to greater capacity and the removal of the inside lane merge. The morning commute is typically the worst operating peak period on H1 eastbound and is therefore reported in this study. Compared to the 'stop-and-go' traffic flow experienced today, vehicles may be able to travel with a more consistent, uniform flow. Average travel speeds approaching Middle Street and through the Likelike Highway off-ramp could increase from 15 to 20 mph with the current H1 eastbound configuration to roughly 20 to 25 mph with freeway improvements.

Eastbound vehicle queues on Moanalua Freeway approaching Middle Street are likely to be present during the morning commute period in 2023 and in 2035, with or without the proposed H1 eastbound lane improvements. With the current lane configuration, the inside lane merge acts as a bottleneck and would result in heavy upstream queues and high lane density as vehicles have very little room to make lane changes or achieve a constant travel speed.

Figure 6 depicts the anticipated freeway volumes and level of service during the morning commute period with and without the proposed H1 lane improvements at the year of opening (2023).

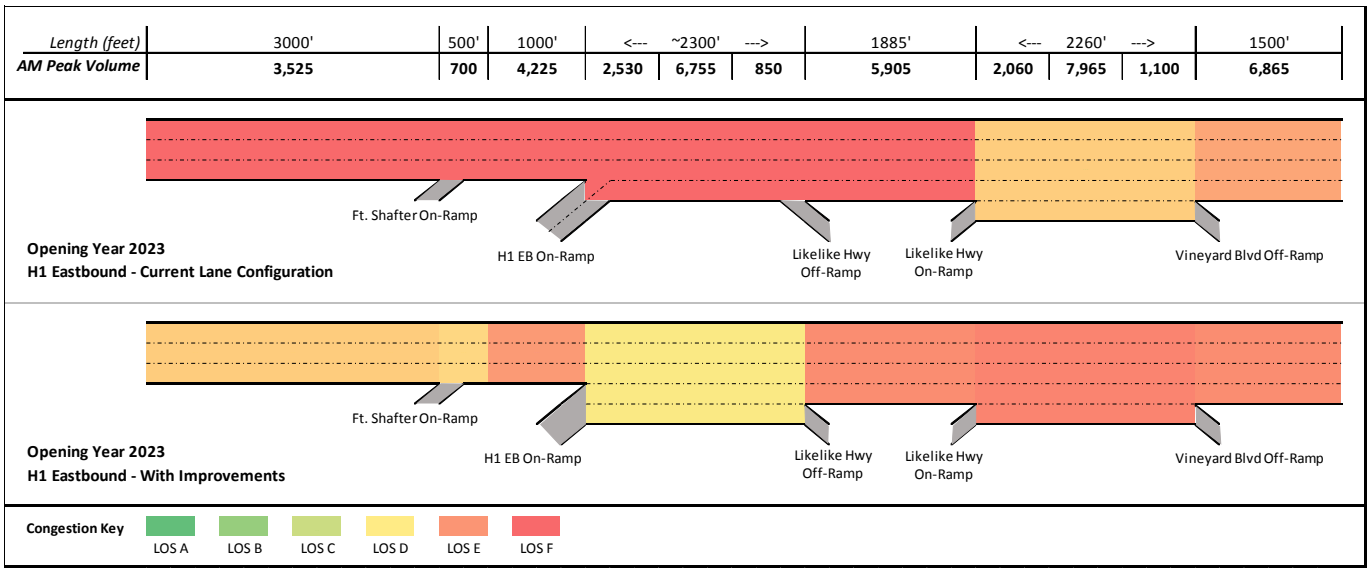


Figure 6. Freeway Operations – Morning Commute Peak Period (2023)

With the additional lane between Middle Street and Likelike Highway, lane density through this segment is expected to decrease, resulting in improved levels of service upstream as vehicles would be able to move or change lanes with fewer restrictions. Improved traffic flow and the removal of the bottleneck would result in more vehicles being able to reach the segment between Likelike Highway and Vineyard Boulevard. This may result in higher lane density and slightly more congestion, compared to the scenario without improvements.

Figure 7 depicts the forecasted freeway volumes and the potential freeway operations during the morning commute period in the year 2035.

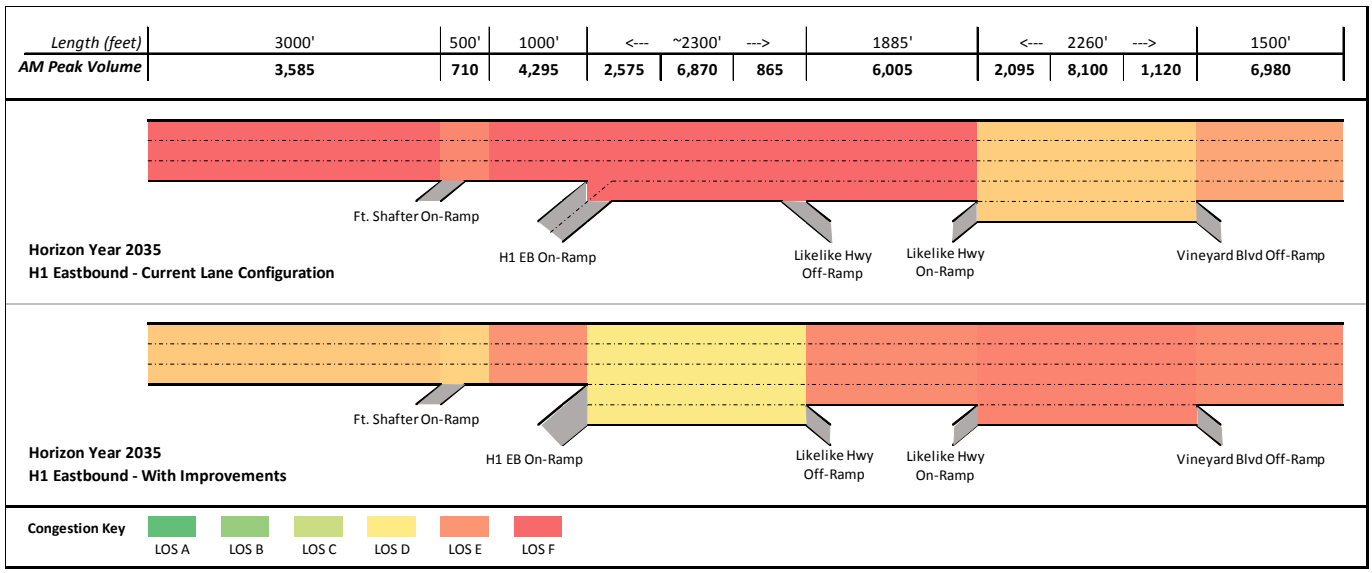


Figure 7. Freeway Operations – Morning Commute Peak Period (2035)

Operational benefits in 2035 with the H1 eastbound improvements are expected to be similar to benefits experienced at the year of opening. Lane density and level of service on the freeway segment between Middle Street and Likelike Highway would improve from LOS F to roughly LOS D, resulting in enhanced upstream operations but also potentially worsening downstream operations as vehicles are able to pass through the improvement area more efficiently. Eliminating the inside lane merge between H1 eastbound and H201 eastbound could also shift the current bottleneck downstream to the Likelike Highway interchange.

Safety Conditions

Historical crash data provided by the State of Hawaii Department of Transportation, Traffic Safety Section revealed 47 total crashes occurred on H1 eastbound between the Middle Street overpass (MP 19.1) and the Likelike Highway northbound overpass (MP 19.9) between January 1, 2014 and December 31, 2018. While no fatality crashes were reported along the segment where proposed improvements would occur, 38 percent of these crashes (18 crashes) involved a personal injury. The remaining 62 percent of crashes (29 crashes) involved property damage only. The most common types of collisions involved a vehicle rear-ending or sideswiping another vehicle.

The H1 eastbound improvements could result in safety benefits in terms of reductions to crashes and severity based on the proposed design modifications. The Enhanced Interchange Safety Analysis Tool (ISATe) is a spreadsheet tool that is commonly used to estimate the potential change in crashes due to geometric modifications to freeway segments. This tool is consistent with Highway Safety Manual calculations for freeways, and takes into account the following:

- Freeway volumes – Forecasted traffic volumes within the study area in 2023 and in 2035 are anticipated to be similar to current traffic volumes.

- Number of lanes in freeway cross section – The number of lanes in the cross section between Middle Street and the Likelike Highway off-ramp would increase from 4 to 5 lanes with the proposed improvement, providing additional capacity and improving lane density.
- Required lane change maneuvers – With the current lane configuration, vehicles from Moanalua Freeway are required to make one lane change to take the Likelike Highway off-ramp. The H1 eastbound improvements would require vehicles from Moanalua Freeway to make two lane changes in order to exit the freeway at Likelike Highway. While this additional required maneuver may change the types or risk of crashes occurring on the freeway, vehicles would likely experience less friction with adjacent vehicles with the improved segment. In the morning commute peak period, nearly half of the vehicles destined to the Likelike Highway off-ramp are forecast to come from the H1 eastbound on-ramp. These vehicles would not be required to merge or change lanes with the proposed improvement configuration.
- Ramp taper lengths – Speed change areas are locations where the design speed of the roadway facility changes and drivers must adjust to adhere to these speed changes, primarily at freeway on-ramps and off-ramps. These speed change areas are influenced by the geometric design of ramp taper lengths. With the proposed freeway improvements, ramp configurations would be modified to allow for improved speed change adjustments.

By eliminating the inside lane merge, and adding a full auxiliary lane between the H1 on-ramp and the Likelike Highway off-ramp, the ISATe tool predicts that up to 10 percent fewer total crashes would occur compared to operations with the current lane configuration. Crash severity could be expected to reduce at the same rate, resulting in 10 percent fewer crashes involving a personal injury and 10 percent fewer crashes involving property damage only. This estimate is specific to the number of crashes and does not predict the number of personal injuries. Table 4-2 presents the predicted crash reductions that could result from the H1 eastbound freeway improvements.

TABLE 4-2
Safety Benefits Summary

	2023 Number of Crashes			2035 Number of Crashes		
Reporting Period	**Current Configuration[1]**	**With Improvements**	**Benefit**	**Current Configuration[1]**	**With Improvements**	**Benefit**
5-year Total	47	42	**5**	48	43	**5**
Average Annual Total	9 – 10	8 – 9	**1**	9 – 10	8 – 9	**1**

[1] Number of future crashes predicted with the current freeway configuration are based on the existing crash history.
Crash predictions are based on ISATe analysis and are consistent with the Highway Safety Manual calculations for freeways.

Assuming traffic volumes in the future would be similar to current volumes, with or without the H1 eastbound improvements, the future year crash predictions estimate approximately 42 crashes could occur over 5 years (compared to 47 crashes recorded in recent history), or roughly 8 or 9 crashes per year (compared to 9 or 10 crashes per year in recent history).

Vehicle Miles/Hours Traveled

A region-wide travel demand model was used to assess vehicle miles traveled (VMT) and vehicle hours traveled (VHT) with and without the H1 eastbound freeway improvements. Both VMT and VHT were measured on the freeway in the eastbound direction between Fort Shafter and the Vineyard Boulevard off-ramp. Forecasted operations for the freeway network account for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040.

Table 4-3 presents the difference in VMT at the year of opening of the H1 eastbound improvements and for the future horizon year. In both years, the VMT during the morning commute peak period and through the average day would be expected to increase. This indicates that more vehicles may be traveling through the analysis

segment with the H1 eastbound improvements as a result of improved lane density and vehicle capacity, and potentially less congestion.

Table 4-4 shows a comparison of the VHT during both analysis years, with and without the proposed freeway improvements on H1 between Middle Street and the Likelike Highway off-ramp. Vehicle hours traveled represents time spent on the transportation network and can be an reasonable indicator of relative congestion through the study area. With the H1 eastbound improvements, VHT during the morning commute peak could be reduced by roughly 7 to 8 percent compared to operations with the current freeway configuration.

TABLE 4-3
Vehicle Miles Traveled Benefits Summary

	2023 VMT				2035 VMT			
Reporting Period	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**
Morning Peak	46,600	47,550	**950**	**2.0%**	46,450	47,350	**900**	**1.9%**
Daily	247,800	249,300	**1,500**	**0.6%**	249,800	251,300	**1,500**	**0.6%**

VMT – Vehicle miles traveled

Vehicle miles traveled are based on travel demand forecasts that account for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040.

TABLE 4-4
Vehicle Hours Traveled Benefits Summary

	2023 VHT				2035 VHT			
Reporting Period	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**
Morning Peak	1,900	1,750	**-150**	**-7.9%**	1,900	1,800	**-100**	**-7.2%**
Daily	5,850	5,650	**-200**	**-3.9%**	6,000	5,800	**-200**	**-4.0%**

VHT – Vehicle hours traveled

Vehicle hours traveled are based on travel demand forecasts that account for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040.

Fuel Consumption and Vehicle Emissions

An estimate of vehicle emission and fuel consumption reductions resulting from the H1 freeway improvements were calculated based on the region-wide travel demand model. With more efficient traffic flow, vehicles would be less likely to idle in congestion through the study area and on upstream segments of H1 eastbound and Moanalua Freeway. Less time spent idling would result in less fuel being wasted by vehicles, and lower amounts of carbon dioxide being generated, which could contribute to improved air quality.

In Table 4-5, the difference in grams of carbon dioxide emissions without and with the H1 eastbound improvements is shown for the morning commute peak period and for the typical day. With the improvements, vehicles would emit roughly 1 million fewer grams of carbon dioxide (nearly 4 percent) during the morning commute peak due to less time spent idling. By 2035, vehicle emissions with the freeway improvements could be approximately 2.5 percent less than emissions with the current lane configuration.

TABLE 4-5
Vehicle Emissions Benefits Summary

	2023 (1000 Grams of CO2)				2035 (1000 Grams of CO2)			
Reporting Period	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**
Morning Peak	25,547	24,544	**(1,003)**	**-3.9%**	111,730	110,904	**(826)**	**-2.5%**
Daily	25,462	24,825	**(637)**	**-0.7%**	112,808	112,725	**(83)**	**-0.1%**

Vehicle emissions are reported in terms of grams of CO2.

Vehicle emissions are reported from a travel demand model that accounts for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040.

While reductions in vehicle emissions are expected throughout the day, benefits from the H1 eastbound freeway improvements are anticipated to be greatest during the morning commute peak because freeway congestion is heaviest during this time period.

Table 4-6 presents a comparison of the predicted savings in fuel consumption without and with the H1 eastbound improvements. Without freeway improvements, vehicles traveling eastbound on H1 in the future would continue to idle in congestion and travel under stop-and-go conditions during the morning commute peak. With the improvements, vehicles would travel more efficiently and likely with less delay and congestion, resulting in nearly 90 gallons of fuel savings in 2023. By 2035, vehicles would continue to benefit from the freeway improvements and could consume less fuel (by approximately 55 gallons) when compared to anticipated operations with the current lane configuration.

TABLE 4-6
Fuel Consumption Benefits Summary

	2023 (Gallons of Fuel)				2035 (Gallons of Fuel)			
Reporting Period	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**	**Current Configuration**	**With Improvements**	**Benefit**	**% Change**
Morning Peak	2,257	2,169	**(88)**	**-3.9%**	2,250	2,194	**(56)**	**-2.5%**
Daily	9,870	9,798	**(72)**	**-0.7%**	9,965	9,958	**(7)**	**-0.1%**

Vehicle fuel consumption is reported in terms of gallons of fuel.

Fuel consumption is reported from a travel demand model that accounts for expected regional development and growth consistent with the Oahu Regional Transportation Plan (ORTP) 2040.

Appendix A

Historic Crash Data

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
M E M O R A N D U M

HWY-TS 19-2.0165

TO: HWY-DS **DATE:** July 25, 2019

ATTN: ERIC WAT

FROM: BRYAN J. KIMURA, HWY-T

SUBJECT: CRASH HISTORY FOR H-1 FREEWAY EASTBOUND FROM MIDDLE STREET OVERPASS TO THE EASTBOUND OFFRAMP TO VINEYARD BOULEVARD

We have received your request regarding major traffic accident data on H-1 Freeway Eastbound from Middle Street overpass to the Eastbound offramp to Vineyard Boulevard.

We are providing an Excel file of the major traffic accidents that occurred for the subject location utilizing the five most recent years of data available in our database, which is 2014 – 2018 for Route 1 from MP 19.1 – MP 20.5. A legend is also being provided for your use.

We would like to remind you that this information is provided through the Highway Safety Improvement Program of Title 23, United States Code (U.S.C.), Section 148. This data is protected under Title 23, U.S.C., Section 409, and is intended for highway safety and educational purposes only.

If there are any questions, please call the Traffic Safety Section at (808) 692-7685.

JH:gm

c: HWY-TS

2014-2018 Accidents on H1 Freeway Eastbound from Middle Street overpass to Eastbound Offramp to Vineyard Blvd

Report No	County	Occur Date	Occur Day	Occur Time	Route No	Milepost	Street Highway	Refer Distance	Refer Dist Unit	Refer Direction	Reference Name	Actions	Location Harm	Lighting	Number Injured	Number Killed
14-015366	HON	13-01-2014	MO	6:22	1	19.9	H1 EB	0	FT	E	KALIHI NB O/P	81, 81	12	2	0	0
14-038665	HON	31-01-2014	FR	9:44	1	19.9	H1 EB	120	FT	W	KALIHI SB O/P	81	10	1	0	0
14-059852	HON	16-02-2014	SU	12:25	1	19.9	H1 EB	305	FT	E	EB OFF>KALIHI NB	81, 81	10	1	0	0
14-092899	HON	13-03-2014	TH	22:35	1	20.5	H1 EB	0	FT	W	EB OFF>VINEYARD	81	10	5	0	0
14-106528	HON	21-03-2014	FR	14:45	1	19.3	H1 EB	0	FT	E	OLA O/P	90	13	1	0	0
14-108121	HON	25-03-2014	TU	16:00	1	20.5	H1 EB	0	FT	W	EB OFF>VINEYARD	82	12	1	0	0
14-120384	HON	4/4/2014	FR	6:30	1	19.9	H1 EB	50	FT	E	KALIHI NB O/P	82	12	2	0	0
14-149174	HON	26-04-2014	SA	15:00	1	19.7	H1 EB	378	FT	W	EB OFF>KALIHI NB	81, 81, 81	10	1	1	0
14-150958	HON	27-04-2014	SU	17:00	1	19.9	H1 EB	125	FT	E	KALIHI NB O/P	8	10	1	2	0
14-231550	HON	28-06-2014	SA	12:10	1	19.9	H1 EB	0	FT	E	KALIHI NB O/P	81	10	1	1	0
14-251131	HON	13-07-2014	SU	11:30	1	19.4	H1 EB	500	FT	E	OLA O/P	82	12	1	0	0
14-271619	HON	28-07-2014	MO	16:08	1	19.4	H1 EB	496	FT	E	OLA O/P	37	10	1	1	0
14-276994	HON	1/8/2014	FR	16:00	1	19.9	H1 EB	75	FT	W	KALIHI NB O/P	81	10	1	1	0
14-311203	HON	27-08-2014	WE	16:40	1	20.2	H1 EB	210	FT	NW	HOUGHTAILING U/P	81	11	1	1	0
14-337392	HON	16-09-2014	TU	8:20	1	20.5	H1 EB	0	FT	E	EB OFF>VINEYARD	82	12	1	0	0
14-347170	HON	23-09-2014	TU	11:20	1	20.0	H1 EB	354	FT	SE	KALIHI NB O/P	81, 37	11	1	1	0
14-354016	HON	28-09-2014	SU	10:38	1	19.1	H1 EB	127	FT	SE	MIDDLE O/P	06, 37	11	1	0	0
14-359665	HON	2/10/2014	TH	17:00	1	20.2	H1 EB	0	FT	E	HOUGHTAILING U/P	82	11	1	0	0
14-362959	HON	5/10/2014	SU	-	1	19.7	H1 EB	0	FT	E	GULICK O/P	37, 31, 02	24	5	0	0
14-364748	HON	6/10/2014	MO	14:20	1	19.9	H1 EB	0	FT	-	KALIHI SB>EB ON	82, 82	12	1	0	0
14-380944	HON	18-10-2014	SA	18:28	1	19.9	H1 EB	0	FT	W	KALIHI SB O/P	22	11	4	0	0
14-394807	HON	29-10-2014	WE	13:37	1	19.8	H1 EB	0	FT	W	EB OFF>KALIHI NB	82, 82, 82	12	1	0	0
14-424819	HON	19-11-2014	WE	17:45	1	20.5	H1 EB	0	FT	NW	EB OFF>VINEYARD	81	11	3	0	0
14-446416	HON	5/12/2014	FR	11:25	1	19.9	H1 EB	330	FT	SE	EB OFF>KALIHI NB	36	44	1	1	0
14-474204	HON	24-12-2014	WE	7:10	1	20.5	H1 EB	0	FT	E	EB OFF>VINEYARD	82, 21	11	3	0	0
14-481073	HON	29-12-2014	MO	9:25	1	19.8	H1 EB	500	FT	W	KALIHI SB O/P	81, 37	10	1	0	0
15-008187	HON	6/1/2015	TU	17:25	1	20.0	H1 EB	850	FT	W	GULICK O/P	81	12	1	0	0
15-021890	HON	16-01-2015	FR	15:45	1	20.5	H1 EB	150	FT	W	EB OFF>VINEYARD	81, 81	12	1	0	0
15-046369	HON	2/2/2015	MO	14:15	1	20.3	H1 EB	620	FT	E	HOUGHTAILING U/P	82, 82, 82, 37	10	1	0	0
15-077630	HON	24-02-2015	TU	8:50	1	20.5	H1 EB	-	-	W	EB OFF>VINEYARD	82	12	1	0	0
15-125535	HON	30-03-2015	MO	7:20	1	20.0	H1 EB	200	FT	E	KALIHI SB>EB ON	21	12	1	1	0
15-161119	HON	23-04-2015	TH	20:00	1	19.2	H1 EB	150	FT	NW	EB TUNNEL E PORTAL	29	20	4	1	0
15-199843	HON	21-05-2015	TH	8:55	1	19.3	H1 EB	215	FT	E	OLA O/P	82	10	1	1	0
15-233273	HON	14-06-2015	SU	12:30	1	20.2	H1 EB	130	FT	SE	HOUGHTAILING U/P	21	12	1	1	0
15-257321	HON	1/7/2015	WE	7:45	1	19.7	H1 EB	123	FT	W	GULICK O/P	82	12	1	0	0
15-270563	HON	10/7/2015	FR	8:30	1	20.5	H1 EB	0	FT	NW	EB OFF>VINEYARD	81	10	1	1	0
15-270563	HAW	10/7/2015	FR	8:30	1	20.5	H1 EB	-	-	W	EB OFF>VINEYARD	80	10	1	1	0
15-270563	HAW	10/7/2015	FR	8:30	1	20.5	H1 EB	-	-	W	EB OFF>VINEYARD	80	10	1	1	0
15-293668	HON	25-07-2015	SA	21:35	1	20.5	H1 EB	0	FT	NW	EB OFF>VINEYARD	81	12	5	0	0
15-321776	HON	14-08-2015	FR	21:40	1	20.1	H1 EB	450	FT	SE	KALIHI SB>EB ON	81, 81, 81	11	6	6	0
15-358691	HON	9/9/2015	WE	5:35	1	20.2	H1 EB	50	FT	W	HOUGHTAILING U/P	21	10	2	1	0
15-376585	HON	21-09-2015	MO	9:26	1	20.5	H1 EB	155	FT	W	EB OFF>VINEYARD	81, 81	12	1	1	0
15-396625	HON	5/10/2015	MO	9:50	1	19.7	H1 EB	0	FT	-	GULICK O/P	25, 13	12	1	1	0
15-435316	HON	31-10-2015	SA	19:10	1	19.9	H1 EB	0	FT	SE	KALIHI NB O/P	13	12	8	0	0
15-447899	HON	9/11/2015	MO	8:00	1	20.4	H1 EB	800	FT	W	EB OFF>VINEYARD	81	10	1	1	0
15-450294	HON	10/11/2015	TU	17:30	1	19.8	H1 EB	500	FT	E	GULICK O/P	82	12	3	0	0
15-471424	HON	25-11-2015	WE	7:55	1	19.7	H1 EB	0	FT	-	GULICK O/P	25	10	1	0	0

Report No	County	Occur Date	Occur Day	Occur Time	Route No	Milepost	Street Highway	Refer Distance	Refer Dist Unit	Refer Direction	Reference Name	Actions	Location Harm	Lighting	Number Injured	Number Killed
15-471459	HON	25-11-2015	WE	7:50	1	19.7	H1 EB	10	FT	W	GULICK O/P	25, 13	10	1	0	0
16-017725	HON	13-01-2016	WE	8:42	1	20.2	H1 EB	120	FT	EAST	HOUGHTAILING U/P	81, 81, 81	10	1	0	0
16-095182	HON	6/3/2016	SU	16:00	1	19.7	H1 EB	-	-	E	GULICK O/P	25	10	1	0	0
16-121140	HON	25-03-2016	FR	4:35	1	19.9	H1 EB	-	-	EAST	KALIHI NB O/P	37	11	5	0	0
16-127370	HON	29-03-2016	TU	15:15	1	19.8	H1 EB	-	-	-	EB OFF>KALIHI NB	81, 81	10	1	2	0
16-138322	HON	6/4/2016	WE	5:50	1	20.0	H1 EB	310	FT	EAST	KALIHI NB O/P	81, 81, 81	11	-	0	0
16-151811	HON	15-04-2016	FR	14:50	1	20.0	H1 EB	725	FT	E	KALIHI NB O/P	81	10	1	1	0
16-264248	HON	3/7/2016	SU	22:10	1	20.5	H1 EB	-	-	-	EB OFF>VINEYARD	82	12	5	4	0
16-309539	HON	4/8/2016	TH	19:00	1	19.2	H1 EB	100	FT	S	EB TUNNEL E PORTAL	82, 02	21	1	1	0
16-314873	HON	8/8/2016	MO	1615	1	19.9	H1 EB	-	-	-	KALIHI NB O/P	-	11	1	0	0
16-337048	HON	24-08-2016	WE	9:32	1	19.7	H1 EB	-	-	W	GULICK O/P	25	12	1	0	0
16-407641	HON	14-10-2016	FR	7:30	1	20.4	H1 EB	656	FT	W	EB OFF>VINEYARD	81	11	1	0	0
16-452342	HON	16-11-2016	WE	1636	1	19.8	H1 EB	458	FT	W	KALIHI SB O/P	81, 88, 81	12	1	0	0
16-455787	HON	19-11-2016	SA	728	1	19.2	H1 EB	20	FT	E	EB TUNNEL E PORTAL	81	11	1	1	0
16-456309	HON	19-11-2016	SA	1440	1	19.9	H1 EB	-	-	-	KALIHI NB O/P	43	10	1	0	0
16-456517	HON	19-11-2016	SA	2004	1	19.8	H1 EB	150	FT	W	EB OFF>KALIHI NB	82, 21	12	5	0	0
16-469487	HON	30-11-2016	WE	1338	1	19.3	H1 EB	101	FT	E	OLA O/P	82	13	-	0	0
17-004216	HON	4/1/2017	WE	7:46	1	20.0	H1 EB	610	FT	E	KALIHI NB O/P	81, 81, 81, 81	12	2	0	0
17-007655	HON	6/1/2017	FR	19:34	1	20.5	H1 EB	120	FT	W	EB OFF>VINEYARD	08, 43	12	5	0	0
17-067492	HON	20-02-2017	MO	16:05	1	20.2	H1 EB	0.3	MI	W	EB OFF>VINYARD	82	10	1	1	0
17-166269	HON	5/5/2017	FR	17:20	1	19.8	H1 EB	180	FT	W	KALIHI SB O/P	81	11	1	0	0
17-177462	HON	13-05-2017	SA	14:40	1	20.2	H1 EB	0.25	MI	W	EB OFF>VINEYARD	81, 81	12	1	2	0
17-212889	HON	8/6/2017	TH	15:48	1	20.5	H1 EB	216	FT	W	EB OFF>VINEYARD	81	10	1	0	0
17-231611	HON	22-06-2017	TH	3:05	1	20.4	H1 EB	600	FT	W	EB OFF>VINEYARD	21, 21	11	4	0	0
17-315114	HON	21-08-2017	MO	10:57	1	19.6	H1 EB	230	FT	W	GULICK O/P	82, 81	12	1	0	0
17-320504	HON	25-08-2017	FR	8:37	1	20.5	H1 EB	237	FT	W	EB OFF>VINEYARD	81	10	1	0	0
17-321960	HON	26-08-2017	SA	8:14	1	20.5	H1 EB	160	FT	W	EB OFF>VINEYARD	38	13	1	0	0
17-364137	HON	25-09-2017	MO	20:30	1	20.0	H1 EB	0.5	MI	W	EB OFF>VINEYARD	82	13	4	0	0
17-369381	HON	29-09-2017	FR	16:45	1	19.1	H1 EB	100	FT	W	MIDDLE O/P	81	11	1	1	0
17-380209	HON	7/10/2017	SA	13:55	1	19.3	H1 EB	680	FT	E	OLA O/P	82	21	1	0	0
17-383630	HON	10/10/2017	TU	6:30	1	20.5	H1 EB				EB OFF>VINEYARD	81, 81	11	1	0	0
17-430606	HON	14-11-2017	TU	4:15	1	20.0	H1 EB	500	FT	E	KALIHI NB O/P	81	12	7	0	0
17-488602	HON	26-12-2017	TU	12:13	1	20.5	H1 EB	183	FT	E	EB OFF>VINEYARD	81, 81	11	1	0	0
17-493100	HON	29-12-2017	FR	19:40	1	20.5	H1 EB	100	FT	E	EB OFF>VINEYARD	81	11	5	1	0
18-006852	HON	5/1/2018	FR	21:55	1	19.2	H1 EB	-	-	E	EB TUNNEL E PORTAL	82	11	4	0	0
18-008690	HON	7/1/2018	SU	9:35	1	20.0	H1 EB	-	-	W	KALIHI SB>EB ON	37	10	1	0	0
18-010361	HON	8/1/2018	MO	16:35	1	19.8	H1 EB	265	FT	E	GULICK O/P	82	13	1	1	0
18-029680	HON	22-01-2018	MO	17:58	1	20.2	H1 EB	-	-	-	HOUGHTAILING U/P	81	10	1	0	0
18-049556	HON	5/2/2018	MO	22:19	1	19.8	H1 EB	300	FT	W	KALIHI NB O/P	81	12	4	1	0
18-150298	HON	20-04-2018	FR	8:20	1	19.8	H1 EB			W	EB OFF>KALIHI NB	81	10	1	1	0
18-178064	HON	10/5/2018	TH	14:40	1	20.5	H1 EB	-	-	W	EB OFF>VINEYARD	82	10	1	0	0
18-193179	HON	21-05-2018	MO	15:56	1	20.3	H1 EB	1100	FT	W	EB OFF>VINEYARD	81	12	1	0	0
18-296290	HON	5/8/2018	SU	18:10	1	20.3	H1 EB	1000	FT	W	EB OFF>VINEYARD	21, 81, 81, 33	11	3	0	0
18-321300	HON	23-08-2018	TH	21:50	1	20.5	H1 EB	100	FT	E	EB OFF>VINEYARD	37, 81	21	5	1	0
18-339495	HON	6/9/2018	TH	14:50	1	20.0	H1 EB				KALIHI SB>EB ON	85	11	1	0	0
18-353807	HON	17-09-2018	MO	5:35	1	19.8	H1 EB				EB OFF>KALIHI NB	14	11	2	1	0
18-359952	HON	21-09-2018	FR	14:20	1	19.2	H1 EB	222	FT	E	OLA O/P	81, 84	11	1	0	0
18-372243	HON	30-09-2018	SU	7:48	1	20.5	H1 EB				EB OFF>VINEYARD	38, 81, 84	23	1	0	0

Appendix B

Existing (2020) and Construction (2022) SYNCHRO Reports

HCM 2010 Signalized Intersection Summary
1: Kalihi St & King St

07/06/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	945	135	100	500	275	180	345	55	200	345	205
Future Volume (veh/h)	320	945	135	100	500	275	180	345	55	200	345	205
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	348	1027	147	109	543	0	196	375	60	217	375	223
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	1075	154	130	751	336	218	954	151	238	694	406
Arrive On Green	0.21	0.36	0.36	0.08	0.22	0.00	0.13	0.32	0.32	0.14	0.33	0.33
Sat Flow, veh/h	1727	3024	432	1727	3446	1542	1727	2976	472	1727	2087	1222
Grp Volume(v), veh/h	348	585	589	109	543	0	196	216	219	217	309	289
Grp Sat Flow(s),veh/h/ln	1727	1723	1733	1727	1723	1542	1727	1723	1725	1727	1723	1585
Q Serve(g_s), s	28.7	47.8	47.9	9.0	21.1	0.0	16.2	14.0	14.3	17.9	21.0	21.5
Cycle Q Clear(g_c), s	28.7	47.8	47.9	9.0	21.1	0.0	16.2	14.0	14.3	17.9	21.0	21.5
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.27	1.00		0.77
Lane Grp Cap(c), veh/h	368	613	616	130	751	336	218	552	553	238	573	527
V/C Ratio(X)	0.95	0.95	0.96	0.84	0.72	0.00	0.90	0.39	0.40	0.91	0.54	0.55
Avail Cap(c_a), veh/h	694	1050	1056	263	1241	555	431	552	553	467	573	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.0	45.4	45.4	65.9	52.4	0.0	62.2	38.1	38.2	61.3	39.2	39.4
Incr Delay (d2), s/veh	5.7	8.2	8.4	5.3	0.5	0.0	5.4	2.1	2.1	5.4	3.6	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	24.1	24.4	4.5	10.1	0.0	8.1	7.0	7.1	8.9	10.6	10.0
LnGrp Delay(d),s/veh	61.7	53.5	53.8	71.2	52.9	0.0	67.6	40.2	40.3	66.8	42.8	43.4
LnGrp LOS	E	D	D	E	D		E	D	D	E	D	D
Approach Vol, veh/h		1522			652			631			815	
Approach Delay, s/veh		55.5			56.0			48.7			49.4	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	52.0	34.7	35.5	23.9	50.3	14.9	55.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	36.0	48.0	58.0	52.0	39.0	45.0	22.0	88.0
Max Q Clear Time (g_c+I1), s	18.2	23.5	30.7	23.1	19.9	16.3	11.0	49.9
Green Ext Time (p_c), s	0.0	0.7	0.1	0.8	0.0	0.5	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	53.0
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	350	100	265	215	185	330	1530	330	270	945	135
Future Volume (veh/h)	75	350	100	265	215	185	330	1530	330	270	945	135
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	82	380	109	288	234	201	359	1663	0	293	1027	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	92	401	113	297	935	409	368	2225	0	302	2036	0
Arrive On Green	0.05	0.15	0.15	0.17	0.27	0.27	0.21	0.45	0.00	0.18	0.41	0.00
Sat Flow, veh/h	1727	2628	742	1727	3446	1508	1727	5115	0	1727	5115	0
Grp Volume(v), veh/h	82	247	242	288	234	201	359	1663	0	293	1027	0
Grp Sat Flow(s),veh/h/ln	1727	1723	1647	1727	1723	1508	1727	1650	0	1727	1650	0
Q Serve(g_s), s	14.8	44.5	45.8	52.0	16.7	35.2	64.8	87.4	0.0	52.9	48.4	0.0
Cycle Q Clear(g_c), s	14.8	44.5	45.8	52.0	16.7	35.2	64.8	87.4	0.0	52.9	48.4	0.0
Prop In Lane	1.00		0.45	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	92	263	251	297	935	409	368	2225	0	302	2036	0
V/C Ratio(X)	0.89	0.94	0.96	0.97	0.25	0.49	0.98	0.75	0.00	0.97	0.50	0.00
Avail Cap(c_a), veh/h	138	269	257	325	935	409	484	2225	0	330	2036	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	147.6	131.6	132.1	129.1	89.4	96.2	122.7	71.7	0.0	128.6	68.6	0.0
Incr Delay (d2), s/veh	25.9	38.0	44.7	39.2	0.1	0.3	28.4	2.3	0.0	38.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	24.1	24.0	28.1	8.0	14.8	33.9	40.4	0.0	28.6	22.2	0.0
LnGrp Delay(d),s/veh	173.5	169.6	176.8	168.2	89.5	96.5	151.1	74.0	0.0	167.6	69.5	0.0
LnGrp LOS	F	F	F	F	F	F	F	E		F	E	
Approach Vol, veh/h		571			723			2022			1320	
Approach Delay, s/veh		173.2			122.8			87.7			91.3	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	70.9	133.1	20.8	89.1	58.9	145.0	58.0	51.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	88.0	113.0	25.0	83.0	60.0	141.0	59.0	49.0
Max Q Clear Time (g_c+I1), s	66.8	50.4	16.8	37.2	54.9	89.4	54.0	47.8
Green Ext Time (p_c), s	0.1	1.5	0.0	0.3	0.0	3.7	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	104.7
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	950	20	70	500	135	10	10	10	125	25	100
Future Volume (veh/h)	75	950	20	70	500	135	10	10	10	125	25	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1850	1850	1814	1850	1850	1814	1850
Adj Flow Rate, veh/h	82	1033	22	76	543	147	11	11	11	136	27	109
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	312	1470	31	199	1141	308	274	270	238	394	92	273
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	748	3449	73	532	2677	722	447	589	518	689	200	595
Grp Volume(v), veh/h	82	516	539	76	349	341	33	0	0	272	0	0
Grp Sat Flow(s),veh/h/ln	748	1723	1800	532	1723	1676	1554	0	0	1484	0	0
Q Serve(g_s), s	6.2	17.1	17.1	9.5	10.1	10.2	0.0	0.0	0.0	6.2	0.0	0.0
Cycle Q Clear(g_c), s	16.4	17.1	17.1	26.6	10.1	10.2	0.7	0.0	0.0	8.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.43	0.33		0.33	0.50		0.40
Lane Grp Cap(c), veh/h	312	734	767	199	734	714	782	0	0	759	0	0
V/C Ratio(X)	0.26	0.70	0.70	0.38	0.47	0.48	0.04	0.00	0.00	0.36	0.00	0.00
Avail Cap(c_a), veh/h	530	1236	1291	354	1236	1202	782	0	0	759	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.3	16.4	16.4	27.3	14.4	14.4	10.4	0.0	0.0	12.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.5	0.4	0.4	0.2	0.2	0.1	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.1	8.5	1.4	4.8	4.7	0.4	0.0	0.0	3.7	0.0	0.0
LnGrp Delay(d),s/veh	20.5	16.8	16.8	27.7	14.6	14.6	10.5	0.0	0.0	13.7	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	B			B		
Approach Vol, veh/h		1137			766			33			272	
Approach Delay, s/veh		17.1			15.9			10.5			13.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		33.7		36.0		33.7
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		32.0		50.0		32.0		50.0
Max Q Clear Time (g_c+I1), s		10.2		28.6		2.7		19.1
Green Ext Time (p_c), s		0.1		1.1		0.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	45	115	155	230	210
Future Volume (veh/h)	15	45	115	155	230	210
Number	7	14	6	16	5	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.93		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1850	1814	1850	1850	1814
Adj Flow Rate, veh/h	16	49	125	168	250	228
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	27	82	595	800	624	553
Arrive On Green	0.07	0.07	0.85	0.85	0.85	0.85
Sat Flow, veh/h	364	1116	700	941	672	650
Grp Volume(v), veh/h	66	0	0	293	478	0
Grp Sat Flow(s),veh/h/ln	1503	0	0	1641	1323	0
Q Serve(g_s), s	4.5	0.0	0.0	3.4	6.8	0.0
Cycle Q Clear(g_c), s	4.5	0.0	0.0	3.4	10.2	0.0
Prop In Lane	0.24	0.74		0.57	0.52	
Lane Grp Cap(c), veh/h	110	0	0	1395	1177	0
V/C Ratio(X)	0.60	0.00	0.00	0.21	0.41	0.00
Avail Cap(c_a), veh/h	330	0	0	1395	1177	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.0	0.0	0.0	1.4	2.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	0.0	0.3	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	1.6	3.7	0.0
LnGrp Delay(d),s/veh	48.9	0.0	0.0	1.8	3.0	0.0
LnGrp LOS	D			A	A	
Approach Vol, veh/h	66		293			478
Approach Delay, s/veh	48.9		1.8			3.0
Approach LOS	D		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		93.0		11.7		93.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		89.0		23.0		89.0		
Max Q Clear Time (g_c+I1), s		12.2		6.5		5.4		
Green Ext Time (p_c), s		0.8		0.1		0.4		

Intersection Summary	
HCM 2010 Ctrl Delay	6.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	500	150	150	450	5	25	10	100	5	5	5
Future Volume (veh/h)	5	500	150	150	450	5	25	10	100	5	5	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1850	1814	1850	1814	1814	1850	1850	1814	1814	1850	1814	1850
Adj Flow Rate, veh/h	5	543	163	163	489	5	27	11	109	5	5	5
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	1155	343	314	1581	16	540	207	683	259	256	227
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	5	2552	758	736	3494	36	1035	464	1531	443	573	508
Grp Volume(v), veh/h	387	0	324	163	241	253	38	0	109	15	0	0
Grp Sat Flow(s),veh/h/ln	1808	0	1507	736	1723	1807	1498	0	1531	1525	0	0
Q Serve(g_s), s	0.0	0.0	11.8	15.6	7.0	7.0	0.1	0.0	3.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.7	0.0	11.8	27.4	7.0	7.0	1.0	0.0	3.3	0.4	0.0	0.0
Prop In Lane	0.01		0.50	1.00		0.02	0.71		1.00	0.33		0.33
Lane Grp Cap(c), veh/h	865	0	682	314	780	817	746	0	683	741	0	0
V/C Ratio(X)	0.45	0.00	0.48	0.52	0.31	0.31	0.05	0.00	0.16	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1924	0	1573	750	1799	1887	746	0	683	741	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.0	0.0	15.0	24.5	13.7	13.7	12.3	0.0	13.0	12.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.5	0.1	0.1	0.1	0.0	0.5	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.0	4.9	3.2	3.3	3.5	0.5	0.0	1.5	0.2	0.0	0.0
LnGrp Delay(d),s/veh	15.1	0.0	15.2	25.0	13.8	13.8	12.5	0.0	13.5	12.2	0.0	0.0
LnGrp LOS	B		B	C	B	B	B		B	B		
Approach Vol, veh/h		711			657			147			15	
Approach Delay, s/veh		15.1			16.6			13.2			12.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		39.0		39.5		39.0		39.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		35.0		82.0		35.0		82.0
Max Q Clear Time (g_c+I1), s		2.4		29.4		5.3		13.8
Green Ext Time (p_c), s		0.0		0.8		0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	580	630	60	0	0	0	0	335	165	70	720	0
Future Volume (vph)	580	630	60	0	0	0	0	335	165	70	720	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						0.99			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.99						0.95			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1723	3392						3243			3430	
Flt Permitted	0.95	1.00						1.00			0.78	
Satd. Flow (perm)	1723	3392						3243			2675	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	630	685	65	0	0	0	0	364	179	76	783	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	630	745	0	0	0	0	0	501	0	0	859	0
Confl. Peds. (#/hr)			10						10	10		10
Turn Type	Split	NA						NA		custom	NA	
Protected Phases	3	3						4		2	2 7	
Permitted Phases										7		
Actuated Green, G (s)	53.0	53.0						41.8			75.0	
Effective Green, g (s)	53.0	53.0						41.8			75.0	
Actuated g/C Ratio	0.38	0.38						0.30			0.54	
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	0.2	0.2						0.2				
Lane Grp Cap (vph)	652	1284						968			1612	
v/s Ratio Prot	c0.37	0.22						0.15			c0.13	
v/s Ratio Perm											c0.16	
v/c Ratio	0.97	0.58						0.52			0.53	
Uniform Delay, d1	42.6	34.6						40.7			21.1	
Progression Factor	1.00	1.00						1.00			0.15	
Incremental Delay, d2	26.6	0.4						2.0			0.1	
Delay (s)	69.3	35.1						42.7			3.3	
Level of Service	E	D						D			A	
Approach Delay (s)		50.7			0.0			42.7			3.3	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	360	370	290	80	835	0	0	430	575
Future Volume (vph)	0	0	0	360	370	290	80	835	0	0	430	575
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)				4.0	4.0			4.0			4.0	4.0
Lane Util. Factor				1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes				1.00	0.99			1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00			1.00			1.00	1.00
Frt				1.00	0.93			1.00			1.00	0.85
Flt Protected				0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)				1723	3177			3431			1814	1496
Flt Permitted				0.95	1.00			0.64			1.00	1.00
Satd. Flow (perm)				1723	3177			2217			1814	1496
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	391	402	315	87	908	0	0	467	625
RTOR Reduction (vph)	0	0	0	0	102	0	0	0	0	0	0	372
Lane Group Flow (vph)	0	0	0	391	615	0	0	995	0	0	467	253
Confl. Peds. (#/hr)						10	10					10
Turn Type				Split	NA		custom	NA			NA	Perm
Protected Phases				2	2		3	3 4			7	
Permitted Phases							4					7
Actuated Green, G (s)				33.2	33.2			94.8			41.8	41.8
Effective Green, g (s)				33.2	33.2			94.8			41.8	41.8
Actuated g/C Ratio				0.24	0.24			0.68			0.30	0.30
Clearance Time (s)				4.0	4.0						4.0	4.0
Vehicle Extension (s)				0.2	0.2						0.2	0.2
Lane Grp Cap (vph)				408	753			1960			541	446
v/s Ratio Prot				c0.23	0.19			c0.19			c0.26	
v/s Ratio Perm								0.15				0.17
v/c Ratio				0.96	0.82			0.51			0.86	0.57
Uniform Delay, d1				52.7	50.5			11.1			46.4	41.5
Progression Factor				1.00	1.00			0.11			1.00	1.00
Incremental Delay, d2				33.3	6.5			0.0			16.5	5.2
Delay (s)				86.0	57.0			1.2			62.9	46.6
Level of Service				F	E			A			E	D
Approach Delay (s)		0.0			67.2			1.2			53.6	
Approach LOS		A			E			A			D	

Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
1: Kalihi St & King St

07/06/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	650	685	70	70	670	425	65	610	65	20	180	375
Future Volume (veh/h)	650	685	70	70	670	425	65	610	65	20	180	375
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	707	745	76	76	728	0	71	663	71	22	196	408
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	720	1854	189	93	774	346	87	784	84	27	371	327
Arrive On Green	0.42	0.59	0.59	0.05	0.22	0.00	0.05	0.25	0.25	0.02	0.22	0.22
Sat Flow, veh/h	1727	3156	322	1727	3446	1542	1727	3137	336	1727	1723	1520
Grp Volume(v), veh/h	707	407	414	76	728	0	71	364	370	22	196	408
Grp Sat Flow(s),veh/h/ln	1727	1723	1755	1727	1723	1542	1727	1723	1750	1727	1723	1520
Q Serve(g_s), s	69.6	21.9	21.9	7.5	35.7	0.0	7.0	34.5	34.6	2.2	17.3	37.0
Cycle Q Clear(g_c), s	69.6	21.9	21.9	7.5	35.7	0.0	7.0	34.5	34.6	2.2	17.3	37.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	720	1012	1031	93	774	346	87	431	437	27	371	327
V/C Ratio(X)	0.98	0.40	0.40	0.82	0.94	0.00	0.81	0.84	0.85	0.80	0.53	1.25
Avail Cap(c_a), veh/h	803	1101	1122	171	941	421	120	431	437	40	371	327
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	19.2	19.2	80.6	65.6	0.0	80.9	61.4	61.4	84.4	59.8	67.5
Incr Delay (d2), s/veh	25.6	0.1	0.1	6.5	14.0	0.0	18.0	18.1	18.0	33.2	5.3	134.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	38.3	10.4	10.6	3.8	18.5	0.0	3.8	18.6	19.0	1.3	8.8	27.7
LnGrp Delay(d),s/veh	75.2	19.3	19.3	87.1	79.6	0.0	98.9	79.5	79.4	117.6	65.1	202.0
LnGrp LOS	E	B	B	F	E		F	E	E	F	E	F
Approach Vol, veh/h		1528			804			805			626	
Approach Delay, s/veh		45.1			80.3			81.2			156.2	
Approach LOS		D			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	41.0	75.7	42.7	6.7	47.0	13.3	105.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	12.0	35.0	80.0	47.0	4.0	43.0	17.0	110.0
Max Q Clear Time (g_c+I1), s	9.0	39.0	71.6	37.7	4.2	36.6	9.5	23.9
Green Ext Time (p_c), s	0.0	0.0	0.2	0.9	0.0	0.6	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	78.8
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	250	250	185	600	200	235	950	120	200	560	80
Future Volume (veh/h)	200	250	250	185	600	200	235	950	120	200	560	80
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	217	272	272	201	652	217	255	1033	0	217	609	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	361	314	215	691	300	269	2266	0	231	2158	0
Arrive On Green	0.13	0.21	0.21	0.12	0.20	0.20	0.16	0.46	0.00	0.13	0.44	0.00
Sat Flow, veh/h	1727	1723	1498	1727	3446	1496	1727	5115	0	1727	5115	0
Grp Volume(v), veh/h	217	272	272	201	652	217	255	1033	0	217	609	0
Grp Sat Flow(s),veh/h/ln	1727	1723	1498	1727	1723	1496	1727	1650	0	1727	1650	0
Q Serve(g_s), s	26.9	32.0	37.9	24.9	40.4	29.3	31.6	30.9	0.0	26.9	17.1	0.0
Cycle Q Clear(g_c), s	26.9	32.0	37.9	24.9	40.4	29.3	31.6	30.9	0.0	26.9	17.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	231	361	314	215	691	300	269	2266	0	231	2158	0
V/C Ratio(X)	0.94	0.75	0.87	0.93	0.94	0.72	0.95	0.46	0.00	0.94	0.28	0.00
Avail Cap(c_a), veh/h	479	677	589	439	1275	553	551	2266	0	479	2158	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	92.8	80.2	82.5	93.8	85.3	80.9	90.4	40.2	0.0	92.8	39.2	0.0
Incr Delay (d2), s/veh	7.4	1.2	2.8	7.5	3.8	1.2	7.4	0.7	0.0	7.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.4	15.4	16.0	12.4	19.7	12.3	15.7	14.2	0.0	13.4	7.8	0.0
LnGrp Delay(d),s/veh	100.2	81.4	85.4	101.2	89.1	82.1	97.8	40.8	0.0	100.2	39.6	0.0
LnGrp LOS	F	F	F	F	F	F	F	D		F	D	
Approach Vol, veh/h		761			1070			1288			826	
Approach Delay, s/veh		88.2			90.0			52.1			55.5	
Approach LOS		F			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.7	98.3	33.0	47.4	33.0	103.0	31.0	49.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	69.0	90.0	60.0	80.0	60.0	99.0	55.0	85.0
Max Q Clear Time (g_c+I1), s	33.6	19.1	28.9	42.4	28.9	32.9	26.9	39.9
Green Ext Time (p_c), s	0.1	0.9	0.0	1.0	0.0	2.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	70.1
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	800	10	35	1050	220	20	20	20	115	10	100
Future Volume (veh/h)	150	800	10	35	1050	220	20	20	20	115	10	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1850	1850	1814	1850	1850	1814	1850
Adj Flow Rate, veh/h	163	870	11	38	1141	239	22	22	22	125	11	109
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	2300	29	414	1872	390	157	154	131	232	33	170
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	391	3485	44	626	2837	590	417	592	505	685	129	652
Grp Volume(v), veh/h	163	430	451	38	690	690	66	0	0	245	0	0
Grp Sat Flow(s),veh/h/ln	391	1723	1806	626	1723	1704	1514	0	0	1466	0	0
Q Serve(g_s), s	40.9	11.3	11.3	2.9	22.7	23.1	0.0	0.0	0.0	11.6	0.0	0.0
Cycle Q Clear(g_c), s	64.0	11.3	11.3	14.2	22.7	23.1	3.0	0.0	0.0	14.6	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.35	0.33		0.33	0.51		0.44
Lane Grp Cap(c), veh/h	240	1137	1192	414	1137	1125	442	0	0	436	0	0
V/C Ratio(X)	0.68	0.38	0.38	0.09	0.61	0.61	0.15	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	240	1137	1192	414	1137	1125	442	0	0	436	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.0	7.7	7.7	10.9	9.6	9.7	28.5	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	6.3	0.1	0.1	0.0	0.7	0.7	0.7	0.0	0.0	5.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	5.3	5.5	0.5	10.9	11.0	1.5	0.0	0.0	6.6	0.0	0.0
LnGrp Delay(d),s/veh	34.3	7.8	7.8	11.0	10.3	10.4	29.2	0.0	0.0	37.8	0.0	0.0
LnGrp LOS	C	A	A	B	B	B	C			D		
Approach Vol, veh/h		1044			1418			66			245	
Approach Delay, s/veh		11.9			10.4			29.2			37.8	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		70.0		30.0		70.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		66.0		26.0		66.0
Max Q Clear Time (g_c+I1), s		16.6		25.1		5.0		66.0
Green Ext Time (p_c), s		0.0		1.9		0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	110	235	225	125	175
Future Volume (veh/h)	20	110	235	225	125	175
Number	7	14	6	16	5	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.96		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1850	1814	1850	1850	1814
Adj Flow Rate, veh/h	22	120	255	245	136	190
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	27	150	693	666	432	587
Arrive On Green	0.12	0.12	0.82	0.82	0.82	0.82
Sat Flow, veh/h	233	1269	849	815	478	719
Grp Volume(v), veh/h	143	0	0	500	326	0
Grp Sat Flow(s),veh/h/ln	1512	0	0	1664	1197	0
Q Serve(g_s), s	11.3	0.0	0.0	9.6	5.7	0.0
Cycle Q Clear(g_c), s	11.3	0.0	0.0	9.6	15.4	0.0
Prop In Lane	0.15	0.84		0.49	0.42	
Lane Grp Cap(c), veh/h	178	0	0	1359	1019	0
V/C Ratio(X)	0.80	0.00	0.00	0.37	0.32	0.00
Avail Cap(c_a), veh/h	395	0	0	1359	1019	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.6	0.0	0.0	2.9	3.5	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.8	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0	4.6	3.6	0.0
LnGrp Delay(d),s/veh	55.8	0.0	0.0	3.7	4.4	0.0
LnGrp LOS	E			A	A	
Approach Vol, veh/h	143		500			326
Approach Delay, s/veh	55.8		3.7			4.4
Approach LOS	E		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		104.0		18.4		104.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		100.0		32.0		100.0		
Max Q Clear Time (g_c+I1), s		17.4		13.3		11.6		
Green Ext Time (p_c), s		0.6		0.0		0.6		

Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	450	100	100	900	5	150	10	100	5	5	5
Future Volume (veh/h)	5	450	100	100	900	5	150	10	100	5	5	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1850	1814	1850	1814	1814	1850	1850	1814	1814	1850	1814	1850
Adj Flow Rate, veh/h	5	489	109	109	978	5	163	11	109	5	5	5
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	1012	223	296	1304	7	785	50	780	295	291	257
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	6	2729	600	813	3515	18	1337	97	1533	438	572	505
Grp Volume(v), veh/h	324	0	279	109	479	504	174	0	109	15	0	0
Grp Sat Flow(s),veh/h/ln	1800	0	1535	813	1723	1810	1434	0	1533	1514	0	0
Q Serve(g_s), s	0.0	0.0	9.3	7.9	16.2	16.2	1.6	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.1	0.0	9.3	17.3	16.2	16.2	4.0	0.0	2.5	4.3	0.0	0.0
Prop In Lane	0.02		0.39	1.00		0.01	0.94		1.00	0.33		0.33
Lane Grp Cap(c), veh/h	723	0	570	296	639	672	835	0	780	843	0	0
V/C Ratio(X)	0.45	0.00	0.49	0.37	0.75	0.75	0.21	0.00	0.14	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1858	0	1563	822	1755	1843	835	0	780	843	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	0.0	16.1	22.8	18.3	18.3	9.0	0.0	8.7	8.1	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.2	0.3	0.7	0.6	0.6	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	4.0	1.8	7.7	8.1	1.9	0.0	1.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	16.2	0.0	16.4	23.1	19.0	18.9	9.5	0.0	9.0	8.2	0.0	0.0
LnGrp LOS	B		B	C	B	B	A		A	A		
Approach Vol, veh/h		603			1092			283			15	
Approach Delay, s/veh		16.3			19.4			9.3			8.2	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		38.0		28.8		38.0		28.8
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		34.0		68.0		34.0		68.0
Max Q Clear Time (g_c+I1), s		6.3		19.3		6.0		11.3
Green Ext Time (p_c), s		0.0		1.2		0.2		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	850	835	80	0	0	0	0	935	150	40	425	0
Future Volume (vph)	850	835	80	0	0	0	0	935	150	40	425	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						1.00			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.99						0.98			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1723	3394						3363			3431	
Flt Permitted	0.95	1.00						1.00			0.72	
Satd. Flow (perm)	1723	3394						3363			2487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	924	908	87	0	0	0	0	1016	163	43	462	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	924	988	0	0	0	0	0	1166	0	0	505	0
Confl. Peds. (#/hr)			10						10	10		
Turn Type	Split	NA						NA		custom	NA	
Protected Phases	3	3						4		2	2 7	
Permitted Phases										7		
Actuated Green, G (s)	35.0	35.0						29.0			53.0	
Effective Green, g (s)	35.0	35.0						29.0			53.0	
Actuated g/C Ratio	0.35	0.35						0.29			0.53	
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	0.2	0.2						0.2				
Lane Grp Cap (vph)	603	1187						975			1544	
v/s Ratio Prot	c0.54	0.29						c0.35			c0.08	
v/s Ratio Perm											0.09	
v/c Ratio	1.53	0.83						1.20			0.33	
Uniform Delay, d1	32.5	29.8						35.5			13.4	
Progression Factor	1.00	1.00						1.00			0.08	
Incremental Delay, d2	247.9	4.9						98.4			0.0	
Delay (s)	280.4	34.7						133.9			1.2	
Level of Service	F	C						F			A	
Approach Delay (s)		153.0			0.0			133.9			1.2	
Approach LOS		F			A			F			A	

Intersection Summary			
HCM 2000 Control Delay	125.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	195	685	290	175	1610	0	0	270	325
Future Volume (vph)	0	0	0	195	685	290	175	1610	0	0	270	325
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)				4.0	4.0			4.0			4.0	4.0
Lane Util. Factor				1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes				1.00	0.99			1.00			1.00	0.98
Flpb, ped/bikes				1.00	1.00			1.00			1.00	1.00
Frt				1.00	0.96			1.00			1.00	0.85
Flt Protected				0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)				1723	3268			3428			1814	1503
Flt Permitted				0.95	1.00			0.72			1.00	1.00
Satd. Flow (perm)				1723	3268			2476			1814	1503
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	212	745	315	190	1750	0	0	293	353
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	0	0	0	251
Lane Group Flow (vph)	0	0	0	212	1036	0	0	1940	0	0	293	102
Confl. Peds. (#/hr)						10	10					10
Turn Type				Split	NA		custom	NA			NA	Perm
Protected Phases				2	2		3	3 4			7	
Permitted Phases							4					7
Actuated Green, G (s)				24.0	24.0			64.0			29.0	29.0
Effective Green, g (s)				24.0	24.0			64.0			29.0	29.0
Actuated g/C Ratio				0.24	0.24			0.64			0.29	0.29
Clearance Time (s)				4.0	4.0						4.0	4.0
Vehicle Extension (s)				0.2	0.2						0.2	0.2
Lane Grp Cap (vph)				413	784			1917			526	435
v/s Ratio Prot				0.12	c0.32			c0.35			0.16	
v/s Ratio Perm								c0.29				0.07
v/c Ratio				0.51	1.32			1.01			0.56	0.24
Uniform Delay, d1				32.9	38.0			18.0			30.1	27.1
Progression Factor				1.00	1.00			0.83			1.00	1.00
Incremental Delay, d2				0.4	153.4			9.5			4.2	1.3
Delay (s)				33.4	191.4			24.4			34.3	28.3
Level of Service				C	F			C			C	C
Approach Delay (s)		0.0			165.0			24.4			31.0	
Approach LOS		A			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	71.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	965	140	100	510	280	180	350	55	205	350	210
Future Volume (veh/h)	325	965	140	100	510	280	180	350	55	205	350	210
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	353	1049	152	109	554	0	196	380	60	223	380	228
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	372	1096	159	130	767	343	217	935	146	244	684	404
Arrive On Green	0.22	0.36	0.36	0.08	0.22	0.00	0.13	0.31	0.31	0.14	0.33	0.33
Sat Flow, veh/h	1727	3019	437	1727	3446	1542	1727	2982	467	1727	2078	1228
Grp Volume(v), veh/h	353	598	603	109	554	0	196	218	222	223	314	294
Grp Sat Flow(s),veh/h/ln	1727	1723	1732	1727	1723	1542	1727	1723	1726	1727	1723	1584
Q Serve(g_s), s	30.0	50.4	50.6	9.3	22.2	0.0	16.7	14.8	15.1	19.0	22.3	22.8
Cycle Q Clear(g_c), s	30.0	50.4	50.6	9.3	22.2	0.0	16.7	14.8	15.1	19.0	22.3	22.8
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.27	1.00		0.78
Lane Grp Cap(c), veh/h	372	625	629	130	767	343	217	540	541	244	567	521
V/C Ratio(X)	0.95	0.96	0.96	0.84	0.72	0.00	0.90	0.40	0.41	0.92	0.55	0.56
Avail Cap(c_a), veh/h	684	1030	1035	244	1180	528	406	540	541	464	567	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	46.3	46.3	68.0	53.6	0.0	64.2	40.2	40.3	63.1	41.0	41.2
Incr Delay (d2), s/veh	7.4	9.7	10.0	5.5	0.5	0.0	5.5	2.2	2.3	5.6	3.9	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.1	25.6	26.0	4.6	10.6	0.0	8.3	7.4	7.6	9.4	11.3	10.6
LnGrp Delay(d),s/veh	65.0	55.9	56.3	73.5	54.1	0.0	69.7	42.4	42.6	68.7	44.9	45.6
LnGrp LOS	E	E	E	E	D		E	D	D	E	D	D
Approach Vol, veh/h		1554			663			636			831	
Approach Delay, s/veh		58.2			57.3			50.9			51.5	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.7	53.0	36.1	37.1	25.0	50.7	15.2	58.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	35.0	49.0	59.0	51.0	40.0	44.0	21.0	89.0
Max Q Clear Time (g_c+I1), s	18.7	24.8	32.0	24.2	21.0	17.1	11.3	52.6
Green Ext Time (p_c), s	0.0	0.7	0.1	0.8	0.0	0.5	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	55.2
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	355	100	270	220	190	335	1560	335	275	965	140
Future Volume (veh/h)	75	355	100	270	220	190	335	1560	335	275	965	140
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	82	386	109	293	239	207	364	1696	0	299	1049	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	92	397	111	302	938	410	373	2207	0	308	2022	0
Arrive On Green	0.05	0.15	0.15	0.17	0.27	0.27	0.22	0.45	0.00	0.18	0.41	0.00
Sat Flow, veh/h	1727	2637	734	1727	3446	1508	1727	5115	0	1727	5115	0
Grp Volume(v), veh/h	82	250	245	293	239	207	364	1696	0	299	1049	0
Grp Sat Flow(s),veh/h/ln	1727	1723	1648	1727	1723	1508	1727	1650	0	1727	1650	0
Q Serve(g_s), s	15.0	46.0	47.2	53.7	17.3	36.9	66.7	92.0	0.0	54.8	50.7	0.0
Cycle Q Clear(g_c), s	15.0	46.0	47.2	53.7	17.3	36.9	66.7	92.0	0.0	54.8	50.7	0.0
Prop In Lane	1.00		0.45	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	92	260	248	302	938	410	373	2207	0	308	2022	0
V/C Ratio(X)	0.89	0.96	0.99	0.97	0.25	0.50	0.98	0.77	0.00	0.97	0.52	0.00
Avail Cap(c_a), veh/h	136	260	248	320	938	410	477	2207	0	325	2022	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	149.8	134.4	134.9	130.6	90.7	97.8	124.1	74.4	0.0	130.0	70.8	0.0
Incr Delay (d2), s/veh	27.4	45.4	52.7	40.5	0.1	0.4	29.6	2.6	0.0	40.4	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	25.2	25.2	29.1	8.3	15.4	35.0	42.6	0.0	29.7	23.3	0.0
LnGrp Delay(d),s/veh	177.2	179.8	187.7	171.1	90.7	98.2	153.7	77.0	0.0	170.4	71.7	0.0
LnGrp LOS	F	F	F	F	F	F	F	E		F	E	
Approach Vol, veh/h		577			739			2060			1348	
Approach Delay, s/veh		182.8			124.7			90.6			93.6	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	72.8	134.1	21.0	90.7	60.8	146.0	59.7	52.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	88.0	114.0	25.0	82.0	60.0	142.0	59.0	48.0
Max Q Clear Time (g_c+I1), s	68.7	52.7	17.0	38.9	56.8	94.0	55.7	49.2
Green Ext Time (p_c), s	0.1	1.6	0.0	0.3	0.0	3.8	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	108.0
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	970	20	70	510	140	10	10	10	130	25	100
Future Volume (veh/h)	75	970	20	70	510	140	10	10	10	130	25	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1850	1850	1814	1850	1850	1814	1850
Adj Flow Rate, veh/h	82	1054	22	76	554	152	11	11	11	141	27	109
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	1494	31	198	1155	316	270	267	235	396	89	265
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	737	3451	72	522	2669	729	446	588	517	703	196	583
Grp Volume(v), veh/h	82	526	550	76	357	349	33	0	0	277	0	0
Grp Sat Flow(s),veh/h/ln	737	1723	1800	522	1723	1675	1552	0	0	1482	0	0
Q Serve(g_s), s	6.3	17.6	17.6	9.8	10.5	10.5	0.0	0.0	0.0	6.7	0.0	0.0
Cycle Q Clear(g_c), s	16.9	17.6	17.6	27.4	10.5	10.5	0.8	0.0	0.0	8.6	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.44	0.33		0.33	0.51		0.39
Lane Grp Cap(c), veh/h	311	746	779	198	746	725	772	0	0	750	0	0
V/C Ratio(X)	0.26	0.71	0.71	0.38	0.48	0.48	0.04	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	514	1222	1276	342	1222	1187	772	0	0	750	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.4	16.3	16.3	27.5	14.3	14.3	10.7	0.0	0.0	12.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.5	0.4	0.5	0.2	0.2	0.1	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.4	8.8	1.4	5.0	4.9	0.4	0.0	0.0	3.8	0.0	0.0
LnGrp Delay(d),s/veh	20.5	16.8	16.8	28.0	14.5	14.5	10.8	0.0	0.0	14.2	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	B			B		
Approach Vol, veh/h		1158			782			33			277	
Approach Delay, s/veh		17.0			15.8			10.8			14.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		34.5		36.0		34.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		32.0		50.0		32.0		50.0
Max Q Clear Time (g_c+I1), s		10.6		29.4		2.8		19.6
Green Ext Time (p_c), s		0.1		1.1		0.0		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	45	115	160	235	215
Future Volume (veh/h)	15	45	115	160	235	215
Number	7	14	6	16	5	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.93		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1850	1814	1850	1850	1814
Adj Flow Rate, veh/h	16	49	125	174	255	234
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	27	82	582	811	620	553
Arrive On Green	0.07	0.07	0.85	0.85	0.85	0.85
Sat Flow, veh/h	364	1116	685	954	668	650
Grp Volume(v), veh/h	66	0	0	299	489	0
Grp Sat Flow(s),veh/h/ln	1503	0	0	1639	1318	0
Q Serve(g_s), s	4.5	0.0	0.0	3.5	7.2	0.0
Cycle Q Clear(g_c), s	4.5	0.0	0.0	3.5	10.7	0.0
Prop In Lane	0.24	0.74		0.58	0.52	
Lane Grp Cap(c), veh/h	110	0	0	1393	1173	0
V/C Ratio(X)	0.60	0.00	0.00	0.21	0.42	0.00
Avail Cap(c_a), veh/h	330	0	0	1393	1173	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.0	0.0	0.0	1.4	2.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	0.0	0.4	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	1.6	3.8	0.0
LnGrp Delay(d),s/veh	48.9	0.0	0.0	1.8	3.1	0.0
LnGrp LOS	D			A	A	
Approach Vol, veh/h	66		299			489
Approach Delay, s/veh	48.9		1.8			3.1
Approach LOS	D		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		93.0		11.7		93.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		89.0		23.0		89.0		
Max Q Clear Time (g_c+I1), s		12.7		6.5		5.5		
Green Ext Time (p_c), s		0.8		0.1		0.4		

Intersection Summary	
HCM 2010 Ctrl Delay	6.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	510	155	155	460	5	25	10	100	5	5	5
Future Volume (veh/h)	5	510	155	155	460	5	25	10	100	5	5	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1850	1814	1850	1814	1814	1850	1850	1814	1814	1850	1814	1850
Adj Flow Rate, veh/h	5	554	168	168	500	5	27	11	109	5	5	5
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	1175	353	315	1614	16	530	203	671	254	251	223
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	5	2545	764	726	3495	35	1034	464	1531	443	573	508
Grp Volume(v), veh/h	396	0	331	168	246	259	38	0	109	15	0	0
Grp Sat Flow(s),veh/h/ln	1808	0	1506	726	1723	1807	1498	0	1531	1525	0	0
Q Serve(g_s), s	0.0	0.0	12.1	16.6	7.2	7.2	0.2	0.0	3.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.0	0.0	12.1	28.7	7.2	7.2	1.0	0.0	3.4	0.4	0.0	0.0
Prop In Lane	0.01		0.51	1.00		0.02	0.71		1.00	0.33		0.33
Lane Grp Cap(c), veh/h	881	0	695	315	795	834	734	0	671	728	0	0
V/C Ratio(X)	0.45	0.00	0.48	0.53	0.31	0.31	0.05	0.00	0.16	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1892	0	1546	725	1769	1855	734	0	671	728	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.8	0.0	14.8	24.8	13.5	13.5	12.9	0.0	13.6	12.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.5	0.1	0.1	0.1	0.0	0.5	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.0	5.0	3.4	3.4	3.6	0.5	0.0	1.6	0.2	0.0	0.0
LnGrp Delay(d),s/veh	14.9	0.0	15.0	25.3	13.6	13.6	13.0	0.0	14.1	12.8	0.0	0.0
LnGrp LOS	B		B	C	B	B	B		B	B		
Approach Vol, veh/h		727			673			147			15	
Approach Delay, s/veh		15.0			16.5			13.8			12.8	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		39.0		40.9		39.0		40.9
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		35.0		82.0		35.0		82.0
Max Q Clear Time (g_c+I1), s		2.4		30.7		5.4		14.1
Green Ext Time (p_c), s		0.0		0.9		0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	590	640	60	0	0	0	0	340	170	70	735	0
Future Volume (vph)	590	640	60	0	0	0	0	340	170	70	735	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						0.99			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.99						0.95			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1723	3393						3241			3430	
Flt Permitted	0.95	1.00						1.00			0.77	
Satd. Flow (perm)	1723	3393						3241			2650	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	696	65	0	0	0	0	370	185	76	799	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	44	0	0	0	0
Lane Group Flow (vph)	641	756	0	0	0	0	0	511	0	0	875	0
Confl. Peds. (#/hr)			10						10	10		10
Turn Type	Split	NA						NA		custom	NA	
Protected Phases	3	3						4		2	2 7	
Permitted Phases										7		
Actuated Green, G (s)	53.3	53.3						41.3			74.7	
Effective Green, g (s)	53.3	53.3						41.3			74.7	
Actuated g/C Ratio	0.38	0.38						0.29			0.53	
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	0.2	0.2						0.2				
Lane Grp Cap (vph)	655	1291						956			1600	
v/s Ratio Prot	c0.37	0.22						0.16			c0.13	
v/s Ratio Perm											c0.16	
v/c Ratio	0.98	0.59						0.53			0.55	
Uniform Delay, d1	42.8	34.5						41.3			21.5	
Progression Factor	1.00	1.00						1.00			0.15	
Incremental Delay, d2	29.4	0.4						2.1			0.1	
Delay (s)	72.2	35.0						43.5			3.4	
Level of Service	E	C						D			A	
Approach Delay (s)		52.0			0.0			43.5			3.4	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	365	380	295	80	850	0	0	440	585
Future Volume (vph)	0	0	0	365	380	295	80	850	0	0	440	585
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)				4.0	4.0			4.0			4.0	4.0
Lane Util. Factor				1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes				1.00	0.99			1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00			1.00			1.00	1.00
Frt				1.00	0.93			1.00			1.00	0.85
Flt Protected				0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)				1723	3178			3431			1814	1496
Flt Permitted				0.95	1.00			0.63			1.00	1.00
Satd. Flow (perm)				1723	3178			2167			1814	1496
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	397	413	321	87	924	0	0	478	636
RTOR Reduction (vph)	0	0	0	0	101	0	0	0	0	0	0	372
Lane Group Flow (vph)	0	0	0	397	633	0	0	1011	0	0	478	264
Confl. Peds. (#/hr)						10	10					10
Turn Type				Split	NA		custom	NA			NA	Perm
Protected Phases				2	2		3	3 4			7	
Permitted Phases							4					7
Actuated Green, G (s)				33.4	33.4			94.6			41.3	41.3
Effective Green, g (s)				33.4	33.4			94.6			41.3	41.3
Actuated g/C Ratio				0.24	0.24			0.68			0.29	0.29
Clearance Time (s)				4.0	4.0						4.0	4.0
Vehicle Extension (s)				0.2	0.2						0.2	0.2
Lane Grp Cap (vph)				411	758			1945			535	441
v/s Ratio Prot				c0.23	0.20			c0.20			c0.26	
v/s Ratio Perm								0.15				0.18
v/c Ratio				0.97	0.83			0.52			0.89	0.60
Uniform Delay, d1				52.7	50.7			11.3			47.2	42.3
Progression Factor				1.00	1.00			0.11			1.00	1.00
Incremental Delay, d2				35.1	7.6			0.1			19.9	5.9
Delay (s)				87.8	58.2			1.3			67.2	48.2
Level of Service				F	E			A			E	D
Approach Delay (s)		0.0			68.6			1.3			56.3	
Approach LOS		A			E			A			E	

Intersection Summary			
HCM 2000 Control Delay	43.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
1: Kalihi St & King St

07/14/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	665	700	70	70	685	435	65	620	65	20	185	385
Future Volume (veh/h)	665	700	70	70	685	435	65	620	65	20	185	385
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	723	761	76	76	745	0	71	674	71	22	201	418
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	735	1903	190	93	791	354	87	743	78	27	348	306
Arrive On Green	0.43	0.60	0.60	0.05	0.23	0.00	0.05	0.24	0.24	0.02	0.20	0.20
Sat Flow, veh/h	1727	3163	316	1727	3446	1542	1727	3143	331	1727	1723	1519
Grp Volume(v), veh/h	723	414	423	76	745	0	71	369	376	22	201	418
Grp Sat Flow(s),veh/h/ln	1727	1723	1756	1727	1723	1542	1727	1723	1750	1727	1723	1519
Q Serve(g_s), s	71.7	21.9	21.9	7.6	36.8	0.0	7.1	36.1	36.2	2.2	18.3	35.0
Cycle Q Clear(g_c), s	71.7	21.9	21.9	7.6	36.8	0.0	7.1	36.1	36.2	2.2	18.3	35.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	735	1037	1057	93	791	354	87	407	414	27	348	306
V/C Ratio(X)	0.98	0.40	0.40	0.82	0.94	0.00	0.81	0.91	0.91	0.80	0.58	1.36
Avail Cap(c_a), veh/h	797	1123	1145	159	974	436	110	407	414	40	348	306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.2	18.1	18.1	81.2	65.6	0.0	81.5	64.3	64.3	85.0	62.5	69.2
Incr Delay (d2), s/veh	26.4	0.1	0.1	6.5	13.7	0.0	24.5	26.3	26.2	34.2	6.8	183.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	39.5	10.4	10.6	3.8	19.1	0.0	4.0	20.2	20.6	1.3	9.4	30.3
LnGrp Delay(d),s/veh	75.6	18.2	18.2	87.7	79.3	0.0	106.0	90.6	90.6	119.3	69.4	252.6
LnGrp LOS	E	B	B	F	E		F	F	F	F	E	F
Approach Vol, veh/h		1560			821			816			641	
Approach Delay, s/veh		44.8			80.1			91.9			190.6	
Approach LOS		D			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	39.0	77.8	43.8	6.7	45.0	13.3	108.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	34.0	80.0	49.0	4.0	41.0	16.0	113.0
Max Q Clear Time (g_c+I1), s	9.1	37.0	73.7	38.8	4.2	38.2	9.6	23.9
Green Ext Time (p_c), s	0.0	0.0	0.1	1.0	0.0	0.4	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	86.7
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	255	255	190	610	205	240	970	120	205	570	80
Future Volume (veh/h)	205	255	255	190	610	205	240	970	120	205	570	80
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	223	277	277	207	663	223	261	1054	0	223	620	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	366	319	221	701	304	275	2226	0	237	2117	0
Arrive On Green	0.14	0.21	0.21	0.13	0.20	0.20	0.16	0.45	0.00	0.14	0.43	0.00
Sat Flow, veh/h	1727	1723	1498	1727	3446	1496	1727	5115	0	1727	5115	0
Grp Volume(v), veh/h	223	277	277	207	663	223	261	1054	0	223	620	0
Grp Sat Flow(s),veh/h/ln	1727	1723	1498	1727	1723	1496	1727	1650	0	1727	1650	0
Q Serve(g_s), s	28.2	33.2	39.3	26.1	41.8	30.7	33.0	32.8	0.0	28.2	18.0	0.0
Cycle Q Clear(g_c), s	28.2	33.2	39.3	26.1	41.8	30.7	33.0	32.8	0.0	28.2	18.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	237	366	319	221	701	304	275	2226	0	237	2117	0
V/C Ratio(X)	0.94	0.76	0.87	0.94	0.95	0.73	0.95	0.47	0.00	0.94	0.29	0.00
Avail Cap(c_a), veh/h	471	649	565	447	1252	543	549	2226	0	471	2117	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	94.1	81.3	83.8	95.1	86.5	82.1	91.7	42.4	0.0	94.1	41.2	0.0
Incr Delay (d2), s/veh	7.5	1.2	2.9	7.6	5.0	1.3	7.5	0.7	0.0	7.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	16.0	16.6	13.0	20.5	12.8	16.4	15.1	0.0	14.0	8.3	0.0
LnGrp Delay(d),s/veh	101.7	82.5	86.6	102.7	91.5	83.4	99.2	43.1	0.0	101.7	41.6	0.0
LnGrp LOS	F	F	F	F	F	F	F	D		F	D	
Approach Vol, veh/h		777			1093			1315			843	
Approach Delay, s/veh		89.5			92.0			54.3			57.5	
Approach LOS		F			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.0	98.2	34.2	48.8	34.2	103.0	32.2	50.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	70.0	89.0	60.0	80.0	60.0	99.0	57.0	83.0
Max Q Clear Time (g_c+I1), s	35.0	20.0	30.2	43.8	30.2	34.8	28.1	41.3
Green Ext Time (p_c), s	0.1	0.9	0.0	1.0	0.0	2.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	72.0
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	815	10	35	1070	225	20	20	20	115	10	100
Future Volume (veh/h)	155	815	10	35	1070	225	20	20	20	115	10	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1850	1850	1814	1850	1850	1814	1850
Adj Flow Rate, veh/h	168	886	11	38	1163	245	22	22	22	125	11	109
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	2300	29	408	1871	391	157	154	131	232	33	170
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	380	3485	43	617	2834	593	417	592	505	685	129	652
Grp Volume(v), veh/h	168	438	459	38	704	704	66	0	0	245	0	0
Grp Sat Flow(s),veh/h/ln	380	1723	1806	617	1723	1704	1514	0	0	1466	0	0
Q Serve(g_s), s	42.0	11.6	11.6	3.0	23.5	24.0	0.0	0.0	0.0	11.6	0.0	0.0
Cycle Q Clear(g_c), s	66.0	11.6	11.6	14.6	23.5	24.0	3.0	0.0	0.0	14.6	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.35	0.33		0.33	0.51		0.44
Lane Grp Cap(c), veh/h	232	1137	1192	408	1137	1125	442	0	0	436	0	0
V/C Ratio(X)	0.72	0.39	0.39	0.09	0.62	0.63	0.15	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	232	1137	1192	408	1137	1125	442	0	0	436	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.0	7.8	7.8	11.1	9.8	9.9	28.5	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	9.4	0.1	0.1	0.0	0.8	0.8	0.7	0.0	0.0	5.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.5	5.8	0.5	11.2	11.4	1.5	0.0	0.0	6.6	0.0	0.0
LnGrp Delay(d),s/veh	39.3	7.8	7.8	11.1	10.5	10.7	29.2	0.0	0.0	37.8	0.0	0.0
LnGrp LOS	D	A	A	B	B	B	C			D		
Approach Vol, veh/h		1065			1446			66			245	
Approach Delay, s/veh		12.8			10.6			29.2			37.8	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		70.0		30.0		70.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		66.0		26.0		66.0
Max Q Clear Time (g_c+I1), s		16.6		26.0		5.0		68.0
Green Ext Time (p_c), s		0.0		1.9		0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	110	240	230	130	180
Future Volume (veh/h)	20	110	240	230	130	180
Number	7	14	6	16	5	2
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.96		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1850	1814	1850	1850	1814
Adj Flow Rate, veh/h	22	120	261	250	141	196
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	27	150	694	665	429	580
Arrive On Green	0.12	0.12	0.82	0.82	0.82	0.82
Sat Flow, veh/h	233	1269	850	814	475	710
Grp Volume(v), veh/h	143	0	0	511	337	0
Grp Sat Flow(s),veh/h/ln	1512	0	0	1664	1185	0
Q Serve(g_s), s	11.3	0.0	0.0	9.9	6.4	0.0
Cycle Q Clear(g_c), s	11.3	0.0	0.0	9.9	16.3	0.0
Prop In Lane	0.15	0.84		0.49	0.42	
Lane Grp Cap(c), veh/h	178	0	0	1359	1009	0
V/C Ratio(X)	0.80	0.00	0.00	0.38	0.33	0.00
Avail Cap(c_a), veh/h	395	0	0	1359	1009	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.6	0.0	0.0	3.0	3.7	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.8	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0	4.8	3.8	0.0
LnGrp Delay(d),s/veh	55.8	0.0	0.0	3.8	4.6	0.0
LnGrp LOS	E			A	A	
Approach Vol, veh/h	143		511			337
Approach Delay, s/veh	55.8		3.8			4.6
Approach LOS	E		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		104.0		18.4		104.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		100.0		32.0		100.0		
Max Q Clear Time (g_c+I1), s		18.3		13.3		11.9		
Green Ext Time (p_c), s		0.6		0.0		0.7		

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	460	100	100	920	5	155	10	100	5	5	5
Future Volume (veh/h)	5	460	100	100	920	5	155	10	100	5	5	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1850	1814	1850	1814	1814	1850	1850	1814	1814	1850	1814	1850
Adj Flow Rate, veh/h	5	500	109	109	1000	5	168	11	109	5	5	5
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	1026	221	294	1316	7	785	48	776	294	291	257
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	6	2741	590	805	3516	18	1345	95	1533	440	574	507
Grp Volume(v), veh/h	330	0	284	109	490	515	179	0	109	15	0	0
Grp Sat Flow(s),veh/h/ln	1800	0	1537	805	1723	1810	1440	0	1533	1520	0	0
Q Serve(g_s), s	0.0	0.0	9.5	8.1	16.7	16.7	0.0	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.3	0.0	9.5	17.6	16.7	16.7	4.1	0.0	2.5	4.1	0.0	0.0
Prop In Lane	0.02		0.38	1.00		0.01	0.94		1.00	0.33		0.33
Lane Grp Cap(c), veh/h	728	0	575	294	645	678	833	0	776	841	0	0
V/C Ratio(X)	0.45	0.00	0.49	0.37	0.76	0.76	0.21	0.00	0.14	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1849	0	1557	809	1746	1834	833	0	776	841	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	0.0	16.1	22.9	18.4	18.4	9.2	0.0	8.8	8.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.2	0.3	0.7	0.7	0.6	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	4.1	1.8	8.0	8.4	2.0	0.0	1.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	16.2	0.0	16.4	23.2	19.1	19.0	9.8	0.0	9.2	8.3	0.0	0.0
LnGrp LOS	B		B	C	B	B	A		A	A		
Approach Vol, veh/h		614			1114			288			15	
Approach Delay, s/veh		16.3			19.5			9.5			8.3	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		38.0		29.1		38.0		29.1
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		34.0		68.0		34.0		68.0
Max Q Clear Time (g_c+I1), s		6.1		19.6		6.1		11.5
Green Ext Time (p_c), s		0.0		1.3		0.2		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	880	850	80	0	0	0	0	955	155	40	435	0
Future Volume (vph)	880	850	80	0	0	0	0	955	155	40	435	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						1.00			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.99						0.98			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1723	3394						3362			3432	
Flt Permitted	0.95	1.00						1.00			0.72	
Satd. Flow (perm)	1723	3394						3362			2487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	957	924	87	0	0	0	0	1038	168	43	473	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	957	1004	0	0	0	0	0	1193	0	0	516	0
Confl. Peds. (#/hr)			10						10	10		
Turn Type	Split	NA						NA		custom	NA	
Protected Phases	3	3						4		2	2 7	
Permitted Phases										7		
Actuated Green, G (s)	35.0	35.0						29.0			53.0	
Effective Green, g (s)	35.0	35.0						29.0			53.0	
Actuated g/C Ratio	0.35	0.35						0.29			0.53	
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	0.2	0.2						0.2				
Lane Grp Cap (vph)	603	1187						974			1544	
v/s Ratio Prot	c0.56	0.30						c0.35			c0.08	
v/s Ratio Perm											0.10	
v/c Ratio	1.59	0.85						1.23			0.33	
Uniform Delay, d1	32.5	30.0						35.5			13.4	
Progression Factor	1.00	1.00						1.00			0.08	
Incremental Delay, d2	272.0	5.5						110.5			0.0	
Delay (s)	304.5	35.5						146.0			1.2	
Level of Service	F	D						F			A	
Approach Delay (s)		166.3			0.0			146.0			1.2	
Approach LOS		F			A			F			A	

Intersection Summary			
HCM 2000 Control Delay	136.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	695	295	180	1655	0	0	275	330
Future Volume (vph)	0	0	0	200	695	295	180	1655	0	0	275	330
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)				4.0	4.0			4.0			4.0	4.0
Lane Util. Factor				1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes				1.00	0.99			1.00			1.00	0.98
Flpb, ped/bikes				1.00	1.00			1.00			1.00	1.00
Frt				1.00	0.96			1.00			1.00	0.85
Flt Protected				0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)				1723	3268			3428			1814	1503
Flt Permitted				0.95	1.00			0.71			1.00	1.00
Satd. Flow (perm)				1723	3268			2455			1814	1503
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	217	755	321	196	1799	0	0	299	359
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	0	0	0	255
Lane Group Flow (vph)	0	0	0	217	1054	0	0	1995	0	0	299	104
Confl. Peds. (#/hr)						10	10					10
Turn Type				Split	NA		custom	NA			NA	Perm
Protected Phases				2	2		3	3 4			7	
Permitted Phases							4					7
Actuated Green, G (s)				24.0	24.0			64.0			29.0	29.0
Effective Green, g (s)				24.0	24.0			64.0			29.0	29.0
Actuated g/C Ratio				0.24	0.24			0.64			0.29	0.29
Clearance Time (s)				4.0	4.0						4.0	4.0
Vehicle Extension (s)				0.2	0.2						0.2	0.2
Lane Grp Cap (vph)				413	784			1911			526	435
v/s Ratio Prot				0.13	c0.32			c0.37			0.16	
v/s Ratio Perm								c0.30				0.07
v/c Ratio				0.53	1.34			1.04			0.57	0.24
Uniform Delay, d1				33.0	38.0			18.0			30.2	27.1
Progression Factor				1.00	1.00			0.84			1.00	1.00
Incremental Delay, d2				0.6	163.4			21.6			4.4	1.3
Delay (s)				33.6	201.4			36.8			34.6	28.4
Level of Service				C	F			D			C	C
Approach Delay (s)		0.0			173.3			36.8			31.2	
Approach LOS		A			F			D			C	

Intersection Summary			
HCM 2000 Control Delay	80.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	990	140	100	370	420	180	350	55	270	350	245
Future Volume (veh/h)	460	990	140	100	370	420	180	350	55	270	350	245
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	500	1076	152	109	402	0	196	380	60	293	380	266
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	518	1124	158	130	504	226	217	787	123	313	621	429
Arrive On Green	0.30	0.37	0.37	0.08	0.15	0.00	0.13	0.26	0.26	0.18	0.32	0.32
Sat Flow, veh/h	1727	3030	427	1727	3446	1542	1727	2981	467	1727	1944	1342
Grp Volume(v), veh/h	500	611	617	109	402	0	196	218	222	293	336	310
Grp Sat Flow(s),veh/h/ln	1727	1723	1734	1727	1723	1542	1727	1723	1725	1727	1723	1562
Q Serve(g_s), s	42.0	50.9	51.1	9.2	16.6	0.0	16.5	15.7	16.0	24.6	24.3	24.8
Cycle Q Clear(g_c), s	42.0	50.9	51.1	9.2	16.6	0.0	16.5	15.7	16.0	24.6	24.3	24.8
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.27	1.00		0.86
Lane Grp Cap(c), veh/h	518	639	643	130	504	226	217	455	455	313	550	499
V/C Ratio(X)	0.97	0.96	0.96	0.84	0.80	0.00	0.90	0.48	0.49	0.94	0.61	0.62
Avail Cap(c_a), veh/h	869	1089	1096	258	960	430	376	455	455	528	550	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	45.1	45.2	67.2	60.7	0.0	63.4	45.6	45.7	59.4	42.3	42.5
Incr Delay (d2), s/veh	12.1	8.3	8.7	5.4	1.1	0.0	7.8	3.6	3.7	10.9	5.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.7	25.6	26.1	4.6	8.0	0.0	8.4	7.9	8.1	12.7	12.3	11.5
LnGrp Delay(d),s/veh	62.9	53.4	53.9	72.6	61.8	0.0	71.2	49.2	49.4	70.3	47.3	48.2
LnGrp LOS	E	D	D	E	E		E	D	D	E	D	D
Approach Vol, veh/h		1728			511			636			939	
Approach Delay, s/veh		56.3			64.1			56.1			54.8	
Approach LOS		E			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	51.0	48.1	25.5	30.7	42.8	15.1	58.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	32.0	47.0	74.0	41.0	45.0	34.0	22.0	93.0
Max Q Clear Time (g_c+I1), s	18.5	26.8	44.0	18.6	26.6	18.0	11.2	53.1
Green Ext Time (p_c), s	0.0	0.8	0.1	0.6	0.1	0.4	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	56.9
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	355	200	285	205	190	360	1720	335	275	1105	0
Future Volume (veh/h)	0	355	200	285	205	190	360	1720	335	275	1105	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	0	386	217	310	223	207	391	1870	0	299	1201	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	351	194	298	1209	532	400	2209	0	287	1886	0
Arrive On Green	0.00	0.17	0.17	0.17	0.35	0.35	0.23	0.45	0.00	0.17	0.38	0.00
Sat Flow, veh/h	1727	2112	1167	1727	3446	1515	1727	5115	0	1727	5115	0
Grp Volume(v), veh/h	0	314	289	310	223	207	391	1870	0	299	1201	0
Grp Sat Flow(s),veh/h/ln	1727	1723	1556	1727	1723	1515	1727	1650	0	1727	1650	0
Q Serve(g_s), s	0.0	54.0	54.0	56.0	14.6	33.4	73.1	109.2	0.0	54.0	64.4	0.0
Cycle Q Clear(g_c), s	0.0	54.0	54.0	56.0	14.6	33.4	73.1	109.2	0.0	54.0	64.4	0.0
Prop In Lane	1.00		0.75	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	1	286	259	298	1209	532	400	2209	0	287	1886	0
V/C Ratio(X)	0.00	1.10	1.12	1.04	0.18	0.39	0.98	0.85	0.00	1.04	0.64	0.00
Avail Cap(c_a), veh/h	21	286	259	298	1209	532	500	2209	0	287	1886	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	135.5	135.5	134.5	73.2	79.3	124.1	80.1	0.0	135.5	82.2	0.0
Incr Delay (d2), s/veh	0.0	81.3	91.7	63.4	0.0	0.2	30.0	4.2	0.0	64.4	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	32.2	29.9	32.0	7.0	14.1	38.3	50.7	0.0	31.0	29.8	0.0
LnGrp Delay(d),s/veh	0.0	216.8	227.2	197.9	73.3	79.5	154.1	84.3	0.0	199.9	83.9	0.0
LnGrp LOS		F	F	F	E	E	F	F		F	F	
Approach Vol, veh/h		603			740			2261			1500	
Approach Delay, s/veh		221.8			127.2			96.4			107.0	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	79.2	127.8	0.0	118.0	58.0	149.0	60.0	58.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	94.0	105.0	4.0	106.0	54.0	145.0	56.0	54.0
Max Q Clear Time (g_c+I1), s	75.1	66.4	0.0	35.4	56.0	111.2	58.0	56.0
Green Ext Time (p_c), s	0.1	1.9	0.0	0.3	0.0	4.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	118.8
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1045	20	70	545	0	10	0	20	205	25	30
Future Volume (veh/h)	0	1045	20	70	545	0	10	0	20	205	25	30
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1850	1850	1814	1850	1850	1814	1850
Adj Flow Rate, veh/h	0	1136	22	76	592	0	11	0	22	223	27	33
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	1587	31	191	1582	0	256	29	440	566	69	72
Arrive On Green	0.00	0.46	0.46	0.46	0.46	0.00	0.43	0.00	0.43	0.43	0.43	0.43
Sat Flow, veh/h	821	3457	67	483	3537	0	441	67	1017	1106	160	167
Grp Volume(v), veh/h	0	566	592	76	592	0	33	0	0	283	0	0
Grp Sat Flow(s),veh/h/ln	821	1723	1801	483	1723	0	1526	0	0	1434	0	0
Q Serve(g_s), s	0.0	19.6	19.6	11.1	8.3	0.0	0.0	0.0	0.0	9.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	19.6	19.6	30.7	8.3	0.0	0.9	0.0	0.0	10.1	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	0.33		0.67	0.79		0.12
Lane Grp Cap(c), veh/h	97	791	827	191	1582	0	725	0	0	708	0	0
V/C Ratio(X)	0.00	0.72	0.72	0.40	0.37	0.00	0.05	0.00	0.00	0.40	0.00	0.00
Avail Cap(c_a), veh/h	276	1165	1218	296	2330	0	725	0	0	708	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	16.1	16.1	28.5	13.1	0.0	12.1	0.0	0.0	14.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.4	0.5	0.1	0.0	0.1	0.0	0.0	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.4	9.8	1.5	4.0	0.0	0.4	0.0	0.0	4.3	0.0	0.0
LnGrp Delay(d),s/veh	0.0	16.6	16.6	29.0	13.1	0.0	12.3	0.0	0.0	16.4	0.0	0.0
LnGrp LOS		B	B	C	B		B			B		
Approach Vol, veh/h		1158			668			33			283	
Approach Delay, s/veh		16.6			14.9			12.3			16.4	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.0		38.0		36.0		38.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		32.0		50.0		32.0		50.0
Max Q Clear Time (g_c+I1), s		12.1		32.7		2.9		21.6
Green Ext Time (p_c), s		0.1		1.2		0.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	605	0	0	485	5	135	0	0	10	0	5
Future Volume (veh/h)	5	605	0	0	485	5	135	0	0	10	0	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.98	0.99		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1850	1814	1850	1814	1814	1850	1850	1814	1814	1850	1814	1850
Adj Flow Rate, veh/h	5	658	0	0	527	5	147	0	0	11	0	5
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	1024	0	114	1063	10	911	0	878	652	17	261
Arrive On Green	0.30	0.30	0.00	0.00	0.30	0.30	0.57	0.00	0.00	0.57	0.00	0.57
Sat Flow, veh/h	6	3451	0	773	3497	33	1400	0	1542	977	30	458
Grp Volume(v), veh/h	355	308	0	0	260	272	147	0	0	16	0	0
Grp Sat Flow(s),veh/h/ln	1807	1568	0	773	1723	1807	1400	0	1542	1464	0	0
Q Serve(g_s), s	0.0	10.7	0.0	0.0	7.8	7.8	2.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.7	10.7	0.0	0.0	7.8	7.8	3.1	0.0	0.0	0.3	0.0	0.0
Prop In Lane	0.01		0.00	1.00		0.02	1.00		1.00	0.69		0.31
Lane Grp Cap(c), veh/h	607	477	0	114	524	549	911	0	878	930	0	0
V/C Ratio(X)	0.59	0.65	0.00	0.00	0.50	0.50	0.16	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	2353	2009	0	869	2208	2316	911	0	878	930	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.0	19.1	0.0	0.0	18.0	18.0	6.5	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.0	0.0	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	4.7	0.0	0.0	3.7	3.9	1.3	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	19.4	19.6	0.0	0.0	18.3	18.3	6.9	0.0	0.0	5.9	0.0	0.0
LnGrp LOS	B	B			B	B	A			A		
Approach Vol, veh/h		663			532			147			16	
Approach Delay, s/veh		19.5			18.3			6.9			5.9	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		23.2		40.0		23.2
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		36.0		81.0		36.0		81.0
Max Q Clear Time (g_c+I1), s		2.3		9.8		5.1		12.7
Green Ext Time (p_c), s		0.0		0.5		0.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	17.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	590	640	60	0	0	0	0	340	170	70	735	0
Future Volume (vph)	590	640	60	0	0	0	0	340	170	70	735	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						0.99			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.99						0.95			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1723	3393						3241			3430	
Flt Permitted	0.95	1.00						1.00			0.77	
Satd. Flow (perm)	1723	3393						3241			2659	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	696	65	0	0	0	0	370	185	76	799	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	45	0	0	0	0
Lane Group Flow (vph)	641	756	0	0	0	0	0	510	0	0	875	0
Confl. Peds. (#/hr)			10						10	10		10
Turn Type	Split	NA						NA		custom	NA	
Protected Phases	3	3						4		2	2 7	
Permitted Phases										7		
Actuated Green, G (s)	53.0	53.0						42.0			75.0	
Effective Green, g (s)	53.0	53.0						42.0			75.0	
Actuated g/C Ratio	0.38	0.38						0.30			0.54	
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	0.2	0.2						0.2				
Lane Grp Cap (vph)	652	1284						972			1606	
v/s Ratio Prot	c0.37	0.22						0.16			c0.13	
v/s Ratio Perm											c0.16	
v/c Ratio	0.98	0.59						0.52			0.54	
Uniform Delay, d1	43.1	34.8						40.7			21.3	
Progression Factor	1.00	1.00						1.00			0.17	
Incremental Delay, d2	30.7	0.4						2.0			0.1	
Delay (s)	73.8	35.2						42.7			3.6	
Level of Service	E	D						D			A	
Approach Delay (s)		52.9			0.0			42.7			3.6	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	365	345	295	80	850	0	0	440	780
Future Volume (vph)	0	0	0	365	345	295	80	850	0	0	440	780
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)				4.0	4.0			4.0			4.0	4.0
Lane Util. Factor				1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes				1.00	0.99			1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00			1.00			1.00	1.00
Frt				1.00	0.93			1.00			1.00	0.85
Flt Protected				0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)				1723	3163			3431			1814	1496
Flt Permitted				0.95	1.00			0.63			1.00	1.00
Satd. Flow (perm)				1723	3163			2188			1814	1496
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	397	375	321	87	924	0	0	478	848
RTOR Reduction (vph)	0	0	0	0	110	0	0	0	0	0	0	395
Lane Group Flow (vph)	0	0	0	397	586	0	0	1011	0	0	478	453
Confl. Peds. (#/hr)						10	10					10
Turn Type				Split	NA		custom	NA			NA	Perm
Protected Phases				2	2		3	3 4			7	
Permitted Phases							4					7
Actuated Green, G (s)				33.0	33.0			95.0			42.0	42.0
Effective Green, g (s)				33.0	33.0			95.0			42.0	42.0
Actuated g/C Ratio				0.24	0.24			0.68			0.30	0.30
Clearance Time (s)				4.0	4.0						4.0	4.0
Vehicle Extension (s)				0.2	0.2						0.2	0.2
Lane Grp Cap (vph)				406	745			1955			544	448
v/s Ratio Prot				c0.23	0.19			c0.20			0.26	
v/s Ratio Perm								0.16				c0.30
v/c Ratio				0.98	0.79			0.52			0.88	1.01
Uniform Delay, d1				53.1	50.2			11.1			46.6	49.0
Progression Factor				1.00	1.00			0.11			1.00	1.00
Incremental Delay, d2				38.3	5.1			0.1			18.0	45.5
Delay (s)				91.4	55.3			1.3			64.6	94.5
Level of Service				F	E			A			E	F
Approach Delay (s)		0.0			68.4			1.3			83.7	
Approach LOS		A			E			A			F	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
1: Kalihi St & King St

07/14/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	895	725	70	70	630	490	65	620	65	60	185	500
Future Volume (veh/h)	895	725	70	70	630	490	65	620	65	60	185	500
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	973	788	76	76	685	0	71	674	71	65	201	543
Adj No. of Lanes	1	2	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	804	1979	191	92	728	326	76	654	69	47	330	291
Arrive On Green	0.47	0.62	0.62	0.05	0.21	0.00	0.04	0.21	0.21	0.03	0.19	0.19
Sat Flow, veh/h	1727	3175	306	1727	3446	1542	1727	3142	331	1727	1723	1518
Grp Volume(v), veh/h	973	428	436	76	685	0	71	369	376	65	201	543
Grp Sat Flow(s),veh/h/ln	1727	1723	1758	1727	1723	1542	1727	1723	1750	1727	1723	1518
Q Serve(g_s), s	85.0	22.7	22.7	8.0	35.7	0.0	7.5	38.0	38.0	5.0	19.5	35.0
Cycle Q Clear(g_c), s	85.0	22.7	22.7	8.0	35.7	0.0	7.5	38.0	38.0	5.0	19.5	35.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	804	1074	1096	92	728	326	76	359	364	47	330	291
V/C Ratio(X)	1.21	0.40	0.40	0.82	0.94	0.00	0.94	1.03	1.03	1.37	0.61	1.87
Avail Cap(c_a), veh/h	804	1085	1107	151	868	388	76	359	364	47	330	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	17.2	17.2	85.5	70.9	0.0	87.0	72.3	72.3	88.8	67.5	73.8
Incr Delay (d2), s/veh	105.9	0.1	0.1	7.0	15.4	0.0	81.3	55.3	55.5	259.0	8.1	402.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	64.1	10.8	11.1	4.0	18.6	0.0	5.3	23.5	23.9	5.8	10.0	47.2
LnGrp Delay(d),s/veh	154.6	17.3	17.3	92.6	86.2	0.0	168.4	127.6	127.8	347.8	75.6	476.5
LnGrp LOS	F	B	B	F	F		F	F	F	F	E	F
Approach Vol, veh/h		1837			761			816			809	
Approach Delay, s/veh		90.1			86.9			131.2			366.5	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	39.0	89.0	42.5	9.0	42.0	13.7	117.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	35.0	85.0	46.0	5.0	38.0	16.0	115.0
Max Q Clear Time (g_c+I1), s	9.5	37.0	87.0	37.7	7.0	40.0	10.0	24.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	150.4
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	255	315	225	575	205	245	1070	120	205	640	10
Future Volume (veh/h)	105	255	315	225	575	205	245	1070	120	205	640	10
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1814	1814	1814	1850	1814	1814	1850
Adj Flow Rate, veh/h	114	277	342	245	625	223	266	1163	0	223	696	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	407	355	257	1074	471	278	2051	0	235	1929	0
Arrive On Green	0.07	0.24	0.24	0.15	0.31	0.31	0.16	0.41	0.00	0.14	0.39	0.00
Sat Flow, veh/h	1727	1723	1503	1727	3446	1512	1727	5115	0	1727	5115	0
Grp Volume(v), veh/h	114	277	342	245	625	223	266	1163	0	223	696	0
Grp Sat Flow(s),veh/h/ln	1727	1723	1503	1727	1723	1512	1727	1650	0	1727	1650	0
Q Serve(g_s), s	16.3	36.4	56.0	35.0	37.9	29.6	38.0	44.7	0.0	31.8	24.8	0.0
Cycle Q Clear(g_c), s	16.3	36.4	56.0	35.0	37.9	29.6	38.0	44.7	0.0	31.8	24.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	127	407	355	257	1074	471	278	2051	0	235	1929	0
V/C Ratio(X)	0.90	0.68	0.96	0.95	0.58	0.47	0.96	0.57	0.00	0.95	0.36	0.00
Avail Cap(c_a), veh/h	222	506	441	445	1455	639	472	2051	0	410	1929	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	114.2	86.4	93.9	104.9	72.0	69.1	103.4	55.7	0.0	106.5	53.9	0.0
Incr Delay (d2), s/veh	10.4	1.6	28.7	14.5	0.2	0.3	15.5	1.1	0.0	13.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	17.6	26.1	17.8	18.1	12.4	19.4	20.7	0.0	16.1	11.4	0.0
LnGrp Delay(d),s/veh	124.7	88.0	122.6	119.4	72.2	69.4	119.0	56.9	0.0	120.4	54.4	0.0
LnGrp LOS	F	F	F	F	E	E	F	E		F	D	
Approach Vol, veh/h		733			1093			1429			919	
Approach Delay, s/veh		109.8			82.2			68.4			70.4	
Approach LOS		F			F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	44.0	100.9	22.3	81.5	37.9	107.0	41.0	62.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	68.0	94.0	32.0	105.0	59.0	103.0	64.0	73.0
Max Q Clear Time (g_c+I1), s	40.0	26.8	18.3	39.9	33.8	46.7	37.0	58.0
Green Ext Time (p_c), s	0.1	1.0	0.0	0.9	0.0	2.3	0.1	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	79.8
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	970	10	35	1355	0	20	0	25	210	10	30
Future Volume (veh/h)	0	970	10	35	1355	0	20	0	25	210	10	30
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1814	1814	1850	1814	1814	1850	1850	1814	1850	1850	1814	1850
Adj Flow Rate, veh/h	0	1054	11	38	1473	0	22	0	27	228	11	33
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	1735	18	254	1711	0	315	27	324	547	31	66
Arrive On Green	0.00	0.50	0.50	0.50	0.50	0.00	0.38	0.00	0.38	0.38	0.38	0.38
Sat Flow, veh/h	358	3493	36	527	3537	0	617	70	843	1165	79	172
Grp Volume(v), veh/h	0	520	545	38	1473	0	49	0	0	272	0	0
Grp Sat Flow(s),veh/h/ln	358	1723	1807	527	1723	0	1529	0	0	1416	0	0
Q Serve(g_s), s	0.0	14.7	14.7	3.8	25.4	0.0	0.0	0.0	0.0	8.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.7	14.7	18.5	25.4	0.0	1.3	0.0	0.0	9.6	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.00	0.45		0.55	0.84		0.12
Lane Grp Cap(c), veh/h	107	856	897	254	1711	0	666	0	0	643	0	0
V/C Ratio(X)	0.00	0.61	0.61	0.15	0.86	0.00	0.07	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	279	1684	1766	507	3368	0	666	0	0	643	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.3	12.3	18.9	14.9	0.0	13.2	0.0	0.0	15.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.2	0.1	0.5	0.0	0.2	0.0	0.0	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	7.3	0.6	12.0	0.0	0.6	0.0	0.0	4.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.5	12.5	19.0	15.5	0.0	13.4	0.0	0.0	17.7	0.0	0.0
LnGrp LOS		B	B	B	B		B			B		
Approach Vol, veh/h		1065			1511			49			272	
Approach Delay, s/veh		12.5			15.6			13.4			17.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		37.5		30.0		37.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		66.0		26.0		66.0
Max Q Clear Time (g_c+I1), s		11.6		27.4		3.3		16.7
Green Ext Time (p_c), s		0.1		2.9		0.0		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	520	0	0	920	5	65	0	0	10	0	5
Future Volume (veh/h)	5	520	0	0	920	5	65	0	0	10	0	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	0.99		1.00	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1850	1814	1850	1814	1814	1850	1850	1814	1814	1850	1814	1850
Adj Flow Rate, veh/h	5	565	0	0	1000	5	71	0	0	11	0	5
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	58	1225	0	109	1282	6	829	0	793	589	16	233
Arrive On Green	0.36	0.36	0.00	0.00	0.36	0.36	0.51	0.00	0.00	0.51	0.00	0.51
Sat Flow, veh/h	7	3443	0	842	3516	18	1400	0	1542	966	32	454
Grp Volume(v), veh/h	305	265	0	0	490	515	71	0	0	16	0	0
Grp Sat Flow(s),veh/h/ln	1799	1568	0	842	1723	1810	1400	0	1542	1451	0	0
Q Serve(g_s), s	0.0	8.5	0.0	0.0	16.7	16.7	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.5	8.5	0.0	0.0	16.7	16.7	1.6	0.0	0.0	0.3	0.0	0.0
Prop In Lane	0.02		0.00	1.00		0.01	1.00		1.00	0.69		0.31
Lane Grp Cap(c), veh/h	711	572	0	109	628	660	829	0	793	839	0	0
V/C Ratio(X)	0.43	0.46	0.00	0.00	0.78	0.78	0.09	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1873	1613	0	668	1773	1863	829	0	793	839	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.0	16.1	0.0	0.0	18.6	18.6	8.2	0.0	0.0	7.9	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.0	0.8	0.8	0.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	3.7	0.0	0.0	8.0	8.4	0.7	0.0	0.0	0.2	0.0	0.0
LnGrp Delay(d),s/veh	16.2	16.3	0.0	0.0	19.5	19.4	8.4	0.0	0.0	7.9	0.0	0.0
LnGrp LOS	B	B			B	B	A			A		
Approach Vol, veh/h		570			1005			71			16	
Approach Delay, s/veh		16.2			19.4			8.4			7.9	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		38.0		28.1		38.0		28.1
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		34.0		68.0		34.0		68.0
Max Q Clear Time (g_c+I1), s		2.3		18.7		3.6		10.5
Green Ext Time (p_c), s		0.0		1.1		0.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	880	850	80	0	0	0	0	955	155	40	435	0
Future Volume (vph)	880	850	80	0	0	0	0	955	155	40	435	0
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						1.00			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.99						0.98			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1723	3394						3362			3432	
Flt Permitted	0.95	1.00						1.00			0.75	
Satd. Flow (perm)	1723	3394						3362			2602	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	957	924	87	0	0	0	0	1038	168	43	473	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	957	1004	0	0	0	0	0	1193	0	0	516	0
Confl. Peds. (#/hr)			10						10	10		
Turn Type	Split	NA						NA		custom	NA	
Protected Phases	3	3						4		2	2 7	
Permitted Phases										7		
Actuated Green, G (s)	33.0	33.0						27.0			55.0	
Effective Green, g (s)	33.0	33.0						27.0			55.0	
Actuated g/C Ratio	0.33	0.33						0.27			0.55	
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	0.2	0.2						0.2				
Lane Grp Cap (vph)	568	1120						907			1663	
v/s Ratio Prot	c0.56	0.30						c0.35			c0.09	
v/s Ratio Perm											0.08	
v/c Ratio	1.68	0.90						1.32			0.31	
Uniform Delay, d1	33.5	31.9						36.5			12.2	
Progression Factor	1.00	1.00						1.00			0.09	
Incremental Delay, d2	315.8	9.3						149.7			0.0	
Delay (s)	349.3	41.1						186.2			1.1	
Level of Service	F	D						F			A	
Approach Delay (s)		191.0			0.0			186.2			1.1	
Approach LOS		F			A			F			A	

Intersection Summary			
HCM 2000 Control Delay	162.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

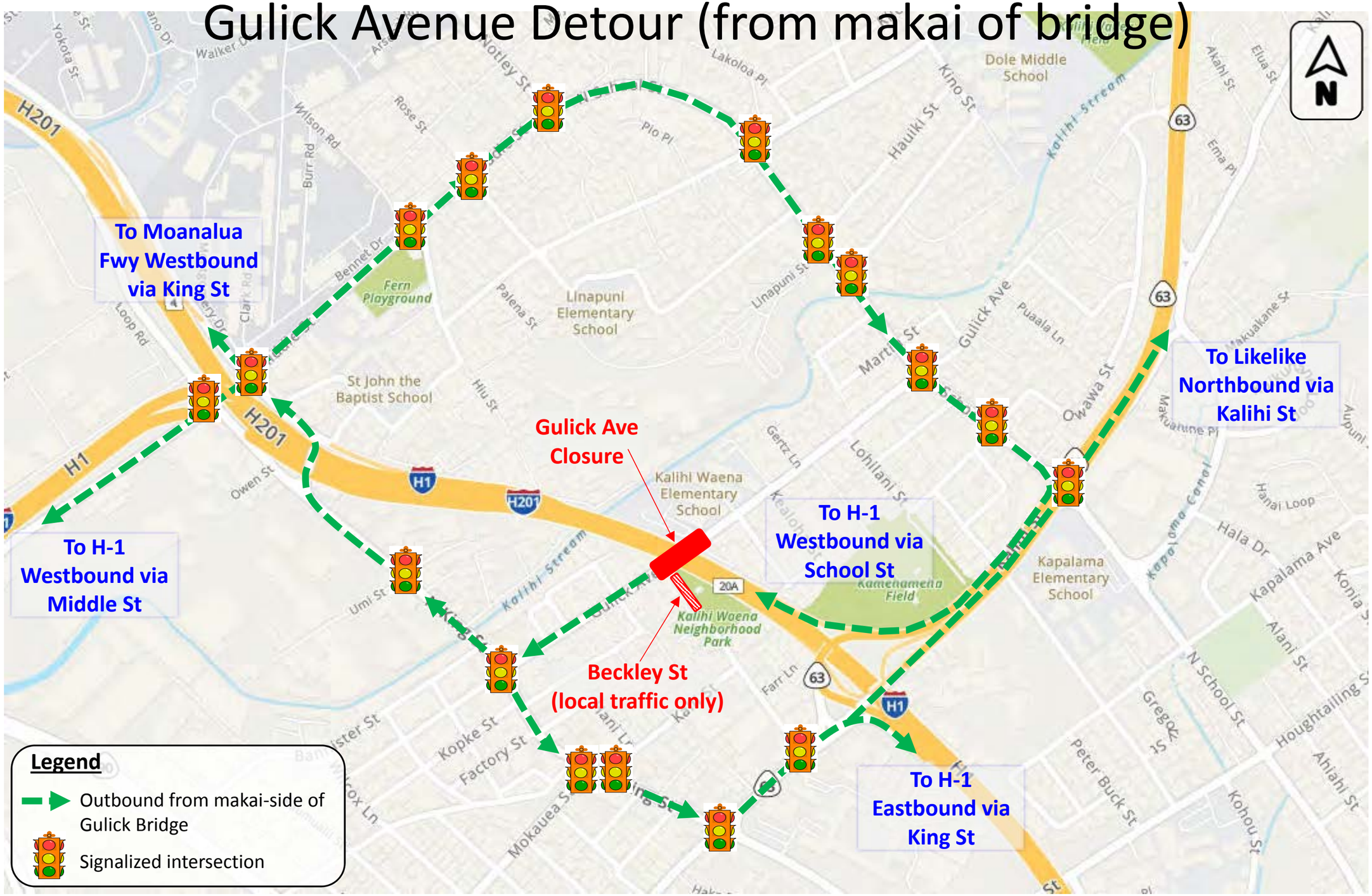
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	680	525	180	1655	0	0	275	475
Future Volume (vph)	0	0	0	200	680	525	180	1655	0	0	275	475
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)				4.0	4.0			4.0			4.0	4.0
Lane Util. Factor				1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes				1.00	0.99			1.00			1.00	0.98
Flpb, ped/bikes				1.00	1.00			1.00			1.00	1.00
Frt				1.00	0.93			1.00			1.00	0.85
Flt Protected				0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)				1723	3186			3428			1814	1503
Flt Permitted				0.95	1.00			0.70			1.00	1.00
Satd. Flow (perm)				1723	3186			2397			1814	1503
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	217	739	571	196	1799	0	0	299	516
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	0	0	0	256
Lane Group Flow (vph)	0	0	0	217	1293	0	0	1995	0	0	299	261
Confl. Peds. (#/hr)						10	10					10
Turn Type				Split	NA		custom	NA			NA	Perm
Protected Phases				2	2		3	3 4			7	
Permitted Phases							4					7
Actuated Green, G (s)				28.0	28.0			60.0			27.0	27.0
Effective Green, g (s)				28.0	28.0			60.0			27.0	27.0
Actuated g/C Ratio				0.28	0.28			0.60			0.27	0.27
Clearance Time (s)				4.0	4.0						4.0	4.0
Vehicle Extension (s)				0.2	0.2						0.2	0.2
Lane Grp Cap (vph)				482	892			1778			489	405
v/s Ratio Prot				0.13	c0.41			c0.37			0.16	
v/s Ratio Perm								c0.30				0.17
v/c Ratio				0.45	1.45			1.12			0.61	0.64
Uniform Delay, d1				29.7	36.0			20.0			31.9	32.2
Progression Factor				1.00	1.00			0.83			1.00	1.00
Incremental Delay, d2				0.2	208.5			55.7			5.6	7.6
Delay (s)				29.9	244.5			72.4			37.5	39.9
Level of Service				C	F			E			D	D
Approach Delay (s)		0.0			214.0			72.4			39.0	
Approach LOS		A			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	116.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	130.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

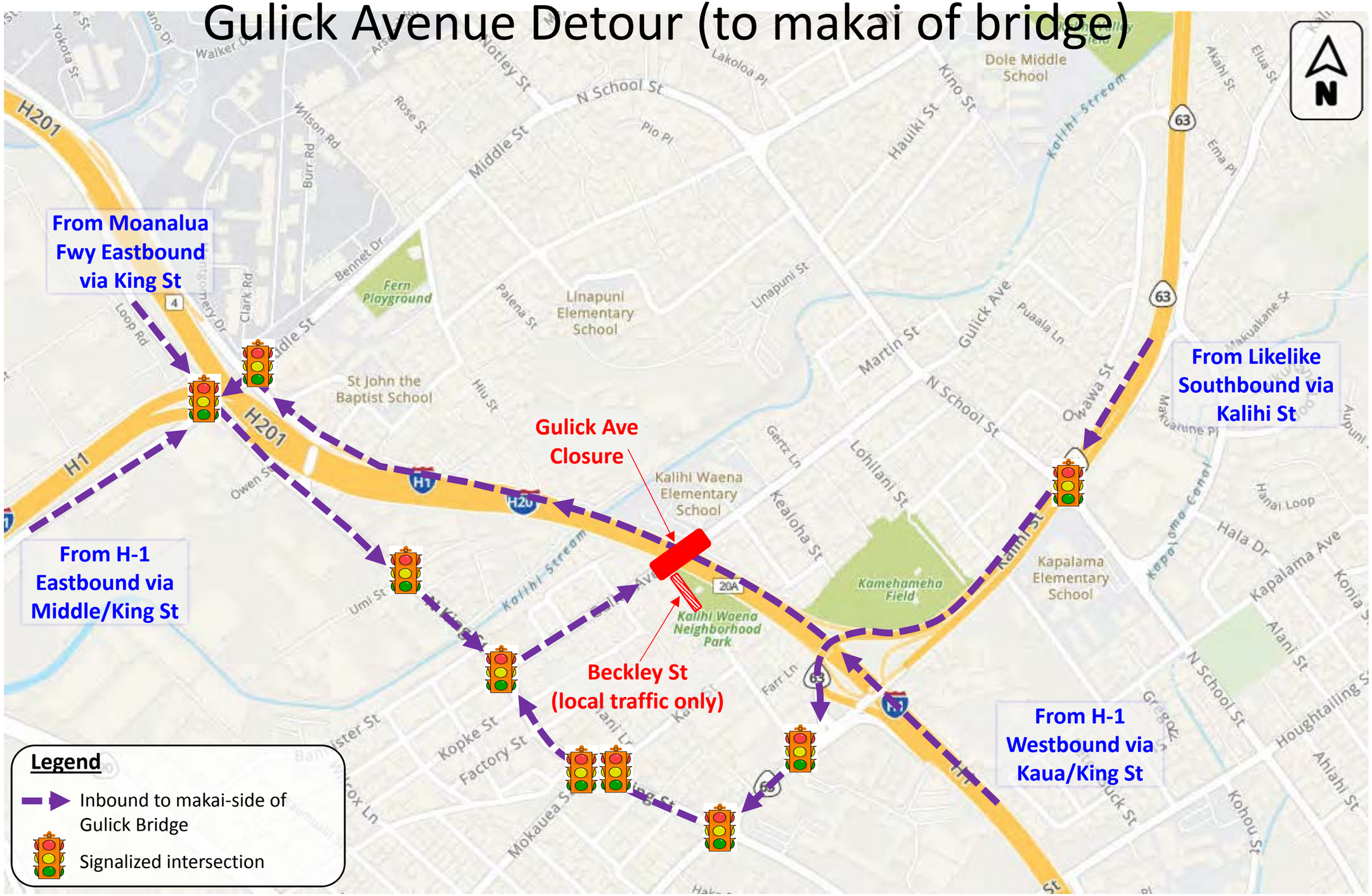
Appendix C

Detour Routes with Gulick Avenue Closure

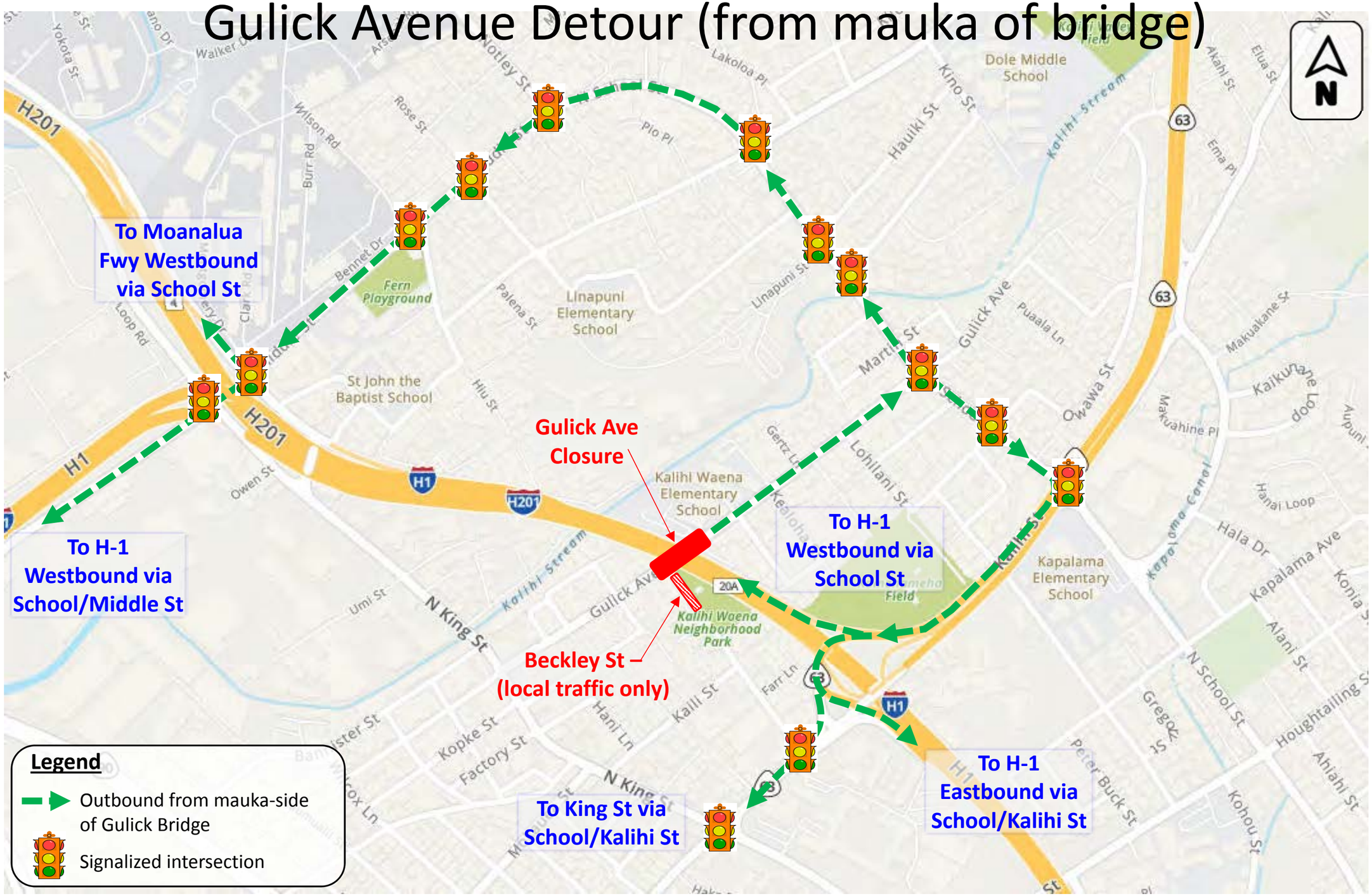
Gulick Avenue Detour (from makai of bridge)



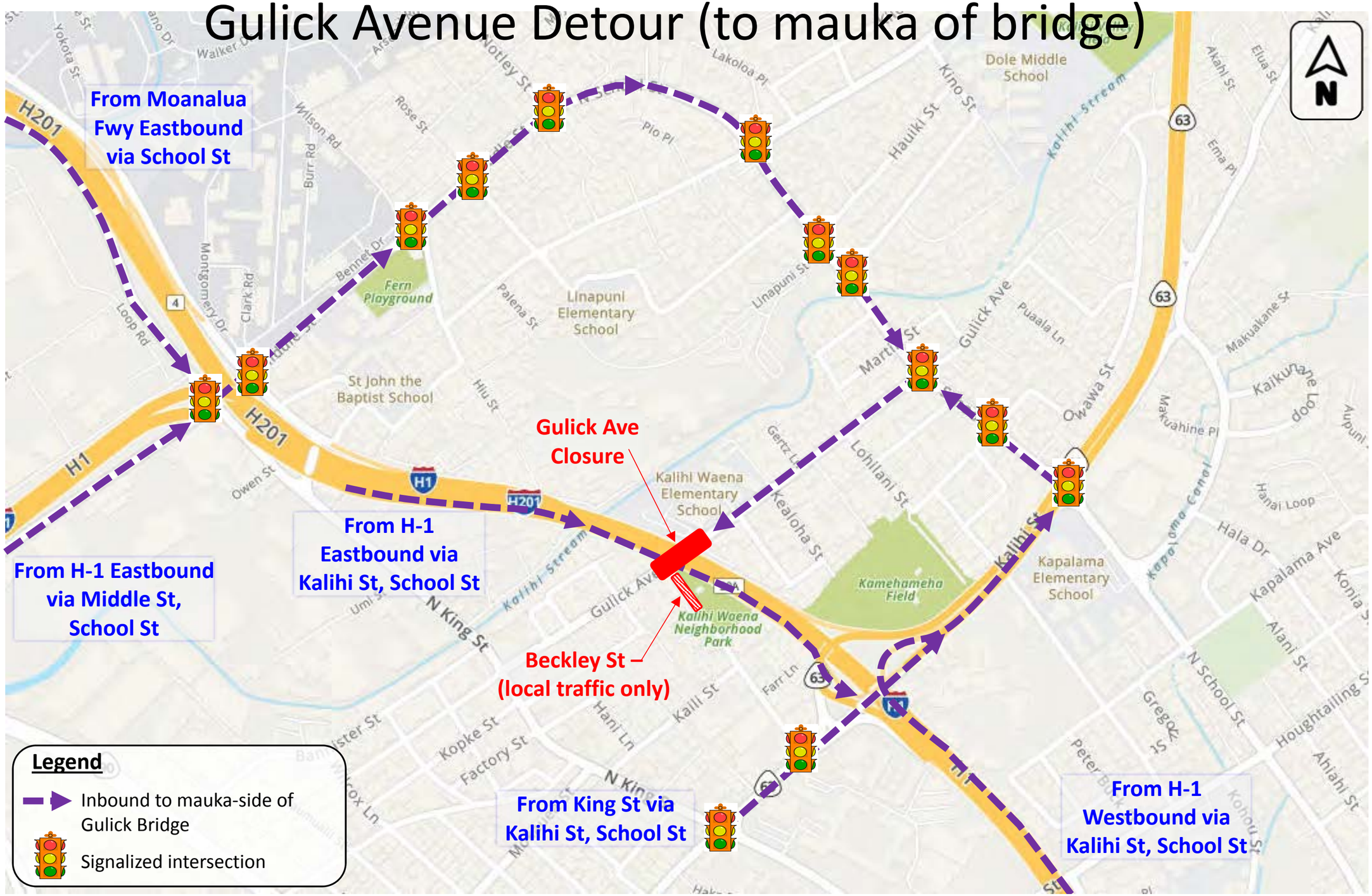
Gulick Avenue Detour (to makai of bridge)



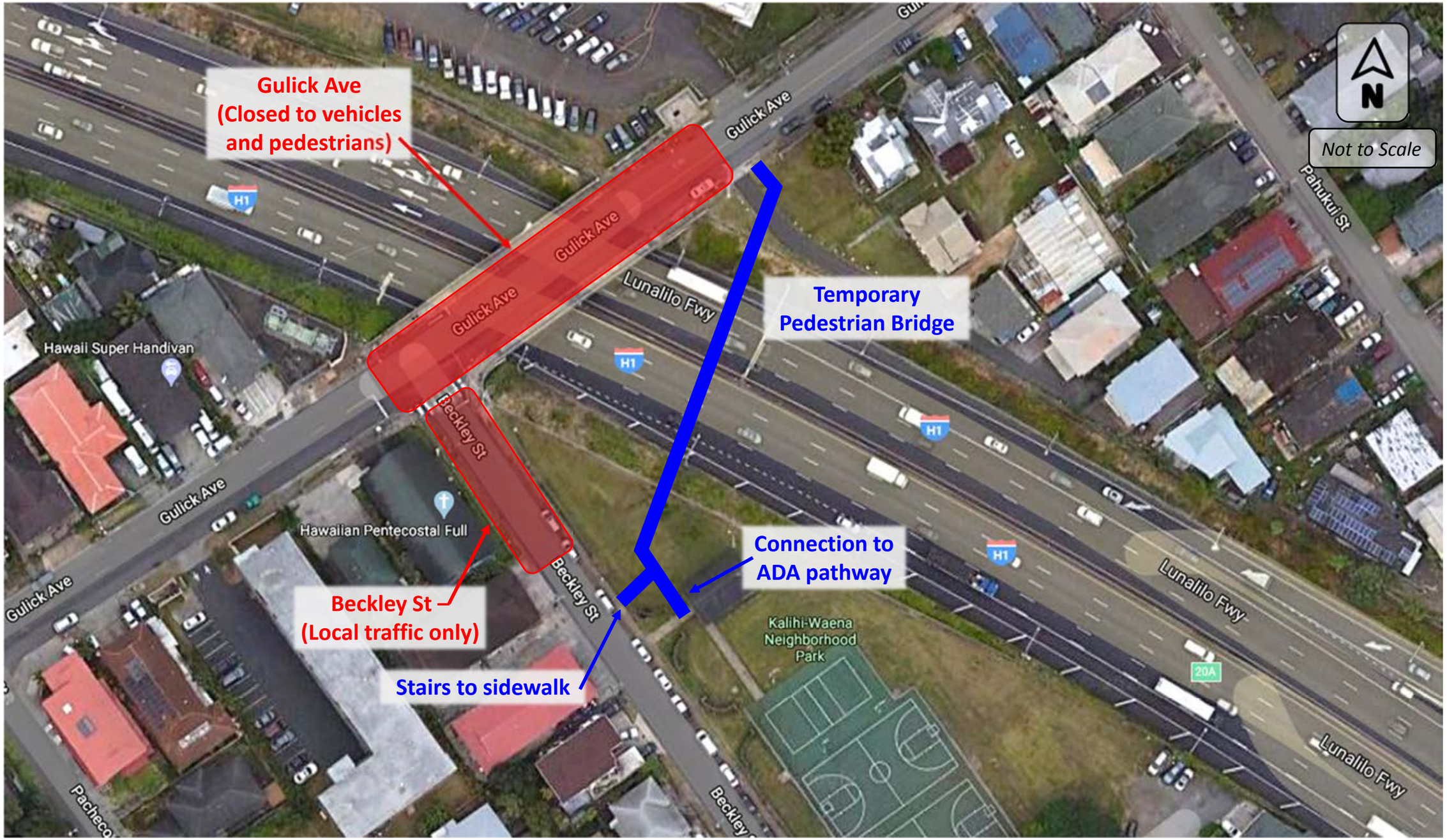
Gulick Avenue Detour (from mauka of bridge)



Gulick Avenue Detour (to mauka of bridge)



Gulick Avenue Detour (Pedestrians)



Appendix B

Appendix B

DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

Natural resources assessment of Kalihi Stream for a project to widen Interstate H-1, Honolulu, Oʻahu

May 8, 2020 | ***DRAFT*** | *AECOS* No. 1623

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Introduction

The Hawaiʻi Department of Transportation (HDOT) proposes to improve a stretch of Interstate H-1 (also known as Queen Liliʻuokalani Freeway or H-1) on Oʻahu, located between Ola Lane and the Kalihi interchange. Proposed improvements include widening of the Kalihi Stream overcrossing ("Project"; Figure 1). *AECOS* Inc. was contracted by Jacobs to conduct a natural resources survey of Kalihi Stream in the Project area and prepare this report assessing potential impacts of the Project on natural resources. Our survey included an assessment of the extent of "waters of the U.S." (federal jurisdictional boundaries), water quality, and terrestrial and aquatic flora and fauna[1].

The first step in obtaining a Department of the Army permit under Section 404 of the Clean Water Act is to establish whether potentially impacted surface waters in a project area are jurisdictional and, if so, delineate the boundaries of the federal jurisdiction. An additional purpose of our survey is to determine whether sensitive biological resources or environments occur in the Project area. Sensitive biota includes species currently listed by the federal Endangered Species Act of 1973 as amended (ESA; see USFWS, 2020a), or by state administrative rule (HDLNR, 1998, 2015), or a biological community comprising species of native plants and animals that may or may not be under any specific threat of extirpation, but which would be regarded as special and

[1] This report will become part of the public record for the subject project. Results will be used for the permitting process to comply with Section 404 (permit program) and 401 (state certification of water quality) of the Clean Water Act (CWA).

worthy of preservation. Sensitive environments include wetlands, which are listed as special aquatic sites in the CWA.

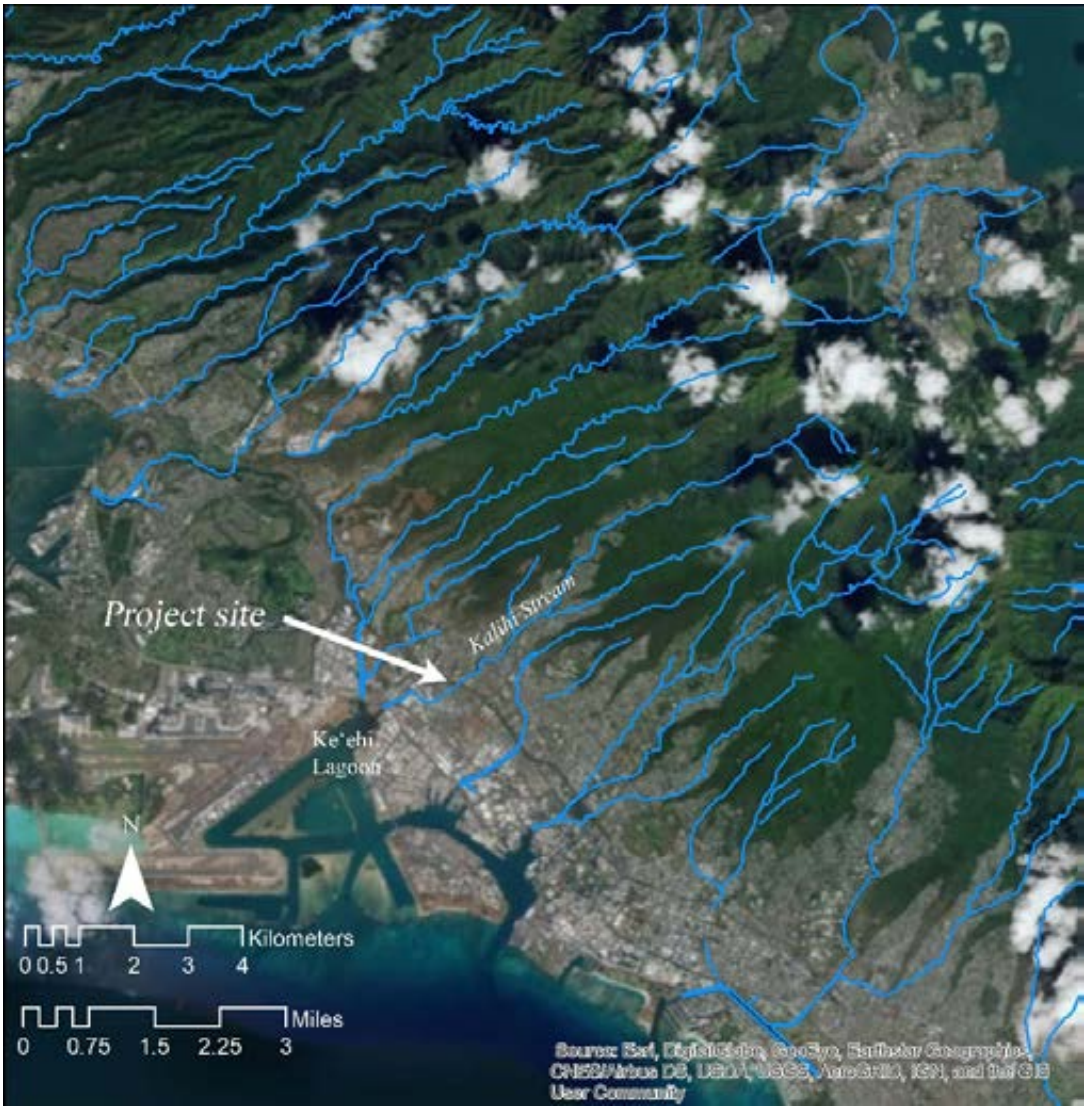

Figure 1. Map of south O'ahu showing Kalihi Stream and Project site located upslope of Ke'ehi Lagoon.

Jurisdictional Waters

Waters of the U.S. (also called jurisdictional waters) include all tidal waters and a subset of streams (both perennial and intermittent), lakes, reservoirs, and wetlands. On December 23, 2019, the US Army Corps of Engineers (USACE) and

US Environmental Protection Agency (USEPA) finalized "Step One" of The Navigable Waters Protection Rule: Definition of Waters of the United States" (USACE & USEPA, 2019), which repealed the 2015 Clean Water Rule and recodified pre-existing rules. On January 23, 2020, the USACE and USEPA issued a pre-publication copy of "Step Two" of the rule (USACE & USEPA, 2020a); and on April 21, 2020, a final rule was published, to become effective on June 22, 2020 (USACE & USEPA, 2020b). As applicable to this survey, jurisdictional waters defined in both the Step One and final rule include tributaries to territorial seas and tidal waters. No other jurisdictional waters (such as wetlands) are present in the Project area. Tributaries (such as Kalihi Stream in the Project area) are jurisdictional up to the ordinary high water mark (OHWM) of the stream.

Methods

Natural resources surveys of the Project area were conducted on April 9, 2020 by the authors of this report.

Jurisdictional Waters Delineation

Our jurisdictional waters survey assessed potential extent of federal jurisdiction of Kalihi Stream as authorized by the CWA. Prior to field surveys, *AECOS* scientist reviewed literature and GIS data, including recent rainfall (NOAA-NWS, 2020), discharge data collected from US Geological Survey (USGS) Sta. No. 16229000 Kalihi Stream upstream of the Project at 142 m (464 ft) above sea level (ASL; USGS, 2020a) and historical data from USGS Sta. No. 16229300 Kalihi Stream upstream of the Project area at 21 m (70 ft) ASL (USGS, 2020b), mapped soil types (USDA-NRCS, 2020a), aquatic features identified in the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI; USFWS, n.d.), and mapped flood zones (HDLNR, n.d.). This information was used, along with physical indicators of flow identified in the field, to delineate[2] jurisdictional boundaries of Kalihi Stream.

We used the following list of physical characteristics, provided in a regulatory guidance document (USACE, 2005) and the final rule (USACE & USEPA, 2020b), to identify the OHWM of Kalihi Stream in the field:

[2] The process of determining a line on the ground (or on maps) separating jurisdictional waters from upland is termed "delineation". Although *AECOS* can "delineate" wetlands and streams, actual jurisdictional determination is the purview of USACE, and that agency must concur with our finding for it to become an official determination of federal jurisdiction.

Natural line impressed on the bank
Shelving
Changes in the character of soil
Destruction of terrestrial vegetation
Presence of litter and debris
Wracking
Vegetation matted down, bent, or absent
Sediment sorting
Leaf litter disturbed or washed away
Scour
Deposition
Multiple observed flow events
Bed and banks
Water staining
Change in plant community

Although a necessary part of wetland boundary determinations, the wetland indicator status of plants is useful when evaluating the extant plant community where establishing an OHWM. The National Wetland Plant List (NWPL), administered by the USACE, assigns a wetland indicator status to each species of vascular plant on a regional basis (USACE, 2012; Lichvar, et al., 2016). Table 1 provides wetland status indicators and their definitions. The wetland indicator status of each species in the plant assemblage at a survey point is used to determine if a site has a "prevalence of vegetation typically adapted for life in saturated soil conditions."

Table 1. Wetland status indicators and their definitions (after Lichvar and Gillrich (2011).

Status indicator (CODE)	Qualitative Description
Obligate (OBL)	Almost always occurs in wetlands
Facultative wetland (FACW)	Usually occur in wetlands, but may occur in non-wetlands
Facultative (FAC)	Occur in wetlands and non-wetlands
Facultative upland (FACU)	Usually occur in non-wetlands, but may occur in wetlands
Upland (UPL)	Almost never occur in wetlands

Water Quality Assessment

We performed basic water quality monitoring on April 9, 2020 at three locations in Kalihi Stream (Figure 2): upstream of the Project site (Sta. "Up"), at the Project site (Sta. "Mid"), and downstream of the Project site (Sta. "Down"). Weather conditions included cloud cover of around 10% and light variable winds.

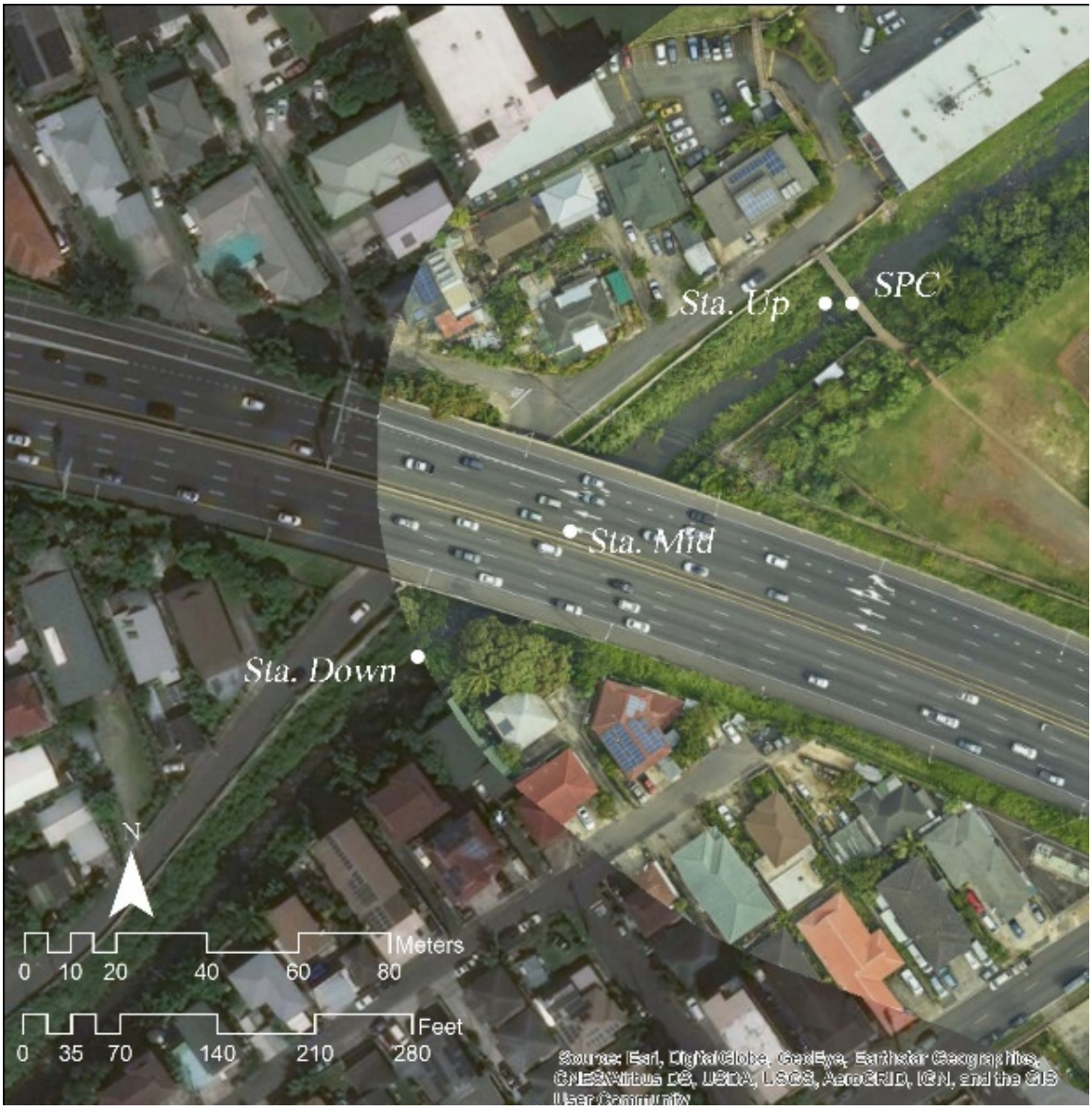

Figure 2. Location of April 9, 2020 water quality sampling stations and avian stationary point count (SPC) station.

At each of these stations, we made *in situ* measurements (temperature, pH, conductivity, and dissolved oxygen) and collected samples for laboratory analyses: turbidity, total suspended solids (TSS), nitrate+nitrite (NO_3+NO_2), total nitrogen (TN), and total phosphorus (TP). Samples were collected from just below the water surface in precleaned plastic bottles and taken directly to the *AECOS* Laboratory in Kāneʻohe for analyses (*AECOS* Laboratory Log No.

39763). Table 2 lists analytical methods used for each of the water quality parameters measured. Stream velocity was measured with a Swoffer Instruments® Model 3000 flow meter and the average depth and width of the flowing portion of the stream measured in order to estimate stream discharge at each station during sampling.

Table 2. Analytical methods used for basic water quality analysis of Kalihi Stream on April 9, 2020.

Analysis	Instrument	Method	Reference
Temperature	YSI Pro plus	SM 2550 B	SM (1998)
Conductivity	YSI Pro plus	SM 2510 B	SM (1998)
pH	Hanna pHep 5	SM 4500 H+	SM (1998)
Dissolved Oxygen	YSI Pro plus	SM 4500-O G	SM (1998)
Turbidity	HACH 2100N Turbidimeter	EPA 180.1 Rev 2.0	USEPA (1993)
Total Suspended Solids	Mettler Balance	SM 2540 D	SM (1998)
Nitrate + Nitrite	Lachat Quickchem 8500 Series 2 Flow Injection Analyzer	EPA 353.2	USEPA (1993)
Total Nitrogen	Shimazdu TNM-1	ASTM D5176-08	ASTM (2015)
Total Phosphorus	Lachat Quickchem 8500 Series 2 Flow Injection Analyzer	Persulfate digestion EPA 365.5	USGS (2003) USEPA (1997)

Terrestrial Biology

Botanical Survey

We conducted a wandering (pedestrian) survey to identify plants in the stream channel and adjacent uplands in the Project area. Plant species were identified as they were encountered and notes kept to report a qualitative sense of species abundance. Any plant not immediately recognized during the survey was photographed and/or a representative feature (flower or fruit) collected for later identification at the laboratory. Conditions with respect to plant

appearance were adequate; plants were readily identifiable by fruits and flowers.

Plant species names in our report follow *Manual of the Flowering Plants of Hawai'i* (Wagner, Herbst, & Sohmer, 1990; Wagner & Herbst, 1999) for native and naturalized flowering plants, *Hawai'i's Ferns and Fern Allies* (Palmer, 2003) for ferns, and *A Tropical Garden Flora* (Staples & Herbst, 2005) for ornamental plants. More recent name changes for naturalized plant species follow Imada (2012).

Avian Survey

We established a single 8-minute avian point-count station at the Kalihi Waena pedestrian bridge upstream of the H-1 viaduct (see Fig. 2). The survey was conducted in the early morning when birds are most active. Birds were identified to species by visual observation, aided by Leica 8 X 42 binoculars, and by listening for vocalizations. Any additional bird species observed in the Project area outside of the timed-duration count were noted as incidental observations. If present , any waterbirds or waterbird habitat observed while on site was noted. The avian phylogenetic order and nomenclature used in this report follows the AOS *Check-List of North and Middle American Birds* (Chesser et al., 2019) and *2017 Hawaiian Islands Birds Checklist* (Vanderwerf, et al. 2018).

Mammalian Survey

We compiled a list of mammals encountered at the Project site. Indicators of mammalian presence, such as tracks, scat, and other sign were noted. Mammalian phylogenetic order and nomenclature follow *Mammal Species of the World* (Wilson and Reeder, 2005).

No survey was conducted for Hawaiian hoary bat or *'ōpe'ape'a* (*Lasiurus cinereus semotus*), the only native land mammal in the Islands. The population of this bat is sparse on O'ahu and detection requires night surveys and deployment of special detection equipment, and making regular observations over a long period of time. Rather, habitat and trees that could serve as roost-sites for the species were noted where present.

Aquatic Biota

The survey for aquatic biota consisted of making visual observations of aquatic organisms while walking in Kalihi Stream in the Project area. We noted relative abundance (e.g., rare, common, abundant) of each species encountered as the survey progressed. Identifications follow *Hawai'i's Native and Exotic Freshwater*

Animals (Yamamoto and Tagawa, 2000) and nomenclature follows the *Integrated Taxonomic Information System* (ITIS, 2020), *AlgaeBase* (Guiry and Guiry, 2020), and FishBase (Frose & Pauly, 2019).

Biological records from four previous *AECOS* surveys in Kalihi Stream were reviewed. Species reported by these previous surveys are included in the species listing as historical records.

Results

Rainfall, stream flow, and soils

The National Weather Service rain gage at Moanalua (MOAH1) recorded above-average rainfall for the 2019–2020 rainy season. Prior to our survey of the Project area on April 9, the MOAH1 gage recorded 1,165 mm (45.9 in) of rain from November through March, representing 138% of the 30-year rainfall average for the same period (NOAA-NWS, 2020).

The only aquatic feature identified on the USFWS NWI within the Project area is Kalihi Stream, a perennial, freshwater stream (USFWS, n.d.). The nearest contemporary streamflow gage for Kalihi Stream is located upstream of the Project at 142 m (464 ft) ASL. On the day of the survey, the gage recorded a 24-hour average discharge of 14.5 cfs, a value higher than the median daily discharge from 1915 through 2019 of 5.93 cfs (USGS, 2020a). At a lower elevation (21 m or 70 ft ASL), the median daily discharge of the stream (between 1963 and 2004) was 8.17 cfs (USGS, 2020b). Due to the restricted capacity of the H-1 viaduct and built-up vegetation and debris within the stream channel (FEMA, 2014), the 1% and 0.2% annual chance flood zones upslope of the H-1 Freeway extend 30 to 40 m (100 to 130 ft) outside of the stream channel (HDLNR, n.d.).

Soils mapped in the Project area are Makiki stony clay loam, 0 to 3 percent slopes and Ewa silty clay loam, 6 to 12 percent slopes (USDA-NRCS, 2020a). Neither soil is on the list of hydric soils for Oʻahu (USDA-NRCS, 2020b).

Jurisdictional Waters

Historically, the flatlands of lower Kalihi and Moanalua valleys were occupied by fishponds and terraced agriculture fed by Kalihi Stream (Sterling and Summers, 1978). Today, the area is urbanized and stream flow is channelized, isolating the stream from the former floodplain. Our survey confirmed that

Kalihi Stream discharges into Keʻehi Lagoon, a traditional navigable water (TNW; jurisdictional by rule).

The segment of Kalihi Stream within the Project area has a natural bottom that consists of silt-covered boulders and gravel. The ordinary high water extends the full width of the channel, out to the concrete and concrete-rubble masonry (CRM) walls that constrain stream flow through the urban corridor.

Stream features within the Project area include point bars and built-up sediment deposits that restrict base flow to a narrowed channel within the larger channel in some places. In segments upstream and downstream of the H-1 viaduct, base flow is restricted to as much as one third the total channel width. Most vegetation within the stream channel is herbaceous or, at most, includes small shrubs. Most abundant are species rated as facultative wetland or wetter (i.e., FAC, FACW, or OBL; see Table 1). These species are: giant reed (*Arundo donax*; FAC), primrose willow (*Ludwigia octovalvis*; OBL), ung-choi (*Ipomoea aquatica*; OBL), and California grass (*Urochloa mutica*; FACW). Physical characteristics of flow include wracking, litter and debris, and matted vegetation along the edges of flowing water. Representative photographs of the stream at the Project area are provided in Figures 3, 4, and 5. Except under the H-1 viaduct (Fig. 4), the OWHM in the photographs is located on the side walls, obscured from view by the dense growth of giant reed.

Water Quality

Water quality results are presented in Table 3. Our estimated stream discharge in the Project area at the time of sampling was 12.5 cfs. Physical water quality characteristics measured in the field (temperature, conductivity, pH, DO and DO saturation) at the three sampling stations varied less than 3%. The low variance may be attributed to swift flow between stations. Turbidity and TSS were slightly higher at Sta. Mid under the H-1 viaduct, than at either the upstream or downstream stations, but no spatial trend for nutrients (NO_3+NO_2, TN, and TP) is evident. At all stations, 66 to 79% of the nitrogen measured as TN is soluble inorganic nitrogen (NO_3+NO_2).

Terrestrial Biology

Vegetation

The survey area includes Kalihi Stream channel and immediately-adjacent upland areas. Concrete and CRM walls confine the riparian zone to the stream channel itself; the stream does not influence the vegetation beyond the channel

Figure 3. Photographs taken from Kalihi Stream upstream of H-1 looking upstream and downstream (top, left and right) and left and right banks (bottom). OHWM is on the vertical channel walls, but obscured by vegetation.

Figure 4. Photographs taken from center of stream under H-1 viaduct looking upstream and downstream (top, left and right) and left and right (bottom). OHWM extends to the vertical concrete side walls.

Figure 5. Photographs taken from Kalihi Stream downstream of H-1 looking upstream and downstream (top, left and right) and left and right (bottom). OHWM extends to the vertical channel walls (obscured by vegetation). Plant and debris wracking are visible on left side of the channel below OWHM.

Table 3. Water quality results for the April 9, 2020 sampling event in Kalihi Stream.

Station	Time	Temperature (°C)	Conductivity µS/ cm	pH	DO (mg/L)	DO Sat. (%)
Up	1038	23.2	255	7.31	8.28	97
Mid	1002	22.5	251	7.11	8.21	95
Down	0936	22.7	253	6.99	8.10	94

	Turbidity (NTU)	TSS (mg/L)	NO_3+NO_2 (µgN/L)	Total N (µgN/L)	Total P (µgP/L)
Up	3.87	4.5	319	486	45
Mid	3.96	6.0	330	486	40
Down	3.40	5.0	337	429	41

walls. Vegetation within the channel consists mostly of herbaceous plants, dominated by giant reed (Figure 6). Ruderal upland (UPL) species are present outside of the channel. A few trees are present in this area.

Flora

A total of 55 species of plants were identified from the survey area. Most of the plant species (85%) are common, naturalized (non-native) species. The remaining plants are "native" to the Hawaiian Islands. Three species are indigenous (native to Hawaiʻi and elsewhere)—*ʻōali* (*Pteris cretica*), *naio* (*Myoporum sandwicense*), and *pōpolo* (*Solanum americanum*)—and five species are Polynesian or likely Polynesian introductions ("canoe plants")—primrose willow (*Ludwigia octovalvis*), *niu* (*Cocos nucifera*), *ʻape* (*Alocasia macrorhiza*), *kalo* (*Calocasia esculenta*), and banana (*Musa* X*paradisiaca*).

The checklist of plant species (Table 4) was compiled from observations made during the field survey. Entries are arranged alphabetically under plant family and include scientific name, common name, and status (i.e., native or non-native; see legend at end of table). In addition to identifying plants present, qualitative estimates of plant abundance are provided. These are coded as explained in the legend for Table 4.

Table 4. Flora listing for Kalihi Stream near the H-1 viaduct.

Family *Species*	Common name	Status	Abundance
FERNS AND FERN ALLIES			
ATHRIACEAE			
Diplazium esculentum (Retz.) Sw.	*paca*	Nat	U †
PTERIDACEAE			
Pteris cretica L.	*ʻōali*, Cretan brake	**Ind**	R †
THEYLYPTERIDACEAE			
Christella dentata (Forssk.) Brownsey & Jermy	wood fern; *paiʻiʻihā*	Nat	R †
FLOWERING PLANTS - DICOTYLEDONS			
ACANTHACEAE			
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	C
Justicia betonica L.	white shrimp plant	Nat	O †
Ruellia brittoniana E. Leonard	---	Nat	A †
AMARANTHACEAE			
Alternanthera pungens Kunth	khaki weed	Nat	U
Amaranthus spinosus L.	spiny amaranth	Nat	R
ARALIACEAE			
Schefflera actinophylla (Endl.) Harms	octopus tree	Nat	U
ASTERACEAE (COMPOSITAE)			
Bidens alba var. *radiata* (Sch. Bip.) Ballard ex Melchert	---	Nat	U
Calyptocarpus vialis Less.	---	Nat	O
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat	R
Tridax procumbens L.	coat buttons	Nat	R
BIGNONIACEA			
Spathodea campanulata P. Beauv.	African tulip	Nat	U †
BRASSICACEAE			
Lepidium virginicum L.	---	Nat	U
CONVOLVULACEAE			
Ipomoea aquatica Forssk.	water spinach	Nat	A †
Ipomoea triloba L.	little bell	Nat	C
EUPHORBIACEA			
Euphorbia hirta L.	garden spurge	Nat	U
Macaranga tanarius (L.) Müll. Arg.	---	Nat	U †
Ricinis communis L.	castor bean; *koli*	Nat	O †

Table 4 (continued).

Family *Species*	Common name	Status	Abundance
FABACEAE			
Leucaena leucocephala (Lam.) de Wit	*koa haole*	Nat	O
Neonotonia wightii (Wight & Arnott) Lackey	glycine vine	Nat	A
Macroptilium atropurpureum (DC.) Urb.	---	Nat	R †
Albizia saman F. Muell.	monkeypod	Nat	U†
MALVACEAE			
Abutilon grandifolium (Wild.)	hairy abutilon	Nat	R †
Hibiscus rosa-sinensis L.	Chinese hibiscus	Orn	R
MORINGACEAE			
Morina oleifera Lam.	horseradish tree	Nat	U †
MYOPORACEAE			
Myoporum sandwicense A. Gray	*naio*	**Ind**	R †
MYRTACEAE			
Syzygium cumini (L.) Skeels	Java plum (seedlings)	Nat	A †
ONAGRACEAE			
Ludwigia octovalvis (Jacq.) P. H. Raven	primrose willow	**Pol?**	O †
OXALIDACEAE			
Oxalis corymbosa DC.	*ʻihi pehu*	Nat	R
SOLANACEAE			
Solanum americanum Mill.	*pōpolo*	**Ind**	R
Solanum torvum Sw.	turkeyberry	Nat	R
ULMACEAE			
Trema orientalis (L.) Blume	gunpowder tree	Nat	O
VERBENACEAE			
Citharexylum caudatum L.	fiddlewood	Nat	O
FLOWERING PLANTS -- MONOCOTS			
AGAVACEAE			
Dracaena marginata Lam.	money tree	Orn	R
ARACEAE			
Alocasia macrorhiza (L.) Schott	*ʻape*	**Pol**	R †
Calocasia esculenta (L.) Schott	*kalo*	**Pol**	R †
Epipremnum pinnatum (L.) Engl.	golden pothos	Nat	U †
ARECACEAE			
Cocos nucifera L.	*niu*, coconut	**Pol**	U
COMMELINACEAE			
Commelina diffusa N. L. Burm.	*honohono*	Nat	C †

Table 4 (continued).

Family *Species*	Common name	Status	Abundance
CYPERACEAE			
Cyperus gracilis R. Br.	McCoy grass	Nat	U
Cyperus involucratus Rottb.	umbrella sedge	Nat	A †
MUSACEAE			
Musa acuminata Colla, cult.	banana	**Pol**	U
POACEAE (GRAMINEAE)			
Arundo donax L.	giant reed	Nat	A †
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	Nat	U
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	O
Coix lachrymal-jobi L.	Job's tears	Nat	U †
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	O
Digitaria insularis (L.) Mez ex Ekman	sourgrass	Nat	U
*Eleusine indica (*L.) Gaertn.	wiregrass	Nat	O
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat	R
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	C
Paspalum vaginatum Sw.	seashore paspalum	Nat	R †
Urochloa mutica (Forssk.) Nguyen	California grass	Nat	A †

†- Distribution limited to stream channel.

Legend to Table 4

Status = distributional status

Ind – Indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

Nat – Naturalized, exotic, plant introduced to the Hawaiian Islands since 1778 and well-established.

Orn – exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).

Pol – Early Polynesian introduction ("canoe plant").

Pol? –Probably a Polynesian introduction, but possibly introduced in historic times.

Abundance = occurrence ratings for plants in the Project area on January 28, 2020

R – Rare - only one or two plants seen.

U - Uncommon - several to a dozen plants observed.

O - Occasional - found regularly, but not abundant anywhere.

C - Common - considered an important part of the vegetation and observed numerous times.

A - Abundant - found in large numbers; may be locally dominant.

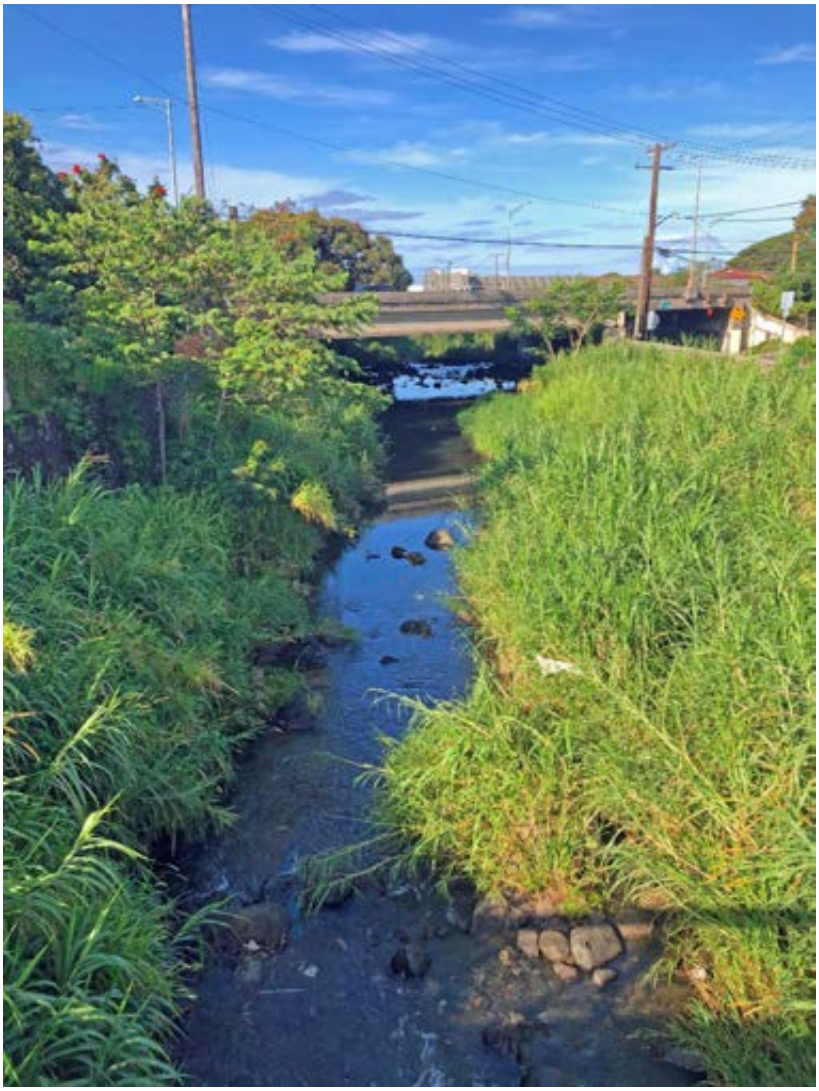

Figure 6. In the Project area, Kalihi Stream channel is dominated by giant reed (*Arundo donax*), a FAC species.

Avian fauna

A total of 59 individual birds of 15 species was recorded from the point-count station (Table 5). No additional bird species were observed during the survey. Of the 15 species identified during the survey, only Pacific Golden-Plover or *kōlea* (*Pluvialis fulva*) is native: an indigenous, migratory species. The remaining species observed are common, non-native species established in the Hawaiian Islands.

Table 5. Avian species near H-1 viaduct detected on April 9, 2020.

ORDER FAMILY *Species*	**Common Name**	**Status**	**Count**
GALLIFORMES			
PHASIANIDAE			
Gallus gallus	Chicken	NN	4
COLUMBIFORMES			
COLUMBIDAE			
Streptopelia chinensis	Spotted Dove	NN	8
Geopelia striata	Zebra Dove	NN	7
CHARADRIIFORMES			
CHARADRIIDAE			
Pluvialis fulva	Pacific Golden-Plover, *kōlea*	**IM**	1
ARDEIDAE			
Bubulcus ibis	Cattle Egret	NN	1
PSITTACIFORMES			
PSITTACULIDAE			
Psittacula krameri	Rose-ringed Parakeet	NN	2
PASSERIFORMES			
PYCNONOTIDAE			
Pycnonotus cafer	Red-vented Bulbul	NN	11
Pycnonotus jocosus	Red-whiskered Bulbul	NN	3
ZOSTEROPIDAE			
Zosterops japonicus	Japanese White-eye	NN	2
STURNIDAE			
Acridotheres tristis	Common Myna	NN	7
CARDINALIDAE			
Cardinalis cardinalis	Northern Cardinal	NN	1
FRINGILLIDAE			
Haemorhous mexicanus	House Finch	NN	2
Crithagra mozambicus	Yellow-fronted Canary	NN	2
PASSERIDAE			
Passer domesticus	House Sparrow	NN	1
ESTRILDIDAE			
Estrilda astrild	Common Waxbill	NN	7

Table 5 (continued).

Legend to Table 5

Status **IM** = Indigenous, migratory species.
NN = Naturalized, non-native species (introduced).

The avian diversity and densities observed from the survey are consistent with the developed residential environment present in the Project area. Red-vented Bulbul (*Pycnonotus cafer*) was the most numerous species observed, followed closely by Spotted Dove (*Streptopelia chinensis*), Zebra Dove (*Geopelia striata*), Common Myna (*Acridotheres tristis*), and Common Waxbill (*Estrilda astrild*). A similar avian assemblage was observed in a survey downstream of the Project site in 2014 (*AECOS*, 2014).

Waterbirds — waterbird species that might typically associate with a flowing stream were not observed. However, the channel appears to have conditions potentially suitable for waterbird species, and waterbirds could be expected to sometimes occur there. Indigenous *ʻaukuʻu* or Black-crowned Night-Heron (*Nycticorax nycticorax*) was observed in a survey of Kalihi Stream farther downstream (*AECOS*, 2014).

Mammalian fauna

Domestic cat (*Felis catus*), dog (*Canis lupis familiaris*), and small Indian mongoose (*Herpestes javanicus*) were observed in the Project area on April 9, 2020. No other mammals were recorded, though it is probable that one or more of the four alien Muridae species (rats and mice) currently established on the Island of Oʻahu utilize this area to some extent.

Aquatic Biota

A list of aquatic animals observed in Kalihi Stream is presented in Table 6, drawn from species observed during the present survey, as well as stream (i.e., not estuarine-specific) species observed in previous *AECOS* surveys in Kalihi Stream (*AECOS*, 1997, 2007, 2008, and 2014) or reported from the middle reach of Kalihi Stream in the Hawaiʻi watershed atlas (Parham et al., 2008). Qualitative abundances are provided only for species observed in the April 2020 survey.

Table 6. List of aquatic species observed or known from the middle reach of Kalihi Stream.

PHYLUM, CLASS, ORDER FAMILY *Species*	Common name	Status	Abundance <note>
	BACTERIA		
CYANOBACTERIA, CYANOPHYCEAE, NOSTOCALES OSCILLATORIACEAE *Oscillatoria* sp.	blue-green algae	**Ind**	✓<1>
	PLANTS		
CHAROPHYTA, KLEBSORMIDIOPHYCEAE, KLEBSORMIDALES KLEBSORMIDACEAE *Klebsormidum* sp.	green algae	**Ind**	✓<1>
CHLOROPHYTA, ULVOPHYCEAE, CHLADOPHORALES CHLADOPHORACEAE *Rhizoclonium* sp.		**Ind**	✓<1>
	INVERTEBRATES		
MOLLUSCA, BIVALVIA, VENEROIDA CORBICULOIDIDAE *Corbicula fluminea* (O.F. Müller, 1774)	Asian flume clam	Nat	A
MOLLUSCA, GASTROPODA, NEOTAENIOGLOSSA THIARIDAE unidentified	melanid snail	Nat	✓<2>
Melanoides tuberculatus (Muller, 1774)	red-rim melania	Nat	✓<1,2>
Tarebia granifera (Lamarck, 1822)	quilted melania	Nat	C
ARTHROPODA, INSECTA, ODONATA LIBELLULIDAE *Pantala flavescens* (Fabricius, 1798)	wandering glider	**Ind**	R
COENAGRIONIDAE *Ischnura posita* (Hagen, 1861)	fragile forktail	Nat	R
Ischnura ramburii (Selys, 1850)	Rambur's forktail	Nat	R

Table 6 (continued).

PHYLUM, CLASS, ORDER FAMILY *Species*	Common name	Status	Abundance <note>
ARTHROPODA, MALACOSTRACA, DECAPODA			
ATYIDAE			
Atyoida bisulcata J. W. Randall, 1840	*ʻōpae kalaʻole*	**End**	✓<2>
Neocaridina denticulata (Kemp, 1918)	grass shrimp	Nat	✓<2>
CAMBARIDAE			
Procambarus clarkii (Girard, 1852)	crayfish	Nat	R†
PALAEMONIDAE			
Macrobrachium grandimanus (J. W. Randall, 1840)	*ʻōpaeʻoehaʻa*	**End**	R
Macrobrachium lar (J. C. Fabricius, 1798)	Pacific prawn	Nat	O
	VERTEBRATES		
	FISHES		
CHORDATA, TELEOSTEI CYPRINIFORMES			
CYPRINIDAE			
Cyprinus carpio Linnaeus, 1758	common carp (koi)	Nat	R
CHORDATA, TELEOSTEI CYPRINODONTIFORMES			
POECILIIDAE			
Gambusia affinis (Baird and Girard, 1853)	mosquitofish	Nat	✓<1,2>
Poecilia sp. hybrid complex (*salvatoris/mexicana* group)	liberty/Mexican molly	Nat	C
Poecilia reticulata Peters, 1859	rainbow guppy	Nat	A
Xiphophorus helleri Heckel, 1848	green swordtail	Nat	✓<1,2>
PERCIFORMES			
CICHLIDAE			
Archocentrus nigrofasciatus (Günther, 1867)	convict cichlid	Nat	O
Oreochromis mossambicus (Peters, 1852)	Mozambique tilapia	Nat	✓<1>
Sarotherodon melanotheron (Rüppell, 1852)	blackchin tilapia	Nat	✓<1>
GOBIIDAE			
Awaous stamineus (Eydoux & Souleyet, 1850)	*ʻoʻopu nākea*	**End**	C

Table 6 (continued).

PHYLUM, CLASS, ORDER FAMILY *Species*	Common name	Status	Abundance <note>
SILURIFORMES			
LORICARIIDAE			
Ancistrus temminckii (Valenciennes in Cuvier and Valenciennes, 1840)	bristle mouth catfish	Nat	✓<2>
Hypostomus cf. *watwata* Hancock, 1828	suckermouth catfish	Nat	A

† - Specimen identified from non-living material: shell, test, or carapace only.

Legend to Table 6

Status categories:

End – Endemic – species found only in Hawaii

Ind – Indigenous – species found in Hawaii and elsewhere

Nat – Naturalized – species were introduced to Hawaii intentionally, or accidentally.

Abundance categories:

R – Rare – only one or two individuals observed.

O – Occasional – seen irregularly in small numbers

C – Common – observed everywhere, although generally not in large numbers.

A – Abundant – observed in large numbers and widely distributed.

Notes:

✓<1> – Historical – recorded previously in the lower reach of Kalihi Stream by *AECOS* biologists (*AECOS*, 1997, 2007, 2008, and 2014)

✓<2> – Historical – reported in the middle reach of Kalihi Stream (Parham, 2008).

The aquatic fauna of the Project area is dominated by naturalized species, although native species are present. Suckermouth catfish (*Hypostomus* cf. *watwata*) is the most abundant of the fishes. Poecilids, such as liberty/Mexican molly (*Poecilia* sp. hybrid complex [*salvatoris/mexicana* group]) and rainbow guppy (*Poecilia reticulata*), inhabit the shallows of the stream. Convict cichlid (*Archocentrus nigrofasciatus*) and koi (*Cyprinus carpio*) are newly-reported species for Kalihi Stream. Small (less than 8 cm or 3 in) *ʻoʻopu nākea* (*Awaous stamineus*), an endemic, amphidromous goby, were plentiful at the time of our survey. We also observed a single *ʻōpaeʻoehaʻa* (*Machrobrachium grandimanus*) and several Pacific prawn (*Macrobrachium lar*) in the stream. *ʻŌpae kalaʻole* (*Atyoida bisulcata*) have been reported from the middle reach of Kalihi Stream (Parham et al., 2008).

The native stream macrofauna are diadromous: eggs are laid in the stream and the larvae that hatch from these eggs move downstream and into the ocean where they develop for a time before migrating back into freshwater to grow to maturity (Ford and Kinzie, 1982; Kinzie, 1988). This life cycle requires an unimpeded pathway be present at the time of the migrations between suitable breeding habitat (usually in the upper reaches) and the ocean.

Discussion

Jurisdictional Waters

Within the Project area, the ordinary high water mark (OHWM) of Kalihi Stream is on the vertical channel walls. Pursuant to the final Navigable Waters Protection Rule: Definition of Waters of the United States (USACE and USEPA, 2020b), the entire channel within the Project area is jurisdictional.

Water Quality

Within the Project area, the middle reach of Kalihi Stream is classified as a Class 2 stream in Hawaiʻi water quality standards (HDOH, 2014). As stated in the standards, the objective of Class 2 waters is to protect their use for recreational purposes, to support and propagate aquatic life, agricultural and industrial water supplies, shipping, and navigation. Kalihi Stream is listed on the HDOH 2018 list of impaired waters in Hawaiʻi, prepared under Clean Water Act §303(d) (HDOH, 2018). This impaired listing is based upon water quality data collected by HDOH and indicates the stream may not meet Hawaiʻi water quality standards for turbidity (dry season), NO_3+NO_2 (wet and dry season), TN (wet season), and trash (wet and dry season). A Total Maximum Daily Load Study (TMDL) is needed (given a medium priority).

State water quality criteria for the parameters monitored during our survey are given in Table 6. Criteria for temperature, conductivity, DO, and pH are essentially applicable to man-made deviations from ambient conditions, while the criteria for turbidity, TSS, and nutrients (nitrogen and phosphorus) are for making comparisons to geometric mean values from collected samples. A minimum of three separate samples per station, and these separated in time, would be needed to make such comparisons for these parameters.

Comparison of measured pH, conductivity (specific conductance) and DO saturation with state criteria described at the bottom of Table 6 has only the relevance that our values are ambient conditions. pH values were in the range

Table 6. Water quality criteria applicable to streams (HDOH, 2014).

Parameter	Geometric Mean value not to exceed this value	Value not to be exceeded more than 10% of the time	Value not to be exceeded more than 2% of the time
Total Nitrogen (µg N/L)	250.0* 180.0**	520.0* 380.0**	800.0* 600.0**
Nitrate+Nitrite (µg N/L)	70.0* 30.0**	180.0* 90.0**	300.0* 170.0**
Total Phosphorus (µg P/L)	50.0* 30.0**	100.0* 60.0**	150.0* 80.0**
Total Suspended Solids (mg/L)	20.0* 10.0**	50.0* 30.0**	80.0* 55.0**
Turbidity (NTU)	5.0* 2.0**	15.0* 5.5**	25.0* 10.0**

* Wet season: November 1 – April 30.
** Dry season: May 1 – October 31.

Other "standards":
- pH units are to be between 5.5 and 8.0 and shall not deviate more than 0.5 units from ambient conditions.
- Dissolved oxygen is not to decrease below 80% of saturation.
- Temperature is not to vary more than 1C° from ambient conditions.
- Specific conductance is to be less than or equal to 300 µmhos/cm.

expected by the state criterion; conductivity was less than the maximum value; and DO saturation values were above the state minimum criterion of 80% saturation at all three stations. NO_3+NO_2 and TN are high in the Project area. Turbidity, TSS, and TP are relatively low in the Project area. Phosphorus tends to attach to soil particles, so it is not surprising the value of these three parameters are correlated.

Water quality impacts generated during construction to widen the Kalihi Stream overcrossing of the H-1 freeway should be temporary and minimal if effective best management practices (BMPs) are employed.

- Construction plans should incorporate BMPs to prevent degradation of the water in Kalihi Stream. An Applicable Monitoring and Assessment Plan (AMAP) should be developed to monitor effectiveness of BMPs deployed during construction.

Terrestrial Biology

Plants

No plant species proposed for listing, or listed as endangered or threatened under either federal or state of Hawaiʻi endangered species statutes (USFWS, 2020a; HDLNR, 1998) was observed during the course of this survey. No native species of concern are present. The vegetation observed in the survey area is neither pristine nor unique and is not inherently worthy of conservation.

Birds and Mammals

Recommendations are partly based on U.S. Fish and Wildlife Service, Animal Avoidance and Minimization Measures (USFWS-PIFWO, nd). Implementation of the recommendations (provided below as bulleted items) by the Project contractor will minimize impacts to listed species to the maximum extent practicable.

None of the 15 avian species recorded at the Project site from this survey is listed as threatened or endangered under federal or state endangered species statutes (HDLNR, 2015; USFWS, 2020a). The only native species recorded—Pacific Golden-Plover—is an indigenous migratory shorebird that nests from the Pacific Northwest to the high Arctic during the late spring and summer months, returning to Hawaiʻi and elsewhere in the tropical Pacific to spend fall and winter months of each year. These birds favor open ground and will likely utilize grassy areas at or near the completed Project site.

Seabirds

Protected seabirds include Hawaiian Petrel (*Pterodroma sandwichensis*), Wedge-tailed Shearwater (*Ardenna pacifica*), Newell's Shearwater (*Puffinus newelli*), and Band-rumped Storm-petrel (*Oceanodroma castro*). Hawaiian Petrel and Newell's Shearwater nest in upland mountainous habitat and have recently been detected on the Island of Oʻahu (Young et al., 2019). In the summer and fall, nocturnally flying seabirds (especially fledglings) transiting to the sea from inland locations can become disoriented by exterior lighting. When disoriented, seabirds can collide with man-made structures or the ground. If not killed outright, dazed or injured birds are easy targets of opportunity for feral mammals (Podolsky et al., 1998; Ainley et al., 2001; Day et al., 2003). The primary cause of mortality in both Hawaiian Petrel and Newell's Shearwater is predation by alien mammalian species at the nesting colonies (USFWS, 1983; Ainley et al., 2001). Collision with man-made structures is considered the

second most significant cause of mortality of these seabirds in Hawai'i. No suitable nesting habitat for seabird species occurs in the Project area.

- Deleterious impacts to transiting seabirds can be avoided if construction occurs during daylight hours and/or all outdoor lighting installed is fully "dark sky compliant" (HDLNR-DOFAW, 2016).

White Tern (*Gygis alba*), or *manu o Kū*, is an indigenous seabird listed as threatened under State of Hawai'i endangered species statute, HRS 195D (HDLNR, 2015). No individuals of White Tern were observed during this survey. In the main Hawaiian Islands, the majority of White Tern population is found in central urban and suburban Honolulu, with a known breeding range extending from Niu Valley to Aloha Tower (isolated pairs occur at Hickam Air Force Base; VanderWerf and Downs, 2018). Nesting occurs in large trees, such as monkey pod. The Project is just west of this species' known range; thus, White Tern nesting at the Project site is not likely.

Waterbirds

At the Project site, Kalihi Stream is a run. Riparian vegetation and small trees grow from the water edge to the base of near vertical channel walls. While not observed during the Project survey, waterbird species which are most likely to utilize the area include indigenous *'auku'u* or Black-crowned Night-Heron (*Nycticorax nycticorax*) and non-native Mallard duck (*Anas platyrhynchos*), neither of which is protected.

On O'ahu, the three ESA-listed waterbird species are: Hawaiian Common Gallinule or *'alae 'ula* (*Gallinula galeata sandvicensis*), Hawaiian Coot or *'alae ke'oke'o* (*Fulica alai*), and the Hawaiian endemic sub-species of the Black-necked Stilt or *ae'o* (*Himantopus mexicanus knudseni*). The Project area has some habitat which could be utilized by protected native waterbirds, but these species are rare in the Kalihi area, and nesting of these species at the Project site is not likely to occur.

- Should an endangered waterbird appear on the Project site during construction, work in that area must cease until the animal voluntarily leaves the area.

Mammals

Mammals observed during the survey are not native to Hawai'i and offer little value from an ecological perspective. Domestic cat and small Indian mongoose encountered during the survey are detrimental to the presence of native faunal

species. With the exception of the endangered Hawaiian hoary bat, all terrestrial mammals currently found on the Island of Oʻahu are alien species, and most are ubiquitous.

It is possible that Hawaiian hoary bat overfly or otherwise utilize the Project area on a seasonal basis. Insect populations around Kalihi Stream may attract foraging bats. Some tall trees within the stream channel, such as gunpowder tree (*Trema orientalis*) along the banks, have potential to serve as bat roosts. The principal potential impact of the Project to bats would occur when site vegetation is cleared and grubbed. Removal of trees could displace individual bats using a tree as a roosting location. However, this species of bat uses multiple roosts within a home territory (Bonaccorso, 2015), so the disturbance associated with removal of any particular tree would be minimal. An exception might be during the pupping season, if a female bat carrying a pup is unable to rapidly vacate a roost tree that is being felled, or if a young unattended pup is unable to flee a tree that is being felled.

- Potential adverse impacts to Hawaiian hoary bat can be avoided or minimized by not clearing woody vegetation taller than 15 ft (4.6 m) between June 1 and September 15, the bat pupping season.

Aquatic Biota

No aquatic species protected by State of Hawaiʻi Administrative Rules (HDLNR, 2014, 2015), nor proposed or listed as federally threatened or endangered (USFWS, 2020a), were observed in Kalihi Stream within the Project area. State regulations (HDLNR, 1989) extend protection to species of *ʻoʻopu* from net fishing activities. We observed two native amphidromous animals—*ʻoʻopu nākea* and *ʻōpaeʻoehaʻa*. *ʻOʻopu nākea* has been recorded both upstream and downstream of the project area; *ʻōpae ʻoehaʻa* and six other native amphidromous animals, have been recorded downstream of the Project area. Kalihi Stream may not provide ideal habitat, but the stream reach through the Project site, at a minimum, serves as passageway to more suitable stream environments upstream.

- BMPs developed and employed during construction to prevent degradation of water quality in Kalihi Stream will also protect aquatic biota. Project BMPs should be monitored closely to ensure that native stream fauna are not adversely impacted by impairments to water quality.

- Stream flow should be maintained at all times during construction and diversions should be temporary to not impede migration of native amphidromous species.

Critical Habitat

No federally designated Critical Habitat occurs in the Project area (USFWS, 2020b). Thus, modification of habitats on all or any part of the site will not result in an impact to federally designated Critical Habitat. No equivalent statute exists under state law.

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Appendix C

Appendix C

DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

ACOUSTIC STUDY FOR THE INTERSTATE ROUTE H-1 (EB) IMPROVEMENTS OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF-RAMP OAHU, HAWAII

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CHAPTER 1. SUMMARY

The Base Year and future traffic noise levels in the environs of the proposed Interstate Route H-1 Widening Project, between Ola Lane and Kalihi Interchange on the island of Oahu were studied in the project area shown in Figure I-1. The objective of this noise study was to evaluate potential noise impacts associated with the proposed improvements to the eastbound Off Ramp at Kalihi Interchange, hereinafter referred to as the Build Alternative. Traffic noise predictions were developed, and noise abatement alternatives evaluated in accordance with current Hawaii State Department of Transportation, Highways Division (HDOT) noise policy.

Base Year traffic noise levels in the project area currently exceed the U.S. Federal Highway Administration (FHWA) and Hawaii State Department of Transportation, Highways Division (HDOT) noise abatement criteria. Future (CY 2035) traffic noise levels with the proposed freeway improvement project are also expected to exceed the 66 Leq HDOT noise abatement criteria for Activity Categories B and C as well as the 71 Leq HDOT noise abatement criteria for Activity Category E.

By 2035, under the Build Alternative, approximately 78.7 percent of the front row lots contained noise impacted single or multifamily residences; approximately 8.5 percent of the front row lots contained noise impacted parks or churches; and approximately 2.1 percent of the front row lots contained noise impacted commercial establishments. The remaining 10.7 percent of the front row lots did not contain noise impacted receptors.

By 2035, under the Build Alternative, at total of 108 mauka and 63 makai (or 171 total) equivalent dwelling units were identified as impacted receptors within 250 feet of the H-1 Freeway baseline. Of these, approximately 83.6 percent were located in single or multifamily residential developments; approximately 14.6 percent were located at churches or parks; and approximately 1.8 percent were located in commercial developments.

Noise impacted churches anticipated in 2035 included Kalihi Union Church and Hawaii Pentacostal Full Gospel Assembly Church. Noise impacted parks included the southwest corner of Kamehameha Community Park and Kalihi Waena Playground. Park. No other existing public use structures, schools, parks, or churches are expected to experience traffic noise levels greater than 66 Leq within the limits of project construction.

By the HDOT noise policy, traffic noise mitigation measures in the form of noise barrier construction may be applied at some, but not all, of the affected residences, commercial properties, and public use grounds and churches. When noise abatement measures were considered, they were evaluated according to the criteria of "reasonable and feasible" as set forth in HDOT's Noise Analysis and Abatement Policy (Reference 4). Noise abatement measures in the form of noise barrier construction should be considered to achieve at least 5 to 7 dBA (A-Weighted decibels) of noise reductions, as

PROJECT STUDY AREA MAP

FIGURE I-1

PROJECT STUDY AREA MAP

FIGURE I-1 (CONT.)

long as they are technically feasible and within overall project cost limits of $60,000 per benefited receptor. The opinions of impacted receptors who would benefit from the proposed noise barriers would also need to be considered in formulating the final noise abatement recommendations for this project.

The following general conclusions can be made in respect to the number of impacted structures and lands which can be expected by CY 2035 under the Build Alternative. These conclusions are valid as long as the future vehicle mixes and average speeds do not differ from the assumed values.

- HDOT's "greater than 15 dBA increase" criteria for substantial change in traffic noise levels will not be exceeded at any noise sensitive structure. Maximum increases in traffic noise levels in the project area should not exceed 2.8 dBA as a result of growth in traffic volumes and improvements to the eastbound Off Ramp at Kalihi Interchange.

- With or without the proposed improvements, future traffic noise levels at essentially all residences and public use structures within 400 to 500 feet of the freeway baseline and with direct lines-of-sight to the freeway lanes are expected to exceed HDOT's 66 Leq criteria for Activity Category B. Noise levels along the first row of structures closest to the freeway will typically exceed the 66 Leq criteria unless their lines-of-sight to the freeway lanes are obstructed. The noise shielding effects from this first row of structures are in the order of 6 to 13 dBA for those buildings whose lines-of-sight to the freeway are partially or totally blocked by terrain or man-made structures.

- The future noise levels at approximately 108 receptors on the mauka side of the freeway exceed current HDOT noise abatement criteria. Of these, 57 (or 53%) receptors should benefit from the recommended noise barriers. Of the 57 benefited receptors, 54 (or 95%) would experience sound attenuation of 7 dBA or greater.

- The future noise levels at approximately 63 receptors on the makai side of the freeway exceed current HDOT noise abatement criteria. Of these, 33 (or 52%) receptors should benefit from the recommended noise barriers. Of the 33 benefited receptors, 29 (or 88%) would experience sound attenuation of 7 dBA or greater.

- Overall, after combining the mauka and makai receptors, the proposed sound attenuating walls should benefit 90 of 170 (or 53%) impacted receptors, and 83 of the 90 benefited receptors (or 92%) should experience sound attenuation of 7 dBA or greater. This composite results does not meet the HDOT minimum requirement of 66.7% of total impacted receptors being benefited by the sound attenuating walls. Therefore, construction of the recommended sound attenuating walls need not be included within this H-1 Freeway Widening Project.

Because two thirds of the impacted receptors on both sides of the freeway would not benefit from either the 5 or 7 dBA walls, evaluations of barrier construction cost and a survey of the "benefited" receptors were not performed.

It should be noted that the sound attenuating walls which are required to comply with the current HDOT noise policy are typically not the result of increases in traffic noise levels associated with the H-1 Widening Project, but result from the high Base Year traffic noise levels along the H-1 Freeway corridor. Typically, those receptors who do not currently benefit from existing sound attenuation walls, berms, or viaduct structures, will be more likely to benefit from new sound attenuation walls as a result of the H-1 Widening Project. Those receptors who currently benefit from existing sound attenuating walls, berms, or viaduct structures will be less likely to benefit from new sound attenuating walls because lower values of additional sound attenuation will typically result from increasing the heights of existing sound attenuation features, and these values may not meet the 5 and 7 dBA attenuation criteria of the HDOT noise policy.

Potential short term construction noise impacts are possible during the project construction period. Minimizing these types of noise impacts is possible using standard curfew periods, properly muffled equipment, administrative controls, and construction barriers as required. If work during the nighttime hours is required to minimize traffic congestion during the normal daytime period, noise impacts are possible at existing residences located along the freeway Right-of-Way. A variance from the existing state noise regulations will be required to perform nighttime work on this project.

CHAPTER II. GENERAL STUDY METHODOLOGY

Noise Measurements. Because traffic volumes on H-1 Freeway had not recovered to CY 2019 levels prior to the COVID-19 crisis, Base Year traffic and background ambient noise levels at noise sensitive locations in the project area were not measured in CY 2019 or CY 2020. Normally, the traffic noise measurements would be used to validate the traffic noise model which was used to calculate the Base Year (CY 2019) and future (CY 2035) traffic noise levels under the No-Build and Build Alternatives. The background ambient noise measurements would be used to define Base Year noise levels at receptors which may be affected by the project. Also, the measurements would be used in conjunction with forecast traffic noise levels to determine if future traffic noise levels are predicted to "substantially exceed" Base Year background ambient noise levels at these receptors, and therefore exceed FHWA and HDOT noise standards and noise abatement criteria (see Reference 4). However, traffic volumes along H-1 Freeway would need to increase by a factor of 31.6 to cause background noise levels to increase by 15 dB, which is very unlikely. Traffic noise modeling using Base Year and CY 2035 traffic volume data and forecasts were relied upon without validation by on-site traffic noise measurements.

Traffic Noise Modeling and Predictions. The Federal Highway Administration (FHWA) Traffic Noise Model, Version 2.5 (or TNM, see Reference 1) was used as the primary method of calculating Base Year and future traffic noise levels, with model parameters adjusted to reflect terrain, ground cover, and local shielding conditions. The average vehicle speeds entered into the TNM were typically higher at 55 mph than posted speed limits of 45 to 50 mph so as to reduce the likelihood of underestimating the traffic noise levels in the project area. Loose soil propagation loss factor was used to provide the higher noise attenuation rate that is typical of dense development along a freeway corridor. With these input speed and ground propagation model adjustments, the TNM was considered to be sufficiently accurate to compare the differences between the Base Year and future year traffic noise levels, and the differences in sound attenuation for various heights of sound attenuating walls.

Base Year and CY 2035 traffic noise levels were modeled using traffic count data provided by HDOT. Best estimates of the H-1 Freeway mainline traffic volumes and vehicle mixes as well as those for the ramps at Kalihi and Kahauiki Interchanges were mutually developed with Jacobs Engineering, Inc. for the AM, Midday, and PM peak traffic hours (Reference 2). These results are summarized in Appendix C. The AM peak hour was used for noise modeling after comparisons of the various traffic volumes during the AM, Midday, and PM peak traffic hours.

The Equivalent (or Average) Hourly Sound Level [Leq(h)] noise descriptor was used to calculate the Base Year and CY 2035 traffic noise levels as required by References 3 and 4. Aerial photo maps, topographic maps, and project highway plans and profiles (where available) were used to determine terrain, ground cover, and local shielding effects and distances from building structures, which were entered into the

noise prediction model. Where topographic contours were not available, receptor elevations were estimated from the closest available elevation contours.

Future year (2035) traffic noise levels were then developed for the No Build and Build (roadway improvement) Alternatives (see Figure I-1) using the future traffic assignments of Reference 2. Under the Build Alternative, it was assumed that the eastbound Off Ramp at Kalihi Interchange could be widened along the Base Year alignment shown in Figure I-1. Under the No Build Alternative, it was assumed that the Base Year roadway would remain unchanged in 2035.

Forecast mixes of vehicle types were assumed to be identical for both Base Year and future traffic, and vehicle speeds for Year 2035 along the improved roadway sections were assumed to be identical to their Base Year values.

Impact Assessments and Mitigation. Base Year traffic noise levels were calculated using the FHWA TNM Version 2.5 for the AM peak hour at front row receptors on both sides of H-1 Freeway within the limits of project construction to establish Base Year traffic noise levels at these receptors. Traffic noise levels at receptors in second and third row lots were assumed to 6 and 13 dBA lower, respectively, than the traffic noise levels determined for the front row receptors. The traffic noise levels at all receptors were compared to the FHWA/HDOT noise abatement criteria shown in Table II-1. All receptors were located within 250 feet of the H-1 Freeway's centerline. Receptors were located at ground level at the single story building walls fronting the roadways. Except for single family dwellings, receptors in duplex or multifamily dwellings were also located at the upper floors where dwelling units separated from the first floor could occur. There were receptors representing multifamily dwelling units in buildings as tall as 6 floors within 250 feet of the H-1 Freeway's centerline and within the limits of project construction. The majority of receptors were in Activity Category B (residential), with a few in Activity Category C (park, church, and school) and two in Activity Category E (office and bank). The Base Year traffic noise levels at all receptors were calculated and used to determine receptor locations where the additional HDOT "15 dBA increase" noise abatement criteria would be exceed in 2035.

Following the calculations of the Base Year traffic noise levels at receptors within the front row lots, calculations of the 2035 traffic noise levels during the AM peak hour were made using the FHWA TNM Version 2.5 at the same noise receptor locations used for the Base Year. Comparisons of predicted future traffic noise levels with FHWA and HDOT noise abatement criteria (see Table II-1) were made to determine specific locations where the noise abatement criteria are expected to be exceeded under the Build Alternative. All receptors whose traffic noise levels exceeded their applicable noise abatement criteria shown in Table II-1, were treated as noise impacted receptors. In addition, HDOT's criteria of "15 dBA or more increase above Base Year background noise levels" was also used as a noise abatement threshold for this project (from Reference 4). HDOT's 66 Leq(h) and the "15 dBA or more increase" criteria were

TABLE II-1

FHWA NOISE ABATEMENT CRITERIA
[Hourly A–Weighted Sound Level––Decibels (dBA)]

ACTIVITY CATEGORY	LEQ (h)*	DESCRIPTION OF ACTIVITY CATEGORY
A	57 (Exterior)	Lands on which serenity and quiet are of extra–ordinary significance and serve an important public need and where the preservation of those qualities is essential if the areas are to continue to serve their intended purpose.
B	67 (Exterior)	Residential.
C	67 (Exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libra–ries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F. Includes undeve–loped lands permitted for this activity category.
F	None	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water re–sources, water treatment, electrical), and warehousing.
G	None	Undeveloped lands that are not permitted.

* The Hawaii State Department of Transportation, Highways Division, utilizes Noise Abatement Criteria levels which are 1 Leq unit less than the FHWA values shown.

both applied to all receptors in Activity Categories B and C along the project corridor, since, by Reference 4, HDOT has replaced the FHWA 67 Leq(h) criteria with their 66 Leq(h) criteria. At all receptors in Activity Category E (bank and office) along the project corridor, HDOT's 71 Leq(h) noise abatement criteria was applied to identify establishments where noise abatement may also be applied. Where noise mitigation measures were indicated for this project, the effectiveness of sound attenuating barriers and other possible noise mitigation measures were evaluated. The ability to meet HDOT's criteria of 5 and 7 dBA noise reduction was also examined for various noise barrier heights.

Noise barriers which would be required to meet the 5 dBA attenuation requirement for at least two thirds of the impacted receptors on both sides H-1 Freeway were evaluated in respect to their feasibility in accordance with Reference 4. Minimum wall heights of 5 feet and as tall as 10 to 15 feet were evaluated for determining the "feasible" noise barriers which would meet the minimum 5 dBA attenuation requirement.

Even though two thirds of the impacted receptors on both sides of the freeway could not be "benefited" by the 5 dBA walls, the heights of the "feasible" noise barriers were increased in order to achieve at least 7 dBA attenuation at these "benefited" receptors. This was done to determine if the number of "benefited" receptors could be increased to achieve the minimum two thirds requirement of Reference 4.

During the evaluations of the 5 and 7 dBA sound attenuating walls, assumptions of receptor elevations, as well as the number of impacted and "benefited" receptors were required. For receptors in Activity Category B located in permitted (structures with county building permits) single family dwellings, only ground level receptors were used at their building's walls closest to the freeway; i.e., second floor receptors were not used for all buildings permitted as single family dwellings. For duplex and multifamily buildings permitted as such, ground level and second floor receptors were used, with the number of total living units (or receptors) assumed to be two for duplex units, and as many living units (or receptors) which could be identified for each building. For lots in Activity Categories C and E, where noise levels were 66 or 71 Leq, respectively, or higher, the total number of equivalent dwelling unit receptors for that lot were determined by dividing the total lot area within the 66 or 71 Leq contour (excluding parking facilities) by 4,200 square feet (the typical urban residential lot size per Reference 4). Where traffic noise levels exceeded the 66 or 71 Leq criteria out to or beyond the 250 foot setback line, the 250 foot setback line was used to define the noise impacted lot area and total number of equivalent dwelling unit receptors.

Final recommendations for inclusion or exclusion of noise barriers within the H-1 Freeway Widening Project were then made based on the feasibility and reasonableness criteria contained in Reference 4. In order for entire set of sound barriers to be included within the project, they collectively were required to meet the following feasibility and reasonableness criteria:

1. The entire set of sound barriers were required to achieve at least 5 dBA of noise reduction at 67 percent of the total number of noise impacted receptors located within 250 feet of the project roadways' centerlines.

2. The total number of noise impacted receptors were calculated as follows:

a. Activity Category B (single family dwelling): 1 ground floor receptor exposed to 66 Leq or more.

b. Activity Category B (permitted duplex dwelling): A ground floor or a second floor receptor exposed to 66 Leq or more.

c. Activity Category B (permitted multifamily): Any ground floor or second floor receptor exposed to 66 Leq or more, where each receptor represents one dwelling unit.

d. Activity Category C: 1 receptor per 4,200 sf of lot area exposed to 66 Leq or more.

e. Activity Category E: 1 receptor per 4,200 sf of lot area exposed to 71 Leq or more.

f. Activity Categories F and G: No noise impacted receptor was included, except where a building permit was pending for lots zoned for Activity Categories B, C, or E. A receptor was then included for that lot under the appropriate Activity Category represented by the lot zoning designation.

3. The entire set of sound barriers were required to be feasible in respect to design and construction issues relating to safety, barrier height, topography, drainage, utilities, maintenance, maintenance access to adjacent properties, and access to adjacent projects.

4. The entire set of sound barriers were required to achieve at least 7 dBA of noise reduction at 75 percent of the total number of benefiting receptors within 250 feet of the roadways' centerlines, where the total number of benefiting receptors was determined in accordance with Paragraph 1 above.

5. At least 67 percent of the land owners and benefited noise impacted receptors surveyed would need to approve the entire set of sound barriers required to achieve the 7 dBA attenuation criteria (Paragraph 4 above).

6. The total estimated cost of the inclusion of the total set of sound barriers could not exceed $60,000 per benefiting receptor, where the total number of benefiting receptors were converted to equivalent dwelling units in accordance with Reference 4.

If one or more of the above feasibility and reasonableness criteria were not met for the entire set of sound barriers, all sound barriers would be excluded from the project.

CHAPTER III. EXISTING ACOUSTICAL ENVIRONMENT

For the purposes of this study, 2019 was used as the Base Year for computing changes in traffic noise levels associated with the Build Alternative in CY 2035. The Base Year noise environment along the inbound (eastbound) and outbound (westbound) sides of the project corridor were described by computing the Hourly Equivalent Sound Levels [Leq(h)] along the existing freeway during the AM peak traffic hour period at the receptors located on the makai and mauka sides of the freeway for the 2019 time period. Tables III-1A through III-1C present the traffic volume, speed, and mix assumptions used to calculate the Base Year traffic noise levels using the FHWA TNM Version 2.5.

Tables III-2A and III-2B present the results of the calculations of Base Year traffic noise levels at all front row receptors located on the mauka and makai sides of H-1 freeway within 250 feet of the freeway baseline and within the limits of project construction. Each receptor location is identified by the Tax Map Key of the parcel on which the receptor is located (see Figure I-1). For the majority of the receptor locations, the receptor was centered at a single building's wall closest to the freeway, and located on the building's wall facing the freeway. The Tax Map Key for the lots fronting the freeway and their respective receptor locations are also shown in Figure I-1. For those lots with more than one building, the receptor locations in Figure I-1 are indicated in Tables III-2A and III-2B using the lower case alphabet letters. For frontal lots with no buildings, the receptor locations within 250 feet of the freeway centerline where noise levels were calculated are shown in Figure I-1).

The Base Year traffic noise level calculations shown in Tables III-2A and III-2B were used to serve as Base Year traffic noise levels for determining the increase in future traffic noise levels at each receptor location by 2035 following completion of the proposed H-1 Widening Project.

From the results shown in Tables III-2A and III-2B, it was concluded that the HDOT 66 Leq(h) noise abatement criteria were exceeded at essentially all of the dwelling units of the lots fronting the mauka and makai Rights-of-Way during the Base Year. Base Year traffic noise levels exceeded the HDOT abatement criteria of 66 Leq at most of the lands in Activity Categories B and C (see Tables III-2A and III-2B) which are within 250 feet of the freeway baseline and which have direct lines of sight to the freeway lanes. The 71 Leq criteria for Activity Category E was also exceeded at one office receptor on the makai side of the freeway.

During the Base Year, approximately 80.5 percent of front row lots contained noise impacted single or multifamily residences; approximately 5.6 percent contained noise impacted parks or churches; and approximately 2.8 percent contained a noise impacted commercial establishment. Approximately 11.1 percent of front row lots did not exceed HDOT noise abatement criteria.

TABLE III-1A

EXISTING (CY 2019) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS H-1 FREEWAY MAINLINES (AM, MIDDAY, AND PM PEAK HOURS)

H-1 FREEWAY MAINLINES	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** CYCLES	AUTOS	BUSES	M TRUCKS	H TRUCKS
AM PEAK:							
H-1 Freeway Mainline At Kahauiki Interchange	60	8,350	4	8,292	54	0	0
H-1 Freeway Mainline At Kalihi Stream Bridge	60	13,750	27	13,424	81	197	21
H-1 Freeway Mainline At Kalihi Interchange	60	12,400	37	11,966	68	298	31
MIDDAY PEAK:							
H-1 Freeway Mainline At Kahauiki Interchange	60	8,550	4	8,508	38	0	0
H-1 Freeway Mainline At Kalihi Stream Bridge	60	12,950	29	12,738	55	98	30
H-1 Freeway Mainline At Kalihi Interchange	60	11,800	41	11,512	47	153	47
PM PEAK:							
H-1 Freeway Mainline At Kahauiki Interchange	60	6,650	10	6,623	17	0	0
H-1 Freeway Mainline At Kalihi Stream Bridge	60	10,550	38	10,365	42	99	6
H-1 Freeway Mainline At Kalihi Interchange	60	9,500	48	9,242	48	152	10

TABLE III-1B

EXISTING (CY 2019) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS KALIHI INTERCHANGE RAMPS (AM, MIDDAY, AND PM PEAK HOURS)

KALIHI INTERCHANGE RAMPS	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** CYCLES	AUTOS	BUSES	M TRUCKS	H TRUCKS
AM PEAK:							
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	50	1,050	2	955	30	51	12
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp F	55	500	1	455	14	24	6
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	50	850	3	771	11	61	4
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-2	55	2,050	3	1,867	58	99	23
MIDDAY PEAK:							
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	50	1,100	2	1,027	31	22	18
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp F	55	500	1	467	14	10	8
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	50	650	2	599	9	35	5
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-2	55	1,950	3	1,819	56	39	33
PM PEAK:							
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	50	1,000	2	910	29	48	11
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp F	55	450	1	409	13	22	5
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	50	600	2	544	8	43	3
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-2	55	1,600	3	1,456	46	77	18

TABLE III-1C

EXISTING (CY 2019) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS KAHAUIKI INTERCHANGE RAMPS (AM, MIDDAY, AND PM PEAK HOURS)

KAHAUIKI INTERCHANGE RAMPS	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** CYCLES	AUTOS	BUSES	M TRUCKS	H TRUCKS
AM PEAK:							
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-	50	400	1	388	3	5	3
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	50	2,500	13	2,357	10	110	10
On Ramp, Viaduct to H-1 (EB) (H1-19)	45	2,500	3	2,369	30	90	8
MIDDAY PEAK:							
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-	50	350	1	331	2	14	2
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	50	1,700	7	1,551	12	121	9
On Ramp, Viaduct to H-1 (EB) (H1-19)	45	2,450	7	2,309	12	115	7
PM PEAK:							
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-	50	350	1	340	2	5	2
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	50	1,800	9	1,669	27	90	5
On Ramp, Viaduct to H-1 (EB) (H1-19)	45	1,750	5	1,704	7	32	2

TABLE III-2A

TRAFFIC NOISE LEVELS AT VARIOUS MAUKA RECEPTOR LOCATIONS (4.92 FT HIGH RECEPTOR)

RECEPTOR LOCATION	ACTIVITY CATEGORY	EXISTING (CY 2019) Leq		(CY 2035) NO MITIGATION/ CHANGE			
Receiver 1-3-01:033a	B	67.0	*	67.1	/	0.1	*
Receiver 1-3-01:033b	B	67.0	*	67.1	/	0.1	*
Receiver 1-3-01:033c	B	67.0	*	67.1	/	0.1	*
Receiver 1-3-01:063	B	64.2		64.3	/	0.1	
Receiver 1-3-01:062	B	72.0	*	72.1	/	0.1	*
Receiver 1-3-01:061	B	68.1	*	68.2	/	0.1	*
Receiver 1-3-01:060	B	72.4	*	72.5	/	0.1	*
Receiver 1-3-09:057	B	72.0	*	72.1	/	0.1	*
Receiver 1-3-09:022	B	68.9	*	69.1	/	0.2	*
Receiver 1-3-09:058	B	68.9	*	69.0	/	0.1	*
Receiver 1-3-09:020a Kodama Orchid Nursery	B	73.4	*	73.5	/	0.1	*
Receiver 1-3-09:020b Kodama Orchid Nursery	B	71.3	*	71.5	/	0.2	*
Receiver 1-3-09:020c Kodama Orchid Nursery	B	73.4	*	73.5	/	0.1	*
Receiver 1-3-09:020d Kodama Orchid Nursery	B	75.9	*	76.1	/	0.2	*
Receiver 1-3-09:020e Kodama Orchid Nursery	B	76.0	*	76.1	/	0.1	*
Receiver 1-3-09:020f Kodama Orchid Nursery	B	76.5	*	76.7	/	0.2	*
Receiver 1-3-09:020g Kodama Orchid Nursery	B	76.9	*	77.0	/	0.1	*
Receiver 1-3-09:020h Kodama Orchid Nursery	B	77.5	*	77.7	/	0.2	*
Receiver 1-3-09:020i Kodama Orchid Nursery	B	77.2	*	77.3	/	0.1	*
Receiver 1-3-09:020j Kodama Orchid Nursery	B	76.7	*	76.9	/	0.2	*
Receiver 1-3-09:019a 1214 Richard Lane	B	75.3	*	75.5	/	0.2	*
Receiver 1-3-09:019b 1214 Richard Lane	B	78.3	*	78.5	/	0.2	*
Receiver 1-3-09:019c 1214 Richard Lane	B	72.2	*	72.3	/	0.1	*
Receiver 1-3-09:017	B	73.8	*	73.9	/	0.1	*
Receiver 1-3-09:013	B	73.9	*	73.9	/	0.0	*
Receiver 1-3-09:006	B	72.1	*	72.4	/	0.3	*
Receiver 1-3-09:007a	B	69.3	*	69.3	/	0.0	*
Receiver 1-3-09:007b	B	70.3	*	70.4	/	0.1	*
Receiver 1-3-09:004	B	68.7	*	68.8	/	0.1	*
Receiver 1-3-09:005	B	68.3	*	68.4	/	0.1	*
Receiver 1-3-09:003	B	66.0	*	66.1	/	0.1	*
Receiver 1-3-09:002	B	63.6		63.8	/	0.2	

TABLE III-2A (CONTINUED)
TRAFFIC NOISE LEVELS AT VARIOUS MAUKA RECEPTOR LOCATIONS (4.92 FT HIGH RECEPTOR)

RECEPTOR LOCATION	ACTIVITY CATEGORY	EXISTING (CY 2019) Leq		(CY 2035) NO MITIGATION/ CHANGE		
Receiver 1-3-39:002a (2nd Floor)	B	68.6	*	68.6	/ 0.0	*
Receiver 1-3-39:002a (3rd Floor)	B	70.1	*	70.3	/ 0.2	*
Receiver 1-3-39:002a (4th Floor)	B	70.6	*	70.9	/ 0.3	*
Receiver 1-3-39:002a (5th Floor)	B	71.1	*	71.3	/ 0.2	*
Receiver 1-3-39:002a (6th Floor)	B	71.3	*	71.6	/ 0.3	*
Receiver 1-3-39:002b (2nd Floor)	B	67.4	*	67.4	/ 0.0	*
Receiver 1-3-39:002b (3rd Floor)	B	69.0	*	69.1	/ 0.1	*
Receiver 1-3-39:002b (4th Floor)	B	69.8	*	70.0	/ 0.2	*
Receiver 1-3-39:002b (5th Floor)	B	70.2	*	70.4	/ 0.2	*
Receiver 1-3-39:002b (6th Floor)	B	70.5	*	70.7	/ 0.2	*
Receiver 1-3-08:004a Kalihi Waena Elemen.	C	63.3		63.5	/ 0.2	
Receiver 1-3-08:004b Kalihi Waena Elemen.	C	61.8		62.0	/ 0.2	
Receiver 1-3-08:004c Kalihi Waena Elemen.	C	57.7		57.9	/ 0.2	
Receiver 1-3-07:067a	B	73.4	*	73.6	/ 0.2	*
Receiver 1-3-07:067b	B	70.1	*	70.3	/ 0.2	*
Receiver 1-3-07:094a	B	76.7	*	76.8	/ 0.1	*
Receiver 1-3-07:094b	B	77.4	*	77.5	/ 0.1	*
Receiver 1-3-07:054	B	78.4	*	78.5	/ 0.1	*
Receiver 1-3-07:049	B	77.9	*	78.0	/ 0.1	*
Receiver 1-3-07:047	B	74.2	*	75.1	/ 0.9	*
Receiver 1-3-07:048	B	78.1	*	78.2	/ 0.1	*
Receiver 1-3-07:035	B	78.3	*	78.4	/ 0.1	*
Receiver 1-3-07:098	B	76.9	*	77.0	/ 0.1	*
Receiver 1-3-07:088	B	70.2	*	70.1	/ -0.1	*
Receiver 1-3-07:087	B	66.3	*	66.2	/ -0.1	*
Receiver 1-3-07:086	B	64.2		65.8	/ 1.6	
Receiver 1-3-07:034	B	62.2		63.8	/ 1.6	
Receiver 1-3-07:103	B	60.0		61.6	/ 1.6	
Receiver 1-3-06:001a	C	66.2	*	67.8	/ 1.6	*
Receiver 1-3-06:001b	C	63.8		65.4	/ 1.6	
Receiver 1-3-06:001c	C	63.4		65.0	/ 1.6	

Notes:

1. All receivers were assumed to be at 4.92 feet above ground level, unless elevated.
2. * Denotes exceedance of HDOT "66 Leq" criteria for Activity Categories B or C.

TABLE III-2B

TRAFFIC NOISE LEVELS AT VARIOUS MAKAI RECEPTOR LOCATIONS (4.92 FT HIGH RECEPTOR)

RECEPTOR LOCATION	ACTIVITY CATEGORY	EXISTING (CY 2019) Leq		(CY 2035) NO MITIGATION/ CHANGE			
Receiver 1-3-02:038 House of Finance Center	E	77.5	*	77.6	/	0.1	*
Receiver 1-3-02:037 First Hawaiian Bank	E	63.1		63.3	/	0.2	
Receiver 1-3-02:036 Kalihi Union Church	C	62.2		62.4	/	0.2	
Receiver 1-3-02:036a Kalihi Union Church	C	61.9		62.4	/	0.5	
Receiver 1-3-02:036b Kalihi Union Church	C	66.0	*	66.5	/	0.5	*
Receiver 1-3-02:036c Kalihi Union Church	C	67.8	*	68.7	/	0.9	*
Receiver 1-3-02:036d Kalihi Union Church	C	76.0	*	77.2	/	1.2	*
Receiver 1-3-02:036e Kalihi Union Church	C	56.1		57.3	/	1.2	
Receiver 1-3-02:022	B	61.5		62.3	/	0.8	
Receiver 1-3-02:023	B	62.2		62.9	/	0.7	
Receiver 1-3-02:024	B	63.0		63.8	/	0.8	
Receiver 1-3-02:025	B	64.6		65.4	/	0.8	
Receiver 1-3-02:030	B	67.7	*	69.0	/	1.3	*
Receiver 1-3-02:033	B	70.3	*	73.1	/	2.8	*
Receiver 1-3-02:034	B	67.4	*	67.3	/	-0.1	*
Receiver 1-3-02:035	B	67.8	*	66.6	/	-1.2	*
Receiver 1-3-03:066	B	74.8	*	73.8	/	-1.0	*
Receiver 1-3-03:064	B	64.8		62.9	/	-1.9	
Receiver 1-3-03:042	B	63.9		62.3	/	-1.6	
Receiver 1-3-03:051	B	62.7		62.2	/	-0.5	
Receiver 1-3-03:034	B	61.0		60.7	/	-0.3	
Receiver 1-3-03:036	B	72.5	*	73.5	/	1.0	*
Receiver 1-3-03:068	B	71.6	*	73.2	/	1.6	*
Receiver 1-3-03:004	B	69.7	*	71.3	/	1.6	*
Receiver 1-3-03:009	B	71.2	*	71.9	/	0.7	*
Receiver 1-3-03:069	B	64.0		64.5	/	0.5	
Receiver 1-3-03:005	B	62.6		63.0	/	0.4	
Receiver 1-3-03:060	B	62.1		62.4	/	0.3	
Receiver 1-3-03:006	B	61.4		61.6	/	0.2	
Receiver 1-3-04:065 Hawaiian Pentecostal	C	65.9		66.9	/	1.0	*
Receiver 1-3-04:066a (Ground)	B	61.2		61.7	/	0.5	
Receiver 1-3-04:066a (2nd Floor)	B	63.6		63.9	/	0.3	
Receiver 1-3-04:066a (3rd Floor))	B	67.0	*	67.3	/	0.3	*

TABLE III-2B (CONTINUED)
TRAFFIC NOISE LEVELS AT VARIOUS MAKAI RECEPTOR LOCATIONS (4.92 FT HIGH RECEPTOR)

RECEPTOR LOCATION	ACTIVITY CATEGORY	EXISTING (CY 2019) Leq		W/O BAR./ (CHANGE)	
H-1 FREEWAY (MAKAI) (Continued):					
Receiver 1-3-04:066a (4th Floor)	B	71.7	*	72.0 / 0.3	*
Receiver 1-3-04:066b (Ground)	B	60.9		61.4 / 0.5	
Receiver 1-3-04:066b (2nd Floor)	B	63.3		63.6 / 0.3	
Receiver 1-3-04:066b (3rd Floor)	B	66.7	*	67.0 / 0.3	*
Receiver 1-3-04:066b (4th Floor)	B	71.4	*	71.7 / 0.3	*
Receiver 1-3-04:067	B	59.9		60.2 / 0.3	
Receiver 1-3-04:132	B	59.5		59.8 / 0.3	
Receiver 1-3-04:134	B	62.5		63.2 / 0.7	
Receiver 1-3-04:064	B	61.3		61.9 / 0.6	
Receiver 1-3-04:063	B	60.1		60.7 / 0.6	
Receiver 1-3-04:061	B	59.3		59.9 / 0.6	
Receiver 1-3-04:123 Tennis Court	C	75.3	*	75.8 / 0.5	*
Receiver 1-3-05:124a Kalihi Waena Park	C	80.5	*	81.0 / 0.5	*
Receiver 1-3-05:124b Kalihi Waena Park	C	64.5		65.1 / 0.6	
Receiver 1-3-04:050	B	58.1		58.6 / 0.5	
Receiver 1-3-04:049	B	57.9		58.4 / 0.5	
Receiver 1-3-05:012	B	80.3	*	80.5 / 0.2	*
Receiver 1-3-05:011	B	76.8	*	77.0 / 0.2	*
Receiver 1-3-05:080	B	63.5		63.8 / 0.3	
Receiver 1-3-05:010	B	60.1		60.5 / 0.4	
Receiver 1-3-05:059	B	75.9	*	76.1 / 0.2	*
Receiver 1-3-05:014a Kamehameha Gardens	B	78.3	*	78.5 / 0.2	*
Receiver 1-3-05:014b Kamehameha Gardens	B	77.8	*	78.0 / 0.2	*
Receiver 1-3-05:014c Kamehameha Gardens	B	77.4	*	77.6 / 0.2	*
Receiver 1-3-05:014d Kamehameha Gardens	B	76.4	*	76.6 / 0.2	*
Receiver 1-3-05:015	B	70.8	*	71.0 / 0.2	*
Receiver 1-3-05:084	B	60.4		60.6 / 0.2	
Receiver 1-3-05:048 The Way of Salvation	C	59.6		59.7 / 0.1	

Notes:

1. All receivers were assumed to be at 4.92 feet above ground level unless elevated.
2. * Denotes exceedance of HDOT "66 Leq" criteria for Activity Categories B or C, or exceedance of "71 Leq" criteria for Activity Category E.

Noise impacted parks included portions of Kamehameha Community Park and Kalihi Waena Playground. Buildings at the Kalihi Union Church experienced traffic noise levels at or above the 66 Leq(h) threshold during the Base Year. The 66 Leq(h) criteria was not exceeded at any other public use structure during the Base Year.

CHAPTER IV. DESCRIPTION OF FUTURE TRAFFIC NOISE LEVELS

The future traffic noise levels in the immediate vicinity of the project during CY 2035 were evaluated for the Build Alternative. The same methodology that was used to calculate the Base Year noise levels was also used to calculate the Year 2035 noise levels. Tables IV-1A, IV-1B, and IV-1C provide the 2035 traffic volumes, average speeds, and vehicle mixes which were used to calculate the future traffic noise levels following completion of the H-1 Widening Project. The AM peak hour was used to calculate future traffic noise levels at all front row receptors on the makai and mauka sides of the freeway.

Because the H-1 Widening Project will not affect the outbound traffic lanes, future worst case traffic noise levels on the mauka side of the freeway should not differ with or without the H-1 Widening Project. The greatest differences between the future traffic noise levels with or without the project should occur on the makai side of the freeway, and in the immediate vicinity of the inbound Off Ramp at the Kalihi Interchange. No average speed changes were assumed between the Build and No Build alternatives.

Tables III-2A and III-2B present the results of the traffic noise level predictions at the front row receivers for 2035 following completion of the H-1 Widening Project without the addition of sound attenuating walls on the mauka and makai sides of the freeway, respectively. The receptor locations are identical to those used to calculate the Base Year traffic noise levels as shown in Tables III-2A and III-2B. The predicted increases in traffic noise levels at each receptor location from 2019 to 2035 under the Build Alternative did not exceed 2.8 dBA, so that the HDOT "15 dBA increase" noise abatement criteria should not be exceeded at any receptor location. This is an expected result because of the relatively high Base Year noise levels along both sides of the H-1 Freeway.

In addition to the front row receptors listed in Tables III-2A and III-2B, second and third row dwellings were also included as future noise impacted receptors if their estimated noise levels were 66 Leq(h) or higher under the Build Alternative. Second and third row receptors were assumed to experience traffic noise levels of 6 and 13 Leq less, respectively, than those indicated for the front row receptors. Second or third row receptors located behind front row receptors with traffic noise levels of 72 through 79 Leq(h) were also considered to be noise impacted receptors.

Tables IV-2A and IV-2B list the Base Year number of equivalent dwelling unit receptors where the 66 Leq and 71 Leq noise abatement criteria (for Activity Categories B/C and E, respectively, shown in Table II-1) are predicted to be exceeded under the Build Alternative. A permitted single family dwelling unit was considered to be an equivalent ground floor dwelling unit. A permitted duplex, single story dwelling was considered to be two equivalent dwelling units. A permitted, duplex, two story dwelling was considered to be two equivalent dwelling units, one located on the ground floor and

TABLE IV-1A

FUTURE (CY 2035) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS H-1 FREEWAY MAINLINES (AM, MIDDAY, AND PM PEAK HOURS)

H-1 FREEWAY MAINLINES	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** CYCLES	AUTOS	BUSES	M TRUCKS	H TRUCKS
AM PEAK:							
H-1 Freeway Mainline At Kahauiki Interchange	60	8,550	4	8,490	56	0	0
H-1 Freeway Mainline At Kalihi Stream Bridge	60	14,150	28	13,814	84	203	21
H-1 Freeway Mainline At Kalihi Interchange	60	12,800	38	12,353	70	307	32
MIDDAY PEAK:							
H-1 Freeway Mainline At Kahauiki Interchange	60	8,550	4	8,508	38	0	0
H-1 Freeway Mainline At Kalihi Stream Bridge	60	13,200	30	12,983	56	100	31
H-1 Freeway Mainline At Kalihi Interchange	60	11,950	42	11,657	48	155	48
PM PEAK:							
H-1 Freeway Mainline At Kahauiki Interchange	60	6,800	10	6,773	17	0	0
H-1 Freeway Mainline At Kalihi Stream Bridge	60	10,800	38	10,611	43	102	6
H-1 Freeway Mainline At Kalihi Interchange	60	9,700	49	9,437	49	155	10

TABLE IV-1B

FUTURE (CY 2035) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS KALIHI INTERCHANGE RAMPS (AM, MIDDAY, AND PM PEAK HOURS)

KALIHI INTERCHANGE RAMPS	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** CYCLES	AUTOS	BUSES	M TRUCKS	H TRUCKS
AM PEAK:							
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	50	1,050	2	955	30	51	12
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp F	55	500	1	455	14	24	6
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	50	850	3	771	11	61	4
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-2	55	2,100	3	1,913	60	101	23
MIDDAY PEAK:							
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	50	1,150	2	1,073	33	23	19
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp F	55	500	1	467	14	10	8
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	50	700	2	646	9	38	5
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-2	55	1,950	3	1,819	56	39	33
PM PEAK:							
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	50	1,050	2	955	30	51	12
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp F	55	450	1	409	13	22	5
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	50	650	2	589	9	47	3
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-2	55	1,650	3	1,503	47	79	18

TABLE IV-1C

FUTURE (CY 2035) TRAFFIC VOLUMES AND NOISE LEVELS ALONG VARIOUS KAHAUIKI INTERCHANGE RAMPS (AM, MIDDAY, AND PM PEAK HOURS)

KAHAUIKI INTERCHANGE RAMPS	SPEED (MPH)	TOTAL VPH	********** VOLUMES (VPH) ********** CYCLES	AUTOS	BUSES	M TRUCKS	H TRUCKS
AM PEAK:							
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-	50	400	1	392	3	5	3
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	50	2,600	13	2,476	10	114	10
On Ramp, Viaduct to H-1 (EB) (H1-19)	45	2,600	3	2,498	31	94	8
MIDDAY PEAK:							
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-	50	350	1	334	2	14	2
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	50	1,750	7	1,617	12	124	9
On Ramp, Viaduct to H-1 (EB) (H1-19)	45	2,500	8	2,374	13	118	8
PM PEAK:							
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-	50	350	1	343	2	5	2
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	50	1,850	9	1,751	28	93	6
On Ramp, Viaduct to H-1 (EB) (H1-19)	45	1,800	5	1,766	7	32	2

TABLE IV-2A
NOISE IMPACTED RECEPTORS AT FIRST AND SECOND ROWS OF MAUKA LOTS

RECEPTOR LOCATION	Without Mitigation dBA	Total Bldgs	---Front Row Dwelling-- Type	Ground Flr.	2nd Flr.	-- 2nd Row Dwelling - Type	Ground Flr.	2nd Flr.
H-1 FREEWAY (MAUKA):								
Receiver 1-3-01:033	67.1	1	MF	1	2		0	0
Receiver 1-3-01:062	72.1	2	SF	1	0	MF	2	1
Receiver 1-3-01:060	72.5	4	SF + MF	2	1	SF	3	0
Receiver 1-3-09:057	72.1	2	SF	1	0	SF	1	0
Receiver 1-3-09:022	69.1	1	SF	1	0		0	0
Receiver 1-3-09:020a Kodama Orchid Nursery	73.5	2	SF	1	0	SF	1	0
Receiver 1-3-09:020b Kodama Orchid Nursery	71.5	1	SF	1	0		0	0
Receiver 1-3-09:020c Kodama Orchid Nursery	73.5	2	SF	1	0	SF	1	0
Receiver 1-3-09:020d Kodama Orchid Nursery	76.1	2	SF	1	0	SF	1	0
Receiver 1-3-09:020e Kodama Orchid Nursery	76.1	3	SF	1	0	SF	2	0
Receiver 1-3-09:020f Kodama Orchid Nursery	76.7	2	SF	1	0	SF	1	0
Receiver 1-3-09:020g Kodama Orchid Nursery	77.0	2	SF	1	0	SF	1	0
Receiver 1-3-09:020h Kodama Orchid Nursery	77.7	3	SF	1	0	SF	2	0
Receiver 1-3-09:020i Kodama Orchid Nursery	77.3	2	SF	1	0	SF	1	0
Receiver 1-3-09:020j Kodama Orchid Nursery	76.9	2	SF	1	0	SF	1	0
Receiver 1-3-09:019a 1214 Richard Lane	75.5	2	SF	1	0	SF	1	0
Receiver 1-3-09:019b 1214 Richard Lane	78.5	2	SF	1	0	SF	1	0
Receiver 1-3-09:017	73.9	2	SF	1	0	SF	1	0
Receiver 1-3-09:013	73.9	2	SF	1	0	MF	2	1
Receiver 1-3-09:006	72.4	2	SF	1	0	SF	1	0
Receiver 1-3-09:004	68.8	1	SF	1	0		0	0
Receiver 1-3-09:005	68.4	1	SF	1	0		0	0
Receiver 1-3-09:003	66.1	1	SF	1	0		0	0

TABLE IV-2A (CONTINUED)
NOISE IMPACTED RECEPTORS AT FIRST AND SECOND ROWS OF MAUKA LOTS

RECEPTOR LOCATION	Without Mitigation dBA	Total Bldgs	---Front Row Dwelling-- Type	Ground Flr.	2nd Flr.	-- 2nd Row Dwelling - Type	Ground Flr.	2nd Flr.
H-1 FREEWAY (MAUKA) (Continued):								
Receiver 1-3-39:002a (2nd Floor)	68.6	1		0	0	MF	0	2
Receiver 1-3-39:002a (3rd Floor)	70.3	1		0	0	MF	0	2
Receiver 1-3-39:002a (4th Floor)	70.9	1		0	0	MF	0	2
Receiver 1-3-39:002a (5th Floor)	71.3	1		0	0	MF	0	2
Receiver 1-3-39:002a (6th Floor)	71.6	1		0	0	MF	0	2
Receiver 1-3-39:002b (2nd Floor)	67.4	1		0	0	MF	0	4
Receiver 1-3-39:002b (3rd Floor)	69.1	1		0	0	MF	0	4
Receiver 1-3-39:002b (4th Floor)	70.0	1		0	0	MF	0	4
Receiver 1-3-39:002b (5th Floor)	70.4	1		0	0	MF	0	4
Receiver 1-3-39:002b (6th Floor)	70.7	1		0	0	MF	0	4
Receiver 1-3-07:067a	73.6	1	SF	1	0		0	0
Receiver 1-3-07:067b	70.3	1	SF	1	0		0	0
Receiver 1-3-07:094a	76.8	2	MF	1	0	SF	1	0
Receiver 1-3-07:094b	77.5	2	SF	1	0	SF	1	0
Receiver 1-3-07:054	78.5	3	SF	1	0	SF	2	0
Receiver 1-3-07:049	78.0	3	SF	1	0	SF	2	0
Receiver 1-3-07:047	75.1	2	SF	1	0	SF	1	0
Receiver 1-3-07:048	78.2	2	SF	1	0	SF	1	0
Receiver 1-3-07:035	78.4	1	SF	1	0		0	0
Receiver 1-3-07:098	77.0	2	SF	1	0	SF	1	0
Receiver 1-3-07:088	70.1	1	SF	1	0		0	0
Receiver 1-3-07:087	66.2	1	SF + MF	2	1		0	0
Receiver 1-3-06:001a	67.8	0	PK	3	0		0	0
TOTALS BY SEPARATE UNITS				40	4		32	32
GRAND TOTAL								108

TABLE IV-2B
NOISE IMPACTED RECEPTORS AT FIRST, SECOND, AND THIRD ROWS OF MAKAI LOTS

RECEPTOR LOCATION	Without Mitigation dBA	Total Bldgs	---Front Row Dwelling-- Type	Ground Flr.	2nd Flr.	-- 2nd Row Dwelling - Type	Ground Flr.	2nd Flr.	-- 3rd Row Dwelling - Type	Ground Flr.	2nd Flr.
H-1 FREEWAY (MAKAI):											
Receiver 1-3-02:038 House of Finance Center	77.6	1	CL	3	0		0	0		0	0
Receiver 1-3-02:036b Kalihi Union Church	66.5	6	CHURCH	12	0		0	0		0	0
Receiver 1-3-02:030	69.0	2	SF	1	0		0	0		0	0
Receiver 1-3-02:033	73.1	1	SF	1	0	SF	1	0		0	0
Receiver 1-3-02:034	67.3	2	SF	1	0		0	0		0	0
Receiver 1-3-02:035	66.6	1	SF	1	0		0	0		0	0
Receiver 1-3-03:066	73.8	1	SF	1	0		0	0		0	0
Receiver 1-3-03:036	73.5	1	SF	1	0	SF	1	0		0	0
Receiver 1-3-03:068	73.2	1	SF	1	0		0	0		0	0
Receiver 1-3-03:004	71.3	1	SF	1	0		0	0		0	0
Receiver 1-3-03:009	71.9	1	SF	1	0		0	0		0	0
Receiver 1-3-04:065 Hawaiian Pentecostal	66.9	2	CHURCH	1	0		0	0		0	0
Receiver 1-3-04:066a (3rd Floor)	67.3	1		0	0	APT	0	3		0	0
Receiver 1-3-04:066a (4th Floor)	72.0	1		0	0	APT	0	3		0	0
Receiver 1-3-04:066b (3rd Floor)	67.0	1		0	0	APT	0	3		0	0
Receiver 1-3-04:066b (4th Floor)	71.7	1		0	0	APT	0	3		0	0
Receiver 1-3-05:124a Kalihi Waena Park	81.0	0	PK	9	0		0	0		0	0
Receiver 1-3-05:012	80.5	1	SF	1	0	SF	1	0	SF	1	0
Receiver 1-3-05:011	77.0	2	SF	1	0		0	0		0	0
Receiver 1-3-05:059	76.1	1	SF	1	0	MF	1	0		0	0
Receiver 1-3-05-014a Kamehameha Gardens	78.5	8	SF	1	0	SF	1	0		0	0
Receiver 1-3-05-014b Kamehameha Gardens	78.0	8	SF	1	0	SF	1	0		0	0
Receiver 1-3-05-014c Kamehameha Gardens	77.6	8	SF	1	0	SF	1	0		0	0
Receiver 1-3-05-014d Kamehameha Gardens	76.6	8	SF	1	0	SF	1	0		0	0
Receiver 1-3-05:015	71.0	1	SF	1	0		0	0		0	0
TOTALS BY SEPARATE UNITS				42	0		8	12		1	0
GRAND TOTAL											63

one located on the second floor. The number of equivalent dwelling units in a permitted, muti-family, one or two story dwelling unit were estimated by counting the number of building entrances and/or the number of electricity meters for the building. Stacked, dwelling units in a multistory building were each considered to be an equivalent dwelling unit.

For churches, schools, parks, commercial lots, the total lot area within the HDOT noise criteria contour (66 or 71 Leq) or the 250 feet setback line from the baseline of H-1 Freeway, whichever was smaller, was used to calculate the equivalent number of dwelling units for that lot. Parking spaces and driveways were excluded from the total lot areas. A factor of 4,200 square feet was used to represent an equivalent dwelling unit for those lots.

By 2035, under the Build Alternative, a total of 108 mauka and 63 makai equivalent dwelling units were identified as impacted receptors within 250 feet of the H-1 Freeway baseline. Of these, 143 receptors were single or multifamily dwelling units; 25 were churches or parks; 3 were commercial; and none were located on undeveloped land with pending building permits.

There were no noise impacted schools except for those associated with Kalihi Union Church. Noise impacted parks included the makai-Ewa corner of the Kamehameha Community Park and the Kalihi Waena Playground located east of Gulick Avenue. The Kalihi Union Church and Hawaiian Pentacostal Full Gospel Assembly were also identified as having future traffic noise levels of 66 Leq(h) or higher.

Extensive noise mitigation measures would be required to reduce CY 2035 traffic noise levels by the 5 dBA and 7 dBA of noise reduction required by the HDOT Noise Policy (Reference 4) at the affected receptors. To a large extent, the need for future traffic noise mitigation measures is not associated with increased traffic noise levels resulting from the Build Alternative, since Base Year traffic noise levels currently exceed HDOT noise abatement criteria at the majority of receptor locations as indicated in Tables III-2A and III-2B). Rather, the bulk of the traffic noise mitigation measures are essentially required to reduce Base Year as well as future traffic noise levels to levels by 5 and 7 dBA in accordance with Reference 4 when within the limits of project construction.

The following general conclusions can be made in respect to the number of impacted structures and lands which can be expected by CY 2035 under the Build Alternative. These conclusions are valid as long as the future vehicle mixes and average speeds do not differ from the assumed values.

- The HDOT's "greater than 15 dBA increase" criteria for substantial change in traffic noise levels will not be exceeded at any receptor location on the mauka or makai sides of the freeway. Maximum increases in traffic noise levels in the

project area should not exceed 2.8 dBA as a result of growth in traffic volumes and improvements to the eastbound Off Ramp at Kalihi Interchange.

- Under the Build Alternative, future traffic noise levels at 143 existing single family and multifamily (low, mid, and high-rise) dwelling units are expected to exceed the HDOT 66 Leq criteria. These dwelling units are located within 250 feet of the freeway baseline on both the mauka and makai sides of the freeway Rights-of-Way.

- Portions of the Kamehameha Community Park, Kalihi Waena Playground, Kalihi Union Church, and Hawaiian Pentacostal Full Gospel Assembly will be impacted by H-1 Freeway noise, with or without the proposed project, and may be considered for noise mitigation measures. The traffic noise level during 2019 did not exceed the 66 Leq criteria at Hawaiian Pentacostal Full Gospel Assembly Church, but was predicted to exceed the 66 Leq criteria without or with the project in 2035.

- One of two commercial properties at the southwest corner of the project area may also be considered for noise mitigation measures, with future traffic noise levels expected to exceed 71 Leq.

CHAPTER V. EVALUATIONS OF POSSIBLE NOISE MITIGATION MEASURES

In addition to the construction of sound attenuating walls along the mauka and makai sides of the freeway, other possible noise mitigation measures considered included the following:

A. Restricting the Growth In the Number of Noisy Buses, Heavy Trucks, Motorcycles, and Automobiles with Defective Mufflers. The percentage contribution to the total traffic noise by heavy trucks, buses, and noisy vehicles is currently less than 20 percent, and elimination of these noise sources would reduce total traffic noise levels by less than 1 Leq(h) unit. Restricting the growth rate of these vehicles (to growth rates below passenger automobile growth rates) could produce noise reductions in the order of 0.5 to 0.9 dBA, which are not considered significant for the level of regulatory efforts required.

B. Alteration of the Horizontal Or Vertical Alignment of the Roadway. Major alterations of the horizontal or vertical alignment of the Base Year freeway was not considered appropriate due to the scope of this roadway improvement project and due to the Right-of-Way constraints on both sides of the freeway. Noise abatement measures will be required on both the mauka and makai sides of the freeway. Vacant lands mauka or makai of H-1 Freeway are not available to accommodate large lateral displacements of the roadway alignment. Vertical realignment of the existing freeway upward would result in adverse visual impacts, and vertical realignment of the freeway via cuts would not be possible without obtaining additional Right-of-Way. For these reasons, realignment of H-1 Freeway away from the affected noise sensitive structures was not considered to be a reasonable noise mitigation measure.

C. Acquisition of Property Rights for Construction of Noise Barriers, and/or Construction of Noise Barriers Along the Right-of-Way. For single story, noise sensitive buildings, construction of a sound attenuating wall along the Right-of-Way is normally the preferred noise mitigation measure. The 5 to 7 dBA of noise attenuation achievable with a 6 to 9 feet high wall may be sufficient for single story structures. Because some of the affected homes, churches, and commercial structures are one-story structures, construction of a sound attenuating barrier could possibly provide sufficient noise reduction benefits at the affected low-rise structures. Parks could also benefit from a sound attenuating barrier. Many of the affected noise sensitive structures are in excess of 10 feet in height, and will not benefit from 6 to 9 feet high walls. In these situations, excessive barrier heights (10 to 15+ feet) will be required to provide sound attenuation to upper floor spaces, and height variances from local codes may be required to construct these high walls. It should also be noted that sound barriers will block the views to and from the freeway and beyond which some of the residents and business owners may enjoy and/or prefer. For these reasons, concurrence from the affected homeowners,

property owners, churches, and commercial establishments should be obtained prior to construction of sound barriers as a noise mitigation measure.

D. Acquisition of Real Property Interests To Serve As A Noise Buffer Zone. Where tall (or multistory) structures are expected to be impacted by future traffic noise, the use of sound attenuating barriers (see para. C above) will not be practical due to the excessive heights required to shield the upper levels from traffic noise. Acquisition of the real property interests to serve as noise buffer zones were considered. However, noise buffer zones extending in excess of 250 feet from the freeway's baseline and at substantial cost would be required to meet the HDOT 66 Leq criteria. In general, the acquisition of property for the creation of noise buffer zones for noise mitigation has seldom been applied in Hawaii.

E. Noise Insulation of Public Use or Nonprofit Institutional Structures. Churches impacted by noise as a result of this project will be considered for noise abatement measures as a result of this project. Noise insulation of public use or nonprofit institutional structures in the form of closure and air conditioning may be preferable over the construction of sound attenuating walls. The application of sound attenuating walls has the added benefit of reducing traffic noise levels in the exterior areas of the public use properties.

Future traffic noise levels in CY 2035 which are expected to exceed the HDOT noise abatement criteria are indicated by a single asterisk in the rightmost column of Tables III-2A and III-2B. The sound attenuation performances of 5 through 10 feet tall sound barriers located along the mauka and makai Rights-of-Way were tested at the various receptor locations listed in Tables V-1A and V-1B. Where existing retaining (sound attenuating) walls have been installed along the makai side of the freeway, the sound attenuation performance possible from modifications of the existing walls were evaluated by increasing their heights in 1 foot increments to a maximum height of 10 feet. Tables V-1A and V-1B summarize the performances of sound attenuating walls of various heights (from 5 feet to 10 feet) at the various noise impacted receptor locations on the makai and mauka sides of the freeway.

The locations and heights of the recommended sound attenuating walls which are required to meet the 5 dBA and 7 dBA sound attenuation requirements dBA and 7 dBA sound attenuation requirements of the HDOT Noise Policy (Reference 4) are shown in Figures V-1A, V-1B, V-2A, and V-2B. The predicted sound levels and sound attenuation provided by these recommended walls are shown in Tables V-2A and V-2B. Where the desired sound attenuation goal of 7 dBA could only be achieved with wall heights of 10 feet or more, sound attenuation walls were not recommended to be included in this project. The primary reason for this was that, where at least 5 dBA of attenuation could not be achieved with wall heights of 10 feet, and where further evaluations for wall heights of at least 15 feet were not productive, further increases in wall heights beyond 10 feet were not considered justifiable.

TABLE V-1A
PREDICTED TRAFFIC NOISE ATTENUATION VS. BARRIER HEIGHTS (MAUKA RECEPTORS)
(4.92 FT HIGH FOR GROUND FLOOR RECEPTOR)

RECEPTOR LOCATION	FUTURE NOISE LEVELS (CY 2035) Leq						
	W/O BAR./ (CHANGE)	5.0 FT WALL/ (CHANGE)	6.0 FT WALL/ (CHANGE)	7.0 FT WALL/ (CHANGE)	8.0 FT WALL/ (CHANGE)	9.0 FT WALL/ (CHANGE)	10.0 FT WALL/ (CHANGE)
H-1 FREEWAY (MAUKA):							
Receiver 1-3-01:033	67.1 / 0.1 *	64.6 / -2.5 **	62.6 / -4.5 **	61.6 / -5.5	60.5 / -6.6	59.4 / -7.7	58.8 / -8.3
Receiver 1-3-01:063	64.3 / 0.1	61.2 / -3.1	60.7 / -3.6	60.4 / -3.9	60.2 / -4.1	60.0 / -4.3	59.8 / -4.5
Receiver 1-3-01:062	72.1 / 0.1 *	70.9 / -1.2 **	67.6 / -4.5 **	65.7 / -6.4	64.2 / -7.9	62.8 / -9.3	61.8 / -10.3
Receiver 1-3-01:061	68.2 / 0.1 *	65.1 / -3.1 **	63.9 / -4.3 **	62.9 / -5.3	62.2 / -6.0	61.7 / -6.5	61.2 / -7.0
Receiver 1-3-01:060	72.5 / 0.1 *	72.4 / -0.1 **	72.3 / -0.2 **	71.9 / -0.6 **	70.1 / -2.4 **	66.5 / -6.0	64.5 / -8.0
Receiver 1-3-09:057	72.1 / 0.1 *	65.9 / -6.2	64.9 / -7.2	64.1 / -8.0	63.4 / -8.7	62.7 / -9.4	62.0 / -10.1
Receiver 1-3-09:022	69.1 / 0.2 *	64.4 / -4.7 **	63.5 / -5.6	62.9 / -6.2	62.3 / -6.8	61.8 / -7.3	61.2 / -7.9
Receiver 1-3-09:058	69.0 / 0.1 *	63.7 / -5.3	63.0 / -6.0	62.5 / -6.5	61.9 / -7.1	61.4 / -7.6	61.0 / -8.0
Receiver 1-3-09:020a Kodama Orchid Nursery	73.5 / 0.1 *	66.4 / -7.1	65.2 / -8.3	64.3 / -9.2	63.5 / -10.0	62.7 / -10.8	62.1 / -11.4
Receiver 1-3-09:020b Kodama Orchid Nursery	71.5 / 0.2 *	65.1 / -6.4	64.4 / -7.1	63.7 / -7.8	63.0 / -8.5	62.4 / -9.1	61.9 / -9.6
Receiver 1-3-09:020c Kodama Orchid Nursery	73.5 / 0.1 *	66.4 / -7.1	65.4 / -8.1	64.4 / -9.1	63.6 / -9.9	62.9 / -10.6	62.3 / -11.2
Receiver 1-3-09:020d Kodama Orchid Nursery	76.1 / 0.2 *	69.7 / -6.4	67.5 / -8.6	65.8 / -10.3	64.5 / -11.6	63.3 / -12.8	62.4 / -13.7
Receiver 1-3-09:020e Kodama Orchid Nursery	76.1 / 0.1 *	69.2 / -6.9	67.3 / -8.8	65.9 / -10.2	64.7 / -11.4	63.7 / -12.4	62.8 / -13.3
Receiver 1-3-09:020f Kodama Orchid Nursery	76.7 / 0.2 *	68.1 / -8.6	66.6 / -10.1	65.3 / -11.4	64.2 / -12.5	63.3 / -13.4	62.5 / -14.2
Receiver 1-3-09:020g Kodama Orchid Nursery	77.0 / 0.1 *	69.4 / -7.6	67.7 / -9.3	66.4 / -10.6	65.2 / -11.8	64.1 / -12.9	63.3 / -13.7
Receiver 1-3-09:020h Kodama Orchid Nursery	77.7 / 0.2 *	70.7 / -7.0	68.5 / -9.2	66.9 / -10.8	65.5 / -12.2	64.4 / -13.3	63.4 / -14.3
Receiver 1-3-09:020i Kodama Orchid Nursery	77.3 / 0.1 *	69.7 / -7.6	68.3 / -9.0	66.9 / -10.4	65.6 / -11.7	64.6 / -12.7	63.8 / -13.5
Receiver 1-3-09:020j Kodama Orchid Nursery	76.9 / 0.2 *	69.6 / -7.3	68.2 / -8.7	66.9 / -10.0	66.0 / -10.9	65.1 / -11.8	64.1 / -12.8
Receiver 1-3-09:019a 1214 Richard Lane	75.5 / 0.2 *	67.9 / -7.6	67.0 / -8.5	66.0 / -9.5	65.1 / -10.4	64.4 / -11.1	63.8 / -11.7
Receiver 1-3-09:019b 1214 Richard Lane	78.5 / 0.2 *	71.7 / -6.8	69.1 / -9.4	67.5 / -11.0	66.3 / -12.2	65.2 / -13.3	64.3 / -14.2
Receiver 1-3-09:019c 1214 Richard Lane	72.3 / 0.1 *	66.7 / -5.6	66.0 / -6.3	65.3 / -7.0	64.6 / -7.7	63.9 / -8.4	63.3 / -9.0
Receiver 1-3-09:017	73.9 / 0.1 *	68.9 / -5.0	68.1 / -5.8	67.3 / -6.6	66.6 / -7.3	65.9 / -8.0	65.3 / -8.6
Receiver 1-3-09:013	73.9 / 0.0 *	70.0 / -3.9 **	69.2 / -4.7 **	68.4 / -5.5	67.6 / -6.3	66.8 / -7.1	66.2 / -7.7
Receiver 1-3-09:006	72.4 / 0.3 *	70.9 / -1.5 **	70.0 / -2.4 **	68.8 / -3.6 **	67.9 / -4.5 **	67.1 / -5.3	66.5 / -5.9
Receiver 1-3-09:007a	69.3 / 0.0 *	67.3 / -2.0 **	66.9 / -2.4 **	66.6 / -2.7 **	66.2 / -3.1 **	65.8 / -3.5 **	65.4 / -3.9 **
Receiver 1-3-09:007b	70.4 / 0.1 *	69.1 / -1.3 **	68.6 / -1.8 **	68.2 / -2.2 **	67.7 / -2.7 **	67.3 / -3.1 **	66.8 / -3.6 **
Receiver 1-3-09:004	68.8 / 0.1 *	68.4 / -0.4 **	68.1 / -0.7 **	67.9 / -0.9 **	67.6 / -1.2 **	67.2 / -1.6 **	66.9 / -1.9 **
Receiver 1-3-09:005	68.4 / 0.1 *	68.2 / -0.2 **	68.1 / -0.3 **	68.1 / -0.3 **	68.1 / -0.3 **	68.0 / -0.4 **	68.0 / -0.4 **
Receiver 1-3-09:003	66.1 / 0.1 *	65.8 / -0.3 **	65.7 / -0.4 **	65.6 / -0.5 **	65.5 / -0.6 **	65.3 / -0.8 **	65.2 / -0.9 **
Receiver 1-3-09:002	63.8 / 0.2	63.5 / -0.3	63.5 / -0.3	63.4 / -0.4	63.3 / -0.5	63.3 / -0.5	63.2 / -0.6

TABLE V-1A (CONTINUED)
PREDICTED TRAFFIC NOISE ATTENUATION VS. BARRIER HEIGHTS (MAUKA RECEPTORS)
(4.92 FT HIGH FOR GROUND FLOOR RECEPTOR)

RECEPTOR LOCATION	FUTURE NOISE LEVELS (CY 2035) Leq						
	W/O BAR./ (CHANGE)	5.0 FT WALL/ (CHANGE)	6.0 FT WALL/ (CHANGE)	7.0 FT WALL/ (CHANGE)	8.0 FT WALL/ (CHANGE)	9.0 FT WALL/ (CHANGE)	10.0 FT WALL/ (CHANGE)
H-1 FREEWAY (MAUKA) (Continued):							
Receiver 1-3-39:002a (2nd Floor)	68.6 / 0.0 *	67.6 / -1.0 **	67.3 / -1.3 **	67.0 / -1.6 **	66.7 / -1.9 **	66.4 / -2.2 **	66.1 / -2.5 **
Receiver 1-3-39:002a (3rd Floor)	70.3 / 0.2 *	69.6 / -0.7 **	69.4 / -0.9 **	69.2 / -1.1 **	68.9 / -1.4 **	68.6 / -1.7 **	68.3 / -2.0 **
Receiver 1-3-39:002a (4th Floor)	70.9 / 0.3 *	70.6 / -0.3 **	70.5 / -0.4 **	70.3 / -0.6 **	70.2 / -0.7 **	69.9 / -1.0 **	69.7 / -1.2 **
Receiver 1-3-39:002a (5th Floor)	71.3 / 0.2 *	71.2 / -0.1 **	71.2 / -0.1 **	71.1 / -0.2 **	71.0 / -0.3 **	70.9 / -0.4 **	70.7 / -0.6 **
Receiver 1-3-39:002a (6th Floor)	71.6 / 0.3 *	71.5 / -0.1 **	71.5 / -0.1 **	71.5 / -0.1 **	71.5 / -0.1 **	71.4 / -0.2 **	71.3 / -0.3 **
Receiver 1-3-39:002b (2nd Floor)	67.4 / 0.0 *	66.5 / -0.9 **	66.3 / -1.1 **	66.0 / -1.4 **	66.0 / -1.4 **	65.7 / -1.7 **	65.3 / -2.1 **
Receiver 1-3-39:002b (3rd Floor)	69.1 / 0.1 *	68.3 / -0.8 **	68.1 / -1.0 **	67.9 / -1.2 **	67.6 / -1.5 **	67.3 / -1.8 **	67.0 / -2.1 **
Receiver 1-3-39:002b (4th Floor)	70.0 / 0.2 *	69.6 / -0.4 **	69.4 / -0.6 **	69.3 / -0.7 **	69.1 / -0.9 **	68.8 / -1.2 **	68.6 / -1.4 **
Receiver 1-3-39:002b (5th Floor)	70.4 / 0.2 *	70.3 / -0.1 **	70.2 / -0.2 **	70.1 / -0.3 **	69.9 / -0.5 **	69.8 / -0.6 **	69.7 / -0.7 **
Receiver 1-3-39:002b (6th Floor)	70.7 / 0.2 *	70.6 / -0.1 **	70.6 / -0.1 **	70.6 / -0.1 **	70.5 / -0.2 **	70.4 / -0.3 **	70.3 / -0.4 **
Receiver 1-3-08:004a Kalihi Waena Elemen.	63.5 / 0.2	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Receiver 1-3-08:004b Kalihi Waena Elemen.	62.0 / 0.2	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Receiver 1-3-08:004c Kalihi Waena Elemen.	57.9 / 0.2	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Receiver 1-3-07:067a	73.6 / 0.2 *	67.6 / -6.0	66.7 / -6.9	65.9 / -7.7	64.1 / -9.5	63.4 / -10.2	62.9 / -10.7
Receiver 1-3-07:067b	70.3 / 0.2 *	64.3 / -6.0	63.4 / -6.9	0.0 / -70.3	62.9 / -7.4	62.5 / -7.8	62.1 / -8.2
Receiver 1-3-07:094a	76.8 / 0.1 *	70.5 / -6.3	68.7 / -8.1	66.0 / -10.8	65.1 / -11.7	64.3 / -12.5	63.6 / -13.2
Receiver 1-3-07:094b	77.5 / 0.1 *	71.6 / -5.9	69.5 / -8.0	67.7 / -9.8	65.6 / -11.9	64.8 / -12.7	64.0 / -13.5
Receiver 1-3-07:054	78.5 / 0.1 *	72.6 / -5.9	70.2 / -8.3	67.0 / -11.5	65.9 / -12.6	64.9 / -13.6	64.1 / -14.4
Receiver 1-3-07:049	78.0 / 0.1 *	71.5 / -6.5	69.2 / -8.8	67.1 / -10.9	66.1 / -11.9	65.2 / -12.8	64.3 / -13.7
Receiver 1-3-07:047	75.1 / 0.9 *	70.2 / -4.9 **	67.8 / -7.3	66.5 / -8.6	65.3 / -9.8	64.6 / -10.5	64.0 / -11.1
Receiver 1-3-07:048	78.2 / 0.1 *	71.1 / -7.1	68.7 / -9.5	67.5 / -10.7	66.4 / -11.8	65.4 / -12.8	64.5 / -13.7
Receiver 1-3-07:035	78.4 / 0.1 *	73.9 / -4.5 **	71.0 / -7.4	67.8 / -10.6	66.4 / -12.0	65.2 / -13.2	64.2 / -14.2
Receiver 1-3-07:098	77.0 / 0.1 *	66.2 / -10.8	65.1 / -11.9	64.1 / -12.9	63.3 / -13.7	62.4 / -14.6	61.8 / -15.2
Receiver 1-3-07:088	70.1 / -0.1 *	65.4 / -4.7 **	64.7 / -5.4	64.1 / -6.0	63.4 / -6.7	63.0 / -7.1	62.6 / -7.5
Receiver 1-3-07:087	66.2 / -0.1 *	63.1 / -3.1 **	62.6 / -3.6 **	62.2 / -4.0 **	61.6 / -4.6 **	61.3 / -4.9 **	61.0 / -5.2
Receiver 1-3-07:086	65.8 / 1.6	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Receiver 1-3-07:034	63.8 / 1.6	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Receiver 1-3-07:103	61.6 / 1.6	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Receiver 1-3-06:001a	67.8 / 1.6 *	66.9 / -0.9 **	66.0 / -1.8 **	65.9 / -1.9 **	64.8 / -3.0 **	64.2 / -3.6 **	63.7 / -4.1 **
Receiver 1-3-06:001b	65.4 / 1.6	64.5 / -0.9	63.6 / -1.8	63.5 / -1.9	62.4 / -3.0	61.8 / -3.6	61.2 / -4.2
Receiver 1-3-06:001c	65.0 / 1.6	64.2 / -0.8	63.4 / -1.6	63.4 / -1.6	62.1 / -2.9	61.6 / -3.4	61.0 / -4.0

Notes:

1. All receivers were assumed to be at 4.92 feet above ground level unless elevated.
2. * Denotes exceedance of HDOT "66 Leq" criteria for Activity Categories B or C, as applicable.
3. ** Denotes noise attenuation does not meet HDOT's 5 dB attenuation criteria for "substantial noise reduction."

TABLE V-1B
PREDICTED TRAFFIC NOISE ATTENUATION VS. BARRIER HEIGHTS (MAKAI RECEPTORS)
(4.92 FT HIGH FOR GROUND FLOOR RECEPTOR)

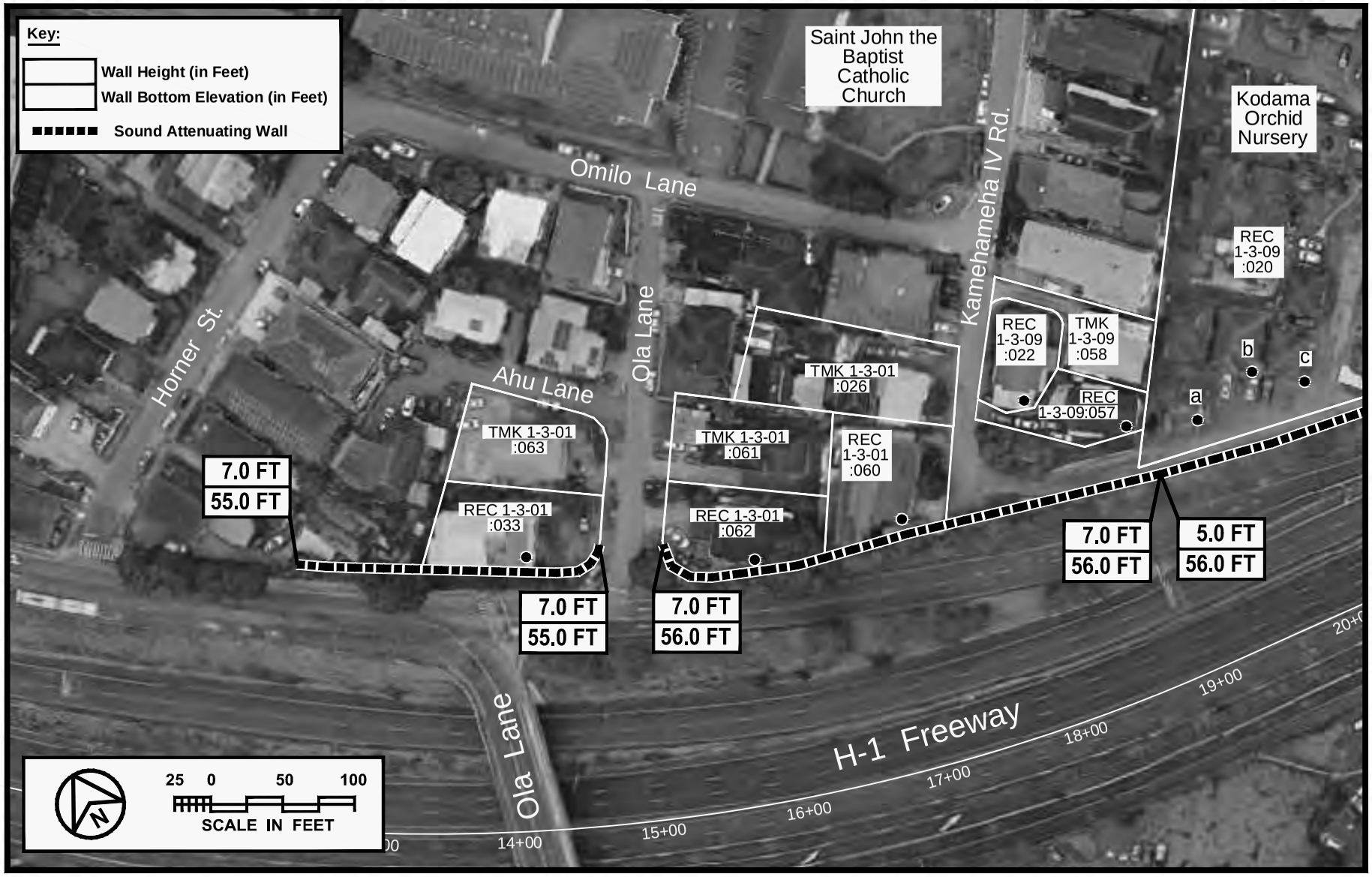
RECEPTOR LOCATION	FUTURE NOISE LEVELS (CY 2035) Leq					
	W/O BAR./ (CHANGE)	5.0 FT WALL/ (CHANGE)	6.0 FT WALL/ (CHANGE)	7.0 FT WALL/ (CHANGE)	8.0 FT WALL/ (CHANGE)	9.0 FT WALL/ (CHANGE)	10.0 FT WALL/ (CHANGE)
H-1 FREEWAY (MAKAI):							
Receiver 1-3-02:038 House of Finance Center	77.6 / 0.1 *	72.4 / -5.2	68.5 / -9.1	66.5 / -11.1	65.3 / -12.3	64.3 / -13.3	63.0 / -14.6
Receiver 1-3-02:037 First Hawaiian Bank	63.3 / 0.2	62.4 / -0.9	62.3 / -1.0	62.2 / -1.1	62.2 / -1.1	62.1 / -1.2	62.1 / -1.2
Receiver 1-3-02:036 Kalihi Union Church	62.4 / 0.2	N/A / N/A	N/A / N/A	62.4 / 0.0	61.4 / -1.0	60.4 / -2.0	59.6 / -2.8
Receiver 1-3-02:036a Kalihi Union Church	62.4 / 0.5	N/A / N/A	N/A / N/A	62.4 / 0.0	60.8 / -1.6	59.3 / -3.1	58.1 / -4.3
Receiver 1-3-02:036b Kalihi Union Church	66.5 / 0.5 *	N/A / N/A **	N/A / N/A **	65.7 / -0.8 **	65.0 / -1.5 **	64.4 / -2.1 **	63.8 / -2.7 **
Receiver 1-3-02:036c Kalihi Union Church	68.7 / 0.9 *	64.3 / -4.4 **	63.9 / -4.8 **	63.4 / -5.3	63.0 / -5.7	62.6 / -6.1	62.2 / -6.5
Receiver 1-3-02:036d Kalihi Union Church	77.2 / 1.2 *	68.9 / -8.3	67.9 / -9.3	67.0 / -10.2	66.2 / -11.0	65.5 / -11.7	64.8 / -12.4
Receiver 1-3-02:036e Kalihi Union Church	57.3 / 1.2	N/A / N/A	N/A / N/A	57.3 / 0.0	56.3 / -1.0	55.3 / -2.0	54.5 / -2.8
Receiver 1-3-02:022	62.3 / 0.8	60.1 / -2.2	59.9 / -2.4	59.7 / -2.6	59.5 / -2.8	59.2 / -3.1	58.9 / -3.4
Receiver 1-3-02:023	62.9 / 0.7	60.5 / -2.4	60.3 / -2.6	60.1 / -2.8	59.8 / -3.1	59.5 / -3.4	59.2 / -3.7
Receiver 1-3-02:024	63.8 / 0.8	61.1 / -2.7	60.8 / -3.0	60.5 / -3.3	60.2 / -3.6	59.9 / -3.9	59.6 / -4.2
Receiver 1-3-02:025	65.4 / 0.8	62.4 / -3.0	62.0 / -3.4	61.7 / -3.7	61.3 / -4.1	61.0 / -4.4	60.6 / -4.8
Receiver 1-3-02:030	69.0 / 1.3 *	65.3 / -3.7 **	64.6 / -4.4 **	64.0 / -5.0	63.6 / -5.4	63.2 / -5.8	62.8 / -6.2
Receiver 1-3-02:033	73.1 / 2.8 *	68.1 / -5.0	67.2 / -5.9	66.4 / -6.7	65.8 / -7.3	65.2 / -7.9	64.6 / -8.5
Receiver 1-3-02:034	67.3 / -0.1 *	65.7 / -1.6 **	65.3 / -2.0 **	64.9 / -2.4 **	64.5 / -2.8 **	64.2 / -3.1 **	63.8 / -3.5 **
Receiver 1-3-02:035	66.6 / -1.2 *	66.1 / -0.5 **	66.0 / -0.6 **	65.7 / -0.9 **	65.3 / -1.3 **	64.4 / -2.2 **	63.9 / -2.7 **
Receiver 1-3-03:066	73.8 / -1.0 *	73.8 / 0.0 **	73.8 / 0.0 **	73.7 / -0.1 **	73.5 / -0.3 **	73.2 / -0.6 **	72.8 / -1.0 **
Receiver 1-3-03:064	62.9 / -1.9	62.8 / -0.1	62.7 / -0.2	62.6 / -0.3	62.5 / -0.4	62.2 / -0.7	61.9 / -1.0
Receiver 1-3-03:042	62.3 / -1.6	62.2 / -0.1	62.1 / -0.2	62.0 / -0.3	61.9 / -0.4	61.8 / -0.5	61.6 / -0.7
Receiver 1-3-03:051	62.2 / -0.5	62.0 / -0.2	61.9 / -0.3	61.8 / -0.4	61.7 / -0.5	61.6 / -0.6	61.4 / -0.8
Receiver 1-3-03:034	60.7 / -0.3	60.4 / -0.3	60.3 / -0.4	60.2 / -0.5	60.0 / -0.7	59.9 / -0.8	59.7 / -1.0
Receiver 1-3-03:036	73.5 / 1.0 *	73.5 / 0.0 **	73.5 / 0.0 **	70.6 / -2.9 **	68.5 / -5.0	67.2 / -6.3	66.1 / -7.4
Receiver 1-3-03:068	73.2 / 1.6 *	73.2 / 0.0 **	73.2 / 0.0 **	70.2 / -3.0 **	67.9 / -5.3	66.3 / -6.9	65.4 / -7.8
Receiver 1-3-03:004	71.3 / 1.6 *	71.3 / 0.0 **	71.3 / 0.0 **	69.1 / -2.2 **	67.3 / -4.0 **	66.1 / -5.2	65.2 / -6.1
Receiver 1-3-03:009	71.9 / 0.7 *	68.6 / -3.3 **	68.2 / -3.7 **	67.3 / -4.6 **	66.6 / -5.3	66.1 / -5.8	65.6 / -6.3
Receiver 1-3-03:069	64.5 / 0.5	63.7 / -0.8	63.5 / -1.0	63.2 / -1.3	62.8 / -1.7	62.5 / -2.0	62.3 / -2.2
Receiver 1-3-03:005	63.0 / 0.4	62.1 / -0.9	62.0 / -1.0	61.7 / -1.3	61.5 / -1.5	61.2 / -1.8	61.0 / -2.0
Receiver 1-3-03:060	62.4 / 0.3	61.6 / -0.8	61.5 / -0.9	61.3 / -1.1	61.0 / -1.4	60.8 / -1.6	60.6 / -1.8
Receiver 1-3-03:006	61.6 / 0.2	60.9 / -0.7	60.8 / -0.8	60.6 / -1.0	60.4 / -1.2	60.1 / -1.5	59.9 / -1.7
Receiver 1-3-04:065 Hawaiian Pentecostal	66.9 / 1.0 *	65.9 / -1.0 **	65.8 / -1.1 **	65.6 / -1.3 **	65.4 / -1.5 **	65.3 / -1.6 **	65.1 / -1.8 **

TABLE V-1B (CONTINUED)
PREDICTED TRAFFIC NOISE ATTENUATION VS. BARRIER HEIGHTS (MAKAI RECEPTORS)
(4.92 FT HIGH FOR GROUND FLOOR RECEPTOR)

RECEPTOR LOCATION	FUTURE NOISE LEVELS (CY 2035) Leq						
	W/O BAR./ (CHANGE)	5.0 FT WALL/ (CHANGE)	6.0 FT WALL/ (CHANGE)	7.0 FT WALL/ (CHANGE)	8.0 FT WALL/ (CHANGE)	9.0 FT WALL/ (CHANGE)	10.0 FT WALL/ (CHANGE)
H-1 FREEWAY (MAKAI) (Continued):							
Receiver 1-3-04:066a (Ground Floor)	61.7 / 0.5	61.1 / -0.6	61.0 / -0.7	60.7 / -1.0	60.6 / -1.1	60.4 / -1.3	60.2 / -1.5
Receiver 1-3-04:066a (2nd Floor)	63.9 / 0.3	62.8 / -1.1	62.7 / -1.2	62.4 / -1.5	62.2 / -1.7	62.0 / -1.9	61.8 / -2.1
Receiver 1-3-04:066a (3rd Floor)	67.3 / 0.3 *	65.1 / -2.2 **	65.0 / -2.3 **	64.7 / -2.6 **	64.4 / -2.9 **	64.1 / -3.2 **	63.9 / -3.4 **
Receiver 1-3-04:066a (4th Floor)	72.0 / 0.3 *	68.1 / -3.9 **	68.0 / -4.0 **	67.7 / -4.3 **	67.4 / -4.6 **	67.0 / -5.0	66.7 / -5.3
Receiver 1-3-04:066b (Ground Floor)	61.4 / 0.5	60.8 / -0.6	60.7 / -0.7	60.4 / -1.0	60.3 / -1.1	60.1 / -1.3	59.9 / -1.5
Receiver 1-3-04:066b (2nd Floor)	63.6 / 0.3	62.5 / -1.1	62.4 / -1.2	62.1 / -1.5	61.9 / -1.7	61.7 / -1.9	61.5 / -2.1
Receiver 1-3-04:066b (3rd Floor)	67.0 / 0.3 *	64.8 / -2.2 **	64.7 / -2.3 **	64.4 / -2.6 **	64.1 / -2.9 **	63.8 / -3.2 **	63.6 / -3.4 **
Receiver 1-3-04:066b (4th Floor)	71.7 / 0.3 *	67.8 / -3.9 **	67.7 / -4.0 **	67.4 / -4.3 **	67.1 / -4.6 **	66.7 / -5.0	66.4 / -5.3
Receiver 1-3-04:067	60.2 / 0.3	59.6 / -0.6	59.5 / -0.7	59.3 / -0.9	59.1 / -1.1	58.9 / -1.3	58.7 / -1.5
Receiver 1-3-04:132	59.8 / 0.3	59.1 / -0.7	59.0 / -0.8	58.8 / -1.0	58.6 / -1.2	58.4 / -1.4	58.2 / -1.6
Receiver 1-3-04:134	63.2 / 0.7	62.4 / -0.8	62.2 / -1.0	62.0 / -1.2	61.7 / -1.5	61.5 / -1.7	61.3 / -1.9
Receiver 1-3-04:064	61.9 / 0.6	61.1 / -0.8	60.9 / -1.0	60.6 / -1.3	60.4 / -1.5	60.2 / -1.7	60.0 / -1.9
Receiver 1-3-04:063	60.7 / 0.6	60.0 / -0.7	59.8 / -0.9	59.6 / -1.1	59.4 / -1.3	59.1 / -1.6	58.9 / -1.8
Receiver 1-3-04:061	59.9 / 0.6	59.3 / -0.6	59.1 / -0.8	58.9 / -1.0	58.7 / -1.2	58.5 / -1.4	58.3 / -1.6
Receiver 1-3-04:123 Tennis Court	75.8 / 0.5 *	67.8 / -8.0	66.6 / -9.2	65.6 / -10.2	64.6 / -11.2	63.9 / -11.9	63.5 / -12.3
Receiver 1-3-05:124a Kalihi Waena Park	81.0 / 0.5 *	76.1 / -4.9 **	71.5 / -9.5	68.3 / -12.7	66.2 / -14.8	64.9 / -16.1	63.9 / -17.1
Receiver 1-3-05:124b Kalihi Waena Park	65.1 / 0.6	63.0 / -2.1	62.6 / -2.5	62.3 / -2.8	61.9 / -3.2	61.6 / -3.5	61.2 / -3.9
Receiver 1-3-04:050	58.6 / 0.5	58.0 / -0.6	57.8 / -0.8	57.6 / -1.0	57.4 / -1.2	57.2 / -1.4	57.0 / -1.6
Receiver 1-3-04:049	58.4 / 0.5	57.7 / -0.7	57.5 / -0.9	57.3 / -1.1	57.1 / -1.3	56.9 / -1.5	56.7 / -1.7
Receiver 1-3-05:012	80.5 / 0.2 *	72.5 / -8.0	70.4 / -10.1	68.4 / -12.1	67.1 / -13.4	66.1 / -14.4	65.4 / -15.1
Receiver 1-3-05:011	77.0 / 0.2 *	67.3 / -9.7	66.3 / -10.7	65.5 / -11.5	65.0 / -12.0	64.5 / -12.5	64.0 / -13.0
Receiver 1-3-05:080	63.8 / 0.3	62.3 / -1.5	61.9 / -1.9	61.6 / -2.2	61.2 / -2.6	60.9 / -2.9	60.6 / -3.2
Receiver 1-3-05:010	60.5 / 0.4	59.7 / -0.8	59.4 / -1.1	59.2 / -1.3	58.9 / -1.6	58.7 / -1.8	58.4 / -2.1
Receiver 1-3-05:059	76.1 / 0.2 *	67.1 / -9.0	66.5 / -9.6	65.9 / -10.2	65.2 / -10.9	64.6 / -11.5	64.1 / -12.0
Receiver 1-3-05:014a Kamehameha Gardens	78.5 / 0.2 *	73.1 / -5.4	69.2 / -9.3	67.2 / -11.3	65.8 / -12.7	64.8 / -13.7	64.1 / -14.4
Receiver 1-3-05:014b Kamehameha Gardens	78.0 / 0.2 *	70.2 / -7.8	67.9 / -10.1	66.8 / -11.2	65.4 / -12.6	64.2 / -13.8	63.4 / -14.6
Receiver 1-3-05:014c Kamehameha Gardens	77.6 / 0.2 *	70.3 / -7.3	68.7 / -8.9	66.8 / -10.8	65.8 / -11.8	64.9 / -12.7	63.7 / -13.9
Receiver 1-3-05:014d Kamehameha Gardens	76.6 / 0.2 *	67.1 / -9.5	65.9 / -10.7	65.0 / -11.6	64.2 / -12.4	63.2 / -13.4	62.5 / -14.1
Receiver 1-3-05:015	71.0 / 0.2 *	64.4 / -6.6	63.8 / -7.2	63.1 / -7.9	62.7 / -8.3	62.2 / -8.8	61.7 / -9.3
Receiver 1-3-05:084	60.6 / 0.2	59.8 / -0.8	59.7 / -0.9	59.4 / -1.2	59.1 / -1.5	59.0 / -1.6	58.7 / -1.9
Receiver 1-3-05:048 The Way of Salvation	59.7 / 0.1	59.1 / -0.6	59.1 / -0.6	59.0 / -0.7	58.9 / -0.8	58.8 / -0.9	58.8 / -0.9

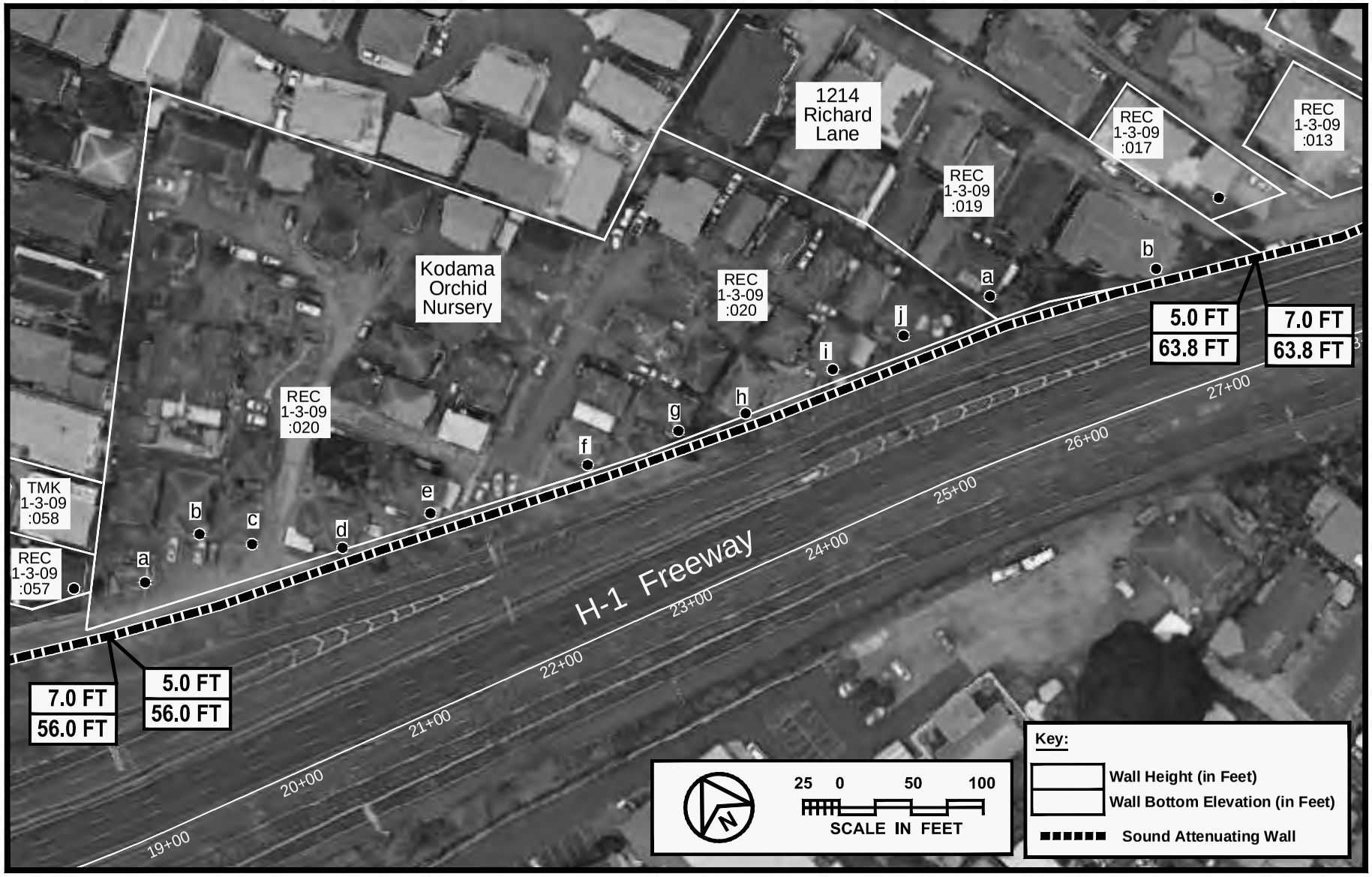
Notes:

1. All receivers were assumed to be at 4.92 feet above ground level unless elevated.
2. * Denotes exceedance of HDOT "66 Leq" criteria for Activity Categories B or C, or exceedance of HDOT "71 Leq" criteria for Activity Catgory E, as applicable.
3. ** Denotes noise attenuation does not meet HDOT's 5 dB attenuation criteria for "substantial noise reduction."



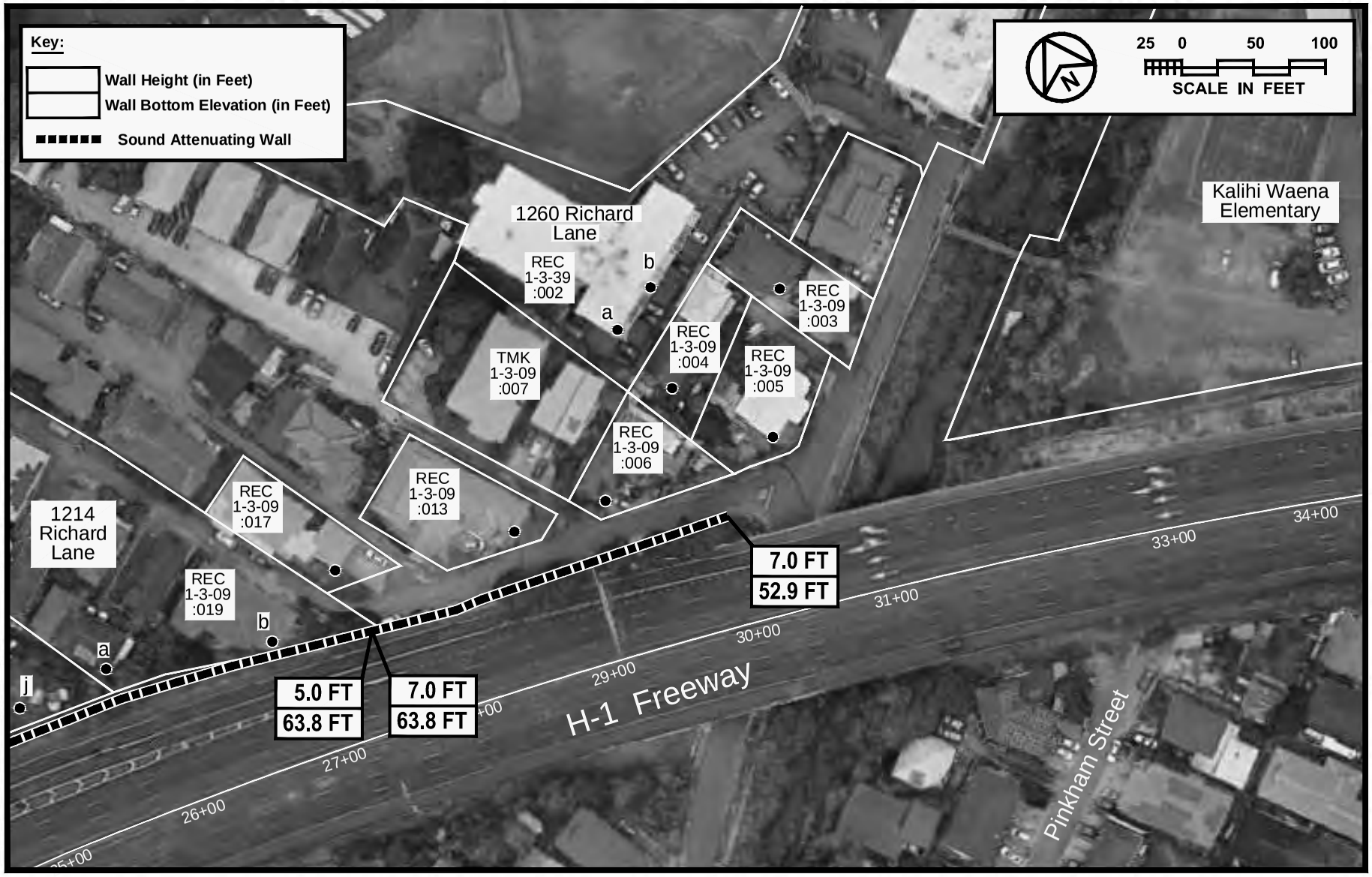
MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1A



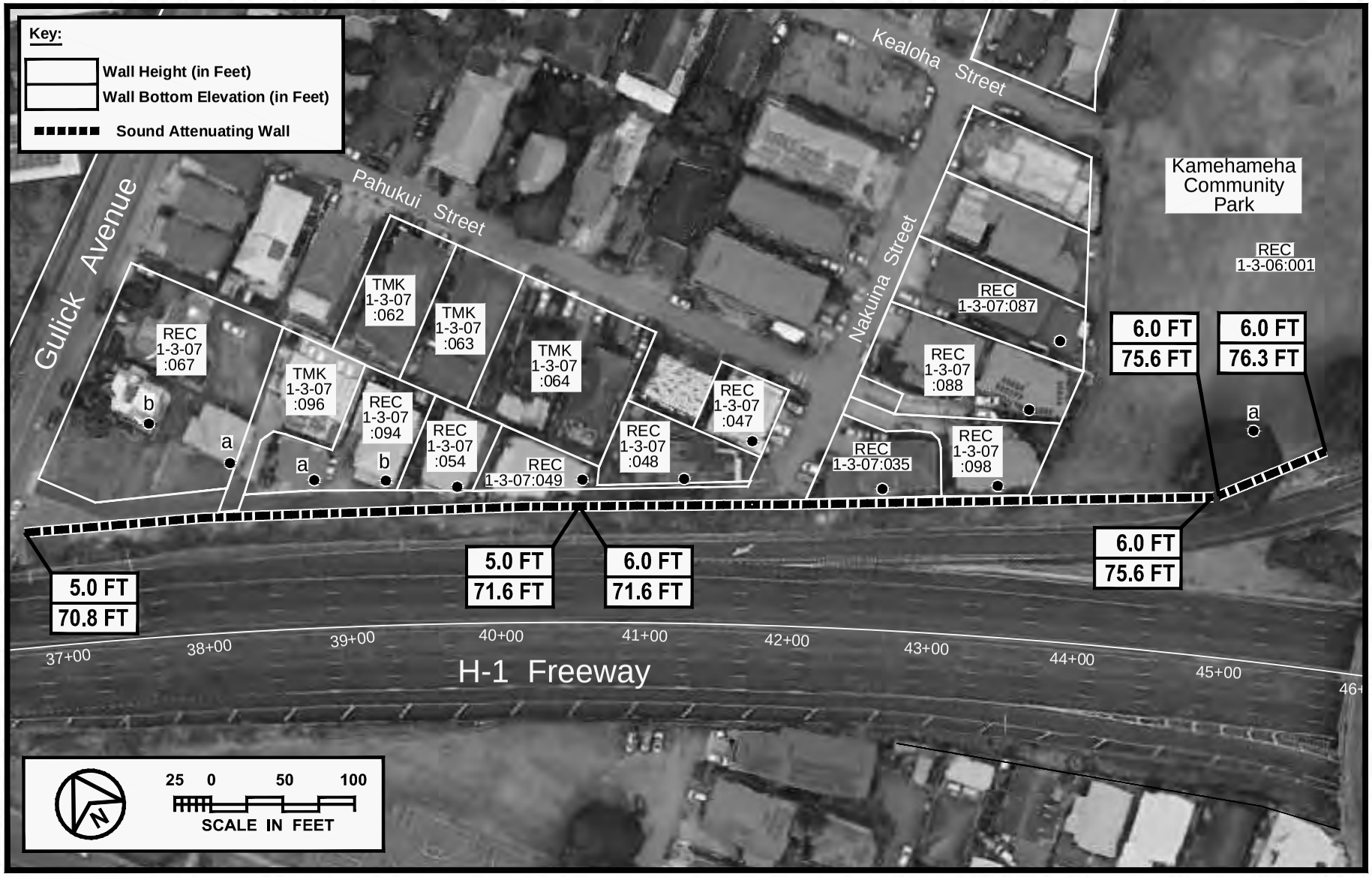
MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1A (CONT.)



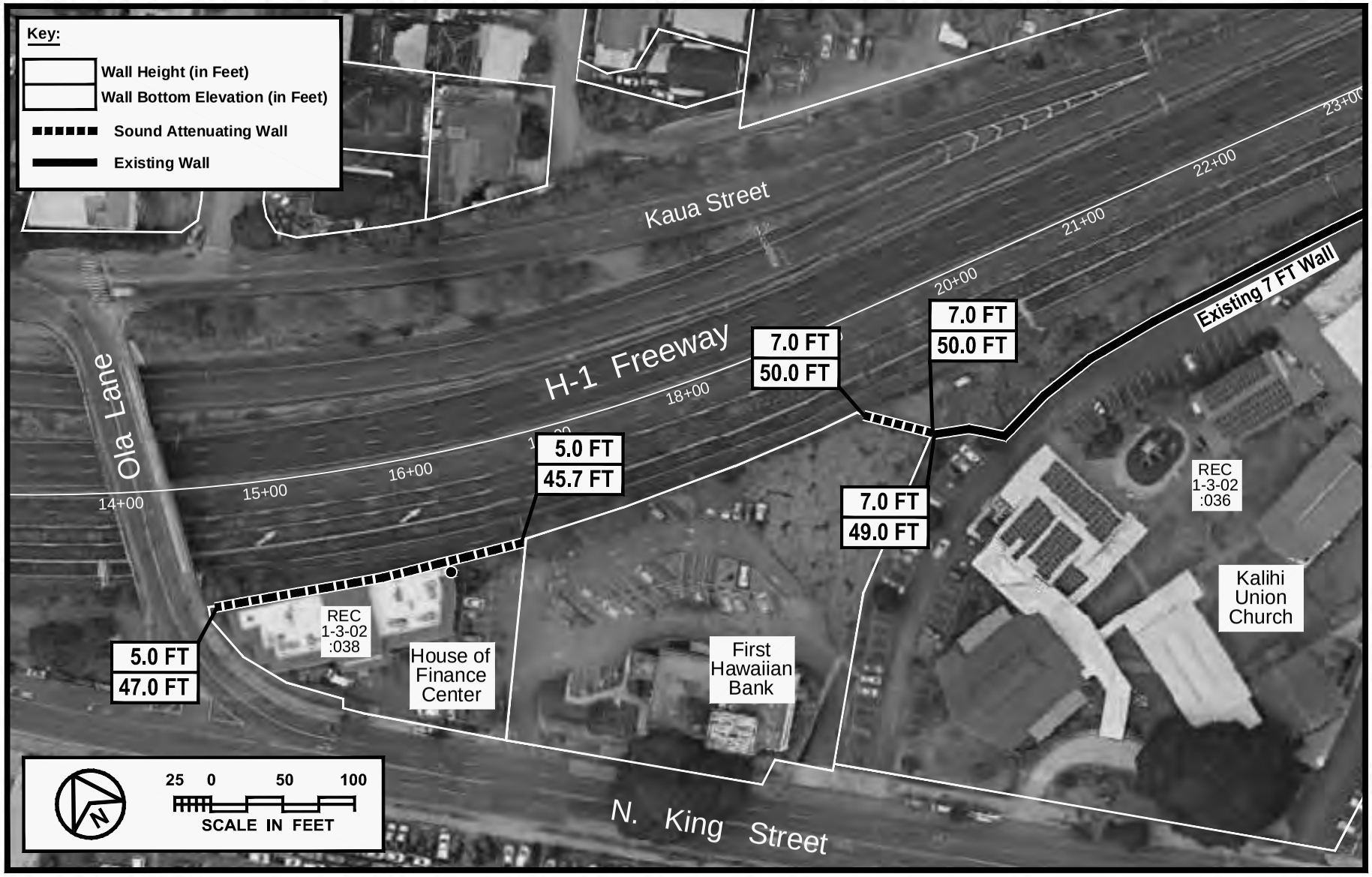
MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1A (CONT.)



MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1A (CONT.)

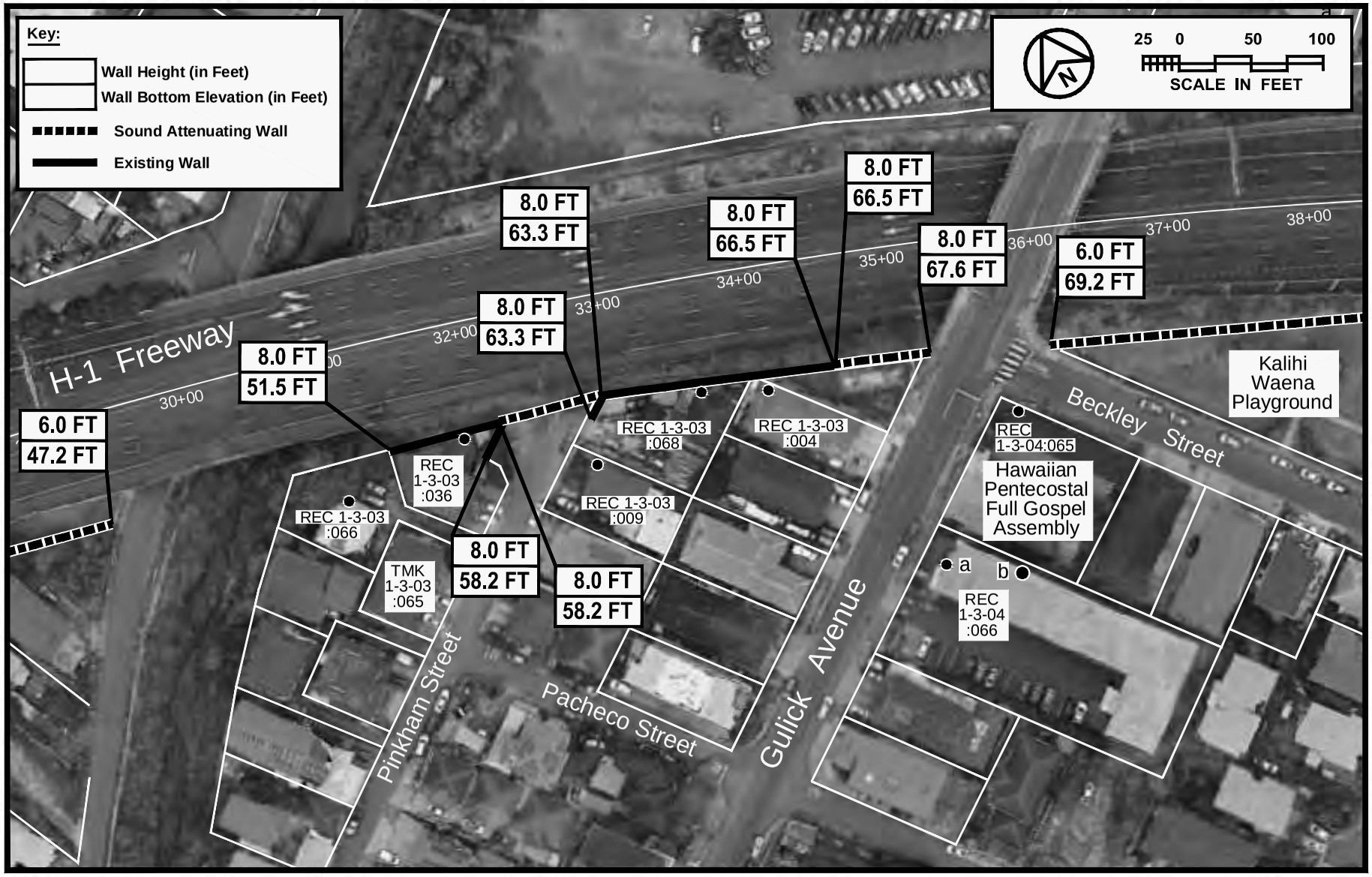


MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1B

MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1B (CONT.)

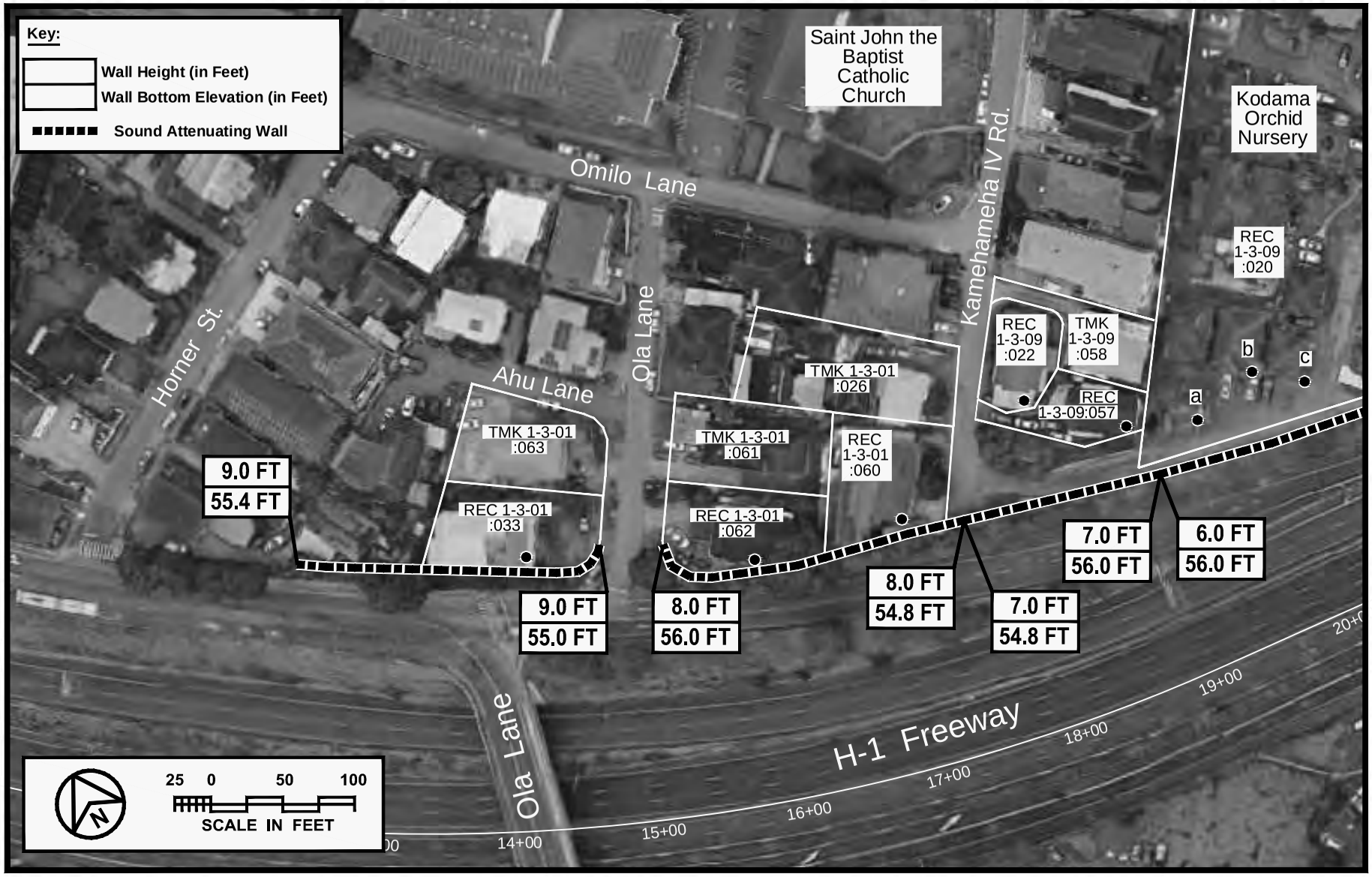


MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1B (CONT.)

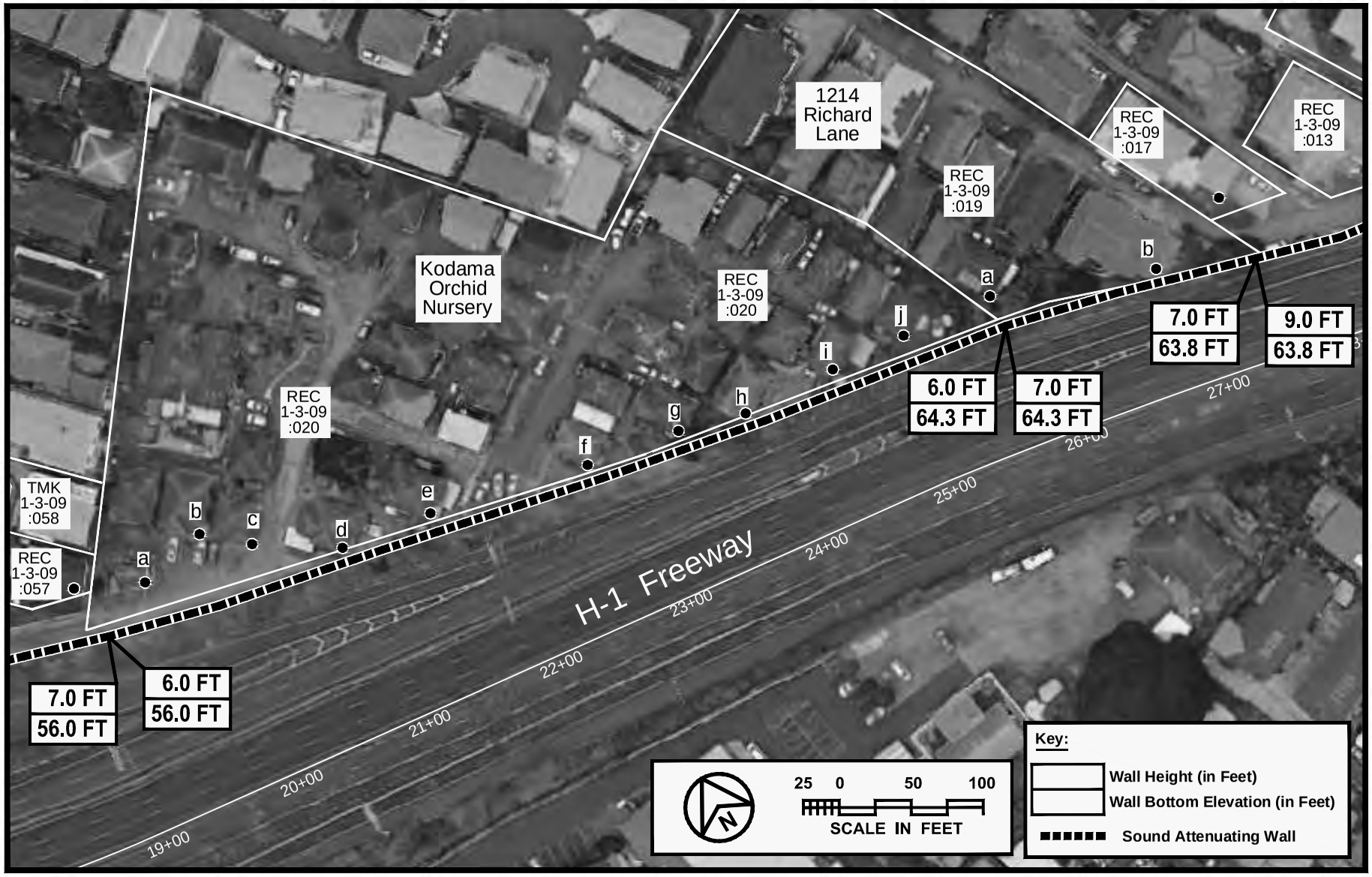
MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 5 dBA OF ATTENUATION

FIGURE V-1B (CONT.)



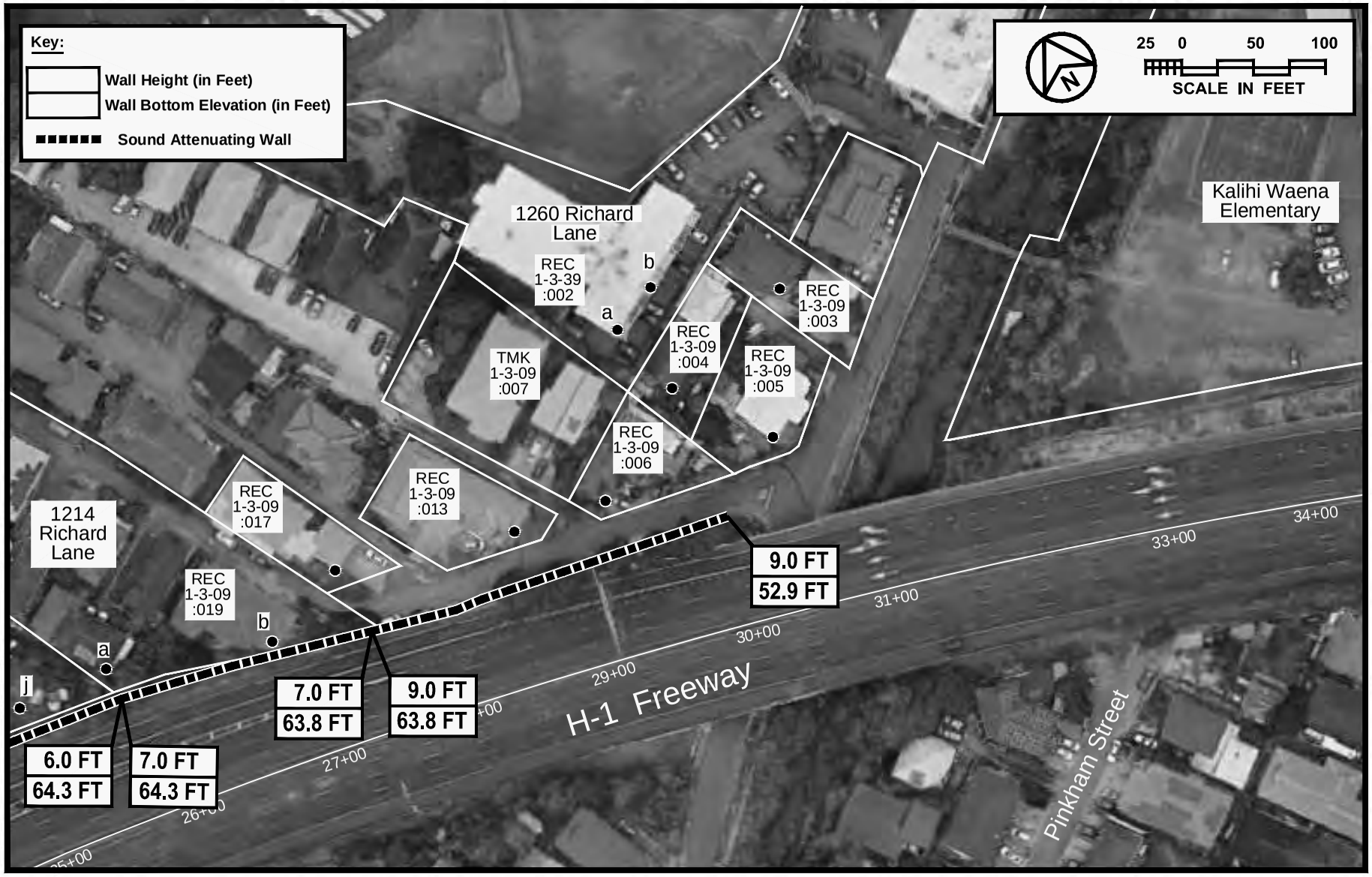
MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2A



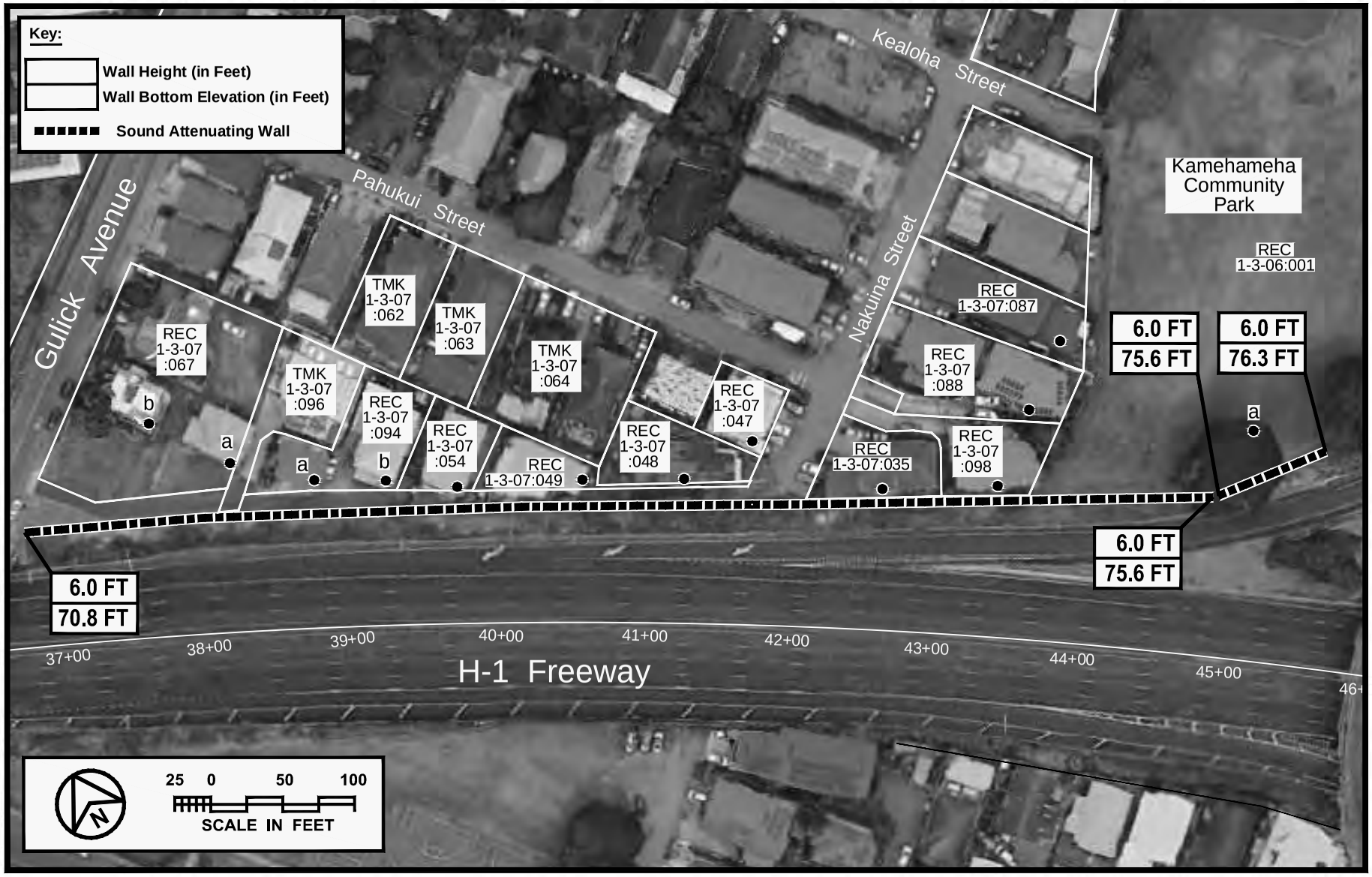
MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2A (CONT.)



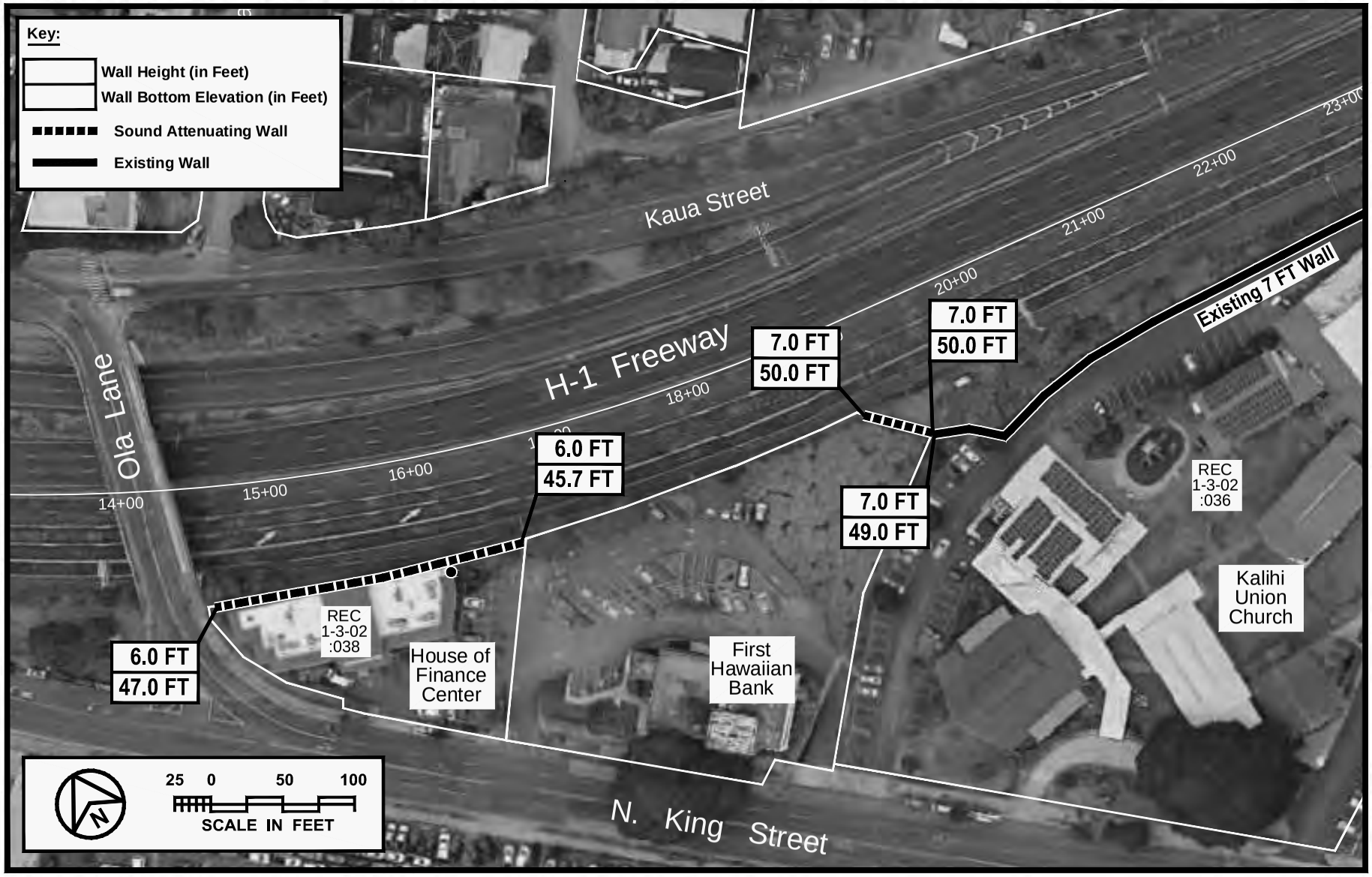
MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2A (CONT.)



MAUKA SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2A (CONT.)

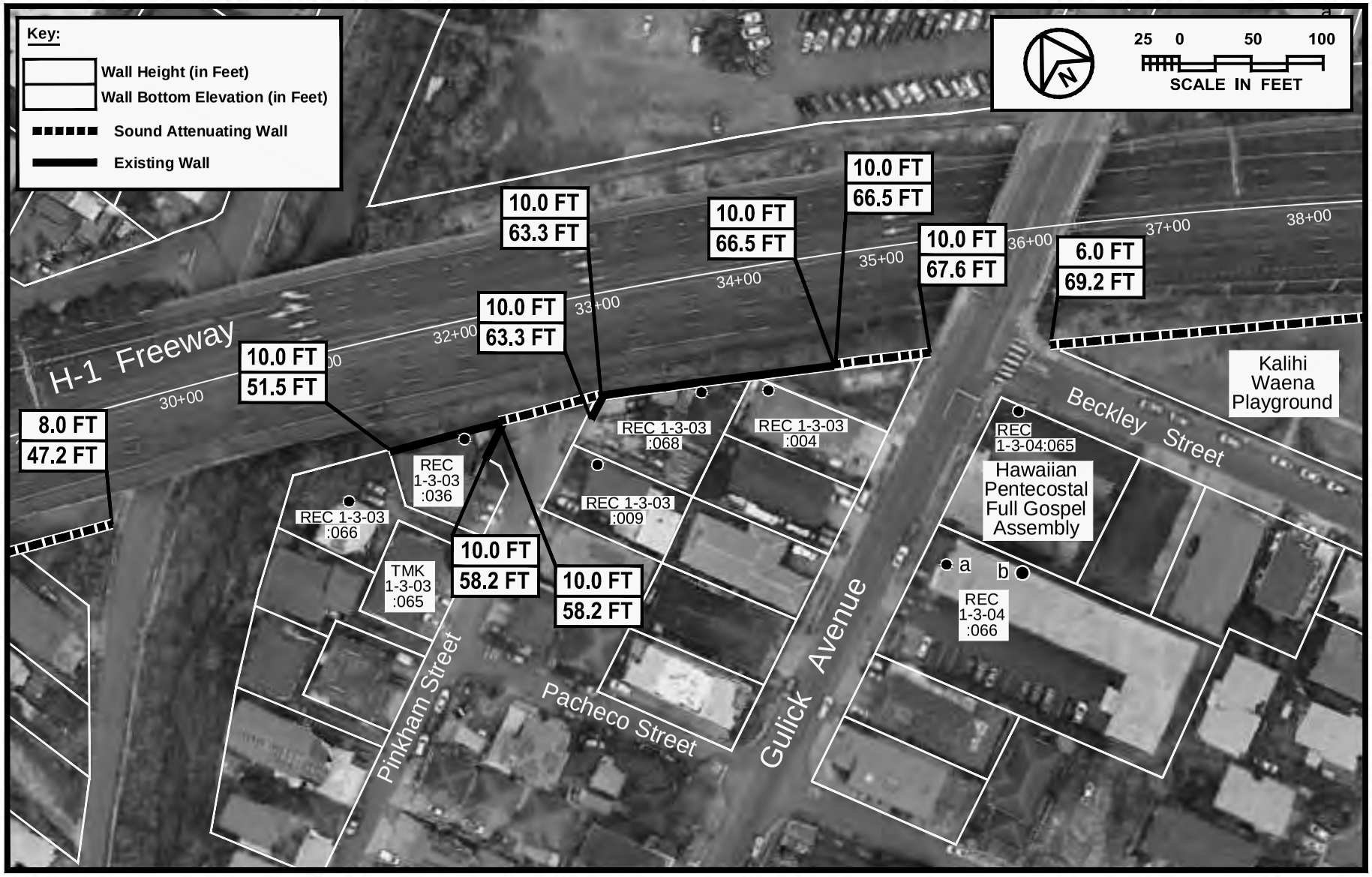


MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2B

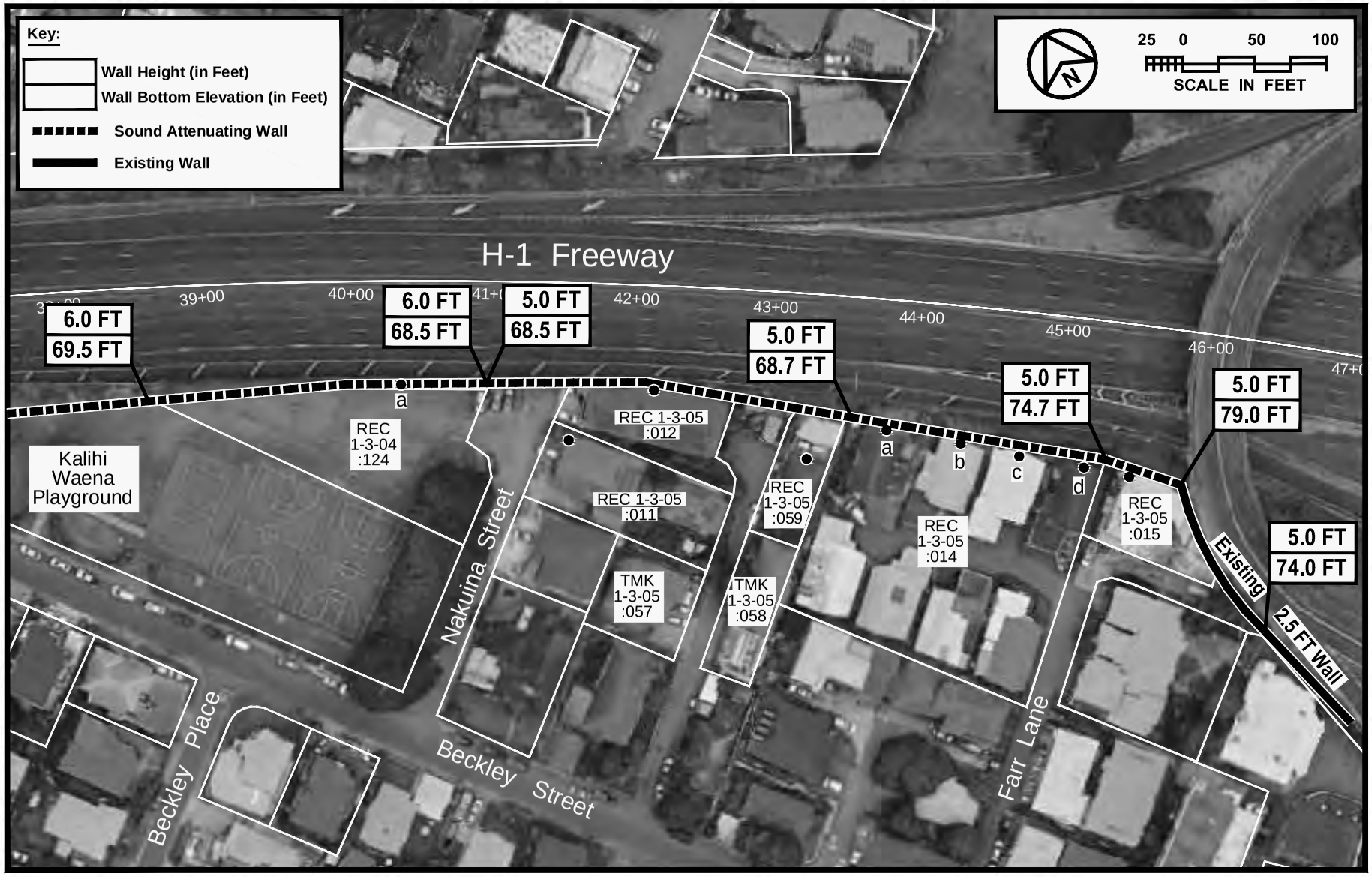
MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2B (CONT.)



MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2B (CONT.)



MAKAI SOUND ATTENUATING WALLS REQUIRED TO ACHIEVE 7 dBA OF ATTENUATION

FIGURE V-2B (CONT.)

TABLE V-2A
PREDICTED TRAFFIC NOISE ATTENUATION WITH 5 dBA AND 7 dBA MAUKA WALLS

RECEPTOR LOCATION	FUTURE NOISE LEVELS (CY 2035) Leq W/O BAR.	5 dBA WALL/ (CHANGE)	7 dBA WALL/ (CHANGE)
Receiver 1-3-01:033	67.1	61.6 / -5.5	59.5 / -7.6
Receiver 1-3-01:062	72.1	65.7 / -6.4	63.3 / -8.8
Receiver 1-3-01:061	68.2	63.0 / -5.2	61.5 / -6.7
Receiver 1-3-01:060	72.5	71.9 / -0.6	64.0 / -8.5
Receiver 1-3-09:057	72.1	64.2 / -7.9	63.9 / -8.2
Receiver 1-3-09:022	69.1	63.1 / -6.0	61.9 / -7.2
Receiver 1-3-09:058	69.0	62.9 / -6.1	62.5 / -6.5
Receiver 1-3-09:020a Kodama Orchid Nursery	73.5	65.9 / -7.6	65.0 / -8.5
Receiver 1-3-09:020b Kodama Orchid Nursery	71.5	64.9 / -6.6	64.3 / -7.2
Receiver 1-3-09:020c Kodama Orchid Nursery	73.5	66.4 / -7.1	65.4 / -8.1
Receiver 1-3-09:020d Kodama Orchid Nursery	76.1	69.7 / -6.4	67.5 / -8.6
Receiver 1-3-09:020e Kodama Orchid Nursery	76.1	69.2 / -6.9	67.3 / -8.8
Receiver 1-3-09:020f Kodama Orchid Nursery	76.7	68.1 / -8.6	66.6 / -10.1
Receiver 1-3-09:020g Kodama Orchid Nursery	77.0	69.4 / -7.6	67.7 / -9.3
Receiver 1-3-09:020h Kodama Orchid Nursery	77.7	70.7 / -7.0	68.5 / -9.2
Receiver 1-3-09:020i Kodama Orchid Nursery	77.3	69.7 / -7.6	68.3 / -9.0
Receiver 1-3-09:020j Kodama Orchid Nursery	76.9	69.6 / -7.3	68.1 / -8.8
Receiver 1-3-09:019a 1214 Richard Lane	75.5	67.9 / -7.6	66.6 / -8.9
Receiver 1-3-09:019b 1214 Richard Lane	78.5	70.9 / -7.6	67.4 / -11.1
Receiver 1-3-09:019c 1214 Richard Lane	72.3	66.5 / -5.8	65.1 / -7.2
Receiver 1-3-09:017	73.9	68.0 / -5.9	66.6 / -7.3
Receiver 1-3-09:013	73.9	65.3 / -8.6	66.5 / -7.4
Receiver 1-3-09:006	72.4	68.8 / -3.6	66.9 / -5.5
Receiver 1-3-09:007a	69.3	66.6 / -2.7	65.7 / -3.6
Receiver 1-3-09:007b	70.4	68.2 / -2.2	67.0 / -3.4
Receiver 1-3-09:004	68.8	67.9 / -0.9	67.0 / -1.8
Receiver 1-3-09:005	68.4	68.1 / -0.3	68.0 / -0.4
Receiver 1-3-09:003	66.1	65.7 / -0.4	65.4 / -0.7
Receiver 1-3-09:002	63.8	63.6 / -0.2	63.5 / -0.3
Receiver 1-3-39:002a (2nd Floor)	68.6	67.4 / -1.2	66.8 / -1.8
Receiver 1-3-39:002a (3rd Floor)	70.3	69.5 / -0.8	68.9 / -1.4
Receiver 1-3-39:002a (4th Floor)	70.9	70.5 / -0.4	70.2 / -0.7
Receiver 1-3-39:002a (5th Floor)	71.3	71.2 / -0.1	71.0 / -0.3
Receiver 1-3-39:002a (6th Floor)	71.6	71.5 / -0.1	71.5 / -0.1
Receiver 1-3-39:002b (2nd Floor)	67.4	66.5 / -0.9	65.7 / -1.7

TABLE V-2A (CONTINUED)
PREDICTED TRAFFIC NOISE ATTENUATION WITH 5 dBA AND 7 dBA MAUKA WALLS

RECEPTOR LOCATION	------- FUTURE NOISE LEVELS (CY 2035) Leq --------		
	W/O BAR.	5 dBA WALL/ (CHANGE)	7 dBA WALL/ (CHANGE)
Receiver 1-3-39:002b (3rd Floor)	69.1	68.3 / -0.8	67.9 / -1.2
Receiver 1-3-39:002b (4th Floor)	70.0	69.6 / -0.4	69.3 / -0.7
Receiver 1-3-39:002b (5th Floor)	70.4	70.3 / -0.1	70.1 / -0.3
Receiver 1-3-39:002b (6th Floor)	70.7	70.6 / -0.1	70.6 / -0.1
Receiver 1-3-07:067a	73.6	67.6 / -6.0	66.7 / -6.9
Receiver 1-3-07:067b	70.3	64.3 / -6.0	63.4 / -6.9
Receiver 1-3-07:094a	76.8	70.5 / -6.3	68.7 / -8.1
Receiver 1-3-07:094b	77.5	71.6 / -5.9	69.5 / -8.0
Receiver 1-3-07:054	78.5	72.6 / -5.9	70.2 / -8.3
Receiver 1-3-07:049	78.0	71.5 / -6.5	69.2 / -8.8
Receiver 1-3-07:047	75.1	67.8 / -7.3	67.8 / -7.3
Receiver 1-3-07:048	78.2	68.7 / -9.5	68.7 / -9.5
Receiver 1-3-07:035	78.4	71.0 / -7.4	71.0 / -7.4
Receiver 1-3-07:098	77.0	65.1 / -11.9	65.1 / -11.9
Receiver 1-3-07:088	70.1	64.7 / -5.4	64.7 / -5.4
Receiver 1-3-07:087	66.2	62.7 / -3.5	62.7 / -3.5
Receiver 1-3-06:001a	67.8	66.0 / -1.8	66.0 / -1.8

TABLE V-2B
PREDICTED TRAFFIC NOISE ATTENUATION WITH 5 dBA AND 7 dBA MAKAI WALLS

RECEPTOR LOCATION	------- FUTURE NOISE LEVELS (CY 2035) Leq -------- W/O BAR.	5 dBA WALL/ (CHANGE)	7 dBA WALL/ (CHANGE)
Receiver 1-3-02:038 House of Finance Center	77.6	72.4 / -5.2	68.5 / -9.1
Receiver 1-3-02:036d Kalihi Union Church	77.2	67.9 / -9.3	66.2 / -11.0
Receiver 1-3-02:030	69.0	64.6 / -4.4	63.6 / -5.4
Receiver 1-3-02:033	73.1	67.2 / -5.9	65.8 / -7.3
Receiver 1-3-02:034	67.3	65.3 / -2.0	64.5 / -2.8
Receiver 1-3-02:035	66.6	66.0 / -0.6	65.3 / -1.3
Receiver 1-3-03:066	73.8	73.5 / -0.3	72.8 / -1.0
Receiver 1-3-03:036	73.5	68.5 / -5.0	66.2 / -7.3
Receiver 1-3-03:068	73.2	67.9 / -5.3	65.4 / -7.8
Receiver 1-3-03:004	71.3	67.3 / -4.0	65.2 / -6.1
Receiver 1-3-03:009	71.9	66.6 / -5.3	65.6 / -6.3
Receiver 1-3-04:065 Hawaiian Pentecostal	66.9	65.6 / -1.3	65.4 / -1.5
Receiver 1-3-04:066a (3rd Floor)	67.3	64.4 / -2.9	63.9 / -3.4
Receiver 1-3-04:066a (4th Floor)	72.0	67.4 / -4.6	66.7 / -5.3
Receiver 1-3-04:066b (3rd Floor)	67.0	64.1 / -2.9	63.6 / -3.4
Receiver 1-3-04:066b (4th Floor)	71.7	67.1 / -4.6	66.4 / -5.3
Receiver 1-3-05:124a Kalihi Waena Park	81.0	71.5 / -9.5	71.5 / -9.5
Receiver 1-3-05:012	80.5	72.5 / -8.0	72.5 / -8.0
Receiver 1-3-05:011	77.0	67.3 / -9.7	67.3 / -9.7
Receiver 1-3-05:059	76.1	67.1 / -9.0	67.1 / -9.0
Receiver 1-3-05:014a Kamehameha Gardens	78.5	73.1 / -5.4	73.1 / -5.4
Receiver 1-3-05:014b Kamehameha Gardens	78.0	70.2 / -7.8	70.2 / -7.8
Receiver 1-3-05:014c Kamehameha Gardens	77.6	70.3 / -7.3	70.3 / -7.3
Receiver 1-3-05:014d Kamehameha Gardens	76.6	67.1 / -9.5	67.1 / -9.5
Receiver 1-3-05:015	71.0	64.4 / -6.6	64.4 / -6.6

Tables V-3A and V-3B also identify the noise impacted receptors, those which are predicted to benefit from the construction of the recommended walls with 5 and 7 dBA of traffic noise attenuation, and those which are not expected to benefit from the recommended walls. Table V-4 summarizes the total numbers of benefited receptors resulting from the implementation of the 5 and 7 dBA sound attenuating walls shown in Figures V-1A, V-1B, V-2A, and V-2B. Of the 171 total noise impacted receptors, 94 receptors (or 55.0 percent of the 171 impacted receptors are predicted to experience at least 5 dBA traffic noise attenuation. This total number of benefited receptors falls short of the minimum 66.7 percent required by the FHWA/HDOT noise policy. Based on this result, the mauka or makai sound attenuating walls would not qualify for inclusion within the H-1 Widening construction project.

TABLE V-3A

SUMMARY OF IMPACTED AND BENEFITED RECEPTORS
MAUKA SOUND ATTENUATING WALLS

RECEPTOR LOCATION	Without Mitigation dBA	Total Impacted Receptors	---BENEFITED RECEPTORS --- By 5 dBA Wall	By 7 dBA Wall
H-1 FREEWAY (MAUKA):				
Receiver 1-3-01:033	67.1	3	3	3
Receiver 1-3-01:062	72.1	4	4	4
Receiver 1-3-01:060	72.5	6	0	6
Receiver 1-3-09:057	72.1	2	2	2
Receiver 1-3-09:022	69.1	1	1	1
Receiver 1-3-09:020a Kodama Orchid Nursery	73.5	2	2	2
Receiver 1-3-09:020b Kodama Orchid Nursery	71.5	1	1	1
Receiver 1-3-09:020c Kodama Orchid Nursery	73.5	2	2	2
Receiver 1-3-09:020d Kodama Orchid Nursery	76.1	2	2	2
Receiver 1-3-09:020e Kodama Orchid Nursery	76.1	3	3	3
Receiver 1-3-09:020f Kodama Orchid Nursery	76.7	2	2	2
Receiver 1-3-09:020g Kodama Orchid Nursery	77.0	2	2	2
Receiver 1-3-09:020h Kodama Orchid Nursery	77.7	3	3	3
Receiver 1-3-09:020i Kodama Orchid Nursery	77.3	2	2	2
Receiver 1-3-09:020j Kodama Orchid Nursery	76.9	2	2	2
Receiver 1-3-09:019a 1214 Richard Lane	75.5	2	2	2
Receiver 1-3-09:019b 1214 Richard Lane	78.5	2	2	2
Receiver 1-3-09:017	73.9	2	2	2
Receiver 1-3-09:013	73.9	4	4	4
Receiver 1-3-09:006	72.4	2	0	0
Receiver 1-3-09:004	68.8	1	0	0
Receiver 1-3-09:005	68.4	1	0	0
Receiver 1-3-09:003	66.1	1	0	0
Receiver 1-3-39:002a (2nd Floor)	68.6	2	0	0
Receiver 1-3-39:002a (3rd Floor)	70.3	2	0	0
Receiver 1-3-39:002a (4th Floor)	70.9	2	0	0
Receiver 1-3-39:002a (5th Floor)	71.3	2	0	0
Receiver 1-3-39:002a (6th Floor)	71.6	2	0	0
Receiver 1-3-39:002b (2nd Floor)	67.4	4	0	0
Receiver 1-3-39:002b (3rd Floor)	69.1	4	0	0
Receiver 1-3-39:002b (4th Floor)	70.0	4	0	0
Receiver 1-3-39:002b (5th Floor)	70.4	4	0	0
Receiver 1-3-39:002b (6th Floor)	70.7	4	0	0
Receiver 1-3-07:067a	73.6	1	1	0
Receiver 1-3-07:067b	70.3	1	1	0
Receiver 1-3-07:094a	76.8	2	2	2
Receiver 1-3-07:094b	77.5	2	2	2
Receiver 1-3-07:054	78.5	3	3	3

TABLE V-3A (CONTINUED)

SUMMARY OF IMPACTED AND BENEFITED RECEPTORS
MAUKA SOUND ATTENUATING WALLS

RECEPTOR LOCATION	Without Mitigation dBA	Total Impacted Receptors	---BENEFITED RECEPTORS --- By 5 dBA Wall	By 7 dBA Wall
H-1 FREEWAY (MAUKA) (Continued):				
Receiver 1-3-07:049	78.0	3	3	3
Receiver 1-3-07:047	75.1	2	2	2
Receiver 1-3-07:048	78.2	2	2	2
Receiver 1-3-07:035	78.4	1	1	1
Receiver 1-3-07:098	77.0	2	2	2
Receiver 1-3-07:088	70.1	1	1	0
Receiver 1-3-07:087	66.2	3	0	0
Receiver 1-3-06:001a	67.8	3	0	0
TOTALS:		108	61	64

TABLE V-3B

SUMMARY OF IMPACTED AND BENEFITED RECEPTORS
MAKAI SOUND ATTENUATING WALLS

RECEPTOR LOCATION	Without Mitigation dBA	Total Impacted Receptors	---BENEFITED RECEPTORS --- By 5 dBA Wall	By 7 dBA Wall
H-1 FREEWAY (MAKAI):				
Receiver 1-3-02:038 House of Finance Center	77.6	3	3	3
Receiver 1-3-02:036b Kalihi Union Church	66.5	12	0	0
Receiver 1-3-02:030	69.0	1	0	0
Receiver 1-3-02:033	73.1	2	2	2
Receiver 1-3-02:034	67.3	1	0	0
Receiver 1-3-02:035	66.6	1	0	0
Receiver 1-3-03:066	73.8	1	0	0
Receiver 1-3-03:036	73.5	2	2	2
Receiver 1-3-03:068	73.2	1	1	1
Receiver 1-3-03:004	71.3	1	0	0
Receiver 1-3-03:009	71.9	1	1	0
Receiver 1-3-04:065 Hawaiian Pentecostal	66.9	1	0	0
Receiver 1-3-04:066a (3rd Floor)	67.3	3	0	0
Receiver 1-3-04:066a (4th Floor)	72.0	3	0	0
Receiver 1-3-04:066b (3rd Floor)	67.0	3	0	0
Receiver 1-3-04:066b (4th Floor)	71.7	3	0	0
Receiver 1-3-05:124a Kalihi Waena Park	81.0	9	9	9
Receiver 1-3-05:012	80.5	3	3	3
Receiver 1-3-05:011	77.0	1	1	1
Receiver 1-3-05:059	76.1	2	2	2
Receiver 1-3-05-014a Kamehameha Gardens	78.5	2	2	0
Receiver 1-3-05-014b Kamehameha Gardens	78.0	2	2	2
Receiver 1-3-05-014c Kamehameha Gardens	77.6	2	2	2
Receiver 1-3-05-014d Kamehameha Gardens	76.6	2	2	2
Receiver 1-3-05:015	71.0	1	1	0
TOTALS:		63	33	29

TABLE V-4

SUMMARY OF IMPACTED AND BENEFITED RECEPTORS MAUKA AND MAKAI SOUND ATTENUATING WALLS

RECEPTOR LOCATION	Total Impacted Receptors	---BENEFITED RECEPTORS --- By 5 dBA Wall	By 7 dBA Wall
On Mauka Side of H-1 Freeway	108	61	64
On Makai Side of H-1 Freeway	63	33	29
TOTALS:	171	94	93
Percent of Impacted Receptors:		55.0%	
Percent of Benefited Receptors:			98.9%

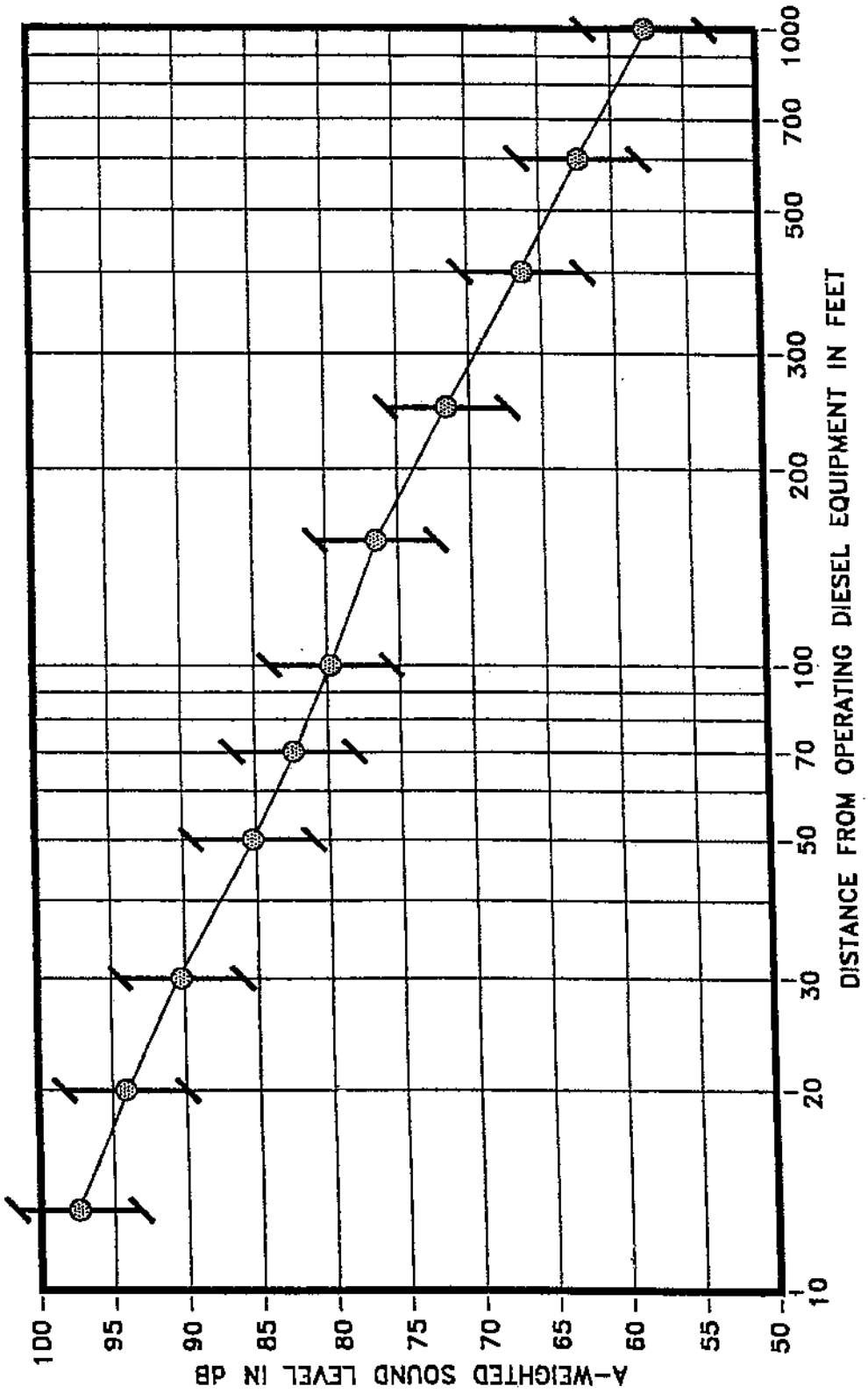
CHAPTER VI. CONSTRUCTION NOISE IMPACTS

Short-term noise impacts associated with construction activities along the freeway corridor between the Ola Lane to Kalihi Interchange may occur on the makai side. The greatest impacts are expected to occur at the makai side of the project corridor where the widened Off Ramp lane at Kalihi Interchange is included in the project. The remaining construction activities included in the project involve removal and reconstruction of retaining walls, restriping inbound lanes, modifications to inbound shoulders, and construction of new sound attenuating walls. The total duration of the construction period for the proposed project is not known, but noise exposure from construction activities at any one receptor location is not expected to be continuous during the total construction period.

Noise levels of diesel powered construction equipment typically range from 80 to 90 dBA at 50 FT distance. Typical levels of noise from construction activity (excluding pile driving activity) are shown in Figure VI-1. The maximum impulsive noise levels of rock breaking equipment (such as hoe rams) can be 5 to 8 dBA greater than those shown in Figure VI-1. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project work areas.

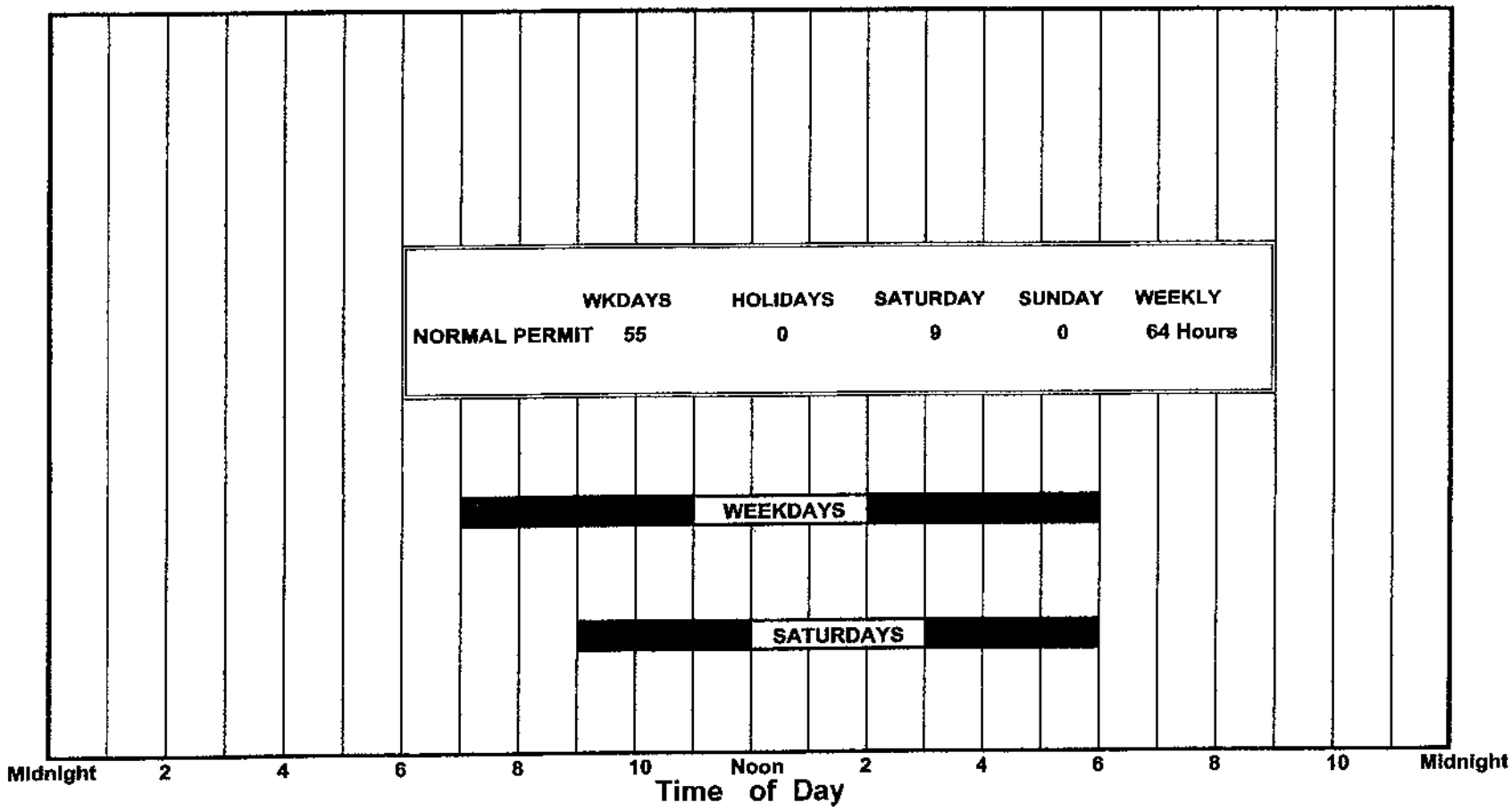
Construction noise levels at the closest existing structures can intermittently exceed 70 dBA when work is being performed at the highway's closest points to these structures. These noise levels are not unusually high and are similar to an automobile at 50 feet. The State Department of Health currently regulates noise from construction activities under a permit system (Reference 5). Under current permit procedures (see Figure VI-2), noisy construction activities are restricted to hours between 7:00 AM and 6:00 PM, from Monday through Friday, and exclude certain holidays. Noisy construction activities are normally restricted to the hours of 9:00 AM to 6:00 PM on Saturdays, with construction not permitted on Sundays. These restrictions minimize construction noise impacts on noise sensitive receptors (such as residences) along the roadway project corridor, and have generally been successfully applied. In this way, construction noise impacts on noise sensitive receptors can be minimized.

In addition, the use of quieted portable engine generators and diesel equipment should be specified for use within 500 FT of noise sensitive properties. Heavy truck and equipment staging areas should also be located at areas which are at least 500 FT from noise sensitive properties whenever possible. Truck routes which avoid residential communities should be identified wherever possible.



ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE VI-1



AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

FIGURE VI-2

APPENDIX A. REFERENCES

(1) "FHWA Highway Traffic Noise Model User's Guide;" FHWA-PD-96-009, Federal Highway Administration; Washington, D.C.; January 1998 and Version 2.5 Upgrade (April 14, 2004).

(2) Base Year and 2035 Traffic Volume and Heavy Truck Mix from Jacobs Engineering, Inc. via June 9 and 10, 2020 emails.

(3) Federal Highway Administration; "Procedures for Abatement of Highway Traffic Noise and Construction Noise;" 23 CFR Chapter I, Subchapter H, Part 772;" April 1, 1995.

(4) "Highway Noise Policy and Abatement Guidelines;" State of Hawaii, Department of Transportation, Highways Division and U.S. Department of Transportation, Federal Highway Administration; April 18, 2016.

(5) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CNABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

TERM	SYMBOL
1. A-Weighted Sound Level	L_A
2. A-Weighted Sound Power Level	L_{WA}
3. Maximum A-Weighted Sound Level	L_{max}
4. Peak A-Weighted Sound Level	L_{Apk}
5. Level Exceeded x% of the Time	L_x
6. Equivalent Sound Level	L_{eq}
7. Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8. Day Sound Level	L_d
9. Night Sound Level	L_n
10. Day-Night Sound Level	L_{dn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$
12. Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78,

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

TERM	A-WEIGHTING	ALTERNATIVE[1] A-WEIGHTING	OTHER[2] WEIGHTING	UNWEIGHTED
1. Sound (Pressure)[3] Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2. Sound Power Level	L_{WA}		L_{WB}	L_W
3. Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4. Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5. Level Exceeded x% of the Time	L_x	L_{Ax}	L_{Bx}	L_{px}
6. Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7. Equivalent Sound Level[4] Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8. Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9. Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10. Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12. Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13. Energy Average Value Over (Non-Time Domain) Set of Observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14. Level Exceeded x% of the Total Set of (Non-Time Domain) Observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15. Average L_x Value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

APPENDIX C

SUMMARY OF BASE YEAR AND FUTURE YEAR TRAFFIC VOLUMES ALONG H-1 FREEWAY

ROADWAY LANES	********** CY 2019 *********			********** CY 2035 *********		
	AM VPH	MIDDAY	PM VPH	AM VPH	MIDDAY	PM VPH
H-1 Freeway Mainline At Kahauiki I.C. (EB)	4,200	3,850	3,100	4,300	3,900	3,150
H-1 Freeway Mainline At Kahauiki I.C. (WB)	4,150	4,600	3,550	4,250	4,650	3,650
Two-Way	8,350	8,450	6,650	8,550	8,550	6,800
H-1 Freeway Mainline At Kalihi Stream Bridge (EB)	6,700	6,300	4,850	6,900	6,450	4,950
H-1 Freeway Mainline At Kalihi Stream Bridge (WB)	7,050	6,650	5,700	7,250	6,750	5,850
Two-Way	13,750	12,950	10,550	14,150	13,200	10,800
H-1 Freeway Mainline At Kalihi I.C. (EB)	5,850	5,650	4,250	6,050	5,700	4,300
H-1 Freeway Mainline At Kalihi I.C. (WB)	6,550	6,150	5,250	6,750	6,250	5,400
Two-Way	12,400	11,800	9,500	12,800	11,950	9,700
KALIHI INTERCHANGE						
Off Ramp, H-1 (WB) to Kalihi St. (NB) (H1-20F)	1,050	1,100	1,000	1,050	1,150	1,050
On Ramp, H-1 (WB) from Kalihi St. (SB) (Ramp R-3)	500	500	450	500	500	450
Off Ramp, H-1 (EB) to Kalihi St. (NB) (Ramp R-1)	850	650	600	850	700	650
On Ramp, H-1 (EB) from Kalihi St. (NB/SB) (H1-20D)	2,050	1,950	1,600	2,100	1,950	1,650
KAHAUIKI INTERCHANGE						
Off Ramp, H-1 (WB) to Middle/Kaua St (WB) (H1-19A)	400	350	350	400	350	350
Off Ramp, H-1 (WB) to Viaduct. (WB) (Ramp 2B)	2,500	1,700	1,800	2,600	1,750	1,850
On Ramp, Viaduct to H-1 (EB) (H1-19)	2,500	2,450	1,750	2,600	2,500	1,800

Appendix D

Appendix D

DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

Gulick Avenue Bridge
Gulick Avenue
Honolulu, HI 96819

Inquiry Number: 6085048.19s
June 08, 2020

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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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), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

GULICK AVENUE
HONOLULU, HI 96819

COORDINATES

Latitude (North):	21.3352480 - 21˚ 20' 6.89''
Longitude (West):	157.8761990 - 157˚ 52' 34.31''
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	616539.9
UTM Y (Meters):	2359528.0
Elevation:	71 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5941635 HONOLULU, HI
Version Date:	2013

MAPPED SITES SUMMARY

Target Property Address:
GULICK AVENUE
HONOLULU, HI 96819

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
Reg	FORT SHAFTER		DOD	Same	623, 0.118, NW
A1	KALIHI CENTRAL OFFIC	1025 KAILI ST	UST, Financial Assurance	Lower	995, 0.188, South
B2	LONGS DRUG STORE NO	2070 NORTH KING STRE	RCRA-VSQG	Lower	1019, 0.193, SW
3	KUHIO PARK TERRACE	1518 LINAPUNI STREET	US BROWNFIELDS	Higher	1058, 0.200, North
C4	IES RETAIL KALIHI ST	2160 N KING ST	RCRA-VSQG, FINDS, ECHO	Lower	1116, 0.211, WSW
C5	IES RETAIL KALIHI ST	2160 N. KING ST.	LUST, UST, Financial Assurance	Lower	1116, 0.211, WSW
A6	AIM KING STREET	1860 N KING ST	LUST, UST, Financial Assurance	Lower	1136, 0.215, South
B7	USEPA R9 REMOVAL ACT	2003 N. KING ST.	RCRA-LQG	Lower	1203, 0.228, SW
B8	FACTORY STREET SITE	2003 N. KING STREET	SEMS-ARCHIVE	Lower	1203, 0.228, SW
B9	FACTORY STREET LEAD	2003 N KING ST	SHWS, ENG CONTROLS, INST CONTROL, SPILLS	Lower	1203, 0.228, SW
D10	PACIFIC TIRE	1955 N KING ST	LUST, UST	Lower	1260, 0.239, SW
C11	HOKU SCIENTIFIC INC	2153 NORTH KING STRE	RCRA NonGen / NLR, ICIS, FINDS, ECHO	Lower	1312, 0.248, WSW
E12	C&CH KALIHI FIRE STA	1742 N KING ST	LUST, UST	Lower	1369, 0.259, South
D13	MORRIS ANGELO	905 FACTORY ST	LUST, UST	Lower	1451, 0.275, SW
E14	IES RETAIL KALIHI	1715 N KING ST	LUST, UST, Financial Assurance	Lower	1478, 0.280, South
15	CHANG-CHOW PROPERTY,	2161 N SCHOOL ST	SHWS	Higher	1610, 0.305, NNE
16	KUHIO PARK TERRACE C	1475 LINAPUNI ST	SHWS, ENG CONTROLS, INST CONTROL	Higher	1629, 0.309, NNW
17	BASE YARD NO. 25		FUDS	Higher	1647, 0.312, ENE
18	RAKUYO KEN U.S.A.	804 GULICK AVE	LUST, UST	Lower	1701, 0.322, WSW
F19	NEW CITY NISSAN	2295 NORTH KING STRE	US BROWNFIELDS	Lower	1880, 0.356, West
F20	KSC SERVICE L-4210	2295 N KING ST	LUST, UST	Lower	1880, 0.356, West
21	KAMEHAMEHA HOUSING P	1629 HAKA DR	LUST, UST	Lower	1978, 0.375, South
G22	FARRINGTON HIGH SCHO	1564 NORTH KING STRE	SEMS	Lower	2019, 0.382, SSE
G23	FARRINGTON HIGH SCHO	1564 N KING ST	SHWS, SPILLS, FTTS, HIST FTTS	Lower	2019, 0.382, SSE
G24	FARRINGTON HIGH SCHO	1564 N. KING STREET	SEMS-ARCHIVE	Lower	2019, 0.382, SSE
25	KUHIO PARK TERRACE	1600 HAUPU PL	US BROWNFIELDS	Higher	2076, 0.393, ENE
26	SAFETY KLEEN CORP 7	723 UMI ST	RCRA-TSDF, RCRA NonGen / NLR	Lower	2129, 0.403, WSW
H27	IES RETAIL MIDDLE ST	1305 MIDDLE ST	LUST, UST, SPILLS, Financial Assurance	Higher	2187, 0.414, NW
I28	AIM KAM IV	2314 N SCHOOL ST	LUST, UST, Financial Assurance	Higher	2218, 0.420, NNE
H29	KANE'S AUTO REPAIR	1325 MIDDLE ST	LUST, UST	Higher	2319, 0.439, NNW
30	2343 NORTH KING STRE	2343 N KING ST	SHWS, INST CONTROL	Lower	2360, 0.447, WNW
I31	HELE KAM IV 7-11 #16	2404 N SCHOOL ST	LUST, UST	Higher	2368, 0.448, North
32	BASE YARD NO. 3 & 4		FUDS	Higher	2715, 0.514, NE
33	HI ARSENAL MILITARY		FUDS	Lower	2746, 0.520, WNW
34	MARSHALL'S SHELL SS	1029 HOUGHTAILING ST	SHWS, LUST, UST, ENG CONTROLS, INST CONTROL,...	Lower	2871, 0.544, SE
35	DILLINGHAM BOULEVARD	DILLINGHAM BLVD & MO	SHWS, ENG CONTROLS, INST CONTROL	Lower	2917, 0.552, SW
J36	220TH SIGNAL DEPOT C		FUDS	Lower	2936, 0.556, West
J37	OTS BUS UNIT REPAIR	811 MIDDLE ST	SHWS, LUST, UST, Financial Assurance	Lower	3071, 0.582, West
38	1812 COLBURN STREET	1812 COLBURN ST	SHWS, INST CONTROL	Lower	3140, 0.595, SSW

MAPPED SITES SUMMARY

Target Property Address:
GULICK AVENUE
HONOLULU, HI 96819

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
K39	HAWAII DAIRY HOLDING	2277 KAMEHAMEHA HWY	SHWS, LUST, UST, VCP, Financial Assurance	Lower	3488, 0.661, WSW
K40	LENAKONA DEVELOPMENT	2305 KAMEHAMEHA HWY	SHWS, LUST, UST	Lower	3630, 0.688, WSW
41	TAKAMIYA PROPERTY	850 MOOWAA ST	SHWS, SPILLS	Lower	3642, 0.690, SSE
L42	HAWAII MEAT COMPANY	711 MIDDLE ST	SHWS, ENG CONTROLS, INST CONTROL, SPILLS	Lower	3704, 0.702, West
43	ROSS TRUSTS	819 MOOWAA ST	SHWS, VCP	Lower	3812, 0.722, SSE
L44	YEE HOP PROPERTY	621 MIDDLE ST	SHWS, SPILLS	Lower	3939, 0.746, West
45	JOHIRO BROTHERS, INC	1240 MOOKAULA ST	SHWS, LUST, UST	Lower	4007, 0.759, SSE
M46	609 WAIAKAMILO ROAD	609 WAIAKAMILO RD	SHWS, SPILLS	Lower	4059, 0.769, South
47	611 MIDDLE STREET WA	611 MIDDLE ST	SHWS, ENG CONTROLS, INST CONTROL, SPILLS	Lower	4095, 0.776, West
48	PACIFIC POULTRY	1804 KANAKANUI ST	SHWS, SPILLS	Lower	4105, 0.777, SSW
N49	GTE-HAWAIIAN TEL EMP	1138 N KING ST	SHWS, ENG CONTROLS, INST CONTROL	Lower	4161, 0.788, SE
M50	KAMEHAMEHA SCHOOLS -	1336 DILLINGHAM BLVD	SHWS, SPILLS	Lower	4251, 0.805, South
O51	YUE-FUNG KWAN CONSTR	2004-2008 REPUBLICAN	SHWS, SPILLS	Lower	4290, 0.812, SW
N52	938 KOHOU STREET	938 KOHOU STREET	SHWS	Lower	4335, 0.821, SSE
P53	1385 COLBURN STREET	1385 COLBURN ST	SHWS	Lower	4421, 0.837, South
P54	GENERAL TIRE	505 WAIAKAMILO RD	SHWS, SPILLS	Lower	4469, 0.846, South
O55	1950 HOMERULE STREET	1950 HOMERULE ST	SHWS, SPILLS	Lower	4514, 0.855, SW
56	HONOLULU WOOD TREATI	2290 ALAHAO PL	SHWS	Lower	4551, 0.862, WSW
57	2147 AOAO STREET	2147 AOAO ST	SHWS, SPILLS	Higher	4570, 0.866, NE
58	MOANALUA CRASH BOAT		FUDS	Lower	4580, 0.867, West
59	CLASSIC BOWL	1190 DILLINGHAM BLVD	SHWS	Lower	4599, 0.871, South
60	JBL HAWAII, LTD	905 KOKEA ST	SHWS, ENG CONTROLS, INST CONTROL	Lower	4651, 0.881, SSE
Q61	KAPALAMA INCINERATOR	757 KOKEA ST	SHWS, INST CONTROL	Lower	4687, 0.888, SSE
Q62	KAPALAMA INCINERATOR	757 KOKEA ST	SHWS	Lower	4687, 0.888, SSE
63	DILLINGHAM BASE YARD		FUDS	Lower	4951, 0.938, South
64	SAND ISLAND ASPHALT		FUDS	Lower	4982, 0.944, SSW
R65	HAGADONE PRINTING CO	2278 HOONEE PL	SHWS, INST CONTROL	Lower	5061, 0.959, WSW
R66	LONGS DRUG STORES WA	2270 HOONEE PL	SHWS, ENG CONTROLS, INST CONTROL, SPILLS	Lower	5068, 0.960, WSW
67	1305 HART STREET	1305 HART ST	SHWS, INST CONTROL, SPILLS	Lower	5121, 0.970, South
68	HAWAIIAN BITUMULS &	248 SAND ISLAND ACCE	SHWS, LUST, UST, INST CONTROL, AIRS	Lower	5134, 0.972, SW
69	HSI MECHANICAL	227-230 PUUHALE RD	SHWS, INST CONTROL	Lower	5195, 0.984, SW
70	YOUNG BROTHERS, LTD.	1331 N NIMITZ HWY	SHWS, SPILLS	Lower	5218, 0.988, South

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

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

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ..... Federal Facility Site Information listing

Federal RCRA CORRACTS facilities list

CORRACTS ..... Corrective Action Report

Federal RCRA generators list

RCRA-SQG ..... RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

LUCIS ..... Land Use Control Information System
US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROLS ..... Institutional Controls Sites List

Federal ERNS list

ERNS ..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ..... Permitted Landfills in the State of Hawaii

State and tribal leaking storage tank lists

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

EXECUTIVE SUMMARY

State and tribal registered storage tank lists

FEMA UST ..... Underground Storage Tank Listing
INDIAN UST ..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing
VCP ..... Voluntary Response Program Sites

State and tribal Brownfields sites

BROWNFIELDS ..... Brownfields Sites

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY ..... SWRCY
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
IHS OPEN DUMPS ..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ..... Delisted National Clandestine Laboratory Register
CDL ..... Clandestine Drug Lab Listing
US CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS 2 ..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
SPILLS ..... Release Notifications
SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties

PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
FINDS	Facility Index System/Facility Registry System
DOCKET HWC	Hazardous Waste Compliance Docket Listing
ECHO	Enforcement & Compliance History Information
UXO	Unexploded Ordnance Sites
FUELS PROGRAM	EPA Fuels Program Registered Listing
AIRS	List of Permitted Facilities
DRYCLEANERS	Permitted Drycleaner Facility Listing
Financial Assurance	Financial Assurance Information Listing
LEAD	LEAD
UIC	Underground Injection Wells Listing
MINES MRDS	Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto	EDR Exclusive Historical Auto Stations
EDR Hist Cleaner	EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS	Recovered Government Archive State Hazardous Waste Facilities List
RGA LF	Recovered Government Archive Solid Waste Facilities List
RGA LUST	Recovered Government Archive Leaking Underground Storage Tank

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.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

SEMS: SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the SEMS list, as provided by EDR, and dated 04/27/2020 has revealed that there is 1 SEMS site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FARRINGTON HIGH SCHO	1564 NORTH KING STRE	SSE 1/4 - 1/2 (0.382 mi.)	G22	70

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 04/27/2020 has revealed that there are 2 SEMS-ARCHIVE sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FACTORY STREET SITE Site ID: 0904939 EPA Id: HI0000049775	2003 N. KING STREET	SW 1/8 - 1/4 (0.228 mi.)	B8	35
FARRINGTON HIGH SCHO	1564 N. KING STREET	SSE 1/4 - 1/2 (0.382 mi.)	G24	81

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or

dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-TSDF list, as provided by EDR, and dated 03/23/2020 has revealed that there is 1 RCRA-TSDF site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAFETY KLEEN CORP 7 EPA ID:: HIT000614008	***723 UMI ST***	***WSW 1/4 - 1/2 (0.403 mi.)***	***26***	***85***

Federal RCRA generators list

RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

A review of the RCRA-LQG list, as provided by EDR, and dated 03/23/2020 has revealed that there is 1 RCRA-LQG site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
USEPA R9 REMOVAL ACT EPA ID:: HIP000200203	2003 N. KING ST.	SW 1/8 - 1/4 (0.228 mi.)	B7	34

RCRA-VSQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-VSQG list, as provided by EDR, and dated 03/23/2020 has revealed that there are 2 RCRA-VSQG sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
LONGS DRUG STORE NO EPA ID:: HIR000140020	2070 NORTH KING STRE	SW 1/8 - 1/4 (0.193 mi.)	B2	9
IES RETAIL KALIHI ST EPA ID:: HID981655285	***2160 N KING ST***	***WSW 1/8 - 1/4 (0.211 mi.)***	***C4***	***14***

EXECUTIVE SUMMARY

State- and tribal - equivalent CERCLIS

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

A review of the SHWS list, as provided by EDR, and dated 04/17/2019 has revealed that there are 38 SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHANG-CHOW PROPERTY,	2161 N SCHOOL ST	NNE 1/4 - 1/2 (0.305 mi.)	15	63
KUHIO PARK TERRACE C	***1475 LINAPUNI ST***	***NNW 1/4 - 1/2 (0.309 mi.)***	***16***	***63***
2147 AOAO STREET	***2147 AOAO ST***	***NE 1/2 - 1 (0.866 mi.)***	***57***	***163***

Lower Elevation	Address	Direction / Distance	Map ID	Page
FACTORY STREET LEAD	***2003 N KING ST***	***SW 1/8 - 1/4 (0.228 mi.)***	***B9***	***37***
FARRINGTON HIGH SCHO	***1564 N KING ST***	***SSE 1/4 - 1/2 (0.382 mi.)***	***G23***	***71***
2343 NORTH KING STRE	***2343 N KING ST***	***WNW 1/4 - 1/2 (0.447 mi.)***	***30***	***97***
MARSHALL'S SHELL SS	***1029 HOUGHTAILING ST***	***SE 1/2 - 1 (0.544 mi.)***	***34***	***100***
DILLINGHAM BOULEVARD	***DILLINGHAM BLVD & MO***	***SW 1/2 - 1 (0.552 mi.)***	***35***	***111***
OTS BUS UNIT REPAIR	***811 MIDDLE ST***	***W 1/2 - 1 (0.582 mi.)***	***J37***	***113***
1812 COLBURN STREET	***1812 COLBURN ST***	***SSW 1/2 - 1 (0.595 mi.)***	***38***	***121***
HAWAII DAIRY HOLDING	***2277 KAMEHAMEHA HWY***	***WSW 1/2 - 1 (0.661 mi.)***	***K39***	***122***
LENAKONA DEVELOPMENT	***2305 KAMEHAMEHA HWY***	***WSW 1/2 - 1 (0.688 mi.)***	***K40***	***125***
TAKAMIYA PROPERTY	***850 MOOWAA ST***	***SSE 1/2 - 1 (0.690 mi.)***	***41***	***126***
HAWAII MEAT COMPANY	***711 MIDDLE ST***	***W 1/2 - 1 (0.702 mi.)***	***L42***	***129***
ROSS TRUSTS	***819 MOOWAA ST***	***SSE 1/2 - 1 (0.722 mi.)***	***43***	***132***
YEE HOP PROPERTY	***621 MIDDLE ST***	***W 1/2 - 1 (0.746 mi.)***	***L44***	***133***
JOHIRO BROTHERS, INC	***1240 MOOKAULA ST***	***SSE 1/2 - 1 (0.759 mi.)***	***45***	***138***
609 WAIAKAMILO ROAD	***609 WAIAKAMILO RD***	***S 1/2 - 1 (0.769 mi.)***	***M46***	***139***
611 MIDDLE STREET WA	***611 MIDDLE ST***	***W 1/2 - 1 (0.776 mi.)***	***47***	***141***
PACIFIC POULTRY	***1804 KANAKANUI ST***	***SSW 1/2 - 1 (0.777 mi.)***	***48***	***149***
GTE-HAWAIIAN TEL EMP	***1138 N KING ST***	***SE 1/2 - 1 (0.788 mi.)***	***N49***	***152***
KAMEHAMEHA SCHOOLS -	***1336 DILLINGHAM BLVD***	***S 1/2 - 1 (0.805 mi.)***	***M50***	***153***
YUE-FUNG KWAN CONSTR	***2004-2008 REPUBLICAN***	***SW 1/2 - 1 (0.812 mi.)***	***O51***	***155***
938 KOHOU STREET	938 KOHOU STREET	SSE 1/2 - 1 (0.821 mi.)	N52	157
1385 COLBURN STREET	1385 COLBURN ST	S 1/2 - 1 (0.837 mi.)	P53	158
GENERAL TIRE	***505 WAIAKAMILO RD***	***S 1/2 - 1 (0.846 mi.)***	***P54***	***158***
1950 HOMERULE STREET	***1950 HOMERULE ST***	***SW 1/2 - 1 (0.855 mi.)***	***O55***	***161***
HONOLULU WOOD TREATI	2290 ALAHAO PL	WSW 1/2 - 1 (0.862 mi.)	56	162
CLASSIC BOWL	1190 DILLINGHAM BLVD	S 1/2 - 1 (0.871 mi.)	59	166
JBL HAWAII, LTD	***905 KOKEA ST***	***SSE 1/2 - 1 (0.881 mi.)***	***60***	***166***
KAPALAMA INCINERATOR	***757 KOKEA ST***	***SSE 1/2 - 1 (0.888 mi.)***	***Q61***	***167***
KAPALAMA INCINERATOR	757 KOKEA ST	SSE 1/2 - 1 (0.888 mi.)	Q62	168
HAGADONE PRINTING CO	***2278 HOONEE PL***	***WSW 1/2 - 1 (0.959 mi.)***	***R65***	***170***
LONGS DRUG STORES WA	***2270 HOONEE PL***	***WSW 1/2 - 1 (0.960 mi.)***	***R66***	***171***
1305 HART STREET	***1305 HART ST***	***S 1/2 - 1 (0.970 mi.)***	***67***	***173***
HAWAIIAN BITUMULS &	***248 SAND ISLAND ACCE***	***SW 1/2 - 1 (0.972 mi.)***	***68***	***177***
HSI MECHANICAL	***227-230 PUUHALE RD***	***SW 1/2 - 1 (0.984 mi.)***	***69***	***180***
YOUNG BROTHERS, LTD.	***1331 N NIMITZ HWY***	***S 1/2 - 1 (0.988 mi.)***	***70***	***180***

EXECUTIVE SUMMARY

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Health's Active Leaking Underground Storage Tank Log Listing.

A review of the LUST list, as provided by EDR, and dated 02/25/2020 has revealed that there are 13 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
IES RETAIL MIDDLE ST	***1305 MIDDLE ST***	***NW 1/4 - 1/2 (0.414 mi.)***	***H27***	***88***
Release ID: 970009 Facility Id: 9-101110 Facility Status: Site Cleanup Completed (NFA)				
AIM KAM IV	***2314 N SCHOOL ST***	***NNE 1/4 - 1/2 (0.420 mi.)***	***I28***	***93***
Release ID: 050028 Release ID: 950035 Facility Id: 9-101867 Facility Status: Site Cleanup Completed (NFA)				
KANE'S AUTO REPAIR	***1325 MIDDLE ST***	***NNW 1/4 - 1/2 (0.439 mi.)***	***H29***	***96***
Release ID: 920086 Facility Id: 9-102478 Facility Status: Site Cleanup Completed (NFA)				
HELE KAM IV 7-11 #16	***2404 N SCHOOL ST***	***N 1/4 - 1/2 (0.448 mi.)***	***I31***	***98***
Release ID: 050038 Release ID: 090019 Facility Id: 9-101187 Facility Status: Site Cleanup Completed (NFA)				

Lower Elevation	Address	Direction / Distance	Map ID	Page
IES RETAIL KALIHI ST	***2160 N. KING ST.***	***WSW 1/8 - 1/4 (0.211 mi.)***	***C5***	***16***
Release ID: 950050 Facility Id: 9-101225 Facility Status: Site Cleanup Completed (NFA)				
AIM KING STREET	***1860 N KING ST***	***S 1/8 - 1/4 (0.215 mi.)***	***A6***	***22***
Release ID: 080005 Release ID: 020036 Facility Id: 9-101186 Facility Status: Consolidated releases Facility Status: Active Remediation				
PACIFIC TIRE	***1955 N KING ST***	***SW 1/8 - 1/4 (0.239 mi.)***	***D10***	***47***
Release ID: 930133 Facility Id: 9-101450 Facility Status: Site Cleanup Completed (NFA)				
C&CH KALIHI FIRE STA	***1742 N KING ST***	***S 1/4 - 1/2 (0.259 mi.)***	***E12***	***58***
Release ID: 940107 Facility Id: 9-100079 Facility Status: Site Cleanup Completed (NFA)				
MORRIS ANGELO	***905 FACTORY ST***	***SW 1/4 - 1/2 (0.275 mi.)***	***D13***	***58***
Release ID: 990189 Facility Id: 9-103511				

Facility Status: Site Cleanup Completed (NFA)

IES RETAIL KALIHI	***1715 N KING ST***	***S 1/4 - 1/2 (0.280 mi.)***	***E14***	***59***
Release ID: 880002 Facility Id: 9-101236 Facility Status: Site Cleanup Completed (NFA)				
RAKUYO KEN U.S.A.	***804 GULICK AVE***	***WSW 1/4 - 1/2 (0.322 mi.)***	***18***	***65***
Release ID: 970014 Facility Id: 9-103254 Facility Status: Site Cleanup Completed (NFA)				
KSC SERVICE L-4210	***2295 N KING ST***	***W 1/4 - 1/2 (0.356 mi.)***	***F20***	***68***
Release ID: 920008 Facility Id: 9-100031 Facility Status: Site Cleanup Completed (NFA)				
KAMEHAMEHA HOUSING P	***1629 HAKA DR***	***S 1/4 - 1/2 (0.375 mi.)***	***21***	***69***
Release ID: 960029 Facility Id: 9-103126 Facility Status: Site Cleanup Completed (NFA)				

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Health's Listing of Underground Storage Tanks.

A review of the UST list, as provided by EDR, and dated 02/25/2020 has revealed that there are 4 UST sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
KALIHI CENTRAL OFFIC	***1025 KAILI ST***	***S 1/8 - 1/4 (0.188 mi.)***	***A1***	***8***
Tank Status: Permanently Out of Use Tank Status: Currently In Use Facility Id: 9-100508 Date Closed: 01/01/1986				
IES RETAIL KALIHI ST	***2160 N. KING ST.***	***WSW 1/8 - 1/4 (0.211 mi.)***	***C5***	***16***
Tank Status: Currently In Use Tank Status: Permanently Out of Use Facility Id: 9-101225 Date Closed: 04/01/1984 Date Closed: 01/01/1995				
AIM KING STREET	***1860 N KING ST***	***S 1/8 - 1/4 (0.215 mi.)***	***A6***	***22***
Tank Status: Permanently Out of Use Tank Status: Permanently out of Use Tank Status: Currently In Use Tank Status: Currently in Use Facility Id: 9-101186 Date Closed: 01/23/2012 Date Closed: 03/21/1994 Date Closed: 08/01/1987				
PACIFIC TIRE	***1955 N KING ST***	***SW 1/8 - 1/4 (0.239 mi.)***	***D10***	***47***

Tank Status: Permanently Out of Use
Facility Id: 9-101450
Date Closed: 07/01/1993

State and tribal institutional control / engineering control registries

ENG CONTROLS: A listing of sites with engineering controls in place.

A review of the ENG CONTROLS list, as provided by EDR, and dated 04/17/2019 has revealed that there are 2 ENG CONTROLS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KUHIO PARK TERRACE C	***1475 LINAPUNI ST***	***NNW 1/4 - 1/2 (0.309 mi.)***	***16***	***63***

Lower Elevation	Address	Direction / Distance	Map ID	Page
FACTORY STREET LEAD	***2003 N KING ST***	***SW 1/8 - 1/4 (0.228 mi.)***	***B9***	***37***

Voluntary Remediation Program and Brownfields sites with institutional controls in place.

A review of the INST CONTROL list, as provided by EDR, and dated 04/17/2019 has revealed that there are 3 INST CONTROL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KUHIO PARK TERRACE C	***1475 LINAPUNI ST***	***NNW 1/4 - 1/2 (0.309 mi.)***	***16***	***63***

Lower Elevation	Address	Direction / Distance	Map ID	Page
FACTORY STREET LEAD	***2003 N KING ST***	***SW 1/8 - 1/4 (0.228 mi.)***	***B9***	***37***
2343 NORTH KING STRE	***2343 N KING ST***	***WNW 1/4 - 1/2 (0.447 mi.)***	***30***	***97***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: The EPA's listing of Brownfields properties from the Cleanups in My Community program, which provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

A review of the US BROWNFIELDS list, as provided by EDR, and dated 12/02/2019 has revealed that there are 3 US BROWNFIELDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KUHIO PARK TERRACE ACRES property ID: 117124 Cleanup Completion Date: -	1518 LINAPUNI STREET	N 1/8 - 1/4 (0.200 mi.)	3	11
KUHIO PARK TERRACE	1600 HAUPU PL	ENE 1/4 - 1/2 (0.393 mi.)	25	82

ACRES property ID: 14408
Cleanup Completion Date: -

Lower Elevation	Address	Direction / Distance	Map ID	Page
NEW CITY NISSAN ACRES property ID: 240569 Cleanup Completion Date: -	2295 NORTH KING STRE	W 1/4 - 1/2 (0.356 mi.)	F19	66

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/23/2020 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
HOKU SCIENTIFIC INC EPA ID:: HIR000136291	***2153 NORTH KING STRE***	***WSW 1/8 - 1/4 (0.248 mi.)***	***C11***	***48***

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 01/28/2020 has revealed that there are 7 FUDS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BASE YARD NO. 25		ENE 1/4 - 1/2 (0.312 mi.)	17	64
BASE YARD NO. 3 & 4		NE 1/2 - 1 (0.514 mi.)	32	99

Lower Elevation	Address	Direction / Distance	Map ID	Page
HI ARSENAL MILITARY		WNW 1/2 - 1 (0.520 mi.)	33	99
220TH SIGNAL DEPOT C		W 1/2 - 1 (0.556 mi.)	J36	112
MOANALUA CRASH BOAT		W 1/2 - 1 (0.867 mi.)	58	165
DILLINGHAM BASE YARD		S 1/2 - 1 (0.938 mi.)	63	169
SAND ISLAND ASPHALT		SSW 1/2 - 1 (0.944 mi.)	64	169

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

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

EXECUTIVE SUMMARY

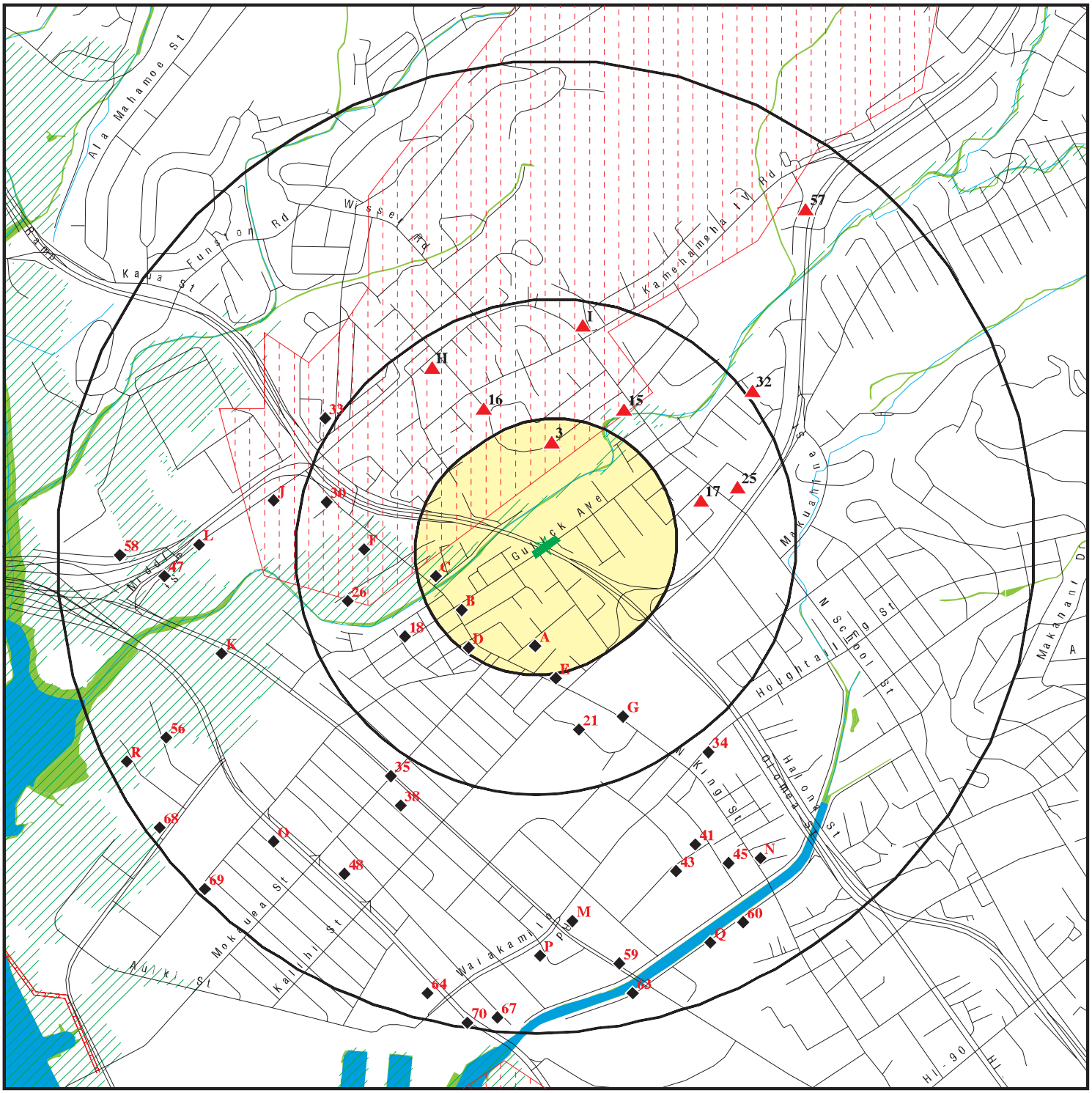
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORT SHAFTER		NW 0 - 1/8 (0.118 mi.)	0	8

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 19 records.

Site Name	Database(s)
1339 SCHOOL STREET	SHWS, ENG CONTROLS, INST CONTROL
KEEHI LAGOON CANOE FACILITY, INCRE	SHWS, ENG CONTROLS, INST CONTROL
KUHIO PARK TERRACE TOWERS	SHWS, ENG CONTROLS, INST CONTROL
333 & 351 N KING ST	SHWS, BROWNFIELDS
UNIVERSITY OF HAWAII INTERCHANGE	SHWS
HALAWA STREAM CHANNEL PETROLEUM CO	SHWS
KALANI, HART, MOKUAEA STREET, HONO	SHWS
ISLAND RECYCLING FIRE	SHWS, SPILLS
ABC DISPOSAL COMPANY	SHWS
HONOLULU COMMUNITY COLLEGE KOKEA S	SHWS
KUHIO PARK TERRACE UNITS D1 AND D2	SHWS, INST CONTROL, BROWNFIELDS
FORMER KAPALAMA MILITARY RESERVATI	SHWS
NIMITZ HIGHWAY WATER IMPROVEMENT P	SHWS
PALI HIGHWAY LEAD CONTAMINATION	SHWS
PIER 32-35 (HONOLULU HARBOR) ENTRA	SHWS, SPILLS
SAND ISLAND ACCESS ROAD AREAWIDE P	SHWS
SAND ISLAND HOUSING FIRST PROJECT	SHWS
KOKUA KALIHI VALLEY ACTIVE LIVING	SHWS, BROWNFIELDS
CITY AND COUNTY OF HONOLULU, KEEHI	SWF/LF

OVERVIEW MAP - 6085048.19S



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

Pipelines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

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: Gulick Avenue Bridge	CLIENT: Jacobs
ADDRESS: Gulick Avenue Honolulu HI 96819	CONTACT: Shane Tom INQUIRY #: 6085048.19s
LAT/LONG: 21.335248 / 157.876199	DATE: June 08, 2020 12:13 pm

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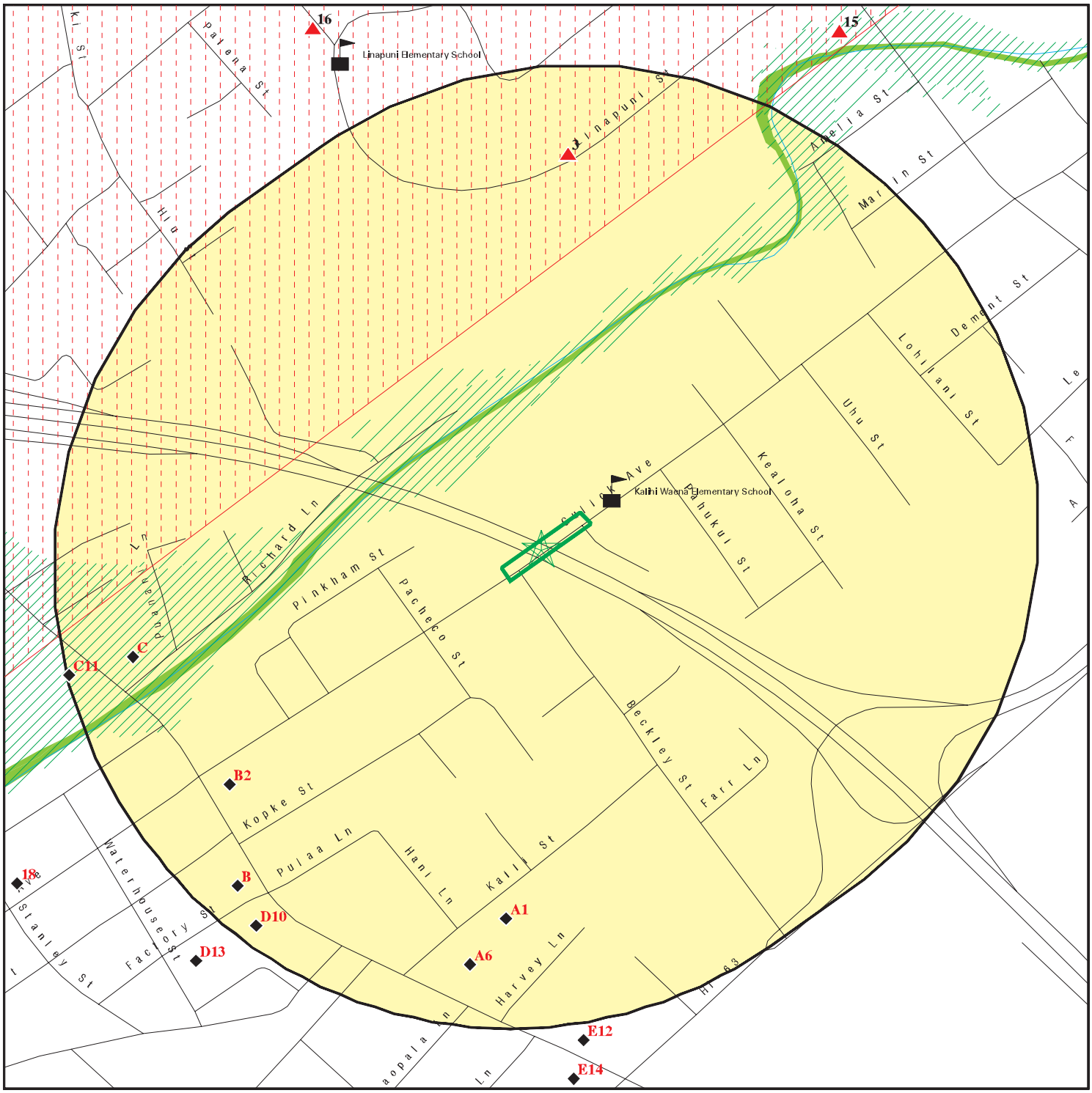
DETAIL MAP - 6085048.19S



0 1/16 1/8 1/4 Miles

- 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
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands

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: Gulick Avenue Bridge	CLIENT: Jacobs
ADDRESS: Gulick Avenue Honolulu HI 96819	CONTACT: Shane Tom
	INQUIRY #: 6085048.19s
LAT/LONG: 21.335248 / 157.876199	DATE: June 08, 2020 12:14 pm

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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								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	1	NR	NR	1
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	1	1	NR	NR	2
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	1	NR	NR	1
Federal RCRA generators list								
RCRA-LQG	0.250		0	1	NR	NR	NR	1
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	2	NR	NR	NR	2
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	1	4	33	NR	38
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	3	10	NR	NR	13
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

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
UST	0.250		0	4	NR	NR	NR	4
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	1	1	NR	NR	2
INST CONTROL	0.500		0	1	2	NR	NR	3
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	1	2	NR	NR	3
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
SPILLS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	1	NR	NR	NR	1
FUDS	1.000		0	0	1	6	NR	7
DOD	1.000		1	0	0	0	NR	1
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0

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
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
LEAD	0.001		0	NR	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	0.001		0	NR	NR	NR	NR	0
RGA LF	0.001		0	NR	NR	NR	NR	0

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
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	1	16	23	39	0	79

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

DOD **FORT SHAFTER** **DOD** **CUSA147753**
Region **N/A**
NW **FORT SHAFTER (County), HI**
< 1/8
623 ft.

DOD:

Feature 1:	Army DOD
Feature 2:	Not reported
Feature 3:	Not reported
URL:	Not reported
Name 1:	Fort Shafter
Name 2:	Not reported
Name 3:	Not reported
State:	HI
DOD Site:	Yes
Tile name:	HIHONOLULU

A1 **KALIHI CENTRAL OFFICE** **UST** **U001235192**
South **1025 KAILI ST** **Financial Assurance** **N/A**
1/8-1/4 **HONOLULU, HI 96819**
0.188 mi.
995 ft. **Site 1 of 2 in cluster A**

Relative:
Lower

Actual:
49 ft.

UST:

Facility ID:	9-100508
Owner:	Hawaiian Telcom
Owner Address:	1177 Bishop Street, Suite 20
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.332283
Longitude:	-157.87642
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	GPS
Tank ID:	M-2
Date Installed:	03/01/1986
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	2000
Substance:	Diesel
Tank ID:	R-M-001
Date Installed:	01/07/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	01/01/1986
Tank Capacity:	1500
Substance:	Diesel

HI Financial Assurance:

Name:	KALIHI CENTRAL OFFICE
Address:	1025 KAILI ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100508
Tank Id:	M-2
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	05/02/2015

KALIHI CENTRAL OFFICE (Continued) **U001235192**

Name:	KALIHI CENTRAL OFFICE
Address:	1025 KAILI ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100508
Tank Id:	R-M-001
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	05/02/2015

Name:	KALIHI CENTRAL OFFICE
Address:	1025 KAILI ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100508
Tank Id:	R-M-001
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	05/02/2018

Name:	KALIHI CENTRAL OFFICE
Address:	1025 KAILI ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100508
Tank Id:	M-2
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	05/02/2018

B2 **LONGS DRUG STORE NO 6928** **RCRA-VSQG** **1014389655**
SW **2070 NORTH KING STREET** **HIR000140020**
1/8-1/4 **HONOLULU, HI 96819**
0.193 mi.
1019 ft. **Site 1 of 4 in cluster B**

Relative:
Lower

Actual:
49 ft.

RCRA-VSQG:

Date form received by agency:	2012-10-05 00:00:00.0
Facility name:	LONGS DRUG STORE NO 6928
Facility address:	2070 NORTH KING STREET #5 HONOLULU, HI 96819
EPA ID:	HIR000140020
Mailing address:	ONE CVS DRIVE WOONSOCKET, RI 02895
Contact:	WENDY L BRANT
Contact address:	ONE CVS DRIVE WOONSOCKET, RI 02895
Contact country:	US
Contact telephone:	401-765-1500
Contact email:	WENDY.BRANT@CVSCAREMARK.COM
EPA Region:	09
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting

LONGS DRUG STORE NO 6928 (Continued) **1014389655**

from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	LONGS DRUG STORES CALIFORNIA, L.L.C
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	2008-10-22 00:00:00.
Owner/Op end date:	Not reported

Owner/operator name:	ALLAN S. TOTOKI & BETTY S TOTOKI, TRUSTE
Owner/operator address:	705 S KING ST #208
	HONOLULU, HI 96813
Owner/operator country:	US
Owner/operator telephone:	808-791-5590
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	2008-10-22 00:00:00.
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	2010-11-01 00:00:00.0
Site name:	LONGS DRUG STORE NO 6928
Classification:	Conditionally Exempt Small Quantity Generator

LONGS DRUG STORE NO 6928 (Continued) **1014389655**

Hazardous Waste Summary:

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D009
. Waste name: MERCURY

. Waste code: D010
. Waste name: SELENIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: P001
. Waste name: 2H-1-BENZOPYRAN-2-ONE, 4-HYDROXY-3-(3-OXO-1-PHENYLBUTYL)-, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3% (OR) WARFARIN, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3%

. Waste code: P042
. Waste name: 1,2-BENZENEDIOL, 4-[1-HYDROXY-2-(METHYLAMINO)ETHYL]-, (R)- (OR) EPINEPHRINE

. Waste code: P075
. Waste name: NICOTINE, & SALTS (OR) PYRIDINE, 3-(1-METHYL-2-PYRROLIDINYL)-,(S)-, & SALTS

. Waste code: P081
. Waste name: 1,2,3-PROPANETRIOL, TRINITRATE (R) (OR) NITROGLYCERINE (R)

Violation Status: No violations found

---

3 **KUHIO PARK TERRACE** **US BROWNFIELDS** **1014697060**
North **1518 LINAPUNI STREET** **N/A**
1/8-1/4 **HONOLULU, HI 96819**
0.200 mi.
1058 ft.

Relative:
Higher

Actual:
85 ft.

US BROWNFIELDS:

Name:	KUHIO PARK TERRACE
Address:	1518 LINAPUNI STREET
City,State,Zip:	HONOLULU, HI 96819
Recipient Name:	R9 TBA (ARRA)
Grant Type:	TBA
Property Number:	1.3039E+11
Parcel size:	3.5
Latitude:	21.3385
Longitude:	-157.8763
HCM Label:	Global Positioning Method-Unspecified Parameters

KUHIO PARK TERRACE (Continued) **1014697060**

Map Scale:	-
Point of Reference:	Center of a Facility or Station
Highlights:	Dieldrin was detected in soils in 1997. Possible lead based paint and asbestos in the buildings onsite.
Datum:	North American Datum of 1983
Acres Property ID:	117124
IC Data Access:	-
Start Date:	-
Redev Completition Date:	-
Completed Date:	-
Acres Cleaned Up:	-
Cleanup Funding:	-
Cleanup Funding Source:	-
Assessment Funding:	17000
Assessment Funding Source:	EPA
Redevelopment Funding:	-
Redev. Funding Source:	-
Redev. Funding Entity Name:	-
Redevelopment Start Date:	-
Assessment Funding Entity:	US EPA - TBA Funding
Cleanup Funding Entity:	-
Grant Type:	Hazardous
Accomplishment Type:	Phase I Environmental Assessment
Accomplishment Count:	Y
Cooperative Agreement Number:	n/a
Start Date:	1-Dec-09
Ownership Entity:	Government
Completion Date:	21-Jul-10
Current Owner:	Hawaii Public Housing Authority
Did Owner Change:	-
Cleanup Required:	U
Video Available:	-
Photo Available:	Y
Institutional Controls Required:	N
IC Category Proprietary Controls:	-
IC Cat. Info. Devices:	-
IC Cat. Gov. Controls:	-
IC Cat. Enforcement Permit Tools:	-
IC in place date:	-
IC in place:	N
State/tribal program date:	-
State/tribal program ID:	-
State/tribal NFA date:	-
Air cleaned:	-
Asbestos found:	-
Asbestos cleaned:	-
Controled substance found:	-
Controled substance cleaned:	-
Drinking water affected:	-
Drinking water cleaned:	-
Groundwater affected:	-
Groundwater cleaned:	-
Lead contaminant found:	-
Lead cleaned up:	-
No media affected:	-
Unknown media affected:	-
Other cleaned up:	-

KUHIO PARK TERRACE (Continued) **1014697060**

Other metals found:	-
Other metals cleaned:	-
Other contaminants found:	-
Other contams found description:	-
PAHs found:	-
PAHs cleaned up:	-
PCBs found:	-
PCBs cleaned up:	-
Petro products found:	-
Petro products cleaned:	-
Sediments found:	-
Sediments cleaned:	-
Soil affected:	Y
Soil cleaned up:	-
Surface water cleaned:	-
VOCs found:	-
VOCs cleaned:	-
Cleanup other description:	-
Num. of cleanup and re-dev. jobs:	-
Past use greenspace acreage:	1
Past use residential acreage:	2.5
Surface Water:	-
Past use commercial acreage:	-
Past use industrial acreage:	-
Future use greenspace acreage:	1
Future use residential acreage:	2.5
Future use commercial acreage:	-
Future use industrial acreage:	-
Superfund Fed. landowner flag:	-
Arsenic cleaned up:	-
Cadmium cleaned up:	-
Chromium cleaned up:	-
Copper cleaned up:	-
Iron cleaned up:	-
mercury cleaned up:	-
Nickel Cleaned Up:	-
No clean up:	-
Pesticides cleaned up:	-
Selenium cleaned up:	-
SVOCs cleaned up:	-
Unknown clean up:	-
Arsenic contaminant found:	-
Cadmium contaminant found:	-
Chromium contaminant found:	-
Copper contaminant found:	-
Iron contaminant found:	-
Mercury contaminant found:	-
Nickel contaminant found:	-
No contaminant found:	-
Pesticides contaminant found:	-
Selenium contaminant found:	-
SVOCs contaminant found:	-
Unknown contaminant found:	-
Future Use: Multistory	-
Media affected Bluiding Material:	-
Media affected indoor air:	-
Building material media cleaned up:	-

KUHIO PARK TERRACE (Continued) **1014697060**

Indoor air media cleaned up:	-
Unknown media cleaned up:	-
Past Use: Multistory	-
Property Description:	Property was used for agricultural purposes until deveoped for residential homes in the 1940s
Below Poverty Number:	3258
Below Poverty Percent:	19.49
Meidan Income:	13121
Meidan Income Number:	5736
Meidan Income Percent:	34.31
Vacant Housing Number:	169
Vacant Housing Percent:	4.6
Unemployed Number:	223
Unemployed Percent:	1.33

C4 WSW 1/8-1/4 0.211 mi. 1116 ft. **IES RETAIL KALIHI STREAM** **RCRA-VSQG** **1004688802**
2160 N KING ST **FINDS** **HID981655285**
HONOLULU, HI 96819 **ECHO**

Site 1 of 3 in cluster C

Relative: Lower
Actual: 31 ft.

RCRA-VSQG:

Date form received by agency:	2016-10-28 00:00:00.0
Facility name:	IES RETAIL KALIHI STREAM
Facility address:	2160 N KING ST HONOLULU, HI 96819
EPA ID:	HID981655285
Mailing address:	91-480 MALAKOLE ST. KAPOLEI, HI 96707
Contact:	MARC DEXTER
Contact address:	91-480 MALAKOLE ST. KAPOLEI, HI 96707
Contact country:	US
Contact telephone:	808-682-5711
Contact email:	MARC.DEXTER@ISLANDENERGYSERVICES.COM
EPA Region:	09
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	IES RETAIL, LLC
Owner/operator address:	ROCKEFELLER PLAZA 54TH FLOOR NEW YORK, NY 10112
Owner/operator country:	US

IES RETAIL KALIHI STREAM (Continued) **1004688802**

Owner/operator telephone: 212-605-6000
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 2016-11-01 00:00:00.
Owner/Op end date: Not reported

Owner/operator name: IES RETAIL, LLC
Owner/operator address: ROCKEFELLER PLAZA 54TH FLOOR
NEW YORK, NY 10112
Owner/operator country: US
Owner/operator telephone: 212-605-6000
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 2016-11-01 00:00:00.
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 2011-05-09 00:00:00.0
Site name: CHEVRON 95592
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 1993-11-10 00:00:00.0
Site name: FRANK'S KALIHI CHEVRON
Classification: Conditionally Exempt Small Quantity Generator

Hazardous Waste Summary:

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D018
. Waste name: BENZENE

IES RETAIL KALIHI STREAM (Continued) **1004688802**

Violation Status: No violations found

FINDS:
Registry ID: 110005724886
Facility URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110005724886

Environmental Interest/Information System:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1004688802
Registry ID: 110005724886
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110005724886
Name: IES RETAIL KALIHI STREAM
Address: 2160 N KING ST
City,State,Zip: HONOLULU, HI 96819

C5 **IES RETAIL KALIHI STREAM** **LUST** **1000316728**
WSW **2160 N. KING ST.** **UST** **N/A**
1/8-1/4 **HONOLULU, HI 96813** **Financial Assurance**
0.211 mi.
1116 ft. **Site 2 of 3 in cluster C**

Relative:
Lower

Actual:
31 ft.

LUST:
Facility ID: 9-101225
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 08/31/1995
Release ID: 950050
Project Officer: Not Assigned

UST:
Facility ID: 9-101225
Owner: IES Retail, LLC
Owner Address: 91-480 Malakole Street
Owner City,St,Zip: Honolulu, 96813 96813
Latitude: 21.334533
Longitude: -157.87984900000001
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: GPS

Tank ID: 1
Date Installed: 07/18/1984
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Diesel

Tank ID: 2

IES RETAIL KALIHI STREAM (Continued) **1000316728**

Date Installed:	07/18/1984
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	3
Date Installed:	07/18/1984
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	R-1
Date Installed:	01/01/1963
Tank Status:	**Permanently Out of Use**
Date Closed:	04/01/1984
Tank Capacity:	Not reported
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	01/01/1963
Tank Status:	**Permanently Out of Use**
Date Closed:	04/01/1984
Tank Capacity:	Not reported
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	01/01/1963
Tank Status:	**Permanently Out of Use**
Date Closed:	04/01/1984
Tank Capacity:	Not reported
Substance:	Gasoline

Tank ID:	R-4
Date Installed:	07/18/1984
Tank Status:	**Permanently Out of Use**
Date Closed:	01/01/1995
Tank Capacity:	1000
Substance:	Used Oil

HI Financial Assurance:

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	IES RETAIL KALIHI STREAM

IES RETAIL KALIHI STREAM (Continued) **1000316728**

Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Guarantee
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Guarantee
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: 3
Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225

IES RETAIL KALIHI STREAM (Continued) **1000316728**

Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Guarantee
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: 3
Tank Status: Currently In Use
FRTYPE: Guarantee
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Guarantee
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: 2
Tank Status: Currently In Use
FRTYPE: Guarantee
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Guarantee

IES RETAIL KALIHI STREAM (Continued) **1000316728**

Expiration Date: Not reported

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Self Insured
Expiration Date: 04/29/2011

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Self Insured
Expiration Date: 04/29/2011

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Self Insured
Expiration Date: 04/29/2011

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Self Insured
Expiration Date: 04/29/2011

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Self Insured
Expiration Date: 04/29/2011

Name: IES RETAIL KALIHI STREAM
Address: 2160 N. KING ST.
City,State,Zip: HONOLULU, HI 96813
Alt Facility ID: 9-101225
Tank Id: 3
Tank Status: Currently In Use
FRTYPE: Self Insured
Expiration Date: 04/29/2011

Name: IES RETAIL KALIHI STREAM

IES RETAIL KALIHI STREAM (Continued) **1000316728**

Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Self Insured
Expiration Date:	04/29/2011

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	1
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	3
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021

Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225

IES RETAIL KALIHI STREAM (Continued) **1000316728**

Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021
Name:	IES RETAIL KALIHI STREAM
Address:	2160 N. KING ST.
City,State,Zip:	HONOLULU, HI 96813
Alt Facility ID:	9-101225
Tank Id:	R-1
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	11/21/2021

A6 **AIM KING STREET** **LUST** **U004223403**
South **1860 N KING ST** **UST** **N/A**
1/8-1/4 **HONOLULU, HI 96819** **Financial Assurance**
0.215 mi.
1136 ft. **Site 2 of 2 in cluster A**

Relative:
Lower

Actual:
46 ft.

LUST:

Facility ID:	9-101186
Facility Status:	Consolidated releases
Facility Status Date:	08/28/2018
Release ID:	080005
Project Officer:	Richard Takaba
Facility ID:	9-101186
Facility Status:	Active Remediation
Facility Status Date:	12/09/2009
Release ID:	020036
Project Officer:	Richard Takaba

UST:

Facility ID:	9-101186
Owner:	ALOHA PETROLEUM, LTD.
Owner Address:	1132 Bishop St, Suite 1700
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.331880000000002
Longitude:	-157.87700000000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	GPS
Tank ID:	1
Date Installed:	03/01/2012
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	13800
Substance:	Gasohol
Tank ID:	2A
Date Installed:	03/01/2012
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	6800
Substance:	Gasohol

AIM KING STREET (Continued) **U004223403**

Tank ID: 2B
Date Installed: 03/01/2012
Tank Status: Currently In Use
Date Closed: Not reported
Tank Capacity: 7000
Substance: Gasohol

Tank ID: 3
Date Installed: 03/01/2012
Tank Status: Currently In Use
Date Closed: Not reported
Tank Capacity: 13800
Substance: Diesel

Tank ID: R-1
Date Installed: 04/04/1980
Tank Status: Permanently Out of Use
Date Closed: 08/01/1987
Tank Capacity: 6000
Substance: Gasoline

Tank ID: R-11
Date Installed: Not reported
Tank Status: Permanently Out of Use
Date Closed: 03/21/1994
Tank Capacity: 1000
Substance: Used Oil

Tank ID: R-2
Date Installed: 04/04/1980
Tank Status: Permanently Out of Use
Date Closed: Not reported
Tank Capacity: 8000
Substance: Gasoline

Tank ID: R-3
Date Installed: 04/04/1980
Tank Status: Permanently Out of Use
Date Closed: 08/01/1987
Tank Capacity: 3800
Substance: Gasoline

Tank ID: R-4
Date Installed: 04/04/1970
Tank Status: Permanently Out of Use
Date Closed: Not reported
Tank Capacity: 550
Substance: Gasoline

Tank ID: R-5

AIM KING STREET (Continued) **U004223403**

Date Installed: 04/04/1966
Tank Status: **Permanently Out of Use**
Date Closed: Not reported
Tank Capacity: 550
Substance: Used Oil

Tank ID: R-6
Date Installed: 04/04/1966
Tank Status: **Permanently Out of Use**
Date Closed: Not reported
Tank Capacity: 550
Substance: Used Oil

Tank ID: r-10
Date Installed: 12/31/1987
Tank Status: **Permanently out of Use**
Date Closed: 01/23/2012
Tank Capacity: 8000
Substance: Diesel

Tank ID: r-7
Date Installed: 12/31/1987
Tank Status: **Permanently out of Use**
Date Closed: 01/23/2012
Tank Capacity: 6000
Substance: Diesel

Tank ID: r-87
Date Installed: 12/31/1980
Tank Status: **Permanently out of Use**
Date Closed: 01/23/2012
Tank Capacity: 8000
Substance: Gasoline

Tank ID: t-92
Date Installed: 12/31/1987
Tank Status: **Permanently out of Use**
Date Closed: 01/23/2012
Tank Capacity: 8000
Substance: Gasoline

HI Financial Assurance:
Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-10
Tank Status: Permanently out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET

AIM KING STREET (Continued) **U004223403**

Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-11
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186

AIM KING STREET (Continued) **U004223403**

Tank Id: r-87
Tank Status: Permanently out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-11
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-5
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-5
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-6
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-6
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-7
Tank Status: Permanently out of Use
FRTYPE: Other

AIM KING STREET (Continued) **U004223403**

Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-10
Tank Status: Permanently out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-87
Tank Status: Permanently out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: t-92
Tank Status: Permanently out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: t-92
Tank Status: Permanently out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-7
Tank Status: Permanently out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET

AIM KING STREET (Continued) **U004223403**

Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 3
Tank Status: Currently In Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2B
Tank Status: Currently In Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2A
Tank Status: Currently In Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2B
Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 3
Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2A
Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186

AIM KING STREET (Continued) **U004223403**

Tank Id: 1
Tank Status: Currently in Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 1
Tank Status: Currently in Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Risk Retention Group
Expiration Date: Not reported

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-87
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: t-92
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-7
Tank Status: Permanently out of Use
FRTYPE: Insurance

AIM KING STREET (Continued) **U004223403**

Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-10
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-6
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 1
Tank Status: Currently in Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2B
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-5
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2A
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 04/01/2014

Name: AIM KING STREET

AIM KING STREET (Continued) **U004223403**

Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	R-11
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	3
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	R-1
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186

AIM KING STREET (Continued) **U004223403**

Tank Id: 2A
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: t-92
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 2B
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 1
Tank Status: Currently in Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-11
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: r-87
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance

AIM KING STREET (Continued) **U004223403**

Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: 3
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-6
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-5
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET
Address: 1860 N KING ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101186
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/15/2020

Name: AIM KING STREET

AIM KING STREET (Continued) **U004223403**

Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	r-10
Tank Status:	Permanently out of Use
FRTYPE:	Insurance
Expiration Date:	09/15/2020

Name:	AIM KING STREET
Address:	1860 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101186
Tank Id:	r-7
Tank Status:	Permanently out of Use
FRTYPE:	Insurance
Expiration Date:	09/15/2020

B7 **USEPA R9 REMOVAL ACTION: FACTORY STREET LEAD SITE** **RCRA-LQG** **1025883881**
SW **2003 N. KING ST.** **HIP000200203**
1/8-1/4 **HONOLULU, HI 96819**
0.228 mi.
1203 ft. **Site 2 of 4 in cluster B**

Relative:
Lower

Actual:
44 ft.

RCRA-LQG:

Date form received by agency:	2019-10-04 00:00:00.0
Facility name:	USEPA R9 REMOVAL ACTION: FACTORY STREET LEAD SITE
Facility address:	2003 N. KING ST. HONOLULU, HI 96819
EPA ID:	HIP000200203
Mailing address:	75 HAWTHORNE ST. SAN FRANCISCO, CA 94105
Contact:	AMANDA PEASE
Contact address:	75 HAWTHORNE ST. SAN FRANCISCO, CA 94105
Contact country:	US
Contact telephone:	415-301-1503
Contact email:	PEASE.AMANDA@EPA.GOV
EPA Region:	09
Classification:	Large Quantity Generator
Description:	Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	Not reported
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No

USEPA R9 REMOVAL ACTION: FACTORY STREET LEAD SITE (Continued) **1025883881**

Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	2019-07-05 00:00:00.0
Site name:	USEPA R9 REMOVAL ACTION: FACTORY STREET LEAD SITE
Classification:	Large Quantity Generator

Hazardous Waste Summary:

. Waste code:	D008
. Waste name:	LEAD

Violation Status: No violations found

B8 **FACTORY STREET SITE** **SEMS-ARCHIVE** **1003879898**
SW **2003 N. KING STREET** **HI0000049775**
1/8-1/4 **HONOLULU, HI 96812**
0.228 mi.
1203 ft. **Site 3 of 4 in cluster B**

Relative:
Lower

Actual:
44 ft.

SEMS Archive:

Site ID:	0904939
EPA ID:	HI0000049775
Name:	FACTORY STREET SITE
Address:	2003 N. KING STREET
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96812
Cong District:	01
FIPS Code:	15003
FF:	N
NPL:	Not on the NPL
Non NPL Status:	NFRAP-Site does not qualify for the NPL based on existing information

SEMS Archive Detail:

Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1
Start Date:	Not reported
Finish Date:	1997-02-06 05:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf In-Hse

FACTORY STREET SITE (Continued) **1003879898**

Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	RV
Action Name:	RMVL
SEQ:	1
Start Date:	2019-06-29 04:00:00
Finish Date:	Not reported
Qual:	Not reported
Current Action Lead:	EPA Perf

Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	CR
Action Name:	CI
SEQ:	1
Start Date:	2019-09-03 04:00:00
Finish Date:	Not reported
Qual:	Not reported
Current Action Lead:	EPA Perf

Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	RS
Action Name:	RV ASSESS
SEQ:	1
Start Date:	2019-06-10 04:00:00
Finish Date:	2019-06-28 04:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf

Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	Not reported
Finish Date:	1995-05-25 04:00:00

FACTORY STREET SITE (Continued) **1003879898**

Qual:	H
Current Action Lead:	St Perf
Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	SI
Action Name:	SI
SEQ:	1
Start Date:	1995-02-17 05:00:00
Finish Date:	1996-09-25 04:00:00
Qual:	N
Current Action Lead:	St Perf
Region:	09
Site ID:	0904939
EPA ID:	HI0000049775
Site Name:	FACTORY STREET SITE
NPL:	N
FF:	N
OU:	00
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1993-11-10 05:00:00
Finish Date:	1993-11-10 05:00:00
Qual:	Not reported
Current Action Lead:	St Perf

B9 **FACTORY STREET LEAD** **SHWS** **1006820199**
SW **2003 N KING ST** **ENG CONTROLS** **N/A**
1/8-1/4 **HONOLULU, HI 96819** **INST CONTROL**
0.228 mi. **SPILLS**
1203 ft. **Site 4 of 4 in cluster B**

Relative:
Lower

Actual:
44 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Factory Street Lead
HID Number:	HI0000049775
Facility Registry Identifier:	110013781167
Lead Agency:	HEER
Program:	State
Project Manager:	Iris van der Zander
Hazard Priority:	Medium
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Factory Street Lead
HID Number:	HI0000049775
Facility Registry Identifier:	110013781167
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls

FACTORY STREET LEAD (Continued) **1006820199**

Priority:	Medium
Assessment:	Response Necessary
Response:	Response Ongoing
Nature of Contamination:	Found: Lead
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Prohibit Any Activity That May Disturb the Integrity of the Capping System
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Iris van der Zander
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

Organization:	Not reported
Supplemental Location:	Kalihi
Island:	Oahu
Environmental Interest:	Factory Street Lead Site - Private Properties
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Iris van der Zander
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Factory Street Lead Site - Private Properties
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Iris van der Zander
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls

FACTORY STREET LEAD (Continued) **1006820199**

Engineering Control: Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

SPILLS:

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930827
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Yes
Less Or Greater Than:	Not reported
Units:	Factory Street Lead Kalihi 1-2-11:1
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Merton Lau
Substances:	Lead
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name: FACTORY STREET LEAD

FACTORY STREET LEAD (Continued) **1006820199**

Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930827
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Yes
Less Or Greater Than:	Not reported
Units:	Factory Street Lead Kalihi 1-2-11:1
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Merton Lau
Substances:	Lead
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.332439999999998
Longitude:	-157.87894299999999

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930827
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Yes
Less Or Greater Than:	Not reported
Units:	Factory Street Lead Kalihi 1-2-11:1

FACTORY STREET LEAD (Continued) **1006820199**

Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Merton Lau
Substances:	Lead
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.332440999999999
Longitude:	-157.878942

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930923-2
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Lead paint chips
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Merton Lau
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported

FACTORY STREET LEAD (Continued) **1006820199**

Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930923-2
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Lead paint chips
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Merton Lau
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported

FACTORY STREET LEAD (Continued) **1006820199**

Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.332440999999999
Longitude:	-157.878942

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930923-2
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Lead paint chips
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Merton Lau
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.332439999999998
Longitude:	-157.87894299999999

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819

FACTORY STREET LEAD (Continued) **1006820199**

Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930924
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Henry Street Lead Sampling
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Merton Lau
Substances:	Lead
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.332439999999998
Longitude:	-157.87894299999999

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930924
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Henry Street Lead Sampling
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported

FACTORY STREET LEAD (Continued) **1006820199**

Result:	SOSC NFA
File Under:	Merton Lau
Substances:	Lead
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	FACTORY STREET LEAD
Address:	2003 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930924
Facility Registry ID:	110013781167
HID Number:	HI0000049775
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Henry Street Lead Sampling
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Merton Lau
Substances:	Lead
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported

FACTORY STREET LEAD (Continued) **1006820199**

Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.332440999999999
Longitude:	-157.878942

Name:	FACTORY STREET LEAD
Address:	Not reported
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20170926-0800
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	Not reported
ER:	No
Less Or Greater Than:	Not reported
Units:	Not reported
Activity Type:	Not reported
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	Referred
File Under:	Not reported
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	09/26/17 2:00 PM EDT
Release Date:	Not reported
Release Duration:	Not reported
Media:	Soil
Waterbody:	Not reported
Summary:	Site characterization of Factory Street indicates lead concentration up to 24,800 ppm. Removal under EPA s Removal program was conducted in the 1990 s, with follow-up given to the State for further action. Remediation Section reviewed the data starting in 2016. Sampling conducted and results provided to EP&R Section on 9/20/2017. Due to the concern to exposure, patching and sealing of exposed areas was conducted on 10/10/2017.
Is Noteworthy for Reports:	Yes
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Liz Galvez
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported

FACTORY STREET LEAD (Continued) **1006820199**

Coordination Needed:	Site Visit
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	HEER
Closed Date:	Dec 27, 2017
Comments:	Referred back to SDAR
Latitude:	Not reported
Longitude:	Not reported

Click this hyperlink while viewing on your computer to access additional HI SPILLS: detail in the EDR Site Report.

D10 **PACIFIC TIRE** **LUST** **U003541731**
SW **1955 N KING ST** **UST** **N/A**
1/8-1/4 **HONOLULU, HI 96819**
0.239 mi.
1260 ft. **Site 1 of 2 in cluster D**

Relative:
Lower

Actual:
43 ft.

LUST:

Facility ID:	9-101450
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	09/09/1993
Release ID:	930133
Project Officer:	Not Assigned

UST:

Facility ID:	9-101450
Owner:	J & B SILVA LTD.
Owner Address:	DBA PACIFIC TIRE 1629 M-1 KINO ST
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.332294000000001
Longitude:	-157.878668
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching

Tank ID:	R-1
Date Installed:	05/15/1966
Tank Status:	**Permanently Out of Use**
Date Closed:	07/01/1993
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	05/15/1966
Tank Status:	**Permanently Out of Use**
Date Closed:	07/01/1993
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	05/15/1966
Tank Status:	**Permanently Out of Use**
Date Closed:	07/01/1993

PACIFIC TIRE (Continued) **U003541731**

Tank Capacity: 4000
Substance: Used Oil

Tank ID: R-4
Date Installed: 05/15/1966
Tank Status: **Permanently Out of Use**
Date Closed: 07/01/1993
Tank Capacity: 4000
Substance: Diesel

Tank ID: R-5
Date Installed: Not reported
Tank Status: **Permanently Out of Use**
Date Closed: 07/01/1993
Tank Capacity: 550
Substance: Used Oil

C11 WSW 1/8-1/4 0.248 mi. 1312 ft. | **HOKU SCIENTIFIC INC** | **RCRA NonGen / NLR** | **1007879509**
2153 NORTH KING STREET | **ICIS** | **HIR000136291**
HONOLULU, HI 96819 | **FINDS**
ECHO

Site 3 of 3 in cluster C

Relative: Lower
Actual: 37 ft.

RCRA NonGen / NLR:
Date form received by agency: 2018-01-30 00:00:00.0
Facility name: HOKU SCIENTIFIC INC
Facility address: 2153 NORTH KING STREET
SUITE 300
HONOLULU, HI 96819
EPA ID: HIR000136291
Contact: WILLIAM R MCCAULEY
Contact address: 2153 NORTH KING STREET SUITE 300
HONOLULU, HI 96819
Contact country: US
Contact telephone: 808-845-7800
Telephone ext.: 340
Contact email: WMCCAULEY@HOKUSCI.COM
EPA Region: 09
Land type: Private
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: HOKU SCIENTIFIC INC
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 2003-01-01 00:00:00.
Owner/Op end date: Not reported

HOKU SCIENTIFIC INC (Continued) **1007879509**

Owner/operator name: HOKU SCIENTIFIC INC
Owner/operator address: Not reported
Not reported
Owner/operator country: US
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 2003-01-01 00:00:00.
Owner/Op end date: Not reported

Owner/operator name: DREAL HAWAII LLC
Owner/operator address: 2153 NORTH KING STREET SUITE 200
HONOLULU, HI 96819
Owner/operator country: US
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 2002-01-01 00:00:00.
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 2004-12-14 00:00:00.0
Site name: HOKU SCIENTIFIC INC
Classification: Small Quantity Generator

Hazardous Waste Summary:

. Waste code: D018
. Waste name: BENZENE

. Waste code: D019
. Waste name: CARBON TETRACHLORIDE

HOKU SCIENTIFIC INC (Continued) **1007879509**

. Waste code: D021
. Waste name: CHLOROBENZENE

. Waste code: D022
. Waste name: CHLOROFORM

. Waste code: D024
. Waste name: M-CRESOL

. Waste code: D027
. Waste name: 1,4-DICHLOROBENZENE

. Waste code: D028
. Waste name: 1,2-DICHLOROETHANE

. Waste code: D036
. Waste name: NITROBENZENE

. Waste code: D038
. Waste name: PYRIDINE

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F004
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: CRESOLS, CRESYLIC ACID, AND NITROBENZENE; AND THE STILL BOTTOMS FROM THE RECOVERY OF THESE SOLVENTS; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS

HOKU SCIENTIFIC INC (Continued) **1007879509**

CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F024
. Waste name: PROCESS WASTES INCLUDING, BUT NOT LIMITED TO, DISTILLATION RESIDUES, HEAVY ENDS, TARS, AND REACTOR CLEAN-OUT WASTES FROM THE PRODUCTION OF CERTAIN CHLORINATED ALIPHATIC HYDROCARBONS BY FREE RADICAL CATALYZED PROCESSES. THESE CHLORINATED ALIPHATIC HYDROCARBONS ARE THOSE HAVING CARBON CHAIN LENGTHS RANGING FROM ONE TO, AND INCLUDING FIVE, WITH VARYING AMOUNTS AND POSITIONS OF CHLORINE SUBSTITUTION. (THIS LISTING DOES NOT INCLUDE WASTEWATERS, WASTEWATER TREATMENT SLUDGE, SPENT CATALYSTS, AND WASTES LISTED IN SECTIONS 261.31. OR 261.32)

. Waste code: F025
. Waste name: CONDENSED LIGHT ENDS, SPENT FILTERS AND FILTER AIDS, AND SPENT DESICCANT WASTES FROM THE PRODUCTION OF CERTAIN CHLORINATED ALIPHATIC HYDROCARBONS BY FREE RADICAL CATALYZED PROCESSES. THESE CHLORINATED ALIPHATIC HYDROCARBONS ARE THOSE HAVING CARBON CHAIN LENGTHS RANGING FROM ONE TO, AND INCLUDING FIVE, WITH VARYING AMOUNTS AND POSITIONS OF CHLORINE SUBSTITUTION.

. Waste code: F037
. Waste name: PETROLEUM REFINERY PRIMARY OIL/WATER/SOLIDS SEPARATION SLUDGE - ANY SLUDGE GENERATED FROM THE GRAVITATIONAL SEPARATION OF OIL/WATER/SOLIDS DURING THE STORAGE OR TREATMENT OF PROCESS WASTEWATERS AND OILY COOLING WASTEWATERS FROM PETROLEUM REFINERIES. SUCH SLUDGES INCLUDE, BUT ARE NOT LIMITED TO, THOSE GENERATED IN OIL/WATER/SOLIDS SEPARATORS; TANKS AND IMPOUNDMENTS; DITCHES AND OTHER CONVEYANCES; SUMPS; AND STORM WATER UNITS RECEIVING DRY WEATHER FLOW. SLUDGES GENERATED IN STORM WATER UNITS THAT DO NOT RECEIVE DRY WEATHER FLOW, SLUDGES GENERATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS AS DEFINED IN SECTION 261.31(B)(2) (INCLUDING SLUDGES GENERATED IN ONE OR MORE ADDITIONAL UNITS AFTER WASTEWATERS HAVE BEEN TREATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS), AND K051 WASTES ARE EXEMPTED FROM THIS LISTING.

. Waste code: F038
. Waste name: PETROLEUM REFINERY SECONDARY (EMULSIFIED) OIL/WATER/SOLIDS SEPARATION SLUDGE - ANY SLUDGE AND/OR FLOAT GENERATED FROM THE PHYSICAL AND/OR CHEMICAL SEPARATION OF OIL/WATER/SOLIDS IN PROCESS WASTEWATERS AND OILY COOLING WASTEWATERS FROM PETROLEUM REFINERIES. SUCH WASTES INCLUDE, BUT ARE NOT LIMITED TO, ALL SLUDGES AND FLOATS GENERATED IN INDUCED AIR FLOTATION (IAF) UNITS, TANKS AND IMPOUNDMENTS, AND ALL SLUDGES GENERATED IN DAF UNITS. SLUDGES GENERATED IN STORMWATER UNITS THAT DO NOT RECEIVE DRY WEATHER FLOW, SLUDGES GENERATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS AS DEFINED IN SECTION 261.31(B)(2) (INCLUDING SLUDGES GENERATED IN ONE OR MORE ADDITIONAL UNITS AFTER WASTEWATERS HAVE BEEN TREATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS), AND F037, K048, AND K051 WASTES ARE EXEMPTED FROM THIS LISTING.

. Waste code: K001
. Waste name: BOTTOM SEDIMENT SLUDGE FROM THE TREATMENT OF WASTEWATERS FROM WOOD PRESERVING PROCESSES THAT USE CREOSOTE AND/OR PENTACHLOROPHENOL.

HOKU SCIENTIFIC INC (Continued) **1007879509**

. Waste code: K009
. Waste name: DISTILLATION BOTTOMS FROM THE PRODUCTION OF ACETALDEHYDE FROM ETHYLENE.

. Waste code: K010
. Waste name: DISTILLATION SIDE CUTS FROM THE PRODUCTION OF ACETALDEHYDE FROM ETHYLENE.

. Waste code: K011
. Waste name: BOTTOM STREAM FROM THE WASTEWATER STRIPPER IN THE PRODUCTION OF ACRYLONITRILE.

. Waste code: K013
. Waste name: BOTTOM STREAM FROM THE ACETONITRILE COLUMN IN THE PRODUCTION OF ACRYLONITRILE.

. Waste code: K014
. Waste name: BOTTOMS FROM THE ACETONITRILE PURIFICATION COLUMN IN THE PRODUCTION OF ACRYLONITRILE.

. Waste code: K015
. Waste name: STILL BOTTOMS FROM THE DISTILLATION OF BENZYL CHLORIDE.

. Waste code: K016
. Waste name: HEAVY ENDS OR DISTILLATION RESIDUES FROM THE PRODUCTION OF CARBON TETRACHLORIDE.

. Waste code: K018
. Waste name: HEAVY ENDS FROM THE FRACTIONATION COLUMN IN ETHYL CHLORIDE PRODUCTION.

. Waste code: K019
. Waste name: HEAVY ENDS FROM THE DISTILLATION OF ETHYLENE DICHLORIDE IN ETHYLENE DICHLORIDE PRODUCTION.

. Waste code: K020
. Waste name: HEAVY ENDS FROM THE DISTILLATION OF VINYL CHLORIDE IN VINYL CHLORIDE MONOMER PRODUCTION.

. Waste code: K021
. Waste name: AQUEOUS SPENT ANTIMONY CATALYST WASTE FROM FLUOROMETHANE PRODUCTION.

. Waste code: K022
. Waste name: DISTILLATION BOTTOM TARS FROM THE PRODUCTION OF PHENOL/ACETONE FROM CUMENE.

. Waste code: K026
. Waste name: STRIPPING STILL TAILS FROM THE PRODUCTION OF METHYL ETHYL PYRIDINES.

. Waste code: K029
. Waste name: WASTE FROM THE PRODUCT STEAM STRIPPER IN THE PRODUCTION OF 1,1,1-TRICHLOROETHANE.

. Waste code: K030
. Waste name: COLUMN BOTTOMS OR HEAVY ENDS FROM THE COMBINED PRODUCTION OF TRICHLOROETHYLENE AND PERCHLOROETHYLENE.

. Waste code: K035

HOKU SCIENTIFIC INC (Continued) **1007879509**

. Waste name: WASTEWATER TREATMENT SLUDGES GENERATED IN THE PRODUCTION OF CREOSOTE.

. Waste code: K036
. Waste name: STILL BOTTOMS FROM TOLUENE RECLAMATION DISTILLATION IN THE PRODUCTION OF DISULFOTON.

. Waste code: K037
. Waste name: WASTEWATER TREATMENT SLUDGES FROM THE PRODUCTION OF DISULFOTON.

. Waste code: K060
. Waste name: AMMONIA STILL LIME SLUDGE FROM COKING OPERATIONS.

. Waste code: K071
. Waste name: BRINE PURIFICATION MUDS FROM THE MERCURY CELL PROCESS IN CHLORINE PRODUCTION, IN WHICH SEPARATELY PREPURIFIED BRINE IS NOT USED.

. Waste code: K073
. Waste name: CHLORINATED HYDROCARBON WASTE FROM THE PURIFICATION STEP OF THE DIAPHRAGM CELL PROCESS USING GRAPHITE ANODES IN CHLORINE PRODUCTION.

. Waste code: K083
. Waste name: DISTILLATION BOTTOMS FROM ANILINE PRODUCTION.

. Waste code: K085
. Waste name: DISTILLATION OR FRACTIONATION COLUMN BOTTOMS FROM THE PRODUCTION OF CHLOROBENZENES.

. Waste code: K087
. Waste name: DECANTER TANK TAR SLUDGE FROM COKING OPERATIONS.

. Waste code: K095
. Waste name: DISTILLATION BOTTOMS FROM THE PRODUCTION OF 1,1,1-TRICHLOROETHANE.

. Waste code: K096
. Waste name: HEAVY ENDS FROM THE HEAVY ENDS COLUMN FROM THE PRODUCTION OF 1,1,1-TRICHLOROETHANE.

. Waste code: K103
. Waste name: PROCESS RESIDUES FROM ANILINE EXTRACTION FROM THE PRODUCTION OF ANILINE.

. Waste code: K104
. Waste name: COMBINED WASTEWATERS GENERATED FROM NITROBENZENE/ANILINE PRODUCTION.

. Waste code: K105
. Waste name: SEPARATED AQUEOUS STREAM FROM THE REACTOR PRODUCT WASHING STEP IN THE PRODUCTION OF CHLOROBENZENES.

. Waste code: K106
. Waste name: WASTEWATER TREATMENT SLUDGE FROM THE MERCURY CELL PROCESS IN CHLORINE PRODUCTION.

. Waste code: K112
. Waste name: REACTION BY-PRODUCT WATER FROM THE DRYING COLUMN IN THE PRODUCTION OF TOLUENEDIAMINE VIA HYDROGENATION OF DINITROTOLUENE.

. Waste code: K113

HOKU SCIENTIFIC INC (Continued) **1007879509**

. Waste name: CONDENSED LIQUID LIGHT ENDS FROM PURIFICATION OF TOLUENEDIAMINE IN PRODUCTION OF TOLUENEDIAMINE VIA HYDROGENATION OF DINITROTOLUENE.

. Waste code: K116
. Waste name: ORGANIC CONDENSATE FROM THE SOLVENT RECOVERY COLUMN IN THE PRODUCTION OF TOLUENE DIISOCYANATE VIA PHOSGENATION OF TOLUENEDIAMINE.

. Waste code: K131
. Waste name: WASTEWATER FROM THE REACTOR AND SPENT SULFURIC ACID FROM THE ACID DRYER FROM THE PRODUCTION OF METHYL BROMIDE.

. Waste code: K141
. Waste name: PROCESS RESIDUES FROM THE RECOVERY OF COAL TAR, INCLUDING, BUT NOT LIMITED TO, TAR COLLECTING SUMP RESIDUES FROM THE PRODUCTION OF COKE FROM COAL OR THE RECOVERY OF COKE BY-PRODUCTS PRODUCED FROM COAL. THIS LISTING DOES NOT INCLUDE K087 (DECANTER TANK SLUDGE FROM COKING OPERATIONS).

. Waste code: K142
. Waste name: TANK STORAGE RESIDUES FROM THE PRODUCTION OF COKE FROM COAL OR FROM THE RECOVERY OF COKE BY-PRODUCTS FROM COAL.

. Waste code: K143
. Waste name: PROCESS RESIDUES FROM THE RECOVERY OF LIGHT OIL, INCLUDING, BUT NOT LIMITED TO, THOSE GENERATED IN STILLS, DECANTERS, AND WASH OIL RECOVERY UNITS FROM THE RECOVERY OF COKE BY-PRODUCTS PRODUCED FROM COAL.

. Waste code: K144
. Waste name: WASTEWATER SUMP RESIDUES FROM LIGHT OIL REFINING, INCLUDING, BUT NOT LIMITED TO, INTERCEPTING OR CONTAMINATION SUMP SLUDGES FROM THE RECOVERY OF COKE BY-PRODUCTS PRODUCED FROM COAL.

. Waste code: K145
. Waste name: RESIDUES FROM NAPHTHALENE COLLECTION AND RECOVERY OPERATIONS FROM THE RECOVERY OF COKE BY-PRODUCTS PRODUCED FROM COAL.

. Waste code: K147
. Waste name: TAR STORAGE RESIDUES FROM COAL TAR REFINING.

. Waste code: K149
. Waste name: DISTILLATION BOTTOMS FROM THE PRODUCTION OF ALPHA (OR METHYL-) CHLORINATED TOLUNES, RING-CHLORINATED TOLUNES, BENZOYL CHLORIDES, AND COMPOUNDS WITH MIXTURES OF THESE FUNCTIONAL GROUPS. [THIS WASTE DOES NOT INCLUDE STILL BOTTOMS FROM THE DISTILLATION OF BENZOYL CHLORIDE]

. Waste code: K150
. Waste name: ORGANIC RESIDULES EXCLUDING SPENT CARBON ADSORBENT, FROM THE SPENT CHLORINE GAS AND HYDROCHLORIC ACID RECOVERY PROCESSES ASSOCIATED WITH THE PRODUCTION OF ALPHA (OR METHYL-) CHLORINATED TOLUNES, BENZOYL CHLORIDES, AND COMPOUNDS WITH MIXTURES OF THESE FUNCTIONAL GROUPS.

. Waste code: K151
. Waste name: WASTEWATER TREATMENT SLUDGES, EXCLUDING NEUTRALIZATION AND BIOLOGICAL SLUDGES, GENERATED DURING THE TREATMENT OF WASTEWATERS FROM THE PRODUCTION OF ALPHA (OR METHYL-) CHLORINATED TOLUNES, BENZOYL CHLORIDES, AND COMPOUNDS WITH MIXTURES OF THESE FUNCTIONAL GROUPS.

HOKU SCIENTIFIC INC (Continued) **1007879509**

. Waste code: K156
. Waste name: ORGANIC WASTE (INCLUDING HEAVY ENDS, STILL BOTTOMS, LIGHT ENDS, SPENT SOLVENTS, FILTRATES, AND DECANTATES) FROM THE PRODUCTION OF CARBAMATES AND CARBAMOYL OXIMES.

. Waste code: K157
. Waste name: WASTEWATERS (INCLUDING SCRUBBER WATERS, CONDENSER WATERS, WASHWATERS, AND SEPARATION WATERS) FROM THE PRODUCTION OF CARBAMATES AND CARBAMOYL OXIMES.

. Waste code: K158
. Waste name: BAG HOUSE DUSTS AND FILTER/SEPARATION SOLIDS FROM THE PRODUCTION OF CARBAMATES AND CARBAMOYL OXIMES.

. Waste code: K159
. Waste name: ORGANICS FROM THE TREATMENT OF THIOCARBAMATE WASTES.

. Waste code: K169
. Waste name: CRUDE OIL STORAGE TANK SEDIMENT FROM PETROLEUM REFINING OPERATIONS

. Waste code: K171
. Waste name: SPENT HYDROTREATING CATALYST FROM PETROLEUM REFINING OPERATIONS,INCLUDING GUARD BEDS USED TO DESULFURIZE FEEDS TO OTHER CATALYTIC REACTORS (THIS LISTING DOES NOT INCLUDE INERT SUPPORT MEDIA)

. Waste code: K175
. Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF VINYL CHLORIDE MONOMER..

. Waste code: P022
. Waste name: CARBON DISULFIDE

. Waste code: P189
. Waste name: CARBAMIC ACID, [(DIBUTYLAMINO)-THIO]METHYL-, 2,3-DIHYDRO-2,2-DIMETHYL -7-BENZOFURANYL ESTER (OR) CARBOSULFAN

Facility Has Received Notices of Violations:

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 2006-10-13 12:08:29.0
Date achieved compliance: 2006-06-30 00:00:00.0
Violation lead agency: EPA
Enforcement action: Not reported
Enforcement action date: 2004-12-20 00:00:00.0
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 2006-10-13 12:08:29.0
Date achieved compliance: 2006-06-30 00:00:00.0
Violation lead agency: EPA
Enforcement action: SINGLE SITE CA/FO

HOKU SCIENTIFIC INC (Continued) **1007879509**

Enforcement action date: 2006-06-30 00:00:00.0
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: Not reported
Final penalty amount: 14200
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 2005-10-10 00:00:00.0
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: EPA

Evaluation date: 2004-11-15 00:00:00.0
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 2006-06-30 00:00:00.0
Evaluation lead agency: EPA

Evaluation date: 2004-11-15 00:00:00.0
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: EPA

ICIS:
Enforcement Action ID: 09-2006-0175
FRS ID: 110020574788
Action Name: Hoku Scientific, Inc.
Facility Name: HOKU SCIENTIFIC INC
Facility Address: 2153 NORTH KING STREET
HONOLULU, HI 96819
Enforcement Action Type: RCRA 3008A AO For Comp And/Or Penalty
Facility County: HONOLULU
Program System Acronym: ICIS
Enforcement Action Forum Desc: Administrative - Formal
EA Type Code: 3008A
Facility SIC Code: 8731
Federal Facility ID: Not reported
Latitude in Decimal Degrees: 21.33423
Longitude in Decimal Degrees: -157.879991
Permit Type Desc: Not reported
Program System Acronym: 600003223
Facility NAICS Code: Not reported
Tribal Land Code: Not reported

Facility Name: HOKU SCIENTIFIC INC
Address: 2153 NORTH KING STREET
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 8731

Facility Name: HOKU SCIENTIFIC INC

HOKU SCIENTIFIC INC (Continued) **1007879509**

Address: 2153 NORTH KING STREET
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 8731

Facility Name: HOKU SCIENTIFIC INC
Address: 2153 NORTH KING STREET
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 8731

FINDS:
Registry ID: 110020574788
Facility URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110020574788

Environmental Interest/Information System:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.
STATE MASTER
ICIS (Integrated Compliance Information System) is the Integrated Compliance Information System and provides a database that, when complete, will contain integrated Enforcement and Compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain Enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions. This information is maintained in ICIS by EPA in the Regional offices and it Headquarters. A future release of ICIS will replace the Permit Compliance System (PCS) which supports the NPDES and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities occurring in the Region that support Compliance and Enforcement programs. These include; Incident Tracking, Compliance Assistance, and Compliance Monitoring.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1007879509
Registry ID: 110020574788
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110020574788
Name: HOKU SCIENTIFIC INC
Address: 2153 NORTH KING STREET
City,State,Zip: HONOLULU, HI 96819

E12 South 1/4-1/2 0.259 mi. 1369 ft. | **C&CH KALIHI FIRE STATION** | **LUST** | **1006843326**
1742 N KING ST | **UST** | **N/A**
HONOLULU, HI 96819

Site 1 of 2 in cluster E

Relative: Lower

Actual: 46 ft.

LUST:

Facility ID:	9-100079
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	07/29/1994
Release ID:	940107
Project Officer:	Lene Ichinotsubo

UST:

Facility ID:	9-100079
Owner:	C&C OF HNL - HONOLULU FIRE DEPARATMENT
Owner Address:	636 South Street
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.331372000000002
Longitude:	-157.875958
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching

Tank ID:	R-1
Date Installed:	09/02/1980
Tank Status:	**Permanently Out of Use**
Date Closed:	05/03/1993
Tank Capacity:	1000
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	06/06/1993
Tank Capacity:	550
Substance:	Gasoline

D13 SW 1/4-1/2 0.275 mi. 1451 ft. | **MORRIS ANGELO** | **LUST** | **U003711688**
905 FACTORY ST | **UST** | **N/A**
HONOLULU, HI 96819

Site 2 of 2 in cluster D

Relative: Lower

Actual: 40 ft.

LUST:

Facility ID:	9-103511
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	05/03/1999
Release ID:	990189
Project Officer:	Renato Maniulit

UST:

Facility ID:	9-103511
Owner:	MORRIS ANGELO
Owner Address:	905 FACTORY ST
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.331956999999999
Longitude:	-157.87921800000001
Horizontal Reference Datum Name:	NAD83

MORRIS ANGELO (Continued) **U003711688**

Horizontal Collection Method Name: Address Matching

Tank ID: R-1
Date Installed: Not reported
Tank Status: **Permanently Out of Use**
Date Closed: 01/28/1999
Tank Capacity: 1000
Substance: Gasoline

Tank ID: R-2
Date Installed: Not reported
Tank Status: **Permanently Out of Use**
Date Closed: 01/29/1999
Tank Capacity: 1000
Substance: Diesel

E14
South
1/4-1/2
0.280 mi.
1478 ft.

IES RETAIL KALIHI **LUST** **U001235428**
1715 N KING ST **UST** **N/A**
HONOLULU, HI 96819 **Financial Assurance**

Site 2 of 2 in cluster E

Relative:
Lower

Actual:
42 ft.

LUST:
Facility ID: 9-101236
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 04/26/2002
Release ID: 880002
Project Officer: Jose Ruiz

UST:
Facility ID: 9-101236
Owner: CHEVRON PRODUCTS COMPANY
Owner Address: Attn Permit Desk PO Box 6004
Owner City,St,Zip: Honolulu, 96819 96819
Latitude: 21.3308
Longitude: -157.87608
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: GPS

Tank ID: 1
Date Installed: 04/21/1978
Tank Status: **Currently in Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 1
Date Installed: 04/21/1978
Tank Status: **Currently in Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 1

IES RETAIL KALIHI (Continued) **U001235428**

Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	2
Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	2
Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	2
Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	3
Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	3
Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	3
Date Installed:	04/21/1978
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

HI Financial Assurance:

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST

IES RETAIL KALIHI (Continued) **U001235428**

City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Trust Fund
Expiration Date:	Not reported

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	3
Tank Status:	Currently in Use
FRTYPE:	Trust Fund
Expiration Date:	Not reported

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	2
Tank Status:	Currently in Use
FRTYPE:	Trust Fund
Expiration Date:	Not reported

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	2
Tank Status:	Currently in Use
FRTYPE:	Guarantee
Expiration Date:	04/28/2009

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Guarantee
Expiration Date:	04/28/2009

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	3
Tank Status:	Currently in Use
FRTYPE:	Guarantee
Expiration Date:	04/28/2009

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	3

IES RETAIL KALIHI (Continued) **U001235428**

Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	04/24/2014

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	04/24/2014

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	2
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	04/24/2014

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	3
Tank Status:	Currently in Use
FRTYPE:	Insurance
Expiration Date:	11/01/2021

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Insurance
Expiration Date:	11/01/2021

Name:	IES RETAIL KALIHI
Address:	1715 N KING ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101236
Tank Id:	2
Tank Status:	Currently in Use
FRTYPE:	Insurance
Expiration Date:	11/01/2021

15 NNE 1/4-1/2 0.305 mi. 1610 ft. | **CHANG-CHOW PROPERTY, NORTH SCHOOL STREET**
2161 N SCHOOL ST
HONOLULU, HI 96817 | **SHWS** | **1006820024**
N/A

Relative: Higher
Actual: 81 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Chang-Chow Property North School Street Underground Storage Tank Closure
HID Number:	Not reported
Facility Registry Identifier:	110013779072
Lead Agency:	HEER
Program:	State
Project Manager:	Mark Sutterfield
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Chang-Chow Property North School Street Underground Storage Tank Closure
HID Number:	Not reported
Facility Registry Identifier:	110013779072
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Diesel contaminated soil/groundwater
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Letter of Completion - Unrestricted Residential Use
Document Date:	11/30/2004
Document Number:	2004-508-MS
Document Subject:	NFA for 500 gallon diesel tank closed in place
Project Manager:	Mark Sutterfield
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

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16 NNW 1/4-1/2 0.309 mi. 1629 ft. | **KUHIO PARK TERRACE COMMUNITY CENTER**
1475 LINAPUNI ST
HONOLULU, HI 96819 | **SHWS**
ENG CONTROLS
INST CONTROL | **S115488710**
N/A

Relative: Higher
Actual: 92 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Kuhio Park Terrace Community Center
HID Number:	Not reported
Facility Registry Identifier:	110013771935
Lead Agency:	HEER
Program:	State
Project Manager:	Melody Calisay
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu

KUHIO PARK TERRACE COMMUNITY CENTER (Continued) **S115488710**

SDAR Environmental Interest Name:	Kuhio Park Terrace Community Center
HID Number:	Not reported
Facility Registry Identifier:	110013771935
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Lead above EALs under building and asphalt.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	08/27/2013
Document Number:	2013-448-MGC
Document Subject:	No Further Action with Institutional Control Determination based on the review of the Remedial Action Implementation Report, Kuhio Park Terrace Property, Jun 21, 2013, prepared by Bureau Veritas North America, Inc
Project Manager:	Melody Calisay
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls
Engineering Control:	Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

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17
ENE
1/4-1/2
0.312 mi.
1647 ft.

BASE YARD NO. 25 **FUDS** **1024901908**
N/A

HONOLULU, HI

Relative:
Higher

Actual:
104 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F378300
Congressional District Number:	01
Facility Name:	BASE YARD NO. 25
FUDS Number:	H09HI0038
City:	HONOLULU
State:	HI
County:	HONOLULU
Object ID:	628
USACE District:	Honolulu District (POH)
Status:	Properties without projects

BASE YARD NO. 25 (Continued) **1024901908**

Current Owner:	Private Sector; State Government
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=62332
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.336666670000000
Longitude:	-157.871111109999000

18
WSW
1/4-1/2
0.322 mi.
1701 ft.

RAKUYO KEN U.S.A.
804 GULICK AVE
HONOLULU, HI 96819

LUST **U003346378**
UST **N/A**

Relative:
Lower

Actual:
40 ft.

LUST:

Facility ID:	9-103254
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	08/05/1998
Release ID:	970014
Project Officer:	Eric Sadoyama

UST:

Facility ID:	9-103254
Owner:	Rakuyo Ken U.S.A.
Owner Address:	c/o KMJ Realty 900 Fort Street Mall, Suite 1150
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.332447999999999
Longitude:	-157.88081700000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching

Tank ID:	UST A
Date Installed:	01/01/1974
Tank Status:	**Permanently Out of Use**
Date Closed:	10/22/1996
Tank Capacity:	1000
Substance:	Gasoline

Tank ID:	UST B
Date Installed:	01/01/1974
Tank Status:	**Permanently Out of Use**
Date Closed:	10/22/1996
Tank Capacity:	500
Substance:	Other

Tank ID:	UST C
Date Installed:	01/01/1974
Tank Status:	**Permanently Out of Use**
Date Closed:	10/22/1996
Tank Capacity:	500
Substance:	Other

F19 West 1/4-1/2 0.356 mi. 1880 ft. | **NEW CITY NISSAN**
2295 NORTH KING STREET
HONOLULU, HI 96819 | **US BROWNFIELDS** | **1026006951**
N/A

Site 1 of 2 in cluster F

Relative: Lower

Actual: 34 ft.

US BROWNFIELDS:

Name:	NEW CITY NISSAN
Address:	2295 NORTH KING STREET
City,State,Zip:	HONOLULU, HI 96819
Recipient Name:	City and County of Honolulu
Grant Type:	Assessment
Property Number:	1-2-014: 049, 062-064, 082, 083, 093; 1-2-015: 001, 002, 005; 1-2-016: 019
Parcel size:	6.5
Latitude:	21.3351319
Longitude:	-157.8823612
HCM Label:	-
Map Scale:	-
Point of Reference:	-
Highlights:	-
Datum:	-
Acres Property ID:	240569
IC Data Access:	-
Start Date:	-
Redev Completition Date:	-
Completed Date:	-
Acres Cleaned Up:	-
Cleanup Funding:	-
Cleanup Funding Source:	-
Assessment Funding:	12500
Assessment Funding Source:	EPA
Redevelopment Funding:	-
Redev. Funding Source:	-
Redev. Funding Entity Name:	-
Redevelopment Start Date:	-
Assessment Funding Entity:	US EPA - Brownfields Assessment Cooperative Agreement
Cleanup Funding Entity:	-
Grant Type:	Hazardous & Petroleum
Accomplishment Type:	Phase I Environmental Assessment
Accomplishment Count:	Y
Cooperative Agreement Number:	99T74601
Start Date:	26-Apr-19
Ownership Entity:	Private
Completion Date:	6-Aug-19
Current Owner:	Rosebridge, LLC
Did Owner Change:	N
Cleanup Required:	N
Video Available:	N
Photo Available:	Y
Institutional Controls Required:	N
IC Category Proprietary Controls:	-
IC Cat. Info. Devices:	-
IC Cat. Gov. Controls:	-
IC Cat. Enforcement Permit Tools:	-
IC in place date:	-
IC in place:	N
State/tribal program date:	-
State/tribal program ID:	-
State/tribal NFA date:	-

NEW CITY NISSAN (Continued) **1026006951**

Air cleaned:	-
Asbestos found:	-
Asbestos cleaned:	-
Controled substance found:	-
Controled substance cleaned:	-
Drinking water affected:	-
Drinking water cleaned:	-
Groundwater affected:	-
Groundwater cleaned:	-
Lead contaminant found:	-
Lead cleaned up:	-
No media affected:	-
Unknown media affected:	-
Other cleaned up:	-
Other metals found:	-
Other metals cleaned:	-
Other contaminants found:	-
Other contams found description:	-
PAHs found:	-
PAHs cleaned up:	-
PCBs found:	-
PCBs cleaned up:	-
Petro products found:	-
Petro products cleaned:	-
Sediments found:	-
Sediments cleaned:	-
Soil affected:	-
Soil cleaned up:	-
Surface water cleaned:	-
VOCs found:	-
VOCs cleaned:	-
Cleanup other description:	-
Num. of cleanup and re-dev. jobs:	-
Past use greenspace acreage:	-
Past use residential acreage:	-
Surface Water:	-
Past use commercial acreage:	6
Past use industrial acreage:	0.5
Future use greenspace acreage:	-
Future use residential acreage:	4
Future use commercial acreage:	2.5
Future use industrial acreage:	-
Superfund Fed. landowner flag:	-
Arsenic cleaned up:	-
Cadmium cleaned up:	-
Chromium cleaned up:	-
Copper cleaned up:	-
Iron cleaned up:	-
mercury cleaned up:	-
Nickel Cleaned Up:	-
No clean up:	-
Pesticides cleaned up:	-
Selenium cleaned up:	-
SVOCs cleaned up:	-
Unknown clean up:	-
Arsenic contaminant found:	-
Cadmium contaminant found:	-

NEW CITY NISSAN (Continued) **1026006951**

Chromium contaminant found:	-
Copper contaminant found:	-
Iron contaminant found:	-
Mercury contaminant found:	-
Nickel contaminant found:	-
No contaminant found:	-
Pesticides contaminant found:	-
Selenium contaminant found:	-
SVOCs contaminant found:	-
Unknown contaminant found:	-
Future Use: Multistory	-
Media affected Bluiding Material:	-
Media affected indoor air:	-
Building material media cleaned up:	-
Indoor air media cleaned up:	-
Unknown media cleaned up:	-
Past Use: Multistory	-
Property Description:	The Site consists of multiple properties covering a total area of approximately 6.5 acres and owned Rosebridge, LLC. The parcels comprising the Site are identified as TMKs: (1)1-2-014-049, 062, 063, 064, 082, 083, 093; (1)1-2-015-001, 002, 005; and (1)1-2-016-019. The property includes (but is not limited to) the following street addresses that are zoned for commercial use: 2295 N King Street, 2229 N King Street, 2329 and 2329A N King Street, 923 Owen Street, 820 Umi Street, and 828 Umi Street. The site was developed for residential use by 1914 and was occupied by multiple dwellings, and motion picture theater. The Site previously operated as a shopping center and bowling alley from the 1950 s until its redevelopment in 2007. Unocal operated a service station and automotive repair shop on the parcel bounded by King and Umi Streets from 1956 through August 1991. The service station structures were completely removed the first half of 1992. The current Site structures were constructed in 1955, 2007, and 2013.
Below Poverty Number:	-
Below Poverty Percent:	-
Meidan Income:	-
Meidan Income Number:	-
Meidan Income Percent:	-
Vacant Housing Number:	-
Vacant Housing Percent:	-
Unemployed Number:	-
Unemployed Percent:	-

F20
West
1/4-1/2
0.356 mi.
1880 ft.

KSC SERVICE L-4210 **LUST** **U001235008**
2295 N KING ST **UST** **N/A**
HONOLULU, HI 96819

Site 2 of 2 in cluster F

Relative:
Lower

Actual:
34 ft.

LUST:

Facility ID:	9-100031
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	03/10/1999
Release ID:	920008
Project Officer:	Eric Sadoyama

UST:

Facility ID:	9-100031

KSC SERVICE L-4210 (Continued) **U001235008**

Owner:	UNOCAL CORPORATION
Owner Address:	3915 Mission Avenue #7416
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.335796999999999
Longitude:	-157.88225700000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching

Tank ID:	R-1
Date Installed:	04/01/1969
Tank Status:	**Permanently Out of Use**
Date Closed:	04/28/1992
Tank Capacity:	10000
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	04/01/1969
Tank Status:	**Permanently Out of Use**
Date Closed:	04/28/1992
Tank Capacity:	10000
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	04/01/1969
Tank Status:	**Permanently Out of Use**
Date Closed:	04/28/1992
Tank Capacity:	550
Substance:	Used Oil

Tank ID:	R-5
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	03/30/1992
Tank Capacity:	5000
Substance:	Gasoline

Tank ID:	R-6
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	03/30/1992
Tank Capacity:	7000
Substance:	Gasoline

---

21 **KAMEHAMEHA HOUSING PROJECT** **LUST** **U003221882**
South **1629 HAKA DR** **UST** **N/A**
1/4-1/2 **HONOLULU, HI 96817**
0.375 mi.
1978 ft.

Relative: LUST:
Lower

Facility ID:	9-103126
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	12/22/1997
Release ID:	960029

Actual:
38 ft.

KAMEHAMEHA HOUSING PROJECT (Continued) **U003221882**

Project Officer: Steven Okoji

UST:

Facility ID:	9-103126
Owner:	STATE DHS - HAWAII HOUSING AUTHORITY
Owner Address:	Not reported
Owner City,St,Zip:	Honolulu, 96817 96817
Latitude:	21.329567000000001
Longitude:	-157.875103
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching
Tank ID:	1
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	Not reported
Tank Capacity:	Not reported
Substance:	Used Oil

G22 **FARRINGTON HIGH SCHOOL FIRING RANGE** **SEMS** **1025802765**
SSE **1564 NORTH KING STREET** **HIN000905821**
1/4-1/2 **HONOLULU, HI 96817**
0.382 mi.
2019 ft. **Site 1 of 3 in cluster G**

Relative:
Lower

Actual:
45 ft.

SEMS:

Site ID:	0905821
EPA ID:	HIN000905821
Name:	FARRINGTON HIGH SCHOOL FIRING RANGE
Address:	1564 NORTH KING STREET
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Cong District:	Not reported
FIPS Code:	15003
Latitude:	Not reported
Longitude:	Not reported
FF:	N
NPL:	Not on the NPL
Non NPL Status:	Other Cleanup Activity: State-Lead Cleanup

SEMS Detail:

Region:	09
Site ID:	0905821
EPA ID:	HIN000905821
Site Name:	FARRINGTON HIGH SCHOOL FIRING RANGE
NPL:	N
FF:	N
OU:	00
Action Code:	HX
Action Name:	PRE-CERC
SEQ:	1
Start Date:	2018-07-01 04:00:00
Finish Date:	6/25/2019 4:00:00 AM
Qual:	DI
Current Action Lead:	St Perf

G23 SSE 1/4-1/2 0.382 mi. 2019 ft.

FARRINGTON HIGH SCHOOL
1564 N KING ST
HONOLULU, HI 96817

Site 2 of 3 in cluster G

SHWS 1007277849
SPILLS N/A
FTTS
HIST FTTS

Relative: Lower

Actual: 45 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Farrington High School
HID Number:	HID984467050
Facility Registry Identifier:	110009278753
Lead Agency:	HEER
Program:	State
Project Manager:	Richard Palmer
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Farrington High School
HID Number:	HID984467050
Facility Registry Identifier:	110009278753
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Found: Petroleum in soil.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Closed - Documentation Inadequate to Evaluate Risk
Document Date:	01/30/1997
Document Number:	1997-050-RK
Document Subject:	Farrington High School
Project Manager:	Richard Palmer
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Farrington High School Firing Range
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Laura Young
Hazard Priority:	High
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Farrington High School Firing Range
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	High

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Laura Young
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19920427-1
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Farrington High School leaking UST
Activity Type:	Response
Activity Lead:	Sheila Mackenzie
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Education
Substances:	Diesel Fuel (Petroleum)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.338951999999999
Longitude:	-157.843605

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19920427-1
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Farrington High School leaking UST
Activity Type:	Response
Activity Lead:	Sheila Mackenzie
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Education
Substances:	Diesel Fuel (Petroleum)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.329924999999999
Longitude:	-157.87034499999999

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19920427-1

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Farrington High School leaking UST
Activity Type:	Response
Activity Lead:	Sheila Mackenzie
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Education
Substances:	Diesel Fuel (Petroleum)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.329861000000001
Longitude:	-157.870507

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19920427-1
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Farrington High School leaking UST
Activity Type:	Response
Activity Lead:	Sheila Mackenzie
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Education
Substances:	Diesel Fuel (Petroleum)

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.330185
Longitude:	-157.873796

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20050309-1109
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Off Scene
Less Or Greater Than:	<
Units:	Broken Thermometer
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2005-03-09 00:00:00
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	Mercury
Quanity:	1
Units:	Pounds
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.338951999999999
Longitude:	-157.843605

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20050309-1109
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Off Scene
Less Or Greater Than:	<
Units:	Broken Thermometer
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2005-03-09 00:00:00
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	Mercury
Quanity:	1
Units:	Pounds
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.329924999999999

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Longitude:	-157.87034499999999

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20050309-1109
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Off Scene
Less Or Greater Than:	<
Units:	Broken Thermometer
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2005-03-09 00:00:00
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	Mercury
Quanity:	1
Units:	Pounds
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.330755
Longitude:	-157.87260499999999

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20050309-1109
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

ER:	Off Scene
Less Or Greater Than:	<
Units:	Broken Thermometer
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2005-03-09 00:00:00
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	Mercury
Quanity:	1
Units:	Pounds
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.330185
Longitude:	-157.873796

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20050309-1109
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Off Scene
Less Or Greater Than:	<
Units:	Broken Thermometer
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2005-03-09 00:00:00
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	Mercury
Quanity:	1
Units:	Pounds
Reported Date:	Not reported

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.329861000000001
Longitude:	-157.870507

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19910725-1
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Farrington High School Chemistry class chemicals tested
Activity Type:	Response
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	CHEMISTRY CLASS CHEMICALS
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.329924999999999
Longitude:	-157.87034499999999

Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N KING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19910725-1
Facility Registry ID:	110009278753
HID Number:	HID984467050
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Farrington High School Chemistry class chemicals tested
Activity Type:	Response
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	State of Hawaii, Department of Education
Substances:	CHEMISTRY CLASS CHEMICALS
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.338951999999999
Longitude:	-157.843605

FARRINGTON HIGH SCHOOL (Continued) **1007277849**

Click this hyperlink while viewing on your computer to access
11 additional HI SPILLS: record(s) in the EDR Site Report.

FTTS INSP:

Inspection Number:	19910624R7016 2
Region:	07
Inspection Date:	06/24/91
Inspector:	CURRY
Violation occurred:	No
Investigation Type:	Asbestos, ASHAA Ongoing
Investigation Reason:	For Cause, Government
Legislation Code:	TSCA
Facility Function:	User

HIST FTTS INSP:

Inspection Number:	19910624R7016 2
Region:	07
Inspection Date:	Not reported
Inspector:	CURRY
Violation occurred:	No
Investigation Type:	Asbestos, ASHAA Ongoing
Investigation Reason:	For Cause, Government
Legislation Code:	TSCA
Facility Function:	User

G24 **FARRINGTON HIGH SCHOOL** **SEMS-ARCHIVE** **1000885453**
SSE **1564 N. KING STREET** **HID984467050**
1/4-1/2 **HONOLULU, HI 96819**
0.382 mi.
2019 ft. **Site 3 of 3 in cluster G**

Relative:
Lower

Actual:
45 ft.

SEMS Archive:

Site ID:	0904999
EPA ID:	HID984467050
Name:	FARRINGTON HIGH SCHOOL
Address:	1564 N. KING STREET
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Cong District:	01
FIPS Code:	15003
FF:	N
NPL:	Not on the NPL
Non NPL Status:	NFRAP-Site does not qualify for the NPL based on existing information

SEMS Archive Detail:

Region:	09
Site ID:	0904999
EPA ID:	HID984467050
Site Name:	FARRINGTON HIGH SCHOOL
NPL:	N
FF:	N
OU:	00
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1

FARRINGTON HIGH SCHOOL (Continued) **1000885453**

Start Date:	Not reported
Finish Date:	2013-11-08 05:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf In-Hse
Region:	09
Site ID:	0904999
EPA ID:	HID984467050
Site Name:	FARRINGTON HIGH SCHOOL
NPL:	N
FF:	N
OU:	00
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1994-04-14 04:00:00
Finish Date:	1994-04-14 04:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf
Region:	09
Site ID:	0904999
EPA ID:	HID984467050
Site Name:	FARRINGTON HIGH SCHOOL
NPL:	N
FF:	N
OU:	00
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	Not reported
Finish Date:	2009-07-17 04:00:00
Qual:	N
Current Action Lead:	EPA Perf

25
ENE
1/4-1/2
0.393 mi.
2076 ft.

KUHIO PARK TERRACE **US BROWNFIELDS** **1014949094**
1600 HAUPU PL **N/A**
KALIHI, OAHU, HI 96819

Relative:
Higher

Actual:
111 ft.

US BROWNFIELDS:

Name:	KUHIO PARK TERRACE
Address:	1600 HAUPU PL
City,State,Zip:	KALIHI, OAHU, HI 96819
Recipient Name:	Hawaii Department of Business, Economy & Tourism
Grant Type:	Assessment
Property Number:	-
Parcel size:	-
Latitude:	21.3365
Longitude:	-157.86998
HCM Label:	-
Map Scale:	-
Point of Reference:	-
Highlights:	-
Datum:	-
Acres Property ID:	14408

KUHIO PARK TERRACE (Continued) **1014949094**

IC Data Access:	-
Start Date:	-
Redev Completition Date:	-
Completed Date:	-
Acres Cleaned Up:	-
Cleanup Funding:	-
Cleanup Funding Source:	-
Assessment Funding:	-
Assessment Funding Source:	-
Redevelopment Funding:	-
Redev. Funding Source:	-
Redev. Funding Entity Name:	-
Redevelopment Start Date:	-
Assessment Funding Entity:	-
Cleanup Funding Entity:	-
Grant Type:	-
Accomplishment Type:	Phase I Environmental Assessment
Accomplishment Count:	N
Cooperative Agreement Number:	98966301
Start Date:	31-Mar-04
Ownership Entity:	-
Completion Date:	31-Mar-04
Current Owner:	Housing and Community Development Corporation
Did Owner Change:	-
Cleanup Required:	-
Video Available:	-
Photo Available:	-
Institutional Controls Required:	-
IC Category Proprietary Controls:	-
IC Cat. Info. Devices:	-
IC Cat. Gov. Controls:	-
IC Cat. Enforcement Permit Tools:	-
IC in place date:	-
IC in place:	U
State/tribal program date:	-
State/tribal program ID:	-
State/tribal NFA date:	-
Air cleaned:	-
Asbestos found:	-
Asbestos cleaned:	-
Controled substance found:	-
Controled substance cleaned:	-
Drinking water affected:	-
Drinking water cleaned:	-
Groundwater affected:	-
Groundwater cleaned:	-
Lead contaminant found:	-
Lead cleaned up:	-
No media affected:	-
Unknown media affected:	-
Other cleaned up:	-
Other metals found:	-
Other metals cleaned:	-
Other contaminants found:	-
Other contams found description:	-
PAHs found:	-
PAHs cleaned up:	-

KUHIO PARK TERRACE (Continued) **1014949094**

PCBs found:	-
PCBs cleaned up:	-
Petro products found:	-
Petro products cleaned:	-
Sediments found:	-
Sediments cleaned:	-
Soil affected:	-
Soil cleaned up:	-
Surface water cleaned:	-
VOCs found:	-
VOCs cleaned:	-
Cleanup other description:	-
Num. of cleanup and re-dev. jobs:	-
Past use greenspace acreage:	-
Past use residential acreage:	-
Surface Water:	-
Past use commercial acreage:	-
Past use industrial acreage:	-
Future use greenspace acreage:	-
Future use residential acreage:	-
Future use commercial acreage:	-
Future use industrial acreage:	-
Superfund Fed. landowner flag:	-
Arsenic cleaned up:	-
Cadmium cleaned up:	-
Chromium cleaned up:	-
Copper cleaned up:	-
Iron cleaned up:	-
mercury cleaned up:	-
Nickel Cleaned Up:	-
No clean up:	-
Pesticides cleaned up:	-
Selenium cleaned up:	-
SVOCs cleaned up:	-
Unknown clean up:	-
Arsenic contaminant found:	-
Cadmium contaminant found:	-
Chromium contaminant found:	-
Copper contaminant found:	-
Iron contaminant found:	-
Mercury contaminant found:	-
Nickel contaminant found:	-
No contaminant found:	-
Pesticides contaminant found:	-
Selenium contaminant found:	-
SVOCs contaminant found:	-
Unknown contaminant found:	-
Future Use: Multistory	-
Media affected Bluiding Material:	-
Media affected indoor air:	-
Building material media cleaned up:	-
Indoor air media cleaned up:	-
Unknown media cleaned up:	-
Past Use: Multistory	-
Property Description:	Public housing
Below Poverty Number:	2629
Below Poverty Percent:	19.63

KUHIO PARK TERRACE (Continued) **1014949094**

Meidan Income:	13315
Meidan Income Number:	4677
Meidan Income Percent:	34.92
Vacant Housing Number:	125
Vacant Housing Percent:	4.3
Unemployed Number:	177
Unemployed Percent:	1.32

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26 WSW 1/4-1/2 0.403 mi. 2129 ft. **SAFETY KLEEN CORP 7 183 04** **RCRA-TSDF** **1000224443**
723 UMI ST **RCRA NonGen / NLR** **HIT000614008**
HONOLULU, HI 96819

Relative: Lower
Actual: 18 ft.

RCRA-TSDF:

Date form received by agency:	1993-09-30 00:00:00.0
Facility name:	SAFETY KLEEN CORP 7 183 04
Facility address:	723 UMI ST HONOLULU, HI 96819
EPA ID:	HIT000614008
Mailing address:	655 BIG TIMBER ROAD ELGIN, IL 60120
Contact:	Not reported
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	09
Land type:	Facility is not located on Indian land. Additional information is not known.
Classification:	TSDF
Description:	Handler is engaged in the treatment, storage or disposal of hazardous waste
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	UNITEK ENVIRONMENTAL SERV
Owner/operator address:	3398 KALIHI STREET HONOLULU, HI 96819
Owner/operator country:	Not reported
Owner/operator telephone:	808-845-1722
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	SAFETY KLEEN CORP ELGIN IL
Owner/operator address:	655 BIG TIMBER ROAD CITY NOT REPORTED, IL 99999
Owner/operator country:	Not reported
Owner/operator telephone:	312-697-8460
Owner/operator email:	Not reported
Owner/operator fax:	Not reported

SAFETY KLEEN CORP 7 183 04 (Continued) **1000224443**

Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 1980-08-18 00:00:00.0
Site name: SAFETY KLEEN CORP 7 183 04
Classification: Not a generator, verified

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 1996-05-22 00:00:00.0
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

RCRA NonGen / NLR:
Date form received by agency: 1993-09-30 00:00:00.0
Facility name: SAFETY KLEEN CORP 7 183 04
Facility address: 723 UMI ST
HONOLULU, HI 96819
EPA ID: HIT000614008
Mailing address: 655 BIG TIMBER ROAD
ELGIN, IL 60120
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Facility is not located on Indian land. Additional information is not known.
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste

SAFETY KLEEN CORP 7 183 04 (Continued) **1000224443**

Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: UNITEK ENVIRONMENTAL SERV
Owner/operator address: 3398 KALIHI STREET
HONOLULU, HI 96819
Owner/operator country: Not reported
Owner/operator telephone: 808-845-1722
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: SAFETY KLEEN CORP ELGIN IL
Owner/operator address: 655 BIG TIMBER ROAD
CITY NOT REPORTED, IL 99999
Owner/operator country: Not reported
Owner/operator telephone: 312-697-8460
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 1980-08-18 00:00:00.0
Site name: SAFETY KLEEN CORP 7 183 04
Classification: Not a generator, verified

Violation Status: No violations found

Evaluation Action Summary:

SAFETY KLEEN CORP 7 183 04 (Continued) **1000224443**

Evaluation date:	1996-05-22 00:00:00.0
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

H27 **IES RETAIL MIDDLE STREET** **LUST** **1000601384**
NW **1305 MIDDLE ST** **UST** **N/A**
1/4-1/2 **HONOLULU, HI 96819** **SPILLS**
0.414 mi. **Financial Assurance**
2187 ft. **Site 1 of 2 in cluster H**

Relative:
Higher

Actual:
92 ft.

LUST:

Facility ID:	9-101110
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	11/04/1999
Release ID:	970009
Project Officer:	Roxanne Kwan

UST:

Facility ID:	9-101110
Owner:	IES Retail, LLC
Owner Address:	91-480 Malakole Street
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.340350000000001
Longitude:	-157.88032999999999
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	GPS

Tank ID:	1
Date Installed:	07/18/1984
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	2
Date Installed:	07/18/1984
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	3
Date Installed:	07/18/1984
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

Tank ID:	R-1
Date Installed:	07/18/1984
Tank Status:	**Permanently Out of Use**
Date Closed:	03/03/1999
Tank Capacity:	1000

IES RETAIL MIDDLE STREET (Continued) **1000601384**

Substance:	Used Oil

SPILLS:

Name:	BENTON'S MIDDLE STREET CHEVRON
Address:	1305 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20150116-1025
Facility Registry ID:	110013784404
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	5 gallons of gas spilled at a station
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2015-01-16 00:00:00
Result:	SOSC NFA
File Under:	Chevron Products Company
Substances:	Gasoline
Quanity:	5
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Name:	BENTON'S MIDDLE STREET CHEVRON
Address:	1305 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20150203-0745
Facility Registry ID:	110013784404
HID Number:	Not reported

IES RETAIL MIDDLE STREET (Continued) **1000601384**

Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Motor Oil Spill on Concrete at a Gas Station
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2015-02-03 00:00:00
Result:	SOSC NFA
File Under:	Chevron Products Company
Substances:	Motor Oil
Quanity:	16
Units:	Ounces
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Name:	CHEVRON MIDDLE STREET GAS STATION RELEASE
Address:	Not reported
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20160822-0915
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	Not reported
ER:	No
Less Or Greater Than:	Not reported
Units:	Not reported
Activity Type:	Not reported
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	NFA
File Under:	Not reported
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported

IES RETAIL MIDDLE STREET (Continued) **1000601384**

Reported Date:	08/22/16 3:15 PM EDT
Release Date:	Not reported
Release Duration:	Not reported
Media:	Concrete
Waterbody:	Not reported
Summary:	Gasoline discharged from a vehicle due to an overfill when the customer was filling up their tank. Cleanup with absorbent pads.
Is Noteworthy for Reports:	No
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Liz Galvez
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	1156780
Coordination Needed:	None
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

HI Financial Assurance:

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Self Insured
Expiration Date:	04/30/2009

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	R-1
Tank Status:	Permanently Out of Use
FRTYPE:	Self Insured
Expiration Date:	04/30/2009

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	3
Tank Status:	Currently in Use
FRTYPE:	Self Insured
Expiration Date:	04/30/2009

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110

IES RETAIL MIDDLE STREET (Continued) **1000601384**

Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Self Insured
Expiration Date:	04/30/2009

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	R-1
Tank Status:	Permanently Out of Use
FRTYPE:	Guarantee
Expiration Date:	04/29/2011

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	3
Tank Status:	Currently in Use
FRTYPE:	Guarantee
Expiration Date:	04/29/2011

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Guarantee
Expiration Date:	04/29/2011

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Guarantee
Expiration Date:	04/29/2011

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	3
Tank Status:	Currently in Use
FRTYPE:	Insurance
Expiration Date:	11/01/2021

Name:	IES RETAIL MIDDLE STREET
Address:	1305 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-101110
Tank Id:	1
Tank Status:	Currently in Use
FRTYPE:	Insurance

IES RETAIL MIDDLE STREET (Continued) **1000601384**

Expiration Date: 11/01/2021

Name: IES RETAIL MIDDLE STREET
Address: 1305 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101110
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 11/01/2021

Name: IES RETAIL MIDDLE STREET
Address: 1305 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-101110
Tank Id: 2
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 11/01/2021

I28 **AIM KAM IV** **LUST** **U001235610**
NNE **2314 N SCHOOL ST** **UST** **N/A**
1/4-1/2 **HONOLULU, HI 96822** **Financial Assurance**
0.420 mi.
2218 ft. **Site 1 of 2 in cluster I**

Relative:
Higher

Actual:
118 ft.

LUST:
Facility ID: 9-101867
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 09/02/2005
Release ID: 050028
Project Officer: Shaobin Li

Facility ID: 9-101867
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 06/27/2000
Release ID: 950035
Project Officer: Shaobin Li

UST:
Facility ID: 9-101867
Owner: ALOHA PETROLEUM, LTD.
Owner Address: 1001 Bishop Street, ASB Tower, Suite 1300
Owner City,St,Zip: Honolulu, 96822 96822
Latitude: 21.341629999999999
Longitude: -157.87450000000001
Horizontal Reference Datum Name: NAD27
Horizontal Collection Method Name: GPS

Tank ID: 1
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

AIM KAM IV (Continued) **U001235610**

Tank ID: 1
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 1
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 2
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 2
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 2
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 92
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 92
Date Installed: 11/30/1988
Tank Status: **Currently In Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 92

AIM KAM IV (Continued) **U001235610**

Date Installed:	11/30/1988
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasohol

HI Financial Assurance:

Name:	AIM KAM IV
Address:	2314 N SCHOOL ST
City,State,Zip:	HONOLULU, HI 96822
Alt Facility ID:	9-101867
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	AIM KAM IV
Address:	2314 N SCHOOL ST
City,State,Zip:	HONOLULU, HI 96822
Alt Facility ID:	9-101867
Tank Id:	92
Tank Status:	Currently In Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	AIM KAM IV
Address:	2314 N SCHOOL ST
City,State,Zip:	HONOLULU, HI 96822
Alt Facility ID:	9-101867
Tank Id:	1
Tank Status:	Currently In Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	AIM KAM IV
Address:	2314 N SCHOOL ST
City,State,Zip:	HONOLULU, HI 96822
Alt Facility ID:	9-101867
Tank Id:	92
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	09/15/2015

Name:	AIM KAM IV
Address:	2314 N SCHOOL ST
City,State,Zip:	HONOLULU, HI 96822
Alt Facility ID:	9-101867
Tank Id:	2
Tank Status:	Currently In Use
FRTYPE:	Insurance
Expiration Date:	09/15/2015

Name:	AIM KAM IV
Address:	2314 N SCHOOL ST
City,State,Zip:	HONOLULU, HI 96822
Alt Facility ID:	9-101867
Tank Id:	1

AIM KAM IV (Continued) **U001235610**

Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2015

Name: AIM KAM IV
Address: 2314 N SCHOOL ST
City,State,Zip: HONOLULU, HI 96822
Alt Facility ID: 9-101867
Tank Id: 92
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2019

Name: AIM KAM IV
Address: 2314 N SCHOOL ST
City,State,Zip: HONOLULU, HI 96822
Alt Facility ID: 9-101867
Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2019

Name: AIM KAM IV
Address: 2314 N SCHOOL ST
City,State,Zip: HONOLULU, HI 96822
Alt Facility ID: 9-101867
Tank Id: 2
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/15/2019

H29 **KANE'S AUTO REPAIR** **LUST** **U001235924**
NNW **1325 MIDDLE ST** **UST** **N/A**
1/4-1/2 **HONOLULU, HI 96819**
0.439 mi.
2319 ft. **Site 2 of 2 in cluster H**

Relative:
Higher

Actual:
95 ft.

LUST:
Facility ID: 9-102478
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 04/12/2002
Release ID: 920086
Project Officer: Shunsheng Fu

UST:
Facility ID: 9-102478
Owner: MILDRED KANESHIRO
Owner Address: 45-240 HIKIWALE PLACE
Owner City,St,Zip: Honolulu, 96819 96819
Latitude: 21.340779000000001
Longitude: -157.87991199999999
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: Address Matching

Tank ID: R-1
Date Installed: 12/30/1951
Tank Status: **Permanently Out of Use**

KANE'S AUTO REPAIR (Continued) **U001235924**

Date Closed:	02/21/1992
Tank Capacity:	1000
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	12/30/1951
Tank Status:	**Permanently Out of Use**
Date Closed:	02/21/1992
Tank Capacity:	1000
Substance:	Gasoline

30
WNW
1/4-1/2
0.447 mi.
2360 ft.

2343 NORTH KING STREET
2343 N KING ST
HONOLULU, HI 96819

SHWS **S115488667**
INST CONTROL **N/A**

Relative:
Lower

Actual:
39 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	2343 North King Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Steve Mow
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	2343 North King Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Not Necessary
Response:	Not reported
Nature of Contamination:	Found: PCP plume.
Nature of Residual Contamination:	TPH-O. PCP removed to below Tier I.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	01/09/2014
Document Number:	2014-014-SPM
Document Subject:	No Further Action with Institutional Controls Determination for 2343 N King St, Oahu HI, TMK 1-1-2-016-023
Project Manager:	Steve Mow
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported

2343 NORTH KING STREET (Continued) **S115488667**

Zip Suffix: Not reported
Island: Oahu
Institutional Control: Government - Hawaii Dept. of Health Letter Issued

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I31
North
1/4-1/2
0.448 mi.
2368 ft.

HELE KAM IV 7-11 #166 **LUST** **U004317082**
2404 N SCHOOL ST **UST** **N/A**
HONOLULU, HI 96819

Site 2 of 2 in cluster I

Relative:
Higher

Actual:
120 ft.

LUST:

Facility ID: 9-101187
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 04/17/2007
Release ID: 050038
Project Officer: Shunsheng Fu

Facility ID: 9-101187
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 08/18/2009
Release ID: 090019
Project Officer: Shunsheng Fu

UST:

Facility ID: 9-101187
Owner: Par Hawaii, LLC
Owner Address: 1132 Bishop Street, Suite 2500
Owner City,St,Zip: Honolulu, 96819 96819
Latitude: 21.341892000000001
Longitude: -157.87481600000001
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: GPS

Tank ID: 1
Date Installed: 11/19/2009
Tank Status: **Currently in Use**
Date Closed: Not reported
Tank Capacity: 12000
Substance: Gasohol

Tank ID: 2
Date Installed: 11/19/2009
Tank Status: **Temporarily out of Use**
Date Closed: Not reported
Tank Capacity: 12000
Substance: Gasohol

Tank ID: r-87
Date Installed: 04/04/1985
Tank Status: **Permanently out of Use**
Date Closed: 05/18/2009
Tank Capacity: 10000
Substance: Gasoline

HELE KAM IV 7-11 #166 (Continued) **U004317082**

Tank ID:	r-89
Date Installed:	04/04/1985
Tank Status:	**Permanently out of Use**
Date Closed:	05/18/2009
Tank Capacity:	10000
Substance:	Gasoline

Tank ID:	r-92
Date Installed:	04/04/1985
Tank Status:	**Permanently out of Use**
Date Closed:	05/18/2009
Tank Capacity:	10000
Substance:	Gasoline

---

32 NE 1/2-1 0.514 mi. 2715 ft. **BASE YARD NO. 3 & 4** **FUDS** **1024901905**
N/A

HONOLULU, HI

Relative: Higher
Actual: 132 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F377800
Congressional District Number:	01
Facility Name:	BASE YARD NO. 3 & 4
FUDS Number:	H09HI0033
City:	HONOLULU
State:	HI
County:	HONOLULU
Object ID:	629
USACE District:	Honolulu District (POH)
Status:	Properties without projects
Current Owner:	Private Sector
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=56876
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.340000000000000
Longitude:	-157.869444439999000

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33 WNW 1/2-1 0.520 mi. 2746 ft. **HI ARSENAL MILITARY RES** **FUDS** **1024901953**
N/A

FORT SHAFTER, HI

Relative: Lower
Actual: 61 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F384700
Congressional District Number:	01
Facility Name:	HI ARSENAL MILITARY RES
FUDS Number:	H09HI0107
City:	FORT SHAFTER
State:	HI
County:	HONOLULU

HI ARSENAL MILITARY RES (Continued) **1024901953**

Object ID:	3603
USACE District:	Honolulu District (POH)
Status:	Properties without projects
Current Owner:	Other Federal Government; State Government
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=56916
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.339166670000000
Longitude:	-157.883333329999000

34
SE
1/2-1
0.544 mi.
2871 ft.

Relative:
Lower

Actual:
20 ft.

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

SHWS **U003402806**
LUST **N/A**
UST
ENG CONTROLS
INST CONTROL
SPILLS
Financial Assurance

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Aloha Houghtailing Fast Track Cleanup
HID Number:	Not reported
Facility Registry Identifier:	110012241733
Lead Agency:	HEER
Program:	Fast Track
Project Manager:	Iris van der Zander
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Aloha Houghtailing Fast Track Cleanup
HID Number:	Not reported
Facility Registry Identifier:	110012241733
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Petroleum contaminants and chlorinated solvents (in maintenance area.)
Nature of Residual Contamination:	TPH, PCE, Benzene from Petroleum contaminants and chlorinated solvents.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	07/29/2016
Document Number:	2016-405-IV
Document Subject:	No Further Action (NFA) with Institutional Controls determination for the Former Houghtailing Shell
Project Manager:	Iris van der Zander
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

MARSHALL'S SHELL SS (Continued) **U003402806**

LUST:

Facility ID:	9-100783
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	06/22/2000
Release ID:	920145
Project Officer:	Shunsheng Fu

Facility ID:	9-100783
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	10/01/2009
Release ID:	080032
Project Officer:	Shunsheng Fu

Facility ID:	9-100783
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	01/30/2007
Release ID:	060022
Project Officer:	Shunsheng Fu

Facility ID:	9-100783
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	10/26/2015
Release ID:	150008
Project Officer:	Shunsheng Fu

UST:

Facility ID:	9-100783
Owner:	ALOHA PETROLEUM, LTD.
Owner Address:	1132 BISHOP STREET, SUITE 1700
Owner City,St,Zip:	Honolulu, 96817 96817
Latitude:	21.328620999999998
Longitude:	-157.87109100000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	GPS

Tank ID:	R-1
Date Installed:	04/19/1971
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	R-1
Date Installed:	04/19/1971
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	4000

MARSHALL'S SHELL SS (Continued) **U003402806**

Substance:	Gasoline

Tank ID:	R-2
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	4000
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	7000
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	7000
Substance:	Gasoline

Tank ID:	R-4
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	R-4
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	R-5
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	550
Substance:	Used Oil

Tank ID:	R-5
Date Installed:	04/18/1968
Tank Status:	**Permanently Out of Use**
Date Closed:	09/30/1991
Tank Capacity:	550
Substance:	Used Oil

MARSHALL'S SHELL SS (Continued) **U003402806**

Tank ID: r-87
Date Installed: 12/01/1991
Tank Status: **Permanently out of Use**
Date Closed: 12/03/2014
Tank Capacity: 12000
Substance: Gasoline

Tank ID: r-87
Date Installed: 12/01/1991
Tank Status: **Permanently out of Use**
Date Closed: 12/03/2014
Tank Capacity: 12000
Substance: Gasoline

Tank ID: r-92
Date Installed: 12/01/1991
Tank Status: **Permanently out of Use**
Date Closed: 12/03/2014
Tank Capacity: 12000
Substance: Gasoline

Tank ID: r-92
Date Installed: 12/01/1991
Tank Status: **Permanently out of Use**
Date Closed: 12/03/2014
Tank Capacity: 12000
Substance: Gasoline

Tank ID: r-Diesel
Date Installed: 12/01/1991
Tank Status: **Permanently out of Use**
Date Closed: 12/03/2014
Tank Capacity: 12000
Substance: Diesel

Tank ID: r-Diesel
Date Installed: 12/01/1991
Tank Status: **Permanently out of Use**
Date Closed: 12/03/2014
Tank Capacity: 12000
Substance: Diesel

ENG CONTROLS:
Supplemental Location Text: Not reported
Zip Suffix: Not reported
Island: Oahu
Potential Hazards And Controls: Hazard Managed With Controls
Engineering Control: Engineering Control Required

INST CONTROL:
Potential hazards and controls: Hazard Managed With Controls

MARSHALL'S SHELL SS (Continued) **U003402806**

Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

SPILLS:

Name:	SHELL SERVICE STATION (MARSHALL'S SHELL SERVICE)
Address:	1029 HOUGHTAILING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20151216-0855
Facility Registry ID:	110012241733
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Phase II-Release of Cu,Pb, Ni, Petroleum
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2016-07-13 00:00:00
Result:	Refer to SDAR
File Under:	Shell Oil Company
Substances:	Copper
Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Name:	SHELL SERVICE STATION (MARSHALL'S SHELL SERVICE)
Address:	1029 HOUGHTAILING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported

MARSHALL'S SHELL SS (Continued) **U003402806**

Case Number:	20151216-0855
Facility Registry ID:	110012241733
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Phase II-Release of Cu,Pb, Ni, Petroleum
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2016-07-13 00:00:00
Result:	Refer to SDAR
File Under:	Shell Oil Company
Substances:	Lead
Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Name:	SHELL SERVICE STATION (MARSHALL'S SHELL SERVICE)
Address:	1029 HOUGHTAILING ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20151216-0855
Facility Registry ID:	110012241733
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Phase II-Release of Cu,Pb, Ni, Petroleum
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2016-07-13 00:00:00
Result:	Refer to SDAR
File Under:	Shell Oil Company

MARSHALL'S SHELL SS (Continued) **U003402806**

Substances:	Petroleum Hydrocarbon
Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

HI Financial Assurance:

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-5
Tank Status:	Permanently Out of Use
FRTYPE:	Not reported
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST

MARSHALL'S SHELL SS (Continued) **U003402806**

City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	r-87
Tank Status:	Permanently out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Not reported
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	r-92
Tank Status:	Permanently out of Use
FRTYPE:	Not reported
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-5
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Not reported
Expiration Date:	Not reported

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	r-87

MARSHALL'S SHELL SS (Continued) **U003402806**

Tank Status: Permanently out of Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: r-92
Tank Status: Permanently out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: r-Diesel
Tank Status: Permanently out of Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: r-Diesel
Tank Status: Permanently out of Use
FRTYPE: Other
Expiration Date: Not reported

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Not reported
Expiration Date: Not reported

MARSHALL'S SHELL SS (Continued) **U003402806**

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: r-Diesel
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2011

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: r-87
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2011

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: r-92
Tank Status: Permanently out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2011

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2011

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: R-5
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2011

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817
Alt Facility ID: 9-100783
Tank Id: R-4
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 04/01/2011

Name: MARSHALL'S SHELL SS
Address: 1029 HOUGHTAILING ST
City,State,Zip: HONOLULU, HI 96817

MARSHALL'S SHELL SS (Continued) **U003402806**

Alt Facility ID:	9-100783
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2011

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2011

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	r-87
Tank Status:	Permanently out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	r-Diesel
Tank Status:	Permanently out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-5
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-1
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	r-92
Tank Status:	Permanently out of Use

MARSHALL'S SHELL SS (Continued) **U003402806**

FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

Name:	MARSHALL'S SHELL SS
Address:	1029 HOUGHTAILING ST
City,State,Zip:	HONOLULU, HI 96817
Alt Facility ID:	9-100783
Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	04/01/2014

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35 SW 1/2-1 0.552 mi. 2917 ft. | **DILLINGHAM BOULEVARD & MOKAUEA STREET**
DILLINGHAM BLVD & MOKAUEA ST
HONOLULU, HI 96819 | **SHWS** **S106816881**
ENG CONTROLS **N/A**
INST CONTROL

Relative: Lower
Actual: 23 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Dillingham and Mokauea
HID Number:	Not reported
Facility Registry Identifier:	110013781372
Lead Agency:	HEER
Program:	State
Project Manager:	Steve Mow
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Dillingham and Mokauea
HID Number:	Not reported
Facility Registry Identifier:	110013781372
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Petroleum free product

DILLINGHAM BOULEVARD & MOKAUEA STREET (Continued) **S106816881**

Nature of Residual Contamination:	No Contamination above HDOH EAL's
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	05/24/2005
Document Number:	2005-255-SPM
Document Subject:	No Further Action Determination
Project Manager:	Steve Mow
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls
Engineering Control:	Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

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J36 **220TH SIGNAL DEPOT CO** **FUDS** **1024902122**
West **N/A**
1/2-1 **KALIHI, HI**
0.556 mi.
2936 ft. **Site 1 of 2 in cluster J**

Relative:
Lower

Actual:
30 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F406200
Congressional District Number:	01
Facility Name:	220TH SIGNAL DEPOT CO
FUDS Number:	H09HI0341
City:	KALIHI
State:	HI
County:	HONOLULU
Object ID:	11
USACE District:	Honolulu District (POH)
Status:	Properties without projects
Current Owner:	Other Federal Government
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=58089
Eligibility:	Ineligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.336666670000000
Longitude:	-157.884999999999000

J37 West 1/2-1 0.582 mi. 3071 ft. | **OTS BUS UNIT REPAIR SHOP**
811 MIDDLE ST
HONOLULU, HI 96819
Site 2 of 2 in cluster J

SHWS **U003541805**
LUST **N/A**
UST
Financial Assurance

Relative: Lower
Actual: 27 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Kalihi-Palama Bus Facility
HID Number:	Not reported
Facility Registry Identifier:	110013788197
Lead Agency:	SHWB
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Kalihi-Palama Bus Facility
HID Number:	Not reported
Facility Registry Identifier:	110013788197
Lead Agency:	SHWB
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	No Hazard Present For Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	01/06/2006
Document Number:	2006-010-ES
Document Subject:	Memo to file: Site close-out
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

LUST:

Facility ID:	9-101884
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	11/27/1998
Release ID:	900026
Project Officer:	Eric Sadoyama

Facility ID:	9-102498
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	11/27/1998
Release ID:	970027
Project Officer:	Eric Sadoyama

UST:

Facility ID:	9-102498
Owner:	C&C HNL - DEPT OF TRANSPORTATION
Owner Address:	650 S. KING ST, 3RD FLOOR

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.334986000000001
Longitude:	-157.88513900000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	GPS

Tank ID:	1 (DF-1)
Date Installed:	05/15/1990
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	12000
Substance:	Diesel

Tank ID:	1 (WO-1)
Date Installed:	04/22/1996
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	2500
Substance:	Used Oil

Tank ID:	10 (WO-2)
Date Installed:	06/01/1989
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	550
Substance:	Used Oil

Tank ID:	2 (DF-2)
Date Installed:	05/15/1990
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	12000
Substance:	Diesel

Tank ID:	2 (WO-2)
Date Installed:	04/22/1996
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	1000
Substance:	Used Oil

Tank ID:	3 (DF-3)
Date Installed:	05/15/1990
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	12000
Substance:	Diesel

Tank ID:	3 (WO-3)
Date Installed:	04/22/1996
Tank Status:	**Currently in Use**

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

Date Closed:	Not reported
Tank Capacity:	1000
Substance:	Used Oil

Tank ID:	4 (DF-1)
Date Installed:	04/22/1996
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	1000
Substance:	Diesel

Tank ID:	4 (DF-4)
Date Installed:	05/15/1990
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	12000
Substance:	Diesel

Tank ID:	5 (UG)
Date Installed:	05/15/1990
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	6000
Substance:	Gasoline

Tank ID:	6 (O-1)
Date Installed:	06/01/1989
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	6000
Substance:	Other

Tank ID:	7 (O-2)
Date Installed:	06/01/1989
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	4000
Substance:	Other

Tank ID:	8 (ATF)
Date Installed:	06/01/1989
Tank Status:	**Currently in Use**
Date Closed:	Not reported
Tank Capacity:	4000
Substance:	Other

Tank ID:	9 (WO-1)
Date Installed:	06/01/1989
Tank Status:	**Currently in Use**
Date Closed:	Not reported

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

Tank Capacity: 4000
Substance: Used Oil

Tank ID: R-001
Date Installed: 02/10/1967
Tank Status: **Permanently Out of Use**
Date Closed: Not reported
Tank Capacity: 1000
Substance: Gasoline

Tank ID: R-002
Date Installed: 02/10/1967
Tank Status: **Permanently Out of Use**
Date Closed: Not reported
Tank Capacity: 6100
Substance: Gasoline

Tank ID: R-003
Date Installed: 02/10/1967
Tank Status: **Permanently Out of Use**
Date Closed: Not reported
Tank Capacity: 6100
Substance: Diesel

Tank ID: R-004
Date Installed: 02/10/1967
Tank Status: **Permanently Out of Use**
Date Closed: Not reported
Tank Capacity: 10000
Substance: Diesel

HI Financial Assurance:
Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 3 (DF-3)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 5 (UG)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

Alt Facility ID: 9-102498
Tank Id: 7 (O-2)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 4 (DF-4)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 8 (ATF)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 2 (DF-2)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 9 (WO-1)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 1 (DF-1)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: Not reported

Name: KALIHI-PALAMA BUS FACILITY
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-102498
Tank Id: 6 (O-1)
Tank Status: Currently in Use

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

FRTYPE:	Not reported
Expiration Date:	Not reported

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	10 (WO-2)
Tank Status:	Currently in Use
FRTYPE:	Not reported
Expiration Date:	Not reported

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	8 (ATF)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	9 (WO-1)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	7 (O-2)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	5 (UG)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	4 (DF-4)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	3 (DF-3)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	2 (DF-2)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	1 (DF-1)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	10 (WO-2)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	KALIHI-PALAMA BUS FACILITY
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-102498
Tank Id:	6 (O-1)
Tank Status:	Currently in Use
FRTYPE:	Other
Expiration Date:	10/10/2018

Name:	OTS BUS UNIT REPAIR SHOP
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-103189
Tank Id:	3 (WO-3)
Tank Status:	Currently in Use
FRTYPE:	Not reported
Expiration Date:	06/30/2007

Name:	OTS BUS UNIT REPAIR SHOP
Address:	811 MIDDLE ST
City,State,Zip:	HONOLULU, HI 96819

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

Alt Facility ID: 9-103189
Tank Id: 1 (WO-1)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: 06/30/2007

Name: OTS BUS UNIT REPAIR SHOP
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-103189
Tank Id: 4 (DF-1)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: 06/30/2007

Name: OTS BUS UNIT REPAIR SHOP
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-103189
Tank Id: 2 (WO-2)
Tank Status: Currently in Use
FRTYPE: Not reported
Expiration Date: 06/30/2007

Name: OTS BUS UNIT REPAIR SHOP
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-103189
Tank Id: 3 (WO-3)
Tank Status: Currently in Use
FRTYPE: Other
Expiration Date: 10/10/2018

Name: OTS BUS UNIT REPAIR SHOP
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-103189
Tank Id: 2 (WO-2)
Tank Status: Currently in Use
FRTYPE: Other
Expiration Date: 10/10/2018

Name: OTS BUS UNIT REPAIR SHOP
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-103189
Tank Id: 1 (WO-1)
Tank Status: Currently in Use
FRTYPE: Other
Expiration Date: 10/10/2018

Name: OTS BUS UNIT REPAIR SHOP
Address: 811 MIDDLE ST
City,State,Zip: HONOLULU, HI 96819
Alt Facility ID: 9-103189
Tank Id: 4 (DF-1)
Tank Status: Currently in Use

OTS BUS UNIT REPAIR SHOP (Continued) **U003541805**

FRTYPE: Other
Expiration Date: 10/10/2018

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38 SSW 1/2-1 0.595 mi. 3140 ft.

1812 COLBURN STREET SITE
1812 COLBURN ST
HONOLULU, HI 96819

SHWS **S123106534**
INST CONTROL **N/A**

Relative: Lower

Actual: 20 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	1812 Colburn Street Site
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Iris van der Zander
Hazard Priority:	Medium
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	1812 Colburn Street Site
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	Medium
Assessment:	Response Necessary
Response:	Response Ongoing
Nature of Contamination:	Not reported
Nature of Residual Contamination:	TPH, Lead, Pesticides, Benzoapyrene
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Proprietary - Environmental Covenant
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Iris van der Zander
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Proprietary - Environmental Covenant

K39 WSW 1/2-1 0.661 mi. 3488 ft. | **HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES** | **SHWS** | **1000934769**
2277 KAMEHAMEHA HWY | **LUST** | **N/A**
HONOLULU, HI 96819 | **UST**
VCP
Site 1 of 2 in cluster K | **Financial Assurance**

Relative: Lower

Actual: 7 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	House Foods, Hawaii (Foremost)
HID Number:	Not reported
Facility Registry Identifier:	110002148747
Lead Agency:	HEER
Program:	Voluntary Response Program
Project Manager:	Wendy Ray
Hazard Priority:	Medium
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	House Foods, Hawaii (Foremost)
HID Number:	Not reported
Facility Registry Identifier:	110002148747
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	Medium
Assessment:	Assessment Ongoing
Response:	Response Ongoing
Nature of Contamination:	Found: Lead/TPH/Heptachlor
Nature of Residual Contamination:	Petroleum contaminated soil
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action - Type Undetermined
Document Date:	08/25/2005
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Wendy Ray
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

LUST:

Facility ID:	9-100210
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	11/27/2005
Release ID:	050043
Project Officer:	Richard Takaba

Facility ID:	9-100210
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	03/09/1999
Release ID:	910053
Project Officer:	Richard Takaba

UST:

Facility ID:	9-100210
Owner:	Hawaii Dairy Holding, inc
Owner Address:	2277 Kamehameha Highway

HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES (Continued) **1000934769**

Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.330825999999998
Longitude:	-157.88635400000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	GPS

Tank ID:	R-2
Date Installed:	03/21/1956
Tank Status:	**Permanently Out of Use**
Date Closed:	Not reported
Tank Capacity:	3000
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	03/21/1956
Tank Status:	**Permanently Out of Use**
Date Closed:	Not reported
Tank Capacity:	4000
Substance:	Gasoline

Tank ID:	R-4
Date Installed:	03/21/1956
Tank Status:	**Permanently Out of Use**
Date Closed:	Not reported
Tank Capacity:	4000
Substance:	Other

Tank ID:	r-2
Date Installed:	10/04/1988
Tank Status:	**Permanently Out of Use**
Date Closed:	07/06/2005
Tank Capacity:	4000
Substance:	Diesel

Tank ID:	r-3
Date Installed:	11/01/1988
Tank Status:	**Permanently Out of Use**
Date Closed:	07/06/2005
Tank Capacity:	8000
Substance:	Diesel

VCP:

Program:	Voluntary Response Program
Zip Suffix:	Not reported
Supplemental Location:	Not reported
Island:	Oahu

HI Financial Assurance:

Name:	HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES
Address:	2277 KAMEHAMEHA HWY
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100210

HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES (Continued) **1000934769**

Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	Not reported

Name:	HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES
Address:	2277 KAMEHAMEHA HWY
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100210
Tank Id:	R-2
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES
Address:	2277 KAMEHAMEHA HWY
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100210
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	Not reported

Name:	HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES
Address:	2277 KAMEHAMEHA HWY
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100210
Tank Id:	R-3
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

Name:	HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES
Address:	2277 KAMEHAMEHA HWY
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100210
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Insurance
Expiration Date:	Not reported

Name:	HAWAII DAIRY HOLDINGS, INC DBA FOREMOST DAIRIES
Address:	2277 KAMEHAMEHA HWY
City,State,Zip:	HONOLULU, HI 96819
Alt Facility ID:	9-100210
Tank Id:	R-4
Tank Status:	Permanently Out of Use
FRTYPE:	Other
Expiration Date:	Not reported

K40 WSW 1/2-1 0.688 mi. 3630 ft. | **LENAKONA DEVELOPMENT, LTD**
2305 KAMEHAMEHA HWY
HONOLULU, HI 96800 | **SHWS LUST UST** | **U001237397 N/A**

Site 2 of 2 in cluster K

Relative: Lower

Actual: 7 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Gaspro Inc. HID980817712
HID Number:	HID980817712
Facility Registry Identifier:	110005723422
Lead Agency:	HEER
Program:	State
Project Manager:	Not reported
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Gaspro Inc. HID980817712
HID Number:	HID980817712
Facility Registry Identifier:	110005723422
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	NFA
Assessment:	Not reported
Response:	Not reported
Nature of Contamination:	Found: No reportable spill.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Historic NFA - Incomplete Documentation
Document Date:	02/05/1995
Document Number:	Not reported
Document Subject:	Site Screening Sheet, Gaspro Inc, 2305 Kamehameha Hwy
Project Manager:	Not reported
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

LUST:

Facility ID:	9-102588
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	11/14/1996
Release ID:	930121
Project Officer:	Jose Ruiz

UST:

Facility ID:	9-102588
Owner:	LENAKONA DEVELOPMENT, LTD
Owner Address:	870 KAPAHULU AVE, #204
Owner City,St,Zip:	Honolulu, 96800 96800
Latitude:	21.331880999999999
Longitude:	-157.886346
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching

LENAKONA DEVELOPMENT, LTD (Continued) **U001237397**

Tank ID:	R-1
Date Installed:	12/30/1969
Tank Status:	**Permanently Out of Use**
Date Closed:	11/20/1992
Tank Capacity:	1000
Substance:	Gasoline

Tank ID:	R-2
Date Installed:	12/30/1960
Tank Status:	**Permanently Out of Use**
Date Closed:	11/20/1992
Tank Capacity:	1500
Substance:	Gasoline

Tank ID:	R-3
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	11/20/1992
Tank Capacity:	1000
Substance:	Gasoline

---

41 **TAKAMIYA PROPERTY** **SHWS** **S106820561**
SSE **850 MOOWAA ST** **SPILLS** **N/A**
1/2-1 **HONOLULU, HI 96817**
0.690 mi.
3642 ft.

Relative:
Lower

Actual:
8 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Takamiya Property
HID Number:	HID984468371
Facility Registry Identifier:	110009278771
Lead Agency:	EPA
Program:	State
Project Manager:	Pierette Arroyo
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Takamiya Property
HID Number:	HID984468371
Facility Registry Identifier:	110009278771
Lead Agency:	EPA
Potential Hazard And Controls:	Hazard Undetermined
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: CCA wood treatment solution
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	NFRAP

TAKAMIYA PROPERTY (Continued) **S106820561**

Document Date:	10/10/2008
Document Number:	Not reported
Document Subject:	Takamiya Property HID984468371
Project Manager:	Pierette Arroyo
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	TAKAMIYA PROPERTY
Address:	850 MOOWAA ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19910308-1
Facility Registry ID:	110009278771
HID Number:	HID984468371
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Ms. Jane Takamiya, 850 Moowaa Street
Activity Type:	Response
Activity Lead:	Pierette Arroyo
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Takamiya Property
Substances:	SUMP WITH CONTAMINATED SOIL AND WATER. (METALS AND CHLORDONE)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.325939999999999
Longitude:	-157.87154699999999

Name:	TAKAMIYA PROPERTY
Address:	850 MOOWAA ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu

TAKAMIYA PROPERTY (Continued) **S106820561**

Supplemental Loc. Text:	Not reported
Case Number:	19910308-1
Facility Registry ID:	110009278771
HID Number:	HID984468371
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Ms. Jane Takamiya, 850 Moowaa Street
Activity Type:	Response
Activity Lead:	Pierette Arroyo
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Takamiya Property
Substances:	SUMP WITH CONTAMINATED SOIL AND WATER. (METALS AND CHLORDONE)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.338951999999999
Longitude:	-157.843605

Name:	TAKAMIYA PROPERTY
Address:	850 MOOWAA ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19910308-1
Facility Registry ID:	110009278771
HID Number:	HID984468371
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Ms. Jane Takamiya, 850 Moowaa Street
Activity Type:	Response
Activity Lead:	Pierette Arroyo
Assignment End Date:	Not reported
Result:	SOSC NFA

TAKAMIYA PROPERTY (Continued) **S106820561**

File Under:	Takamiya Property
Substances:	SUMP WITH CONTAMINATED SOIL AND WATER. (METALS AND CHLORDONE)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.326267000000001
Longitude:	-157.871353

L42 **HAWAII MEAT COMPANY LTD** **SHWS** **1006820927**
West **711 MIDDLE ST** **ENG CONTROLS** **N/A**
1/2-1 **HONOLULU, HI 96819** **INST CONTROL**
0.702 mi. **SPILLS**
3704 ft. **Site 1 of 2 in cluster L**

Relative: **Lower**
Actual: **12 ft.**

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Hawaii Meat
HID Number:	Not reported
Facility Registry Identifier:	110013789560
Lead Agency:	HEER
Program:	State
Project Manager:	Mark Sutterfield
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Hawaii Meat
HID Number:	Not reported
Facility Registry Identifier:	110013789560
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Not Necessary
Response:	Not reported
Nature of Contamination:	Found: Petroleum in soil and groundwater. One UST was NFA further work required.
Nature of Residual Contamination:	TPH-D They still have to remediate another release on site that

HAWAII MEAT COMPANY LTD (Continued) **1006820927**

	extended to the yee hop property
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Prohibit Any Activity That May Disturb the Integrity of the Capping System
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	09/23/2004
Document Number:	2004-401-MS
Document Subject:	NFA for Tank 3 and Request for Information on Tank 1
Project Manager:	Mark Sutterfield
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls
Engineering Control:	Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

SPILLS:

Name:	HAWAII MEAT COMPANY LTD
Address:	711 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930111-5
Facility Registry ID:	110013789560
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Old UST at Hawaii Meat
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Hawaii Meat Co. Ltd.
Substances:	Bunker - C Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported

HAWAII MEAT COMPANY LTD (Continued) **1006820927**

Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	HAWAII MEAT COMPANY LTD
Address:	711 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930111-5
Facility Registry ID:	110013789560
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Old UST at Hawaii Meat
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Hawaii Meat Co. Ltd.
Substances:	Bunker - C Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported

HAWAII MEAT COMPANY LTD (Continued) **1006820927**

Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.33541
Longitude:	-157.88728900000001

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43 SSE 1/2-1 0.722 mi. 3812 ft.

ROSS TRUSTS
819 MOOWAA ST
HONOLULU, HI 96817

SHWS **S103290154**
VCP **N/A**

Relative: Lower

Actual: 6 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Ross Trusts
HID Number:	Not reported
Facility Registry Identifier:	110013778634
Lead Agency:	HEER
Program:	Voluntary Response Program
Project Manager:	Mark Sutterfield
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Ross Trusts
HID Number:	Not reported
Facility Registry Identifier:	110013778634
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Assessment Ongoing
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	No Hazard Present For Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	07/17/2002
Document Number:	2002-165-MS
Document Subject:	Covering Memo Ross Trust LOC
Project Manager:	Mark Sutterfield
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

VCP:

Program:	Voluntary Response Program
Zip Suffix:	Not reported
Supplemental Location:	Not reported
Island:	Oahu

L44 West 1/2-1 0.746 mi. 3939 ft. | **YEE HOP PROPERTY 621 MIDDLE ST HONOLULU, HI 96819** | **SHWS SPILLS** | **1006819624 N/A**

Site 2 of 2 in cluster L

Relative: Lower

Actual: 7 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Yee Hop Property
HID Number:	Not reported
Facility Registry Identifier:	110013774601
Lead Agency:	HEER
Program:	State
Project Manager:	Cal Miyahara
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Yee Hop Property
HID Number:	Not reported
Facility Registry Identifier:	110013774601
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Presumed: Case 19950310-3 -. Black oil leaching from Yee Hop properties into the Kalihi stream. Also possible petroleum contamination from adjacent property.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Cal Miyahara
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	YEE HOP PROPERTY
Address:	621 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950309
Facility Registry ID:	110013774601
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Yee Hop Dewatering
Activity Type:	Response
Activity Lead:	Terry Corpus

YEE HOP PROPERTY (Continued) **1006819624**

Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	Diesel Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.334271999999999
Longitude:	-157.88700900000001

Name:	YEE HOP PROPERTY
Address:	621 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950309
Facility Registry ID:	110013774601
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Yee Hop Dewatering
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	Diesel Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported

YEE HOP PROPERTY (Continued) **1006819624**

Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.334237000000002
Longitude:	-157.88716199999999

Name:	YEE HOP PROPERTY
Address:	621 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950309
Facility Registry ID:	110013774601
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Yee Hop Dewatering
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	Diesel Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported

YEE HOP PROPERTY (Continued) **1006819624**

Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	YEE HOP PROPERTY
Address:	621 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950310-3
Facility Registry ID:	110013774601
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Yee Hop Black Oil Leaching form Soil
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	oil (black)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.334237000000002
Longitude:	-157.88716199999999

Name:	YEE HOP PROPERTY
Address:	621 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported

YEE HOP PROPERTY (Continued) **1006819624**

Case Number:	19950310-3
Facility Registry ID:	110013774601
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Yee Hop Black Oil Leaching form Soil
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	oil (black)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	YEE HOP PROPERTY
Address:	621 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950310-3
Facility Registry ID:	110013774601
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Yee Hop Black Oil Leaching form Soil
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd

YEE HOP PROPERTY (Continued) **1006819624**

Substances:	oil (black)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.334271999999999
Longitude:	-157.88700900000001

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45 SSE 1/2-1 0.759 mi. 4007 ft. **JOHIRO BROTHERS, INC.** **SHWS** **U003154457**
1240 MOOKAULA ST **LUST** **N/A**
HONOLULU, HI 96817 **UST**

Relative: Lower

Actual: 9 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	1240 Mookaula Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Lauren Cruz
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	1240 Mookaula Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Response Ongoing
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported

JOHIRO BROTHERS, INC. (Continued) **U003154457**

Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Lauren Cruz
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

LUST:

Facility ID:	9-100258
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	05/11/1999
Release ID:	930050
Project Officer:	Richard Takaba

UST:

Facility ID:	9-100258
Owner:	JOHIRO BROTHERS, INC.
Owner Address:	1240 MOOKAULA ST
Owner City,St,Zip:	Honolulu, 96817 96817
Latitude:	21.325581
Longitude:	-157.87021300000001
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching
Tank ID:	R-1
Date Installed:	04/01/1976
Tank Status:	**Permanently Out of Use**
Date Closed:	01/26/1993
Tank Capacity:	1000
Substance:	Gasoline

M46 **609 WAIAKAMILO ROAD** **SHWS** **S110169078**
South **609 WAIAKAMILO RD** **SPILLS** **N/A**
1/2-1 **HONOLULU, HI**
0.769 mi.
4059 ft. **Site 1 of 2 in cluster M**

Relative:
Lower

Actual:
10 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	609 Waiakamilo Road UST
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Not reported
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	609 Waiakamilo Road UST
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER

609 WAIAKAMILO ROAD (Continued) **S110169078**

Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Not reported
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	609 WAIAKAMILO ROAD
Address:	609 WAIAKAMILO RD
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Kamehameha Schools Bishop Estates
Case Number:	20090331-1230
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	609 Waiakamilo Road Diesel Release
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	Not reported
Result:	Not reported
File Under:	Not reported
Substances:	Diesel Fuel
Quanity:	0
Units:	Unknown
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported

609 WAIAKAMILO ROAD (Continued) **S110169078**

Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

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47 West 1/2-1 0.776 mi. 4095 ft.

611 MIDDLE STREET WAREHOUSE
611 MIDDLE ST
HONOLULU, HI 96819

SHWS
ENG CONTROLS
INST CONTROL
SPILLS

S106815670
N/A

Relative: Lower

Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Middle Street Intermodal Center
HID Number:	Not reported
Facility Registry Identifier:	110013783361
Lead Agency:	HEER
Program:	State
Project Manager:	Cal Miyahara
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Middle Street Intermodal Center
HID Number:	Not reported
Facility Registry Identifier:	110013783361
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: TPH diesel and oil, arsenic, lead, chromium, chlordane and dieldrin, and PCB in soil. TPH diesel, lead, chromium, arsenic, dieldrin, DDT in the groundwater above HDOH EAL.
Nature of Residual Contamination:	TPH diesel and oil, arsenic, lead, chromium, chlordane and dieldrin, and PCB in soil. TPH diesel, lead, chromium, arsenic, dieldrin, DDT in the groundwater above HDOH EAL.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Cap and retaining wall in place along stream.
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	01/05/2009
Document Number:	2009-004-RB
Document Subject:	NFA Letter
Project Manager:	Cal Miyahara
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Engineering Control: Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

SPILLS:

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19981228-1320
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	611A Middle St, oily substance
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Referred
File Under:	Yee Hop Realty Ltd
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.333860999999999
Longitude:	-157.88817900000001

Name: 611 MIDDLE STREET WAREHOUSE

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19981228-1320
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	611A Middle St, oily substance
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Referred
File Under:	Yee Hop Realty Ltd
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.33389
Longitude:	-157.888172

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19981228-1320
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	611A Middle St, oily substance

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Referred
File Under:	Yee Hop Realty Ltd
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930112
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Hawaii Environmental, syringe disposal
Activity Type:	Response
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	Syringe (capped)
Quanity:	1
Units:	Syringe
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930112
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Hawaii Environmental, syringe disposal
Activity Type:	Response
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	Syringe (capped)
Quanity:	1
Units:	Syringe
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.33389
Longitude:	-157.888172

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19930112
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Hawaii Environmental, syringe disposal
Activity Type:	Response
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Yee Hop Realty Ltd
Substances:	Syringe (capped)
Quanity:	1
Units:	Syringe
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.333860999999999
Longitude:	-157.88817900000001

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950510
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	611 Middle St, warehouse fire
Activity Type:	Response
Activity Lead:	Laura Young
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Yee Hop Realty Ltd
Substances:	Chlordane
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.333860999999999
Longitude:	-157.88817900000001

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950510
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	611 Middle St, warehouse fire
Activity Type:	Response
Activity Lead:	Laura Young
Assignment End Date:	2017-01-31 00:00:00

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Result:	Closed Incomplete Documentation
File Under:	Yee Hop Realty Ltd
Substances:	Chlordane
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	611 MIDDLE STREET WAREHOUSE
Address:	611 MIDDLE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950510
Facility Registry ID:	110013783361
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	611 Middle St, warehouse fire
Activity Type:	Response
Activity Lead:	Laura Young
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Yee Hop Realty Ltd
Substances:	Chlordane
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported

611 MIDDLE STREET WAREHOUSE (Continued) **S106815670**

Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.33389
Longitude:	-157.888172

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48 SSW 1/2-1 0.777 mi. 4105 ft. | **PACIFIC POULTRY** | **SHWS** | **1006819073**
1804 KANAKANUI ST | **SPILLS** | **N/A**
HONOLULU, HI 96819

Relative: Lower

Actual: 13 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Pacific Poultry
HID Number:	Not reported
Facility Registry Identifier:	110013768397
Lead Agency:	HEER
Program:	State
Project Manager:	Mark Sutterfield
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Pacific Poultry
HID Number:	Not reported
Facility Registry Identifier:	110013768397
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Diesel.
Nature of Residual Contamination:	Petroleum contaminated soil.
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Letter of Completion - Unrestricted Residential Use
Document Date:	12/06/2004
Document Number:	2004-519-MS
Document Subject:	NFA for diesel release from UST
Project Manager:	Mark Sutterfield
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

PACIFIC POULTRY (Continued) **1006819073**

SPILLS:

Name:	PACIFIC POULTRY
Address:	1804 KANAKANUI ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20010202-0955
Facility Registry ID:	110013768397
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Pacific Poultry tank closure
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	Not reported
File Under:	Pacific Poultry Company, Ltd.
Substances:	Diesel Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	PACIFIC POULTRY
Address:	1804 KANAKANUI ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20010202-0955
Facility Registry ID:	110013768397
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported

PACIFIC POULTRY (Continued) **1006819073**

Less Or Greater Than:	Not reported
Units:	Pacific Poultry tank closure
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	Not reported
File Under:	Pacific Poultry Company, Ltd.
Substances:	Diesel Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.325326
Longitude:	-157.88266899999999

Name:	PACIFIC POULTRY
Address:	1804 KANAKANUI ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20010202-0955
Facility Registry ID:	110013768397
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Pacific Poultry tank closure
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	Not reported
Result:	Not reported
File Under:	Pacific Poultry Company, Ltd.
Substances:	Diesel Fuel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported

PACIFIC POULTRY (Continued) **1006819073**

Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.325136000000001
Longitude:	-157.88289399999999

N49 **GTE-HAWAIIAN TEL EMPLOYEES FEDERAL CREDIT UNION (H** **SHWS** **1006820922**
SE **1138 N KING ST** **ENG CONTROLS** **N/A**
1/2-1 **HONOLULU, HI 96817** **INST CONTROL**
0.788 mi.
4161 ft. **Site 1 of 2 in cluster N**

Relative:
Lower

Actual:
11 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	GTE-Hawaiian Tel Employees Federal Credit Union (HTEFCU)
HID Number:	Not reported
Facility Registry Identifier:	110013789506
Lead Agency:	HEER
Program:	State
Project Manager:	Richard Palmer
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	GTE-Hawaiian Tel Employees Federal Credit Union (HTEFCU)
HID Number:	Not reported
Facility Registry Identifier:	110013789506
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Presumed: Low Priority, 1999, lack of data re possible PAHs, chlorinated solvents &/or PCBs. Capped by building.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Prohibit Any Activity That May Disturb the Integrity of the Capping System
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported

GTE-HAWAIIAN TEL EMPLOYEES FEDERAL CREDIT UNION (HTEFCU) (Continued) **1006820922**

Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	07/11/2008
Document Number:	Not reported
Document Subject:	Hawaiian Tel Employees Federal Credit Union, Closed EI, LUC IC
Project Manager:	Richard Palmer
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls
Engineering Control:	Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

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M50 **KAMEHAMEHA SCHOOLS - 1336 DILLINGHAM BOULEVARD** **SHWS** **S110061575**
South **1336 DILLINGHAM BLVD** **SPILLS** **N/A**
1/2-1 **HONOLULU, HI 96813**
0.805 mi.
4251 ft. **Site 2 of 2 in cluster M**

Relative:
Lower

Actual:
9 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Kamehameha Schools - 1336 Dillingham Boulevard
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Steve Mow
Hazard Priority:	Medium
Potential Hazards And Controls:	Hazard Present
Island:	Oahu
SDAR Environmental Interest Name:	Kamehameha Schools - 1336 Dillingham Boulevard
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Present
Priority:	Medium
Assessment:	Response Necessary
Response:	Response Ongoing
Nature of Contamination:	Found: TCE in soil and groundwater
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported

KAMEHAMEHA SCHOOLS - 1336 DILLINGHAM BOULEVARD (Continued) **S110061575**

Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Steve Mow
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	KAMEHAMEHA SCHOOLS - 1336 DILLINGHAM BOULEVARD
Address:	1336 DILLINGHAM BLVD
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96813
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20090213-1326
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	1336 Dillingham Blvd.
Activity Type:	Response
Activity Lead:	Paul Chong
Assignment End Date:	2009-02-19 00:00:00
Result:	Refer to SDAR
File Under:	Kamehameha Schools
Substances:	Chlorinated Cleaners TPH-Diesel
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.323499999999999
Longitude:	-157.87450000000001

O51 SW 1/2-1 0.812 mi. 4290 ft. | **YUE-FUNG KWAN CONSTRUCTION SITE**
2004-2008 REPUBLICAN ST
HONOLULU, HI 96819

SHWS **S110061865**
SPILLS **N/A**

Site 1 of 2 in cluster O

Relative: Lower

Actual: 11 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	822 Kawaiahao Street
Island:	Oahu
Environmental Interest:	Yue-Fung Kwan Construction Site
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Kelton Otsuka
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Yue-Fung Kwan Construction Site
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Bunker Fuel Oil in Soil.
Nature of Residual Contamination:	Not reported
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	06/20/2008
Document Number:	2008-414-KO
Document Subject:	UST Closure Report, 2004 & 2008 Republican St, Honolulu HI 96813
Project Manager:	Kelton Otsuka
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	YUE-FUNG KWAN CONSTRUCTION SITE
Address:	2004-2008 REPUBLICAN ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	822 Kawaiahao Street
Case Number:	20080302-1104
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	2004 Republic Street UST
Activity Type:	Response
Activity Lead:	Paul Chong
Assignment End Date:	2008-03-11 00:00:00
Result:	Refer to SDAR

YUE-FUNG KWAN CONSTRUCTION SITE (Continued) **S110061865**

File Under:	Yue-Fung Kwan
Substances:	Waste Oil
Quanity:	5
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	YUE-FUNG KWAN CONSTRUCTION SITE
Address:	2004-2008 REPUBLICAN ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	822 Kawaiahao Street
Case Number:	20080302-1104
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	2004 Republic Street UST
Activity Type:	Response
Activity Lead:	Paul Chong
Assignment End Date:	2008-03-11 00:00:00
Result:	Refer to SDAR
File Under:	Yue-Fung Kwan
Substances:	Waste Oil
Quanity:	5
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported

YUE-FUNG KWAN CONSTRUCTION SITE (Continued) **S110061865**

Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.326346000000001
Longitude:	-157.884962

N52 **938 KOHOU STREET** **SHWS** **S123106537**
SSE **938 KOHOU STREET** **N/A**
1/2-1 **HONOLULU, HI 96817**
0.821 mi.
4335 ft. **Site 2 of 2 in cluster N**

Relative:
Lower

Actual:
3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	938 Kohou Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Iris van der Zander
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Present
Island:	Oahu
SDAR Environmental Interest Name:	938 Kohou Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Present
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Response Ongoing
Nature of Contamination:	Found: TPH in soil and groundwater
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Iris van der Zander
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

P53 **1385 COLBURN STREET** **SHWS** **S118422779**
South **1385 COLBURN ST** **N/A**
1/2-1 **HONOLULU, HI 96817**
0.837 mi.
4421 ft. **Site 1 of 2 in cluster P**

Relative:
Lower

Actual:
10 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	1385 Colburn Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Paul Chong
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	1385 Colburn Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Paul Chong
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

P54 **GENERAL TIRE** **SHWS** **S106817180**
South **505 WAIAKAMILO RD** **SPILLS** **N/A**
1/2-1 **HONOLULU, HI 96817**
0.846 mi.
4469 ft. **Site 2 of 2 in cluster P**

Relative:
Lower

Actual:
10 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Former General Tire Petroleum Contamination
HID Number:	Not reported
Facility Registry Identifier:	110005726884
Lead Agency:	HEER
Program:	State
Project Manager:	Mark Sutterfield
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu

GENERAL TIRE (Continued) **S106817180**

SDAR Environmental Interest Name:	Former General Tire Petroleum Contamination
HID Number:	Not reported
Facility Registry Identifier:	110005726884
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Petroleum contaminated soil detected at concentrations below HDOH EALs
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	01/28/2004
Document Number:	2004-033-MS
Document Subject:	NFA for Former General Tire Location
Project Manager:	Mark Sutterfield
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	GENERAL TIRE
Address:	505 WAIAKAMILO RD
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20020225-1414
Facility Registry ID:	110005726884
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Less Or Greater Than:	Not reported
Units:	General Tire Hydraulic Oil Release
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Continental Tire
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported

GENERAL TIRE (Continued) **S106817180**

Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.323027
Longitude:	-157.87651700000001

Name:	GENERAL TIRE
Address:	505 WAIAKAMILO RD
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20020225-1414
Facility Registry ID:	110005726884
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Less Or Greater Than:	Not reported
Units:	General Tire Hydraulic Oil Release
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Continental Tire
Substances:	Not reported
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.338951999999999
Longitude:	-157.843605

O55 SW 1/2-1 0.855 mi. 4514 ft. | **1950 HOMERULE STREET**
1950 HOMERULE ST
HONOLULU, HI 96819

Site 2 of 2 in cluster O

SHWS **S113230429**
SPILLS **N/A**

Relative: Lower

Actual: 10 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	1950 Homerule Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	Low
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	1950 Homerule Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	Low
Assessment:	Response Not Necessary
Response:	Not reported
Nature of Contamination:	Found: PAHs
Nature of Residual Contamination:	Not reported
Use Restrictions:	No Hazard Present For Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Action Letter
Document Date:	10/19/2012
Document Number:	2012-587-ES
Document Subject:	Review of Limited Phase II ESA, 1950 Homerule St, Honolulu HI 96819 (revised Oct 2012)
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	1950 HOMERULE STREET
Address:	1950 HOMERULE ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20120917-1022
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	1950 Homerule
Activity Type:	Response
Activity Lead:	TC
Assignment End Date:	Not reported

1950 HOMERULE STREET (Continued) **S113230429**

Result:	SOSC NFA
File Under:	Not reported
Substances:	Polycyclic Aromatic Hydrocarbons
Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.325659999999999
Longitude:	-157.8852

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56 WSW 1/2-1 0.862 mi. 4551 ft. **HONOLULU WOOD TREATING CO, LTD** **SHWS** **S123106588**
2290 ALAHAO PL **N/A**
HONOLULU, HI 96819

Relative: Lower
Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Honolulu Wood Treating Co, Ltd
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	Site Discovery
Project Manager:	Laura Young
Hazard Priority:	Medium
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Honolulu Wood Treating Co, Ltd
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Medium
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Presumed: Pentachlorophenol in soil.
Nature of Residual Contamination:	Not reported

HONOLULU WOOD TREATING CO, LTD (Continued) **S123106588**

Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Laura Young
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

57
NE
1/2-1
0.866 mi.
4570 ft.

2147 AOAO STREET **SHWS** **S106815333**
2147 AOAO ST **SPILLS** **N/A**
HONOLULU, HI 96819

Relative:
Higher

Actual:
174 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Off of Likelike Hwy
Island:	Oahu
Environmental Interest:	2147 Aoao Street UST Removal
HID Number:	Not reported
Facility Registry Identifier:	110013783450
Lead Agency:	HEER
Program:	State
Project Manager:	Richard Palmer
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	2147 Aoao Street UST Removal
HID Number:	Not reported
Facility Registry Identifier:	110013783450
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	32 ppm Chlordane from pre 1970 use.
Use Restrictions:	No Hazard Present For Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Historic NFA - Incomplete Documentation
Document Date:	10/21/1999
Document Number:	Not reported
Document Subject:	UST Closure and Short-Term Release Response Report for 2147 Aoao St, Honolulu HI
Project Manager:	Richard Palmer
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	2147 AOAO STREET
Address:	2147 AOAO ST

2147 AOAO STREET (Continued) **S106815333**

Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Off of Likelike Hwy
Case Number:	19990726-0925
Facility Registry ID:	110013783450
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	Barrels at 2147 Aoao Street
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Walter Kaneshiro
Substances:	Chlordane
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	2147 AOAO STREET
Address:	2147 AOAO ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Off of Likelike Hwy
Case Number:	19990726-0925
Facility Registry ID:	110013783450
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Site Visit
Less Or Greater Than:	Not reported
Units:	Barrels at 2147 Aoao Street
Activity Type:	Response

2147 AOAO STREET (Continued) **S106815333**

Activity Lead:	Liz Galvez
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Walter Kaneshiro
Substances:	Chlordane
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.345427000000001
Longitude:	-157.86784299999999

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58 **MOANALUA CRASH BOAT BASE** **FUDS** **1024902053**
West **N/A**
1/2-1 **MOANALUA, HI**
0.867 mi.
4580 ft.

Relative:
Lower

Actual:
3 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F397100
Congressional District Number:	01
Facility Name:	MOANALUA CRASH BOAT BASE
FUDS Number:	H09HI0236
City:	MOANALUA
State:	HI
County:	HONOLULU
Object ID:	5024
USACE District:	Honolulu District (POH)
Status:	Properties without projects
Current Owner:	Other Federal Government; State Government
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=55034
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.335000000000000
Longitude:	-157.889999999999000

59 South 1/2-1 0.871 mi. 4599 ft. | **CLASSIC BOWL**
1190 DILLINGHAM BLVD
HONOLULU, HI 96817 | **SHWS** | **S117391422**
N/A

Relative: Lower
Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Classic Bowl
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Jordan Nakayama
Hazard Priority:	Medium
Potential Hazards And Controls:	Hazard Present
Island:	Oahu
SDAR Environmental Interest Name:	Classic Bowl
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Present
Priority:	Medium
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Found: Petroleum-impacted soil, groundwater, and soil gas.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Jordan Nakayama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

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60 SSE 1/2-1 0.881 mi. 4651 ft. | **JBL HAWAII, LTD**
905 KOKEA ST
HONOLULU, HI 96817 | **SHWS**
ENG CONTROLS
INST CONTROL | **1006820832**
N/A

Relative: Lower
Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	JBL Hawaii, Limited
HID Number:	Not reported
Facility Registry Identifier:	110013788473
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu

JBL HAWAII, LTD (Continued) **1006820832**

SDAR Environmental Interest Name:	JBL Hawaii, Limited
HID Number:	Not reported
Facility Registry Identifier:	110013788473
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	Low
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Petroleum impacted soils, gasoline in gw does not exceed EALs
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Prohibit Any Activity That May Disturb the Integrity of the Capping System
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	08/29/2005
Document Number:	2005-440-ES
Document Subject:	Comments on Aug 12, 2005 "Groundwater Monitoring and Sampling Report"
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls
Engineering Control:	Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

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Q61 **KAPALAMA INCINERATOR OFF-SITE CONTAMINATION** **SHWS** **S121406149**
SSE **757 KOKEA ST** **INST CONTROL** **N/A**
1/2-1 **HONOLULU, HI 96817**
0.888 mi.
4687 ft. **Site 1 of 2 in cluster Q**

Relative:
Lower

Actual:
3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Kapalama Incinerator Off-Site Contamination
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	Medium
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Kapalama Incinerator Off-Site Contamination

KAPALAMA INCINERATOR OFF-SITE CONTAMINATION (Continued) **S121406149**

HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	Medium
Assessment:	Response Necessary
Response:	Response Ongoing
Nature of Contamination:	Presumed: Lead in soil.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

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Q62 **KAPALAMA INCINERATOR** **SHWS** **S121406150**
SSE **757 KOKEA ST** **N/A**
1/2-1 **HONOLULU, HI 96817**
0.888 mi.
4687 ft. **Site 2 of 2 in cluster Q**

Relative:
Lower

Actual:
3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Kapalama Incinerator
HID Number:	HISFN0905436
Facility Registry Identifier:	110005729701
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Kapalama Incinerator
HID Number:	HISFN0905436
Facility Registry Identifier:	110005729701
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Lead in soil
Nature of Residual Contamination:	Not reported

KAPALAMA INCINERATOR (Continued) **S121406150**

Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	10/24/2005
Document Number:	2005-543-ES
Document Subject:	Comments on Aug 2005 Final Closure Report and "No Further Action" determination for Kapalama Incinerator Unit
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

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63 South 1/2-1 0.938 mi. 4951 ft. **DILLINGHAM BASE YARD** **FUDS** **1024901925** **N/A**

HONOLULU, HI

Relative: Lower

Actual: 2 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F380900
Congressional District Number:	01
Facility Name:	DILLINGHAM BASE YARD
FUDS Number:	H09HI0066
City:	HONOLULU
State:	HI
County:	HONOLULU
Object ID:	2038
USACE District:	Honolulu District (POH)
Status:	Properties without projects
Current Owner:	Private Sector
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=54588
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.321666669999900
Longitude:	-157.873333330000000

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64 SSW 1/2-1 0.944 mi. 4982 ft. **SAND ISLAND ASPHALT PLANT** **FUDS** **1024901885** **N/A**

HONOLULU, HI

Relative: Lower

Actual: 7 ft.

FUDS:

EPA Region:	09
Installation ID:	HI99799F375300
Congressional District Number:	01
Facility Name:	SAND ISLAND ASPHALT PLANT
FUDS Number:	H09HI0005
City:	HONOLULU
State:	HI
County:	HONOLULU
Object ID:	7060
USACE District:	Honolulu District (POH)

SAND ISLAND ASPHALT PLANT (Continued) **1024901885**

Status:	Properties without projects
Current Owner:	Other
EMS Map Link:	https://fudsportal.usace.army.mil/ems/ems/inventory/map/map?id=62324
Eligibility:	Eligible
Has Projects:	No
NPL Status:	Not Listed
Latitude:	21.321666669999900
Longitude:	-157.879999999999000

R65 WSW 1/2-1 0.959 mi. 5061 ft. **HAGADONE PRINTING COMPANY SAND ISLAND** **SHWS** **S106817239**
2278 HOONEE PL **INST CONTROL** **N/A**
HONOLULU, HI 96819

Site 1 of 2 in cluster R

Relative: Lower

Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Hagadone Printing Company Sand Island
HID Number:	Not reported
Facility Registry Identifier:	110013790139
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Hagadone Printing Company Sand Island
HID Number:	Not reported
Facility Registry Identifier:	110013790139
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Petroleum in soil and groundwater.
Nature of Residual Contamination:	Petroleum in soil and groundwater.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Prohibit Excavation
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	03/16/2004
Document Number:	2004-099-ES
Document Subject:	Former Hagadone Printing Company site, 2278 Hoonee Pl, Honolulu
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

R66 WSW 1/2-1 0.960 mi. 5068 ft. | **LONGS DRUG STORES WAREHOUSE**
2270 HOONEE PL
HONOLULU, HI 96819

Site 2 of 2 in cluster R

SHWS
ENG CONTROLS
INST CONTROL
SPILLS

S106818797
N/A

Relative: Lower

Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Longs Drug Stores Warehouse
HID Number:	Not reported
Facility Registry Identifier:	110013771203
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Longs Drug Stores Warehouse
HID Number:	Not reported
Facility Registry Identifier:	110013771203
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	Low
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Petroleum in soil and groundwater
Nature of Residual Contamination:	Petroleum in soil and groundwater.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Engineering Control Required
Description of Restrictions:	Prohibit Excavation
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	01/30/2014
Document Number:	2014-055-ES
Document Subject:	No Further Action with Institutional Controls Determination for Longs Drug Stores Warehouse
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

ENG CONTROLS:

Supplemental Location Text:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Potential Hazards And Controls:	Hazard Managed With Controls
Engineering Control:	Engineering Control Required

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

SPILLS:

Name:	LONGS DRUG STORES WAREHOUSE

LONGS DRUG STORES WAREHOUSE (Continued) **S106818797**

Address:	2270 HOONEE PL
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950620
Facility Registry ID:	110013771203
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Longs Drug Store Warehouse
Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Longs Drugs
Substances:	Petroleum (diesel with oil)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.352150999999999
Longitude:	-157.874246

Name:	LONGS DRUG STORES WAREHOUSE
Address:	2270 HOONEE PL
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96819
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	19950620
Facility Registry ID:	110013771203
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Longs Drug Store Warehouse

LONGS DRUG STORES WAREHOUSE (Continued) **S106818797**

Activity Type:	Response
Activity Lead:	Terry Corpus
Assignment End Date:	Not reported
Result:	Refer to ISST
File Under:	Longs Drugs
Substances:	Petroleum (diesel with oil)
Quanity:	Not reported
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.328205000000001
Longitude:	-157.889692

67
South
1/2-1
0.970 mi.
5121 ft.

1305 HART STREET
1305 HART ST
HONOLULU, HI 96814

SHWS **S106815169**
INST CONTROL **N/A**
SPILLS

Relative:
Lower

Actual:
3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	1305 Hart St, 1301 and 1321 also?
Island:	Oahu
Environmental Interest:	1305 Hart Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Mark Sutterfield
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	1305 Hart Street
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary

1305 HART STREET (Continued) **S106815169**

Response:	Response Complete
Nature of Contamination:	Not reported
Nature of Residual Contamination:	Lead in soil
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	12/16/2004
Document Number:	2004-539-MS
Document Subject:	NFA 1305 Hart St Lead in surface below Tier I based on 95% UCL
Project Manager:	Mark Sutterfield
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	1305 Hart St, 1301 and 1321 also?
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

SPILLS:

Name:	1305 HART STREET
Address:	1305 HART ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96814
Island:	Oahu
Supplemental Loc. Text:	1305 Hart St, 1301 and 1321 also?
Case Number:	20041004-1522
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Less Or Greater Than:	Not reported
Units:	Hart Street Groundwater
Activity Type:	Response
Activity Lead:	Mike Cripps
Assignment End Date:	2005-10-28 00:00:00
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Hawaiian Home Lands
Substances:	vinyl chloride,lead
Quanity:	Not reported
Units:	Unknown
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported

1305 HART STREET (Continued) **S106815169**

Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.320712
Longitude:	-157.87732700000001

Name:	1305 HART STREET
Address:	1305 HART ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96814
Island:	Oahu
Supplemental Loc. Text:	1305 Hart St, 1301 and 1321 also?
Case Number:	20041004-1522
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Less Or Greater Than:	Not reported
Units:	Hart Street Groundwater
Activity Type:	Response
Activity Lead:	Mike Cripps
Assignment End Date:	2005-10-28 00:00:00
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Hawaiian Home Lands
Substances:	vinyl chloride,lead
Quanity:	Not reported
Units:	Unknown
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.295252000000001
Longitude:	-157.84531899999999

1305 HART STREET (Continued) **S106815169**

Name:	1305 HART STREET
Address:	1305 HART ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96814
Island:	Oahu
Supplemental Loc. Text:	1305 Hart St, 1301 and 1321 also?
Case Number:	20041004-1522
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Less Or Greater Than:	Not reported
Units:	Hart Street Groundwater
Activity Type:	Response
Activity Lead:	Mike Cripps
Assignment End Date:	2005-10-28 00:00:00
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Hawaiian Home Lands
Substances:	vinyl chloride,lead
Quanity:	Not reported
Units:	Unknown
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321469
Longitude:	-157.87813600000001

Name:	1305 HART STREET
Address:	1305 HART ST
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI 96814
Island:	Oahu
Supplemental Loc. Text:	1305 Hart St, 1301 and 1321 also?
Case Number:	20041004-1522
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	No
Less Or Greater Than:	Not reported

1305 HART STREET (Continued) **S106815169**

Units:	Hart Street Groundwater
Activity Type:	Response
Activity Lead:	Mike Cripps
Assignment End Date:	2005-10-28 00:00:00
Result:	Refer to ISST
File Under:	State of Hawaii, Department of Hawaiian Home Lands
Substances:	vinyl chloride,lead
Quanity:	Not reported
Units:	Unknown
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321096000000001
Longitude:	-157.87816100000001

68
SW
1/2-1
0.972 mi.
5134 ft.

HAWAIIAN BITUMULS & PAVING
248 SAND ISLAND ACCESS RD
HONOLULU, HI 96819

SHWS **U001235221**
LUST **N/A**
UST
INST CONTROL
AIRS

Relative:
Lower

Actual:
3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	Hawaiian Bitumuls Paving & Precast Company-Sand Island Access Road
HID Number:	HID006926919
Facility Registry Identifier:	110005284101
Lead Agency:	HEER
Program:	State
Project Manager:	Laura Young
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	Hawaiian Bitumuls Paving & Precast Company-Sand Island Access Road
HID Number:	HID006926919
Facility Registry Identifier:	110005284101
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA

HAWAIIAN BITUMULS & PAVING (Continued) **U001235221**

Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Petroleum in soil and groundwater.
Nature of Residual Contamination:	Petroleum in soil and groundwater
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Prohibit Excavation
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	01/28/2000
Document Number:	2000-044-MN
Document Subject:	NFA letter for 248 Sand Island Access Rd
Project Manager:	Laura Young
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

LUST:

Facility ID:	9-100764
Facility Status:	Site Cleanup Completed with EHMP
Facility Status Date:	01/28/2000
Release ID:	900050
Project Officer:	To HEER

UST:

Facility ID:	9-100764
Owner:	HAWAIIAN BITUMULS & PAVING
Owner Address:	P.O. BOX 2240
Owner City,St,Zip:	Honolulu, 96819 96819
Latitude:	21.327521000000001
Longitude:	-157.88972799999999
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Map

Tank ID:	R-01
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	01/28/2000
Tank Capacity:	10000
Substance:	Diesel

Tank ID:	R-02
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	01/28/2000
Tank Capacity:	10000
Substance:	Gasoline

Tank ID:	R-03
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	01/28/2000
Tank Capacity:	10000
Substance:	Not Listed

HAWAIIAN BITUMULS & PAVING (Continued) **U001235221**

Tank ID:	R-04
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	01/28/2000
Tank Capacity:	1000
Substance:	Other

Tank ID:	R-5
Date Installed:	Not reported
Tank Status:	**Permanently Out of Use**
Date Closed:	01/28/2000
Tank Capacity:	800
Substance:	Not Listed

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

AIRS:

Name:	BLACK PLUMERIA, LLC
Address:	248 SAND ISLAND ACCESS ROAD
City,State,Zip:	HONOLULU, HI
Facility Identifier:	0540-01-C
Island:	Oahu
Mailing Address:	P.O. Box 579
Locale:	Not reported
Mailing City:	Honolulu
Contact Name:	John Romanowski
Mailing State:	Hawaii
Mailing Zip:	96809
Contact Phone:	Vice President
Business Phone:	Not reported
Issue Date:	10/12/2011
Expiration Date:	10/11/2016
Description:	300 TPH Drum-Mix Asphalt Plant with 1,322 bhp Cummins QST30-G5-NR2 Diesel Engine Generator1.The 300 TPH asphalt plant encompasses the following equipment and associated appurtenances:a.One (1) CMI Drum-Mixer, model PTD-300 with ESII100 Burner;b.One (1) 1,322 bhp Cummins QST30-G2 diesel engine generator, c.One (1) Roto-Aire Baghouse servicing the Drum-Mixer;d.Two (2) CMI Hot Oil Heaters, model CEI-2000;e.One (1) CMI 20-Ton Capacity Portable Recycle Bin, model PRB-120;f.One (1) 300 TPH Reclaimed Asphalt Plant (RAP) roller crusher connected to the portable recycling bin;g.4’ x 10’ Scalping Screen;h.Aggregate Bins;i.Asphalt Storage Silo; andj.Various conveyor belts.

69 SW 1/2-1 0.984 mi. 5195 ft.

HSI MECHANICAL
227-230 PUUHALE RD
HONOLULU, HI 96819

SHWS **S121406118**
INST CONTROL **N/A**

Relative: Lower
Actual: 7 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Not reported
Island:	Oahu
Environmental Interest:	HSI Mechanical
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Program:	State
Project Manager:	Steve Mow
Hazard Priority:	NFA
Potential Hazards And Controls:	Hazard Managed With Controls
Island:	Oahu
SDAR Environmental Interest Name:	HSI Mechanical
HID Number:	Not reported
Facility Registry Identifier:	Not reported
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Managed With Controls
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Ongoing
Nature of Contamination:	Not reported
Nature of Residual Contamination:	POL.
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued
Within Designated Areawide Contamination:	Not reported
Site Closure Type:	No Further Action Letter - Restricted Use
Document Date:	08/14/2017
Document Number:	2017-234-SPM
Document Subject:	No Further Action with Institutional Controls (ICs) determination for HSI Mechanical, 227-230 Puuhale Rd, Honolulu, 96819, TMK 1-1-2-007-027
Project Manager:	Steve Mow
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

INST CONTROL:

Potential hazards and controls:	Hazard Managed With Controls
Supplemental Location:	Not reported
Zip Suffix:	Not reported
Island:	Oahu
Institutional Control:	Government - Hawaii Dept. of Health Letter Issued

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70 South 1/2-1 0.988 mi. 5218 ft.

YOUNG BROTHERS, LTD. PIERS 39, 40
1331 N NIMITZ HWY
HONOLULU, HI 96801

SHWS **S108009312**
SPILLS **N/A**

Relative: Lower
Actual: 3 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Honolulu Harbor Pier 39/40/41 at Waiakamilo Rd
Island:	Oahu

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Environmental Interest:	Young Brothers, Ltd. Piers 39, 40
HID Number:	Not reported
Facility Registry Identifier:	110013774521
Lead Agency:	HEER
Program:	State
Project Manager:	Unassigned
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Undetermined
Island:	Oahu
SDAR Environmental Interest Name:	Young Brothers, Ltd. Piers 39, 40
HID Number:	Not reported
Facility Registry Identifier:	110013774521
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Undetermined
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Found: TPH-d and TPH-o in soil borings.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Undetermined
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Honolulu Harbor Kapalama Unit
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Unassigned
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	19990221-1737
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Waste Oil at Young Brothers, Ltd.-Pier 39
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Young Brothers, Ltd.
Substances:	Oil, Waste
Quanity:	200
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321346999999999
Longitude:	-157.88025999999999

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	19990221-1737
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	Not reported
Less Or Greater Than:	Not reported
Units:	Waste Oil at Young Brothers, Ltd.-Pier 39
Activity Type:	Response
Activity Lead:	Bill Perry
Assignment End Date:	2017-01-31 00:00:00
Result:	Closed Incomplete Documentation
File Under:	Young Brothers, Ltd.
Substances:	Oil, Waste
Quanity:	200
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.319652999999999
Longitude:	-157.88081700000001

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20140310-1609
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Young Brothers hydraulic Pier 40
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2014-07-22 00:00:00
Result:	SOSC NFA
File Under:	Young Brothers, Ltd.
Substances:	Hydraulic
Quanity:	35
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321346999999999
Longitude:	-157.88025999999999

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20140310-1609
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Young Brothers hydraulic Pier 40
Activity Type:	Response
Activity Lead:	Liz Galvez
Assignment End Date:	2014-07-22 00:00:00
Result:	SOSC NFA
File Under:	Young Brothers, Ltd.
Substances:	Hydraulic
Quanity:	35
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.319652999999999
Longitude:	-157.88081700000001

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	PO BOX 3288
City,State,Zip:	HONOLULU, HI 96801
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20100927-1210
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	>
Units:	YOUNG BROTHERS HYDRAULIC OIL RELEASE
Activity Type:	Response
Activity Lead:	Curtis Martin
Assignment End Date:	2010-09-27 00:00:00

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Result:	SOSC NFA
File Under:	Young Brothers, Ltd.
Substances:	Hydraulic Oil
Quanity:	100
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321346999999999
Longitude:	-157.88025999999999

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	PO BOX 3288
City,State,Zip:	HONOLULU, HI 96801
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20100927-1210
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	>
Units:	YOUNG BROTHERS HYDRAULIC OIL RELEASE
Activity Type:	Response
Activity Lead:	Curtis Martin
Assignment End Date:	2010-09-27 00:00:00
Result:	SOSC NFA
File Under:	Young Brothers, Ltd.
Substances:	Hydraulic Oil
Quanity:	100
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.319652999999999
Longitude:	-157.88081700000001

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20111102-1645
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Young Brothers medical waste spill
Activity Type:	Response
Activity Lead:	TC
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Young Brothers, Ltd.
Substances:	medical waste
Quanity:	1
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321346999999999
Longitude:	-157.88025999999999

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20111102-1645
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Young Brothers medical waste spill
Activity Type:	Response
Activity Lead:	TC
Assignment End Date:	Not reported
Result:	SOSC NFA
File Under:	Young Brothers, Ltd.
Substances:	medical waste
Quanity:	1
Units:	Gallons
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.319652999999999
Longitude:	-157.88081700000001

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20120819-2139

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Security Breach at 1331 N. Nimitz Hwy.
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2012-08-20 00:00:00
Result:	Not reported
File Under:	Young Brothers, Ltd.
Substances:	Security Breach
Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.321346999999999
Longitude:	-157.88025999999999

Name:	YOUNG BROTHERS, LTD. PIERS 39, 40
Address:	1331 N NIMITZ HWY
Address 2:	Not reported
City,State,Zip:	HONOLULU, HI
Island:	Oahu
Supplemental Loc. Text:	Honolulu Harbor Pier 39/40 at Waiakamilo Rd
Case Number:	20120819-2139
Facility Registry ID:	110013774521
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Security Breach at 1331 N. Nimitz Hwy.
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2012-08-20 00:00:00
Result:	Not reported
File Under:	Young Brothers, Ltd.
Substances:	Security Breach

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	21.319652999999999
Longitude:	-157.88081700000001

Name:	YOUNG BROTHERS REFRIGERATE RELEASE
Address:	1331 N NIMITZ HWY
Address 2:	HONOLULU HARBOR, PIER 40
City,State,Zip:	HONOLULU, HI 96817
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20120420-1430
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Young Brothers Refrigerate Release
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2012-04-20 00:00:00
Result:	SOSC NFA
File Under:	Not reported
Substances:	Quest 134A Refrigerate
Quanity:	16
Units:	Ounces
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported

YOUNG BROTHERS, LTD. PIERS 39, 40 (Continued) **S108009312**

Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported
Invoice To:	Not reported
Closed Date:	Not reported
Comments:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Click this hyperlink while viewing on your computer to access
7 additional HI SPILLS: record(s) in the EDR Site Report.

Count: 19 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HONOLULU	S117391417	1339 SCHOOL STREET	1339, 1341, 1343 N SCHOOL ST	96817	SHWS, ENG CONTROLS, INST CONT
HONOLULU	S123106535	333 & 351 N KING ST	333 & 351 N KING ST	96817	SHWS, BROWNFIELDS
HONOLULU	S118943721	UNIVERSITY OF HAWAII INTERCHANGE	H-1 AND UNIVERSITY AVE		SHWS
HONOLULU	S106817262	HALAWA STREAM CHANNEL PETROLEUM CO	H-3		SHWS
HONOLULU	S108008549	KALANI, HART, MOKUAEA STREET, HONO	HART ST & KALANI ST & MOKAUEA		SHWS
HONOLULU	1006819301	KEEHI LAGOON CANOE FACILITY, INCRE	HOONEE PL	96819	SHWS, ENG CONTROLS, INST CONT
HONOLULU	S115555270	ISLAND RECYCLING FIRE	ISLAND RECYCLING - 50 SAND ISL		SHWS, SPILLS
HONOLULU	1006820337	ABC DISPOSAL COMPANY	2760 KAMEHAMEHA HWY	96819	SHWS
HONOLULU	S123640152	HONOLULU COMMUNITY COLLEGE KOKEA S	KOKEA ST		SHWS
HONOLULU	S121406165	KUHIO PARK TERRACE UNITS D1 AND D2	LINAPUNI ST	96819	SHWS, INST CONTROL, BROWNFIEL
HONOLULU	S121406164	KUHIO PARK TERRACE TOWERS	LINAPUNI ST	96819	SHWS, ENG CONTROLS, INST CONT
HONOLULU	S124516648	CITY AND COUNTY OF HONOLULU, KEEHI	606 MIDDLE STREET		SWF/LF
HONOLULU	S111704706	FORMER KAPALAMA MILITARY RESERVATI	N NIMITZ HWY		SHWS
HONOLULU	S106819311	NIMITZ HIGHWAY WATER IMPROVEMENT P	N NIMITZ HWY	96817	SHWS
HONOLULU	S123640218	PALI HIGHWAY LEAD CONTAMINATION	PALI HIGHWAY		SHWS
HONOLULU	S108009155	PIER 32-35 (HONOLULU HARBOR) ENTRA	PIER 32 STATE ACCESS ROAD OFF		SHWS, SPILLS
HONOLULU	S118943717	SAND ISLAND ACCESS ROAD AREAWIDE P	SAND ISLAND ACCESS RD		SHWS
HONOLULU	S118422854	SAND ISLAND HOUSING FIRST PROJECT	SAND ISLAND ACCESS RD		SHWS
HONOLULU	S108859926	KOKUA KALIHI VALLEY ACTIVE LIVING	UPPER KALIHI ST		SHWS, BROWNFIELDS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/27/2020	Source: EPA
Date Data Arrived at EDR: 05/06/2020	Telephone: N/A
Date Made Active in Reports: 05/28/2020	Last EDR Contact: 06/03/2020
Number of Days to Update: 22	Next Scheduled EDR Contact: 07/13/2020
	Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1 Telephone 617-918-1143	EPA Region 6 Telephone: 214-655-6659
EPA Region 3 Telephone 215-814-5418	EPA Region 7 Telephone: 913-551-7247
EPA Region 4 Telephone 404-562-8033	EPA Region 8 Telephone: 303-312-6774
EPA Region 5 Telephone 312-886-6686	EPA Region 9 Telephone: 415-947-4246
EPA Region 10 Telephone 206-553-8665	

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/27/2020	Source: EPA
Date Data Arrived at EDR: 05/06/2020	Telephone: N/A
Date Made Active in Reports: 05/28/2020	Last EDR Contact: 06/03/2020
Number of Days to Update: 22	Next Scheduled EDR Contact: 07/13/2020
	Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 22

Source: EPA
Telephone: N/A
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/03/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 22

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 22

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/23/2020
Date Data Arrived at EDR: 03/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 57

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/23/2020
Date Data Arrived at EDR: 03/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/23/2020
Date Data Arrived at EDR: 03/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/23/2020
Date Data Arrived at EDR: 03/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/23/2020
Date Data Arrived at EDR: 03/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/04/2019
Date Data Arrived at EDR: 11/13/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 76

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/14/2020
Next Scheduled EDR Contact: 08/24/2020
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/13/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 05/15/2020
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/15/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/13/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 05/15/2020
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/15/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/19/2019
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 78

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/24/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: Sites List

Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 05/26/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Permitted Landfills in the State of Hawaii

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/09/2020
Date Data Arrived at EDR: 03/13/2020
Date Made Active in Reports: 05/29/2020
Number of Days to Update: 77

Source: Department of Health
Telephone: 808-586-4245
Last EDR Contact: 03/05/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 02/25/2020
Date Data Arrived at EDR: 02/26/2020
Date Made Active in Reports: 05/01/2020
Number of Days to Update: 65

Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 05/29/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Semi-Annually

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/04/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/10/2019
Date Data Arrived at EDR: 12/05/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 67

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/11/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 10/02/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/03/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 72

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/15/2019
Date Data Arrived at EDR: 12/17/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 08/27/2019
Date Data Arrived at EDR: 08/28/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 75

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 03/19/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 02/25/2020
Date Data Arrived at EDR: 02/26/2020
Date Made Active in Reports: 05/01/2020
Number of Days to Update: 65

Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 05/29/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/11/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/10/2019
Date Data Arrived at EDR: 12/05/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 67

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/02/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 10/11/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/03/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 72

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/04/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 85

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/20/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Control Sites
A listing of sites with engineering controls in place.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 9

Source: Department of Health
Telephone: 404-586-4249
Last EDR Contact: 05/26/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

INST CONTROL: Sites with Institutional Controls
Voluntary Remediation Program and Brownfields sites with institutional controls in place.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 05/26/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/18/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Response Program Sites
Sites participating in the Voluntary Response Program. The purpose of the VRP is to streamline the cleanup process in a way that will encourage prospective developers, lenders, and purchasers to voluntarily cleanup properties.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 05/26/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Sites
With certain legal exclusions and additions, the term ‘brownfield site’ means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/30/2019
Number of Days to Update: 9

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 05/26/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/02/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/02/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: SWRCY
A listing of recycling and drop-off facilities located in Hawaii.

Date of Government Version: 02/09/2020
Date Data Arrived at EDR: 03/13/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 76

Source: Department of Health
Telephone: 808-586-4226
Last EDR Contact: 03/05/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/16/2020
Next Scheduled EDR Contact: 08/10/2020
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/09/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 05/01/2020
Next Scheduled EDR Contact: 08/10/2020
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Lab Listing
A listing of clandestine drug lab site locations.

Date of Government Version: 08/04/2010
Date Data Arrived at EDR: 09/10/2010
Date Made Active in Reports: 10/22/2010
Number of Days to Update: 42

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 22

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/05/2019
Date Data Arrived at EDR: 12/06/2019
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 70

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/24/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

SPILLS: Release Notifications
Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 11/18/2019
Date Data Arrived at EDR: 11/19/2019
Date Made Active in Reports: 01/21/2020
Number of Days to Update: 63

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 05/14/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 03/10/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/11/2013
Number of Days to Update: 39

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/23/2020
Date Data Arrived at EDR: 03/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/28/2020
Date Data Arrived at EDR: 02/19/2020
Date Made Active in Reports: 05/14/2020
Number of Days to Update: 85

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/06/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/15/2020
Next Scheduled EDR Contact: 08/24/2020
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/19/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/24/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/04/2020
Next Scheduled EDR Contact: 08/17/2020
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/08/2020
Next Scheduled EDR Contact: 08/17/2020
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/20/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 79

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/21/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 10/23/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 84

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/21/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 22

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 09/14/2020
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/05/2019
Date Data Arrived at EDR: 11/20/2019
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 149

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/15/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/06/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 8

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 08/17/2020
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 10/09/2019
Date Data Arrived at EDR: 10/11/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 70

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/25/2019
Date Data Arrived at EDR: 10/25/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 82

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 42

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 06/05/2020
Next Scheduled EDR Contact: 09/14/2020
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/01/2020
Next Scheduled EDR Contact: 09/14/2020
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/08/2020
Next Scheduled EDR Contact: 08/17/2020
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/01/2019
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/28/2020
Next Scheduled EDR Contact: 08/10/2020
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 01/17/2020
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 49

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/29/2020
Next Scheduled EDR Contact: 08/17/2020
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 22

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data
Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 03/31/2020
Date Data Arrived at EDR: 04/01/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 50

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 05/27/2020
Next Scheduled EDR Contact: 09/14/2020
Data Release Frequency: Quarterly

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/11/2020
Date Data Arrived at EDR: 02/25/2020
Date Made Active in Reports: 05/21/2020
Number of Days to Update: 86

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/21/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 02/28/2020
Date Made Active in Reports: 05/22/2020
Number of Days to Update: 84

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/21/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/05/2020
Date Data Arrived at EDR: 03/06/2020
Date Made Active in Reports: 05/29/2020
Number of Days to Update: 84

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 09/21/2020
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/03/2020
Date Data Arrived at EDR: 03/03/2020
Date Made Active in Reports: 05/28/2020
Number of Days to Update: 86

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 06/02/2020
Next Scheduled EDR Contact: 09/14/2020
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/05/2020
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 59

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/07/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/03/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/18/2020
Date Data Arrived at EDR: 02/19/2020
Date Made Active in Reports: 05/14/2020
Number of Days to Update: 85

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/19/2020
Next Scheduled EDR Contact: 08/31/2020
Data Release Frequency: Quarterly

AIRS: List of Permitted Facilities
A listing of permitted facilities in the state.

Date of Government Version: 12/19/2019
Date Data Arrived at EDR: 12/23/2019
Date Made Active in Reports: 03/02/2020
Number of Days to Update: 70

Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 03/20/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Varies

DRYCLEANERS: Permitted Drycleaner Facility Listing
A listing of permitted drycleaner facilities in the state.

Date of Government Version: 12/19/2019
Date Data Arrived at EDR: 12/23/2019
Date Made Active in Reports: 03/04/2020
Number of Days to Update: 72

Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 03/20/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Varies

Financial Assurance: Financial Assurance Information Listing
A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 03/11/2020
Date Data Arrived at EDR: 03/12/2020
Date Made Active in Reports: 05/22/2020
Number of Days to Update: 71

Source: Department of Health
Telephone: 808-586-4226
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 09/21/2020
Data Release Frequency: Varies

LEAD: Lead Inspection Listing
Lead inspections

Date of Government Version: 03/05/2020
Date Data Arrived at EDR: 03/06/2020
Date Made Active in Reports: 05/15/2020
Number of Days to Update: 70

Source: Department of Health
Telephone: 808-586-5800
Last EDR Contact: 06/03/2020
Next Scheduled EDR Contact: 09/21/2020
Data Release Frequency: Varies

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 02/07/2013
Date Data Arrived at EDR: 02/12/2013
Date Made Active in Reports: 04/09/2013
Number of Days to Update: 56

Source: Department of Health
Telephone: 808-586-4258
Last EDR Contact: 05/18/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

PCS INACTIVE: Listing of Inactive PCS Permits
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Semi-Annually

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 03/09/2020
Next Scheduled EDR Contact: 06/22/2020
Data Release Frequency: Semi-Annually

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 05/21/2020
Next Scheduled EDR Contact: 09/07/2020
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 191

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 200

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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.

State Wetlands Data: Wetlands Inventory
Source: Office of Planning
Telephone: 808-587-2895

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

GULICK AVENUE BRIDGE
GULICK AVENUE
HONOLULU, HI 96819

TARGET PROPERTY COORDINATES

Latitude (North):	21.335248 - 21˚ 20' 6.89''
Longitude (West):	157.876199 - 157˚ 52' 34.32''
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	616539.9
UTM Y (Meters):	2359528.0
Elevation:	71 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5941635 HONOLULU, HI
Version Date:	2013

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 principle 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).

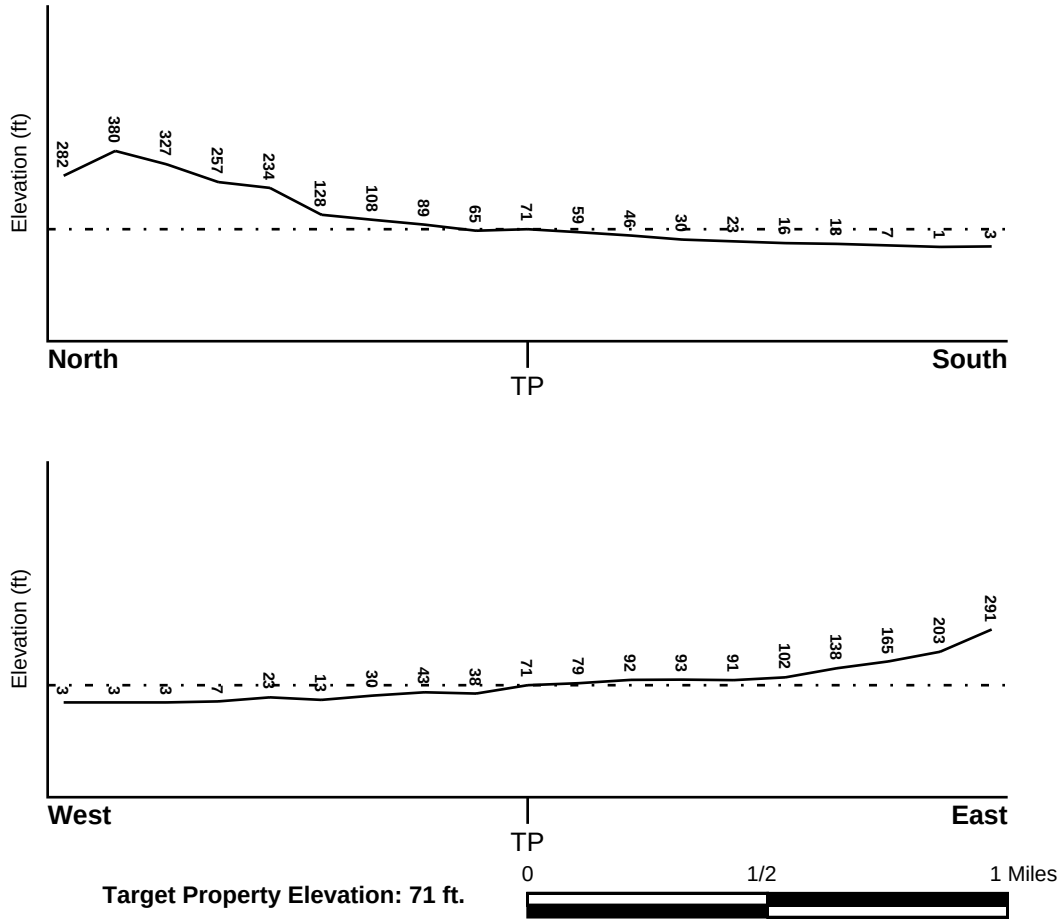
TOPOGRAPHIC INFORMATION

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 SW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 71 ft.

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

Flood Plain Panel at Target Property	FEMA Source Type
15003C0353G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
15003C0351G	FEMA FIRM Flood data
15003C0352F	FEMA FIRM Flood data
15003C0354G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

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.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
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

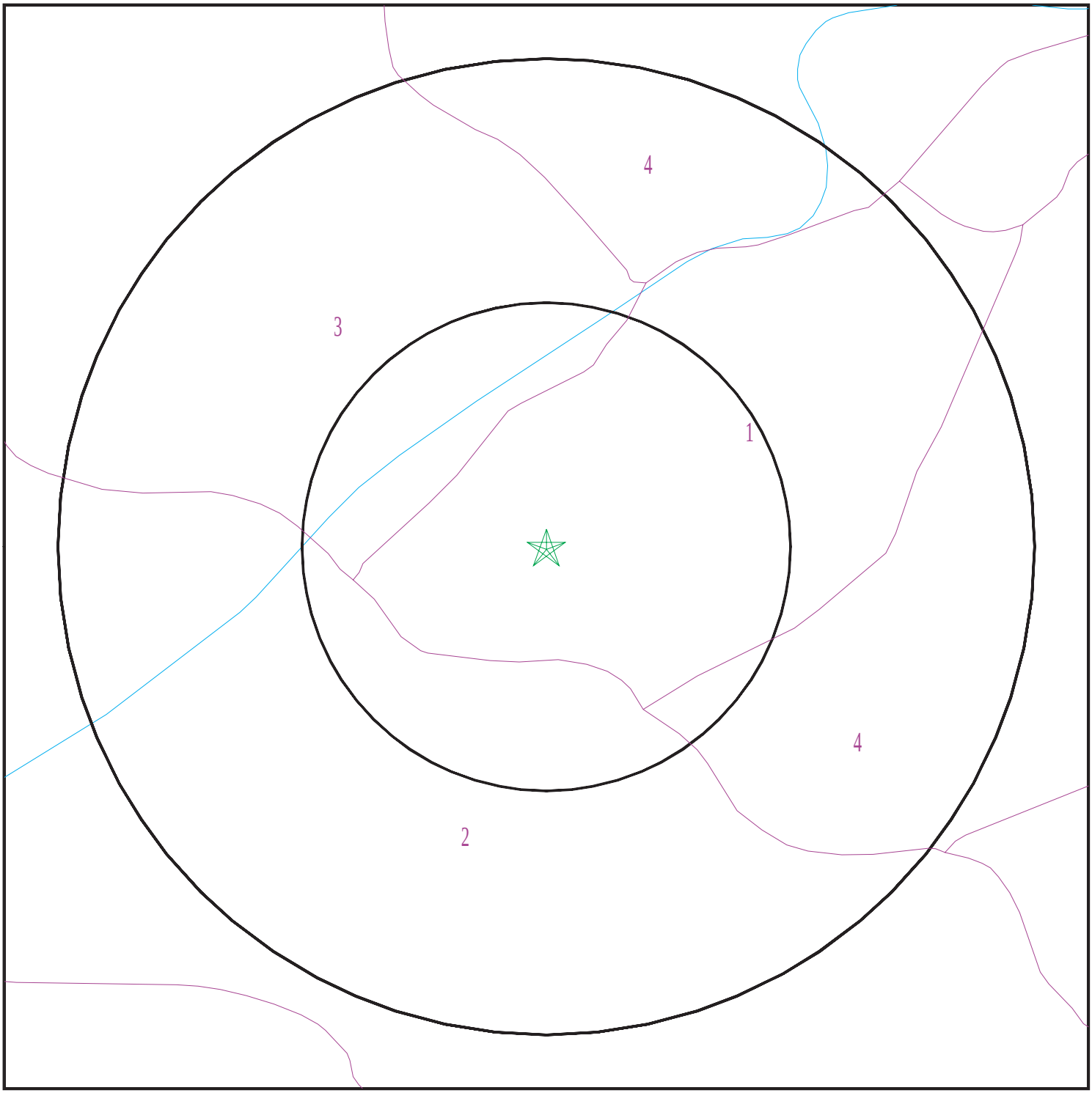
Era:	-
System:	-
Series:	-
Code:	N/A *(decoded above as Era, System & Series)*

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 - 6085048.19s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME: Gulick Avenue Bridge ADDRESS: Gulick Avenue Honolulu HI 96819 LAT/LONG: 21.335248 / 157.876199	CLIENT: Jacobs CONTACT: Shane Tom INQUIRY #: 6085048.19s DATE: June 08, 2020 12:14 pm

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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: 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

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	ML-K (proposed)	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6
2	18 inches	59 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	ML-K (proposed)	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6

Soil Map ID: 2

Soil Component Name: Honouliuli

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: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 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: 7.8 Min: 6.6
2	14 inches	68 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: 7.8 Min: 6.6

Soil Map ID: 3

Soil Component Name: Makiki

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

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	stony clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 14.11	Max: 6 Min: 5.6
2	20 inches	29 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 14.11	Max: 6 Min: 5.6
3	29 inches	59 inches	paragravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141.14 Min: 14.11	Max: 6 Min: 5.6

Soil Map ID: 4

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

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	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: 1.41 Min: 0.01	Max: 7.3 Min: 6.6
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

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

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

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A2	USGS40000269908	1/4 - 1/2 Mile SW
B4	USGS40000269910	1/4 - 1/2 Mile SW
C6	USGS40000269939	1/4 - 1/2 Mile West
D9	USGS40000269889	1/4 - 1/2 Mile SSW
D10	USGS40000269880	1/4 - 1/2 Mile SSW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
E12	USGS40000269900	1/4 - 1/2 Mile SE
E14	USGS40000269894	1/4 - 1/2 Mile SE
F15	USGS40000269919	1/2 - 1 Mile East
G18	USGS40000269893	1/2 - 1 Mile ESE
I29	USGS40000269913	1/2 - 1 Mile WSW
H31	USGS40000269869	1/2 - 1 Mile SSE
H32	USGS40000269870	1/2 - 1 Mile SSE
H33	USGS40000269871	1/2 - 1 Mile SSE
H34	USGS40000269866	1/2 - 1 Mile SSE
H35	USGS40000269865	1/2 - 1 Mile SSE
H36	USGS40000269868	1/2 - 1 Mile SSE
H37	USGS40000269867	1/2 - 1 Mile SSE
F38	USGS40000269923	1/2 - 1 Mile East
H40	USGS40000269864	1/2 - 1 Mile SSE
J42	USGS40000269945	1/2 - 1 Mile West
F43	USGS40000269937	1/2 - 1 Mile East
H45	USGS40000269855	1/2 - 1 Mile SSE
K48	USGS40000269940	1/2 - 1 Mile West
L49	USGS40000269881	1/2 - 1 Mile SW
M52	USGS40000269899	1/2 - 1 Mile ESE
N54	USGS40000269977	1/2 - 1 Mile WNW
57	USGS40000269904	1/2 - 1 Mile West
M58	USGS40000269888	1/2 - 1 Mile ESE
P59	USGS40000269998	1/2 - 1 Mile NW
P60	USGS40000269999	1/2 - 1 Mile NW
O62	USGS40000269834	1/2 - 1 Mile SSW
P64	USGS40000270000	1/2 - 1 Mile NW
Q67	USGS40000269856	1/2 - 1 Mile SW
Q68	USGS40000269857	1/2 - 1 Mile SW
Q69	USGS40000269858	1/2 - 1 Mile SW
74	USGS40000269830	1/2 - 1 Mile SSW
S76	USGS40000269821	1/2 - 1 Mile SSW
T80	USGS40000269854	1/2 - 1 Mile SE
82	USGS40000269997	1/2 - 1 Mile NW
T83	USGS40000269863	1/2 - 1 Mile ESE
S84	USGS40000269819	1/2 - 1 Mile SSW
S85	USGS40000269820	1/2 - 1 Mile SSW
T87	USGS40000269853	1/2 - 1 Mile SE
T90	USGS40000269850	1/2 - 1 Mile SE
U99	USGS40000269815	1/2 - 1 Mile SSE
U100	USGS40000269816	1/2 - 1 Mile SSE
U101	USGS40000269817	1/2 - 1 Mile SSE
U102	USGS40000269814	1/2 - 1 Mile SSE
U103	USGS40000269813	1/2 - 1 Mile SSE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
H30	HI0000331	1/2 - 1 Mile SSE

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

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

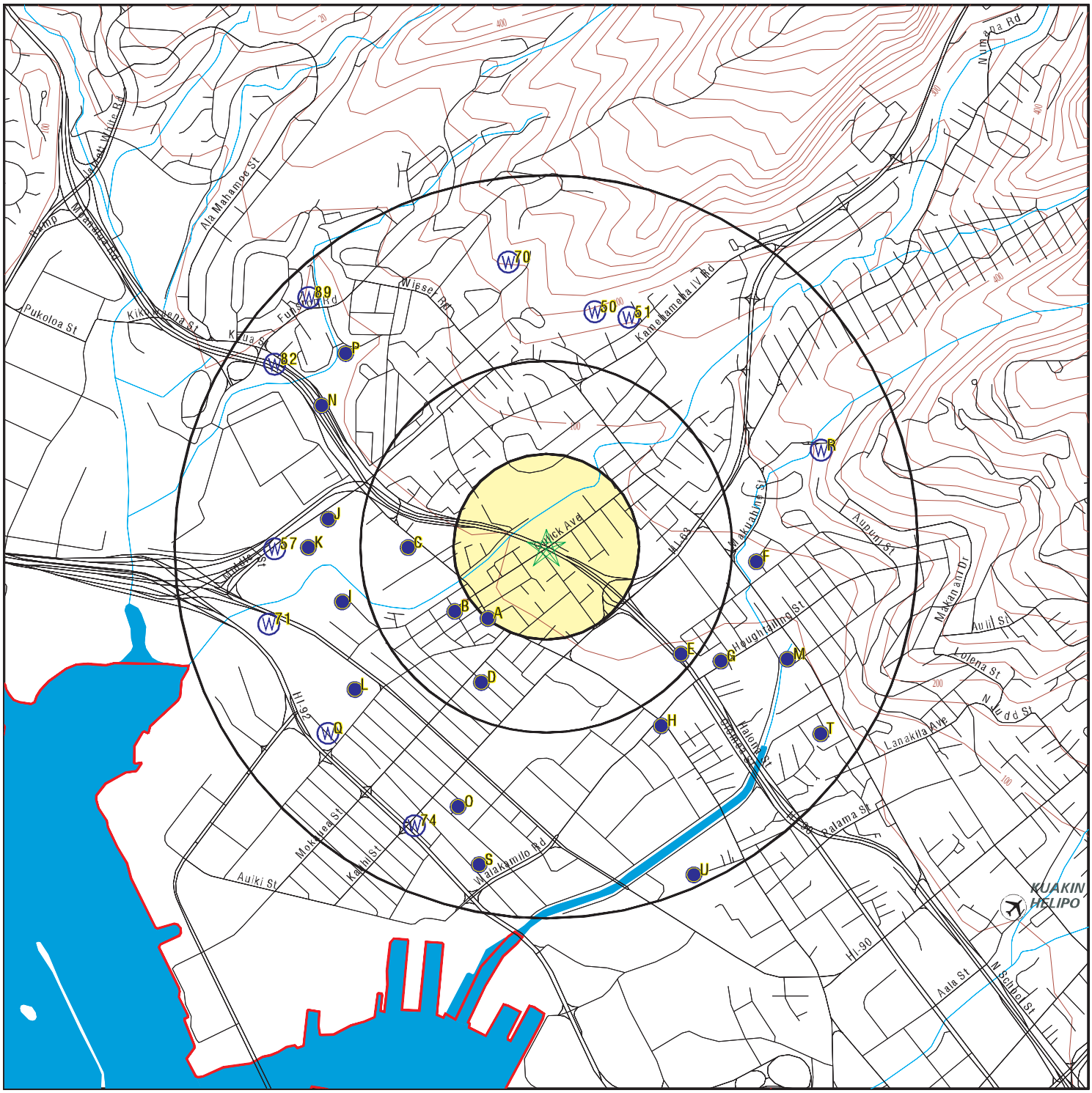
MAP ID	WELL ID	LOCATION FROM TP
A1	HI1100000001114	1/8 - 1/4 Mile SW
B3	HI1100000001111	1/4 - 1/2 Mile SW
C5	HI1100000001127	1/4 - 1/2 Mile West
D7	HI1100000001110	1/4 - 1/2 Mile SSW
D8	HI1100000000941	1/4 - 1/2 Mile SSW
E11	HI1100000001115	1/4 - 1/2 Mile SE
E13	HI1100000001113	1/4 - 1/2 Mile SE
F16	HI1100000001119	1/2 - 1 Mile East
G17	HI1100000001112	1/2 - 1 Mile ESE
H19	HI1100000000955	1/2 - 1 Mile SSE
H20	HI1100000000956	1/2 - 1 Mile SSE
H21	HI1100000000947	1/2 - 1 Mile SSE
H22	HI1100000000945	1/2 - 1 Mile SSE
H23	HI1100000000946	1/2 - 1 Mile SSE
H24	HI1100000000961	1/2 - 1 Mile SSE
H25	HI1100000000987	1/2 - 1 Mile SSE
H26	HI1100000000957	1/2 - 1 Mile SSE
H27	HI1100000000958	1/2 - 1 Mile SSE
I28	HI1100000001132	1/2 - 1 Mile WSW
F39	HI1100000001116	1/2 - 1 Mile East
J41	HI1100000001129	1/2 - 1 Mile West
F44	HI1100000001120	1/2 - 1 Mile East
K46	HI1100000001133	1/2 - 1 Mile West
L47	HI1100000000988	1/2 - 1 Mile SW
50	HI1100000001117	1/2 - 1 Mile NNE
51	HI1100000001124	1/2 - 1 Mile NNE
M53	HI1100000001121	1/2 - 1 Mile ESE
N55	HI1100000001125	1/2 - 1 Mile WNW
O56	HI1100000000977	1/2 - 1 Mile SSW
P61	HI1100000001128	1/2 - 1 Mile NW
P63	HI1100000001135	1/2 - 1 Mile NW
P65	HI1100000001134	1/2 - 1 Mile NW
P66	HI1100000001137	1/2 - 1 Mile NW
70	HI1100000001118	1/2 - 1 Mile North
71	HI1100000001136	1/2 - 1 Mile WSW
R72	HI1100000001123	1/2 - 1 Mile ENE
R73	HI1100000001122	1/2 - 1 Mile ENE
S75	HI1100000000973	1/2 - 1 Mile SSW
T77	HI1100000000949	1/2 - 1 Mile SE
S78	HI1100000000974	1/2 - 1 Mile SSW
S79	HI1100000000975	1/2 - 1 Mile SSW
T81	HI1100000000948	1/2 - 1 Mile ESE
T86	HI1100000000944	1/2 - 1 Mile SE
T88	HI1100000000943	1/2 - 1 Mile SE
89	HI1100000001131	1/2 - 1 Mile NW
U91	HI1100000000980	1/2 - 1 Mile SSE
U92	HI1100000000981	1/2 - 1 Mile SSE
U93	HI1100000000978	1/2 - 1 Mile SSE
U94	HI1100000000979	1/2 - 1 Mile SSE
U95	HI1100000000984	1/2 - 1 Mile SSE
U96	HI1100000000985	1/2 - 1 Mile SSE
U97	HI1100000000982	1/2 - 1 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
U98	HI1100000000983	1/2 - 1 Mile SSE

PHYSICAL SETTING SOURCE MAP - 6085048.19s



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: Gulick Avenue Bridge ADDRESS: Gulick Avenue Honolulu HI 96819 LAT/LONG: 21.335248 / 157.876199	CLIENT: Jacobs CONTACT: Shane Tom INQUIRY #: 6085048.19s DATE: June 08, 2020 12:14 pm

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Map ID Direction Distance Elevation	Database	EDR ID Number
A1 **SW** **1/8 - 1/4 Mile** **Lower**	**HI WELLS**	**HI1100000001114**

Well ID:	3-2052-005	Well Name:	N King St
Well Owner:	E. Winston	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1905
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	10
Ground Elevation (ft):	40	Well Depth (ft):	500
Solid Casing Depth:	458	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	30.9
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	134	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-460	Solid Casing Bottom Elevation:	-418
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1905	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

A2 **SW** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000269908**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-05 W138 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19050101
Well Depth:	500	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

B3 **SW** **1/4 - 1/2 Mile** **Lower**	**HI WELLS**	**HI1100000001111**

Well ID:	3-2052-002	Well Name:	Kalihi
Well Owner:	City & County of Honolulu, C&CH		
Land Owner:	Not Reported	Pump Rate (g/m):	Not Reported
Year Drillled:	1888	Original Well Name:	Not Reported
Driller:	Not Reported	Well Construction Type:	Not Reported
Casing Diameter (in):	8	Ground Elevation (ft):	41
Well Depth (ft):	600	Solid Casing Depth:	Not Reported
Perforated Casing Depth:	Not Reported	Major Well Use:	Abandoned-Sealed
Inital Water Level (ft):	32.2	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	81
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported

Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-559
Solid Casing Bottom Elevation:	Not Reported	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	01/01/1888
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

B4
SW
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269910**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-02 W139 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18880101
Well Depth:	600	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

C5
West
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001127**

Well ID:	3-2053-003	Well Name:	Kalihi
Well Owner:	U. Yamana	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1886
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	6
Ground Elevation (ft):	27	Well Depth (ft):	645
Solid Casing Depth:	520	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	28.5
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	89	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	21.5
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-618	Solid Casing Bottom Elevation:	-493
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1886	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
C6 **West** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000269939**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-03 W141 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18860101
Well Depth:	645	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

D7 **SSW** **1/4 - 1/2 Mile** **Lower**	**HI WELLS**	**HI1100000001110**

Well ID:	3-2052-001	Well Name:	Kalihi
Well Owner:	W. Hills	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1883
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	7
Ground Elevation (ft):	29	Well Depth (ft):	503
Solid Casing Depth:	348	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	29.4
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-474	Solid Casing Bottom Elevation:	-319
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1883	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

D8 **SSW** **1/4 - 1/2 Mile** **Lower**	**HI WELLS**	**HI1100000000941**

Well ID:	3-1952-002	Well Name:	Kalihi
Well Owner:	F. Felix	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1883
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	8
Ground Elevation (ft):	30	Well Depth (ft):	600
Solid Casing Depth:	380	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	13.4
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported

Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-570	Solid Casing Bottom Elevation:	-350
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1883	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

D9
SSW
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269889**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-01 W136 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18830101
Well Depth:	503	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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D10
SSW
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269880**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-02 W135 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18830101
Well Depth:	600	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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E11
SE
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001115**

Well ID:	3-2052-006	Well Name:	Kapalama Ave
Well Owner:	B P Bishop Trust Estate	Land Owner:	B P Bishop Trust Estate
Pump Rate (g/m):	Not Reported	Year Drillled:	1910
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	43	Well Depth (ft):	351
Solid Casing Depth:	232	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	28.8
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	65	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported

Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-308	Solid Casing Bottom Elevation:	-189
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1910	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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E12
SE
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269900**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-06 W132 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19100101
Well Depth:	351	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

E13
SE
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001113**

Well ID:	3-2052-004	Well Name:	Bishop Museum
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1895
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	8
Ground Elevation (ft):	28	Well Depth (ft):	346
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	28.7
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	86	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-318	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1895	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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E14
SE
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269894**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-04 W129 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000

Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18950101
Well Depth:	346	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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F15
East
1/2 - 1 Mile
Higher

FED USGS **USGS40000269919**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-10 T69 KALIHI	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19590101
Well Depth:	283	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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F16
East
1/2 - 1 Mile
Higher

HI WELLS **HI1100000001119**

Well ID:	3-2052-010	Well Name:	Kapalama
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Not Reported	Pump Rate (g/m):	0
Year Drillled:	1959	Original Well Name:	Not Reported
Driller:	Samson/Smock	Well Construction Type:	Not Reported
Casing Diameter (in):	8	Ground Elevation (ft):	80
Well Depth (ft):	283	Solid Casing Depth:	233
Perforated Casing Depth:	Not Reported	Major Well Use:	Water Level Observaiton
Inital Water Level (ft):	24.2	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-203
Solid Casing Bottom Elevation:	-153	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	1/1/1959
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

G17
ESE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001112**

Well ID:	3-2052-003	Well Name:	Waiakamilo
Well Owner:	Chinese YWCA	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1894

Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	8
Ground Elevation (ft):	29	Well Depth (ft):	210
Solid Casing Depth:	147	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	31.2
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	114	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-181	Solid Casing Bottom Elevation:	-118
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1894	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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G18
ESE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269893**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-03 W131 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18940101
Well Depth:	210	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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H19
SSE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000955**

Well ID:	3-1952-016	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1926
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	21	Well Depth (ft):	430
Solid Casing Depth:	240	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	25.6
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-409	Solid Casing Bottom Elevation:	-219
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1926	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
H20 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000956**

Well ID:	3-1952-017	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1926
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	19	Well Depth (ft):	401
Solid Casing Depth:	363	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	26.1
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	88	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-382	Solid Casing Bottom Elevation:	-344
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1926	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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H21 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000947**

Well ID:	3-1952-008	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1900
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	21	Well Depth (ft):	490
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	29.7
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	80	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-469	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1900	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
H22 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000945**

Well ID:	3-1952-006	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1900
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	21	Well Depth (ft):	460
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	30.4
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	80	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-439	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1900	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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H23 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000946**

Well ID:	3-1952-007	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1900
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	20	Well Depth (ft):	475
Solid Casing Depth:	229	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	28.8
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	80	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-455	Solid Casing Bottom Elevation:	-209
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1900	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
H24 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000961**

Well ID:	3-1952-022	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1927
Original Well Name:	Not Reported	Driller:	G Primmer
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	24	Well Depth (ft):	360
Solid Casing Depth:	251	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	25.9
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-336	Solid Casing Bottom Elevation:	-227
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1927	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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H25 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000987**

Well ID:	3-1952-048	Well Name:	Kalihi Sta Deep Monitor
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	0	Year Drillled:	2000
Original Well Name:	Not Reported	Driller:	Water Resources International, Inc.
Well Construction Type:	Rotary	Casing Diameter (in):	8
Ground Elevation (ft):	21	Well Depth (ft):	1200
Solid Casing Depth:	260	Perforated Casing Depth:	Not Reported
Major Well Use:	Deep (through Transition zone)		
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-1179
Solid Casing Bottom Elevation:	-239	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	Not Reported
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
H26 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000957**

Well ID:	3-1952-018	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1926
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	24	Well Depth (ft):	442
Solid Casing Depth:	265	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	25.9
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-418	Solid Casing Bottom Elevation:	-241
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1926	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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H27 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000958**

Well ID:	3-1952-019	Well Name:	Kalihi Pump Station
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	Not Reported	Year Drillled:	1926
Original Well Name:	Not Reported	Driller:	G Primmer
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	23	Well Depth (ft):	414
Solid Casing Depth:	271	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	26
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-391	Solid Casing Bottom Elevation:	-248
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1926	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
I28 **WSW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001132**

Well ID:	3-2053-008	Well Name:	Kalihi
Well Owner:	Dail Electric Supply Co., Inc.		
Land Owner:	Fasi Family Trust	Pump Rate (g/m):	Not Reported
Year Drillled:	1903	Original Well Name:	Not Reported
Driller:	L. McCandless	Well Construction Type:	Not Reported
Casing Diameter (in):	10	Ground Elevation (ft):	7
Well Depth (ft):	670	Solid Casing Depth:	507
Perforated Casing Depth:	Not Reported	Major Well Use:	Unused
Inital Water Level (ft):	28	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	109
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-663
Solid Casing Bottom Elevation:	-500	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	1/1/1903
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

I29 **WSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269913**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-08 Kalihi, Oahu, HI		
Type:	Well	Description:	former local no. W142
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Hawaii volcanic-rock aquifers
Formation Type:	Koolau Volcanic Series, Lava Flows		
Aquifer Type:	Unconfined single aquifer	Construction Date:	19030101
Well Depth:	607	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	24	Level reading date:	2004-10-15
Feet below surface:	Not Reported	Feet to sea level:	18.60
Note:	Not Reported		
Level reading date:	2004-06-26	Feet below surface:	Not Reported
Feet to sea level:	18.35	Note:	Not Reported
Level reading date:	2004-06-17	Feet below surface:	Not Reported
Feet to sea level:	18.40	Note:	Not Reported
Level reading date:	2004-03-08	Feet below surface:	Not Reported
Feet to sea level:	17.53	Note:	Not Reported
Level reading date:	2004-01-07	Feet below surface:	Not Reported
Feet to sea level:	16.94	Note:	Not Reported

Level reading date:	2003-09-29	Feet below surface:	Not Reported
Feet to sea level:	17.32	Note:	Not Reported
Level reading date:	2003-06-16	Feet below surface:	Not Reported
Feet to sea level:	16.68	Note:	Not Reported
Level reading date:	2003-04-18	Feet below surface:	Not Reported
Feet to sea level:	17.32	Note:	Not Reported
Level reading date:	2003-03-10	Feet below surface:	Not Reported
Feet to sea level:	17.18	Note:	Not Reported
Level reading date:	2003-01-23	Feet below surface:	Not Reported
Feet to sea level:	17.52	Note:	Not Reported
Level reading date:	2002-12-09	Feet below surface:	Not Reported
Feet to sea level:	17.42	Note:	Not Reported
Level reading date:	2002-10-10	Feet below surface:	Not Reported
Feet to sea level:	17.04	Note:	Not Reported
Level reading date:	2002-09-17	Feet below surface:	Not Reported
Feet to sea level:	17.23		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2002-07-18	Feet below surface:	Not Reported
Feet to sea level:	17.55		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2002-05-16	Feet below surface:	Not Reported
Feet to sea level:	17.77		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2002-03-25	Feet below surface:	Not Reported
Feet to sea level:	17.72		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2001-12-27	Feet below surface:	Not Reported
Feet to sea level:	17.69		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2001-09-25	Feet below surface:	Not Reported
Feet to sea level:	16.77		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2001-08-08	Feet below surface:	Not Reported
Feet to sea level:	16.78		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2001-06-14	Feet below surface:	Not Reported
Feet to sea level:	17.21		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2001-03-13	Feet below surface:	Not Reported
Feet to sea level:	17.62		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2000-11-07	Feet below surface:	Not Reported
Feet to sea level:	17.59		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	2000-09-12	Feet below surface:	Not Reported

Feet to sea level:	17.50		
Note:	The site was flowing, but the head could not be measured without additional equipment.		
Level reading date:	1910-04-01	Feet below surface:	-21.00
Feet to sea level:	Not Reported	Note:	Not Reported

H30
SSE
1/2 - 1 Mile
Lower

FRDS PWS **HI0000331**

Epa region:	09	State:	HI
Pwsid:	HI0000331	Pwsname:	HNL-WINDWARD-PEARL HARBOR
Cityserved:	HONOLULU-WINDWARD-PEARLHARBOR	Stateserved:	HI
Zipserved:	Not Reported	Fipscounty:	Not Reported
Status:	Active	Retpopsrvd:	665735
Pwssvcconn:	104070	Psource longname:	Groundwater
Pwstype:	CWS	Owner:	Local_Govt
Contact:	KAWATA, ERWIN	Contactorgname:	KAWATA, ERWIN
Contactphone:	808-748-5080	Contactaddress1:	Honolulu Board of Water Supply
Contactaddress2:	630 S. Beretania St., Rm. 308	Contactcity:	HONOLULU
Contactstate:	HI	Contactzip:	96843
Pwsactivitycode:	A		

Pwsid:	HI0000331	Facid:	1185
Facname:	PUNALUU II P4	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1194
Facname:	BERETANIA PUMPING STATION CHLORINATOR		
Factype:	Treatment_plant	Facactivitycode:	A
Trtobjective:	organics removal	Trtprocess:	gaseous chlorination, pre
Factypecode:	TP		

Pwsid:	HI0000331	Facid:	1195
Facname:	BERETANIA TP 4	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1196
Facname:	BERETANIA TP 5	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1197
Facname:	BERETANIA TP 6	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1198
Facname:	BERETANIA TP 7	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1199
Facname:	BERETANIA TP 8	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1200

Facname:	BERETANIA TP 9	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1201
Facname:	BERETANIA TP 2	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1202
Facname:	BERETANIA TP 3	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1258
Facname:	KAHALUU TUNNEL & WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1259
Facname:	KAHALUU WELL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1260
Facname:	KAHANA PUMP 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1267
Facname:	KALIHI AERATOR WELL	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1270
Facname:	KALIHI TP 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	gaseous chlorination, post	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1271
Facname:	KALIHI TP 4	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1274
Facname:	KALIHI TP 5	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1284
Facname:	LULUKU	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1285
Facname:	LULUKU TUNNEL AND WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1286
Facname:	MAKIKI SPRING A	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal

Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1287
Facname:	MAKIKI SPRING B	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1297
Facname:	NUUANU AERATOR UPPER A	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1299
Facname:	NUUANU AERATOR LOWER B	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1300
Facname:	NUUANU AERATOR UPPER B	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1302
Facname:	NUUANU AERATOR LOWER A	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1304
Facname:	PEARL CITY SHAFT CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1305
Facname:	PEARL CITY I PUMP 1	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1317
Facname:	WAIMANALO TUNNEL III	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1318
Facname:	WAIMANALO TUNNEL II	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1319
Facname:	WAIMANALO TUNNEL I-IV CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1320
Facname:	WAIMANALO TUNNEL IV	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	1581
Facname:	AIEA WELLS PUMP 1 & 2 (260) CHLORINATOR		
Factype:	Treatment_plant	Facactivitycode:	A
Trtobjective:	disinfection	Trtprocess:	chlorination (frds-1.5)
Factypecode:	TP		

Pwsid:	HI0000331	Facid:	1582
Facname:	HALAWA WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1584
Facname:	HAUULA WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1585
Facname:	HECO WAIAU WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1587
Facname:	KAAHUMANU WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1588
Facname:	KAAMILO WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1591
Facname:	KAPALAMA WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1592
Facname:	KULIOUOU WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1593
Facname:	KUOU WELLS I CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1594
Facname:	KUOU WELLS II CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1596
Facname:	MAAKUA WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1597
Facname:	KAIMUKI PUMPING STATION CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1598
Facname:	HALAWA SHAFT CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1599
Facname:	AINA KOA WELLS 1 CHLORINATOR	Factype:	Treatment_plant

Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1604
Facname:	MANOA WELLS II CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1605
Facname:	MANANA WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1606
Facname:	MOANALUA WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1607
Facname:	NEWTOWN WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1610
Facname:	PEARL CITY WELLS I CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1611
Facname:	PEARL CITY WELLS II CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1612
Facname:	PUNALUU WELLS I CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1613
Facname:	PUNALUU WELLS II CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1614
Facname:	WAIAU WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1615
Facname:	WAIHEE TUNN + INCLINED WELLS CHLORINATOR		
Factype:	Treatment_plant	Facactivitycode:	A
Trtobjective:	disinfection	Trtprocess:	chlorination (frds-1.5)
Factypecode:	TP		
Pwsid:	HI0000331	Facid:	1616
Facname:	WAILUPE WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1617
Facname:	WAIMANALO WELLS II CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection

Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1630
Facname:	KUOU WELLS III CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	1631
Facname:	KALAUAO WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	chlorination (frds-1.5)	Factypecode:	TP
Pwsid:	HI0000331	Facid:	214
Facname:	PUNANANI PUMP 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	215
Facname:	PUNANANI PUMP 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	216
Facname:	PUNANANI PUMP 4	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	217
Facname:	PUNANANI PUMP 3	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	218
Facname:	PUNANANI PUMP 5	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	221
Facname:	PEARL CITY I P2	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	222
Facname:	IOLEKAA WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	223
Facname:	PEARL CITY WELLS III CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	225
Facname:	WAIHEE TUNNEL	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	227
Facname:	WAIHEE INCLINED 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	228
Facname:	WAIHEE INCLINED 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	229
Facname:	WAIHEE INCLINED 3	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	230
Facname:	WAIHEE INCLINED 4	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	231
Facname:	WAIHEE PUMP 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	gaseous chlorination, post	Factypecode:	TP
Pwsid:	HI0000331	Facid:	232
Facname:	WAIHEE PUMP 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	disinfection
Trtprocess:	gaseous chlorination, post	Factypecode:	TP
Pwsid:	HI0000331	Facid:	233
Facname:	KAHANA PUMP 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	235
Facname:	PUNALUU WELLS III CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	236
Facname:	PUNALUU III P2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	237
Facname:	PUNALUU II P6	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	238
Facname:	PUNALUU II P3	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	239
Facname:	PUNALUU II P2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	240
Facname:	PUNALUU II P1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	241
Facname:	PUNALUU II P5	Factype:	Treatment_plant

Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	242
Facname:	PALOLO WELL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	243
Facname:	WILDER 3	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	244
Facname:	WILDER 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	245
Facname:	WILDER WELLS CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	246
Facname:	WILDER 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	247
Facname:	KALIHI SHAFT CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	248
Facname:	PALOLO TUNNEL CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	249
Facname:	MANOA TUNNEL III CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	253
Facname:	KALIHI STATION TP	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	254
Facname:	KALIHI TP 3	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	256
Facname:	KALIHI TP 7	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	257
Facname:	KALIHI PUMPING STATION CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	270
Facname:	HALAWA WELL 2	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	271
Facname:	HALAWA WELL 3	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	272
Facname:	HALAWA WELL 1	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	275
Facname:	AIEA GULCH WELLS PUMP 1 CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	276
Facname:	AIEA GULCH WELLS PUMP2 CHLORINATOR	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	277
Facname:	AIEA PUMP 1	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	278
Facname:	AIEA PUMP 2	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	279
Facname:	KALAUAO PUMP 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	280
Facname:	KALAUAO PUMP 2	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	281
Facname:	KALAUAO PUMP 3	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	282
Facname:	KALAUAO PUMP 4	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	284
Facname:	KALAUAO PUMP 5	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP
Pwsid:	HI0000331	Facid:	285
Facname:	KALAUAO PUMP 6	Factype:	Treatment_plant

Facactivitycode: I
Trtprocess: gaseous chlorination, pre
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: KAONOHI WELLS I CHLORINATOR
Facactivitycode: I
Trtprocess: gaseous chlorination, pre
Facid: 286
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: KAONOHI PUMP 1
Facactivitycode: A
Trtprocess: gaseous chlorination, pre
Facid: 287
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: KAONOHI II P2
Facactivitycode: I
Trtprocess: gaseous chlorination, pre
Facid: 288
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: KAONOHI II P3
Facactivitycode: A
Trtprocess: gaseous chlorination, pre
Facid: 289
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: KAONOHI II P1
Facactivitycode: A
Trtprocess: gaseous chlorination, pre
Facid: 290
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: HAIKU TUNNEL AND WELL CHLORINATOR
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP
Facid: 291
Facactivitycode: A
Trtprocess: gaseous chlorination, pre

Pwsid: HI0000331
Facname: HAIKU WELL
Facactivitycode: A
Trtprocess: gaseous chlorination, pre
Facid: 292
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: NEWTOWN PUMP 1
Facactivitycode: I
Trtprocess: gaseous chlorination, pre
Facid: 293
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: NEWTOWN PUMP 2
Facactivitycode: I
Trtprocess: gaseous chlorination, pre
Facid: 294
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: NEWTOWN PUMP 3
Facactivitycode: I
Trtprocess: gaseous chlorination, pre
Facid: 295
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: PEARL CITY II P1
Facactivitycode: A
Trtprocess: gaseous chlorination, pre
Facid: 296
Factype: Treatment_plant
Trtobjective: organics removal
Factypecode: TP

Pwsid: HI0000331
Facname: PEARL CITY II P2
Facactivitycode: A
Facid: 297
Factype: Treatment_plant
Trtobjective: organics removal

Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	298
Facname:	PEARL CITY II P3	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

Pwsid:	HI0000331	Facid:	299
Facname:	PUNANANI WELLS CHLORINATOR		
Factype:	Treatment_plant	Facactivitycode:	A
Trtobjective:	organics removal	Trtprocess:	gaseous chlorination, pre
Factypecode:	TP		

Pwsid:	HI0000331	Facid:	40T
Facname:	KALIHI STATION 6 1952-19	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	gaseous chlorination, post		
Factypecode:	TP		

Pwsid:	HI0000331	Facid:	894
Facname:	MANOA II	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	organics removal
Trtprocess:	gaseous chlorination, pre	Factypecode:	TP

PWS ID:	HI0000331	PWS name:	HONOLULU-WINDWARD-PEARL HARBOR
Address:	630 SOUTH BERETANIA	Care of:	630 S BERETANIA STREET
City:	HONOLULU, OANU	State:	HI
Zip:	96843	Owner:	HONOLULU-WINDWARD-PEARL HARBOR
Source code:	Ground water	Population:	645741

PWS ID:	HI0000331	PWS type:	System Owner/Responsible Party
PWS name:	MR. KAZU HAYASHIDA	PWS address:	BOARD OF WATER SUPPLY
PWS address:	630 SOUTH BERETANIA STREET		
PWS city:	HONOLULU	PWS state:	HI
PWS zip:	96843	County:	HONOLULU
Source:	Ground water	Treatment Objective:	DISINFECTION
Process:	GASEOUS CHLORINATION, POST		
Population:	645741		

County:	HONOLULU	Source:	Ground water
Treatment Objective:	DISINFECTION	Process:	CHLORINATION (FRDS-1.5)
Population:	645741		

PWS ID:	HI0000331	Activity status:	Active
Date system activated:	7706	Date system deactivated:	Not Reported
Retail population:	00645741	System name:	HONOLULU-WINDWARD-PEARL HARBOR
System address:	630 S BERETANIA STREET	System address:	630 SOUTH BERETANIA
System city:	HONOLULU, OANU	System state:	HI
System zip:	96843		

County FIPS:	003	City served:	AIEA
County FIPS:	003	City served:	PEARL CITY
County FIPS:	003	City served:	KANEOHE
County FIPS:	003	City served:	KAILUA
County FIPS:	Not Reported	City served:	HONO-WINDW-PEAR
County FIPS:	003	City served:	HONOLULU

Population served:	over 100,000 Persons	Treatment:	Mixed (treated and untreated)
Latitude:	211813	Longitude:	1574947
Latitude:	211813	Longitude:	1574947
Latitude:	211831	Longitude:	1575120
Latitude:	211831	Longitude:	1575120
Latitude:	211831	Longitude:	1575143
Latitude:	211831	Longitude:	1575120
Latitude:	211831	Longitude:	1575120
Latitude:	211831	Longitude:	1575120
Latitude:	211831	Longitude:	1575120
Latitude:	211833	Longitude:	1575123
Latitude:	211958	Longitude:	1574358
Latitude:	211936	Longitude:	1574627
Latitude:	211959	Longitude:	1574733
Latitude:	211959	Longitude:	1574818
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	211953	Longitude:	1575227
Latitude:	212007	Longitude:	1574444
Latitude:	212012	Longitude:	1574455
Latitude:	212014	Longitude:	1574501
Latitude:	212011	Longitude:	1574512
Latitude:	212002	Longitude:	1575208
Latitude:	212152	Longitude:	1574811
Latitude:	212117	Longitude:	1574840
Latitude:	212116	Longitude:	1574914

Latitude:	212127	Longitude:	1574905
Latitude:	212120	Longitude:	1575355
Latitude:	212120	Longitude:	1575354
Latitude:	212119	Longitude:	1575354
Latitude:	212235	Longitude:	1574955
Latitude:	212228	Longitude:	1574949
Latitude:	212256	Longitude:	1574935
Latitude:	212258	Longitude:	1574935
Latitude:	212214	Longitude:	1575011
Latitude:	212257	Longitude:	1575514
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Latitude:	213441	Longitude:	1574917
Latitude:	212342	Longitude:	1574909
Latitude:	212305	Longitude:	1575426
Latitude:	212322	Longitude:	1575503
Latitude:	212322	Longitude:	1575503
Latitude:	212313	Longitude:	1575535
Latitude:	212313	Longitude:	1275535
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Latitude:	212338	Longitude:	1575554
Latitude:	212337	Longitude:	1575553
Latitude:	212342	Longitude:	1575647
Latitude:	212348	Longitude:	1575622
Latitude:	212349	Longitude:	1575622
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Latitude:	212320	Longitude:	1575603
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Latitude:	212338	Longitude:	1575649
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Latitude:	212337	Longitude:	1575727
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Latitude:	212435	Longitude:	1575002
Latitude:	212412	Longitude:	1575647
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Latitude:	212410	Longitude:	1575645
Latitude:	212439	Longitude:	1575759
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Latitude:	212413	Longitude:	1585724
Latitude:	212412	Longitude:	1585723
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Latitude:	212413	Longitude:	1575812
Latitude:	212413	Longitude:	1575812
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Latitude:	212553	Longitude:	1575731
Latitude:	212616	Longitude:	1575132
Latitude:	212658	Longitude:	1575140
Latitude:	212616	Longitude:	1575123

Latitude:	213639	Longitude:	1575212
Latitude:	212639	Longitude:	1575212
Latitude:	212639	Longitude:	1575212
Latitude:	212639	Longitude:	1575212
Latitude:	212703	Longitude:	1575138
Latitude:	212702	Longitude:	1575141
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Latitude:	213315	Longitude:	1575311
Latitude:	213439	Longitude:	1575347
Latitude:	213441	Longitude:	1575344
Latitude:	213527	Longitude:	1575359
Latitude:	213522	Longitude:	1575353
Latitude:	213517	Longitude:	1575349
Latitude:	213517	Longitude:	1575346
Latitude:	213527	Longitude:	1575359
Latitude:	211753	Longitude:	1574519
Latitude:	213450	Longitude:	1575312
Latitude:	212052	Longitude:	1575236
Latitude:	211713	Longitude:	1574653
Latitude:	211707	Longitude:	1574617
Latitude:	211719	Longitude:	1574736
Latitude:	211727	Longitude:	1574858
Latitude:	211727	Longitude:	1574858
Latitude:	211217	Longitude:	1574858
Latitude:	211727	Longitude:	1574858
Latitude:	211727	Longitude:	1574858
Latitude:	211727	Longitude:	1574858
Latitude:	211727	Longitude:	1574858
Latitude:	211727	Longitude:	1574858
Latitude:	211837	Longitude:	1574729
Latitude:	211613	Longitude:	1574947

Latitude:	211813	Longitude:	1574947

State:	HI	Latitude degrees:	21
Latitude minutes:	12	Latitude seconds:	17.0000
Longitude degrees:	157	Longitude minutes:	48
Longitude seconds:	58.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	16	Latitude seconds:	13.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	47.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	17	Latitude seconds:	7.0000
Longitude degrees:	157	Longitude minutes:	46
Longitude seconds:	17.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	17	Latitude seconds:	13.0000
Longitude degrees:	157	Longitude minutes:	46
Longitude seconds:	53.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	17	Latitude seconds:	19.0000
Longitude degrees:	157	Longitude minutes:	47
Longitude seconds:	36.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	17	Latitude seconds:	27.0000
Longitude degrees:	157	Longitude minutes:	48
Longitude seconds:	58.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	17	Latitude seconds:	53.0000
Longitude degrees:	157	Longitude minutes:	45
Longitude seconds:	19.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	18	Latitude seconds:	13.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	47.0000		

State:	HI	Latitude degrees:	21
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Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	20.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	18	Latitude seconds:	31.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	43.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	18	Latitude seconds:	33.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	23.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	18	Latitude seconds:	37.0000
Longitude degrees:	157	Longitude minutes:	47
Longitude seconds:	29.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	19	Latitude seconds:	36.0000
Longitude degrees:	157	Longitude minutes:	46
Longitude seconds:	27.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	19	Latitude seconds:	53.0000
Longitude degrees:	157	Longitude minutes:	52
Longitude seconds:	27.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	19	Latitude seconds:	58.0000
Longitude degrees:	157	Longitude minutes:	43
Longitude seconds:	58.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	19	Latitude seconds:	59.0000
Longitude degrees:	157	Longitude minutes:	47
Longitude seconds:	33.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	19	Latitude seconds:	59.0000
Longitude degrees:	157	Longitude minutes:	48
Longitude seconds:	18.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	20	Latitude seconds:	2.0000
Longitude degrees:	157	Longitude minutes:	52
Longitude seconds:	8.0000		

State:	HI	Latitude degrees:	21
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Longitude degrees:	157	Longitude minutes:	44
Longitude seconds:	44.0000		

State:	HI	Latitude degrees:	21
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Longitude degrees:	157	Longitude minutes:	45
Longitude seconds:	12.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	20	Latitude seconds:	12.0000
Longitude degrees:	157	Longitude minutes:	44
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State:	HI	Latitude degrees:	21
Latitude minutes:	20	Latitude seconds:	14.0000
Longitude degrees:	157	Longitude minutes:	45
Longitude seconds:	1.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	20	Latitude seconds:	52.0000
Longitude degrees:	157	Longitude minutes:	52
Longitude seconds:	36.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	21	Latitude seconds:	16.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	14.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	21	Latitude seconds:	17.0000

Longitude degrees:	157	Longitude minutes:	48
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State:	HI	Latitude degrees:	21
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Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	54.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	21	Latitude seconds:	20.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	54.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	21	Latitude seconds:	20.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	55.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	21	Latitude seconds:	27.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	5.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	21	Latitude seconds:	52.0000
Longitude degrees:	157	Longitude minutes:	48
Longitude seconds:	11.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	22	Latitude seconds:	14.0000
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Longitude seconds:	11.0000		

State:	HI	Latitude degrees:	21
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Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	49.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	22	Latitude seconds:	35.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	55.0000		

State:	HI	Latitude degrees:	21
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Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	35.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	22	Latitude seconds:	57.0000
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Longitude seconds:	14.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	22	Latitude seconds:	58.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	35.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	5.0000
Longitude degrees:	157	Longitude minutes:	48
Longitude seconds:	31.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	5.0000
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Longitude seconds:	26.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	13.0000
Longitude degrees:	127	Longitude minutes:	55
Longitude seconds:	35.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	13.0000
Longitude degrees:	157	Longitude minutes:	55
Longitude seconds:	35.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	20.0000
Longitude degrees:	157	Longitude minutes:	56
Longitude seconds:	3.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	22.0000
Longitude degrees:	157	Longitude minutes:	48
Longitude seconds:	52.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	22.0000
Longitude degrees:	157	Longitude minutes:	55
Longitude seconds:	3.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	27.0000
Longitude degrees:	157	Longitude minutes:	56
Longitude seconds:	43.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	27.0000
Longitude degrees:	157	Longitude minutes:	56
Longitude seconds:	47.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	37.0000
Longitude degrees:	157	Longitude minutes:	55
Longitude seconds:	53.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	37.0000
Longitude degrees:	157	Longitude minutes:	57
Longitude seconds:	25.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	37.0000
Longitude degrees:	157	Longitude minutes:	57
Longitude seconds:	27.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	38.0000
Longitude degrees:	157	Longitude minutes:	55
Longitude seconds:	54.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	23	Latitude seconds:	38.0000

Longitude degrees: 157
Longitude minutes: 55
Longitude seconds: 55.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 38.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 49.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 39.0000
Longitude degrees: 157
Longitude minutes: 55
Longitude seconds: 53.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 39.0000
Longitude degrees: 157
Longitude minutes: 55
Longitude seconds: 54.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 39.0000
Longitude degrees: 157
Longitude minutes: 55
Longitude seconds: 55.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 42.0000
Longitude degrees: 157
Longitude minutes: 49
Longitude seconds: 9.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 42.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 47.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 48.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 22.0000

State: HI
Latitude degrees: 21
Latitude minutes: 23
Latitude seconds: 49.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 22.0000

State: HI
Latitude degrees: 21
Latitude minutes: 24
Latitude seconds: 7.0000
Longitude degrees: 157
Longitude minutes: 58
Longitude seconds: 25.0000

State: HI
Latitude degrees: 21
Latitude minutes: 24
Latitude seconds: 10.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 45.0000

State: HI
Latitude degrees: 21
Latitude minutes: 24
Latitude seconds: 11.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 46.0000

State: HI
Latitude degrees: 21
Latitude minutes: 24
Latitude seconds: 12.0000
Longitude degrees: 157
Longitude minutes: 56
Longitude seconds: 47.0000

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	12.0000
Longitude degrees:	158	Longitude minutes:	57
Longitude seconds:	23.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	13.0000
Longitude degrees:	157	Longitude minutes:	58
Longitude seconds:	12.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	13.0000
Longitude degrees:	158	Longitude minutes:	57
Longitude seconds:	24.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	14.0000
Longitude degrees:	157	Longitude minutes:	57
Longitude seconds:	6.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	14.0000
Longitude degrees:	158	Longitude minutes:	57
Longitude seconds:	25.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	35.0000
Longitude degrees:	157	Longitude minutes:	50
Longitude seconds:	2.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	37.0000
Longitude degrees:	157	Longitude minutes:	50
Longitude seconds:	8.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	24	Latitude seconds:	39.0000
Longitude degrees:	157	Longitude minutes:	57
Longitude seconds:	59.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	25	Latitude seconds:	7.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	41.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	25	Latitude seconds:	53.0000
Longitude degrees:	157	Longitude minutes:	57
Longitude seconds:	31.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	26	Latitude seconds:	16.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	23.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	26	Latitude seconds:	16.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	32.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	26	Latitude seconds:	39.0000

Longitude degrees:	157	Longitude minutes:	52
Longitude seconds:	12.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	26	Latitude seconds:	58.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	40.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	27	Latitude seconds:	2.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	41.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	27	Latitude seconds:	3.0000
Longitude degrees:	157	Longitude minutes:	51
Longitude seconds:	38.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	33	Latitude seconds:	14.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	8.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	33	Latitude seconds:	15.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	11.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	34	Latitude seconds:	39.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	47.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	34	Latitude seconds:	41.0000
Longitude degrees:	157	Longitude minutes:	49
Longitude seconds:	17.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	34	Latitude seconds:	41.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	44.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	34	Latitude seconds:	50.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	12.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	35	Latitude seconds:	17.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	46.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	35	Latitude seconds:	17.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	49.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	35	Latitude seconds:	22.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	53.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	35	Latitude seconds:	27.0000
Longitude degrees:	157	Longitude minutes:	53
Longitude seconds:	59.0000		

State:	HI	Latitude degrees:	21
Latitude minutes:	36	Latitude seconds:	39.0000
Longitude degrees:	157	Longitude minutes:	52
Longitude seconds:	12.0000		

Violation id:	8310290	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	1005	Contamination Name:	Arsenic
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	332	Rule name:	Arsenic
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310291	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	1010	Contamination Name:	Barium
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	333	Rule name:	Other IOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310292	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	1015	Contamination Name:	Cadmium
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	333	Rule name:	Other IOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310293	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	1020	Contamination Name:	Chromium
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	333	Rule name:	Other IOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310294	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	1035	Contamination Name:	Mercury
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	333	Rule name:	Other IOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310295	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	1036	Contamination Name:	Nickel
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	333	Rule name:	Other IOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008

Cmp edt: 12/31/2010

Violation id: 8310296
State: HI
Contamination code: 1074
Violation code: 03
Rule code: 333
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 12/31/2010
Orig code: S
Violation Year: 2008
Contamination Name: Antimony, Total
Violation name: Monitoring, Regular
Rule name: Other IOC
Unit of measure: Not Reported
Cmp bdt: 01/01/2008

Violation id: 8310297
State: HI
Contamination code: 1075
Violation code: 03
Rule code: 333
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 12/31/2010
Orig code: S
Violation Year: 2008
Contamination Name: Beryllium, Total
Violation name: Monitoring, Regular
Rule name: Other IOC
Unit of measure: Not Reported
Cmp bdt: 01/01/2008

Violation id: 8310298
State: HI
Contamination code: 1085
Violation code: 03
Rule code: 333
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 12/31/2010
Orig code: S
Violation Year: 2008
Contamination Name: Thallium, Total
Violation name: Monitoring, Regular
Rule name: Other IOC
Unit of measure: Not Reported
Cmp bdt: 01/01/2008

Violation id: 8310299
State: HI
Contamination code: 1045
Violation code: 03
Rule code: 333
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 12/31/2010
Orig code: S
Violation Year: 2008
Contamination Name: Selenium
Violation name: Monitoring, Regular
Rule name: Other IOC
Unit of measure: Not Reported
Cmp bdt: 01/01/2008

Violation id: 8310300
State: HI
Contamination code: 1025
Violation code: 03
Rule code: 333
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 12/31/2010
Orig code: S
Violation Year: 2008
Contamination Name: Fluoride
Violation name: Monitoring, Regular
Rule name: Other IOC
Unit of measure: Not Reported
Cmp bdt: 01/01/2008

Violation id: 8310301
State: HI
Contamination code: 1040
Violation code: 03
Rule code: 331
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 12/31/2010
Orig code: S
Violation Year: 2008
Contamination Name: Nitrate
Violation name: Monitoring, Regular
Rule name: Nitrates
Unit of measure: Not Reported
Cmp bdt: 01/01/2008

Violation id: 8310302
State: HI
Contamination code: 1041
Violation code: 03
Rule code: 331
Violation measur: Not Reported
Orig code: S
Violation Year: 2008
Contamination Name: Nitrite
Violation name: Monitoring, Regular
Rule name: Nitrates
Unit of measure: Not Reported

State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310303	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2378	Contamination Name:	1,2,4-Trichlorobenzene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310304	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2380	Contamination Name:	cis-1,2-Dichloroethylene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310305	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2955	Contamination Name:	Xylenes, Total
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310306	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2964	Contamination Name:	DICHLOROMETHANE
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310307	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2968	Contamination Name:	o-Dichlorobenzene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310308	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2969	Contamination Name:	p-Dichlorobenzene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310309	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2976	Contamination Name:	Vinyl chloride
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC

Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310310	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2977	Contamination Name:	1,1-Dichloroethylene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310311	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2979	Contamination Name:	trans-1,2-Dichloroethylene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310312	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2980	Contamination Name:	1,2-Dichloroethane
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310313	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2981	Contamination Name:	1,1,1-Trichloroethane
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310314	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2982	Contamination Name:	Carbon tetrachloride
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310315	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2983	Contamination Name:	1,2-Dichloropropane
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310316	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2984	Contamination Name:	Trichloroethylene
Violation code:	03	Violation name:	Monitoring, Regular

Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310317	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2985	Contamination Name:	1,1,2-Trichloroethane
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310318	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2987	Contamination Name:	Tetrachloroethylene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310319	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2989	Contamination Name:	CHLOROBENZENE
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310320	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2990	Contamination Name:	Benzene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310321	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2991	Contamination Name:	Toluene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310322	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2992	Contamination Name:	Ethylbenzene
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310323	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2996	Contamination Name:	Styrene

Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	310	Rule name:	VOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310324	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2034	Contamination Name:	Glyphosate
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	320	Rule name:	SOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310325	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2036	Contamination Name:	OXAMYL
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	320	Rule name:	SOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310326	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2046	Contamination Name:	Carbofuran
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	320	Rule name:	SOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310327	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2051	Contamination Name:	LASSO
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	320	Rule name:	SOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310328	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2931	Contamination Name:	1,2-DIBROMO-3-CHLOROPROPANE
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	320	Rule name:	SOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310329	Orig code:	S
State:	HI	Violation Year:	2008
Contamination code:	2946	Contamination Name:	ETHYLENE DIBROMIDE
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	320	Rule name:	SOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2008
Cmp edt:	12/31/2010		

Violation id:	8310330	Orig code:	S
State:	HI	Violation Year:	2013

Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	21	Violation name:	MCL, Acute (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	10/01/2013
Cmp edt:	10/31/2013		

Violation ID:	8310290	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310290	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310290	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310291	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310291	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310291	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310292	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310292	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310292	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310293	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310293	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310293	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310294	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310294	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	8310294	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310295	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310295	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310295	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310296	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310296	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310296	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310297	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310297	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310297	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310298	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310298	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310298	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310299	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310299	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310299	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013

Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310300	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310300	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310300	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310301	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310301	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310301	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310302	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310302	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310302	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310303	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310303	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310303	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310304	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310304	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310304	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal

Violation ID:	8310305	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310305	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310305	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310306	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310306	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310306	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310307	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310307	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310307	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310308	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310308	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310308	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310309	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310309	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310309	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310310	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013

Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310310	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310310	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310311	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310311	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310311	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310312	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310312	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310312	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310313	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310313	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310313	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310314	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310314	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310314	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310315	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal

Violation ID:	8310315	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310315	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310316	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310316	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310316	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310317	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310317	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310317	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310318	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310318	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310318	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310319	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310319	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310319	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310320	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310320	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013

Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310320	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310321	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310321	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310321	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310322	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310322	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310322	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310323	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310323	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310323	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310324	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310324	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310324	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310325	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310325	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal

Violation ID:	8310325	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310326	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310326	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310326	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310327	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310327	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310327	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310328	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310328	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310328	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310329	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/01/2013
Enforcement Detail:	St Violation/Reminder Notice	Enforcement Category:	Informal
Violation ID:	8310329	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/16/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310329	Orig Code:	S
Enforcemnt FY:	2013	Enforcement Action:	07/31/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310330	Orig Code:	S
Enforcemnt FY:	2014	Enforcement Action:	10/19/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	8310330	Orig Code:	S
Enforcemnt FY:	2014	Enforcement Action:	10/19/2013
Enforcement Detail:	St Public Notif received	Enforcement Category:	Informal
Violation ID:	8310330	Orig Code:	S
Enforcemnt FY:	2014	Enforcement Action:	10/18/2013

Enforcement Detail: St Violation/Reminder Notice Enforcement Category: Informal

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H31
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269869**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-22 W128-D KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19270101
Well Depth:	360	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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H32
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269870**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-18 W128-C KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19260101
Well Depth:	442	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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H33
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269871**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-19 W128-E KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19260101
Well Depth:	414	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

H34
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269866**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-17 W128-B KAP	Type:	Well
Description:	Not Reported	HUC:	20060000

Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19260101
Well Depth:	401	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

H35
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269865**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-06 W128-F KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19000101
Well Depth:	460	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

H36
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269868**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-16 W128-A KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19260101
Well Depth:	430	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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H37
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269867**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-07 W128-G KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19000101
Well Depth:	475	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
F38 **East** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40000269923**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-07 W133 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19270201
Well Depth:	321	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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F39 **East** **1/2 - 1 Mile** **Higher**	**HI WELLS**	**HI1100000001116**

Well ID:	3-2052-007	Well Name:	Kamehameha Sch 1
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	600	Year Drillled:	1927
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	80	Well Depth (ft):	321
Solid Casing Depth:	118	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	26
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	84	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-241	Solid Casing Bottom Elevation:	-38
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	0.864
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1927	Latest WCR2 Report:	1/1/1977
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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H40 **SSE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269864**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-06-08,16-19,22 Kalihi Station, Oahu, HI		
Type:	Well: Multiple wells		
Description:	former W128-A-H,NAWQA entry ver. 05/15/2002 Hunt C		
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Hawaii volcanic-rock aquifers
Formation Type:	Koolau Volcanic Series, Lava Flows		
Aquifer Type:	Confined single aquifer	Construction Date:	Not Reported
Well Depth:	490	Well Depth Units:	ft
Well Hole Depth:	490	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation	Database	EDR ID Number
J41 **West** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001129**

Well ID:	3-2053-005	Well Name:	Kalihi
Well Owner:	Ameron HC&D	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1894
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	6
Ground Elevation (ft):	20	Well Depth (ft):	471
Solid Casing Depth:	347	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	30
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	96	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-451	Solid Casing Bottom Elevation:	-327
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1894	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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J42 **West** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269945**	

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-05 W144 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18940101
Well Depth:	471	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	1	Level reading date:	1916-09-03
Feet below surface:	-3.98	Feet to sea level:	Not Reported
Note:	Not Reported		

F43 **East** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40000269937**	

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-11 KALIHI	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19770714

Well Depth:	334	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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F44
East
1/2 - 1 Mile
Higher

HI WELLS **HI1100000001120**

Well ID:	3-2052-011	Well Name:	Kamehameha Sch 2
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	600	Year Drillled:	1977
Original Well Name:	Not Reported	Driller:	Water Resources International, Inc.
Well Construction Type:	Rotary	Casing Diameter (in):	12
Ground Elevation (ft):	90	Well Depth (ft):	334
Solid Casing Depth:	129	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	50	Date Tested:	1/1/1977
Test Pump Rate (g/m):	850	Test Drawdown Rate (ft):	4.8
Test Chloride Content (MG/L):	75	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-244	Solid Casing Bottom Elevation:	-39
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	0.864
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	7/1/1977	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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H45
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269855**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-08 W128-H KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19000101
Well Depth:	490	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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K46
West
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001133**

Well ID:	3-2053-009	Well Name:	Kalihi
Well Owner:	Hawaii Meat Co.	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1905
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	8
Ground Elevation (ft):	22	Well Depth (ft):	607
Solid Casing Depth:	449	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	28

Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	89	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	21.6
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-585	Solid Casing Bottom Elevation:	-427
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1905	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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L47
SW
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000988**

Well ID:	3-1953-001	Well Name:	Oahu Prison
Well Owner:	State of Hawaii	Land Owner:	State of Hawaii
Pump Rate (g/m):	Not Reported	Year Drillled:	1915
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	17	Well Depth (ft):	666
Solid Casing Depth:	564	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-649	Solid Casing Bottom Elevation:	-547
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1915	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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K48
West
1/2 - 1 Mile
Lower

FED USGS **USGS40000269940**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-09 W143 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19050101
Well Depth:	635	Well Depth Units:	ft
Well Hole Depth:	635	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1924-01-15
Feet below surface:	-5.95	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
L49 **SW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269881**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1953-02 W137 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19150101
Well Depth:	666	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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50 **NNE** **1/2 - 1 Mile** **Higher**	**HI WELLS**	**HI1100000001117**

Well ID:	3-2052-008	Well Name:	Kalihi Shaft
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	State of Hawaii, DLNR Land Division Oahu, DLNR-LD		
Pump Rate (g/m):	15000	Year Drillled:	1937
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Shaft	Casing Diameter (in):	99
Ground Elevation (ft):	160	Well Depth (ft):	154
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	29.6
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	73	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	4.2
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	6	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	1977	Pump Capacity (MM gal/day):	21.6
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1937	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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51 **NNE** **1/2 - 1 Mile** **Higher**	**HI WELLS**	**HI1100000001124**

Well ID:	3-2052-015	Well Name:	Kalihi Sh Deep Monitor
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	0	Year Drillled:	1999
Original Well Name:	Not Reported	Driller:	Water Resources International, Inc.
Well Construction Type:	Rotary	Casing Diameter (in):	8
Ground Elevation (ft):	154	Well Depth (ft):	2035
Solid Casing Depth:	150	Perforated Casing Depth:	Not Reported
Major Well Use:	Deep (through Transition zone)		
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported

Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-1881
Solid Casing Bottom Elevation:	4	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	Not Reported
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

M52
ESE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269899**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-12 KALIHI	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Hawaii volcanic-rock aquifers		
Formation Type:	Volcanic Rocks	Aquifer Type:	Not Reported
Construction Date:	19810501	Well Depth:	1150
Well Depth Units:	ft	Well Hole Depth:	1150
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1981-06-12
Feet below surface:	8.80	Feet to sea level:	Not Reported
Note:	Not Reported		

M53
ESE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001121**

Well ID:	3-2052-012	Well Name:	Jonathan Springs
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Not Reported	Pump Rate (g/m):	0
Year Drillled:	2002	Original Well Name:	Not Reported
Driller:	Roscoe Moss Hawaii Inc	Well Construction Type:	Percussion
Casing Diameter (in):	14	Ground Elevation (ft):	31
Well Depth (ft):	1150	Solid Casing Depth:	150
Perforated Casing Depth:	Not Reported	Major Well Use:	Deep (through Transition zone)
Inital Water Level (ft):	21.9	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	1165
Test Drawdown Rate (ft):	1.2	Test Chloride Content (MG/L):	120
Test Water Temp:	22.2	Temp Unit:	C
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-1119
Solid Casing Bottom Elevation:	-119	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	1/1/1981
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
N54 **WNW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269977**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-01 W147 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18830101
Well Depth:	331	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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N55 **WNW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001125**

Well ID:	3-2053-001	Well Name:	Fort Shafter
Well Owner:	C. Gulick	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1883
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	8
Ground Elevation (ft):	12	Well Depth (ft):	331
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	72	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-319	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	01/01/1883	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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O56 **SSW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000977**

Well ID:	3-1952-038	Well Name:	Kapalama
Well Owner:	Kamehameha Schools	Land Owner:	Kamehameha Schools
Pump Rate (g/m):	Not Reported	Year Drillled:	1900
Original Well Name:	Not Reported	Driller:	Not Reported
Well Construction Type:	Not Reported	Casing Diameter (in):	10
Ground Elevation (ft):	15	Well Depth (ft):	603
Solid Casing Depth:	492	Perforated Casing Depth:	Not Reported
Major Well Use:	Unused	Inital Water Level (ft):	25.6
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	124	Date Tested:	Not Reported
Test Pump Rate (g/m):	12	Test Drawdown Rate (ft):	Not Reported

Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-588	Solid Casing Bottom Elevation:	-477
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1900	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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57
West
1/2 - 1 Mile
Lower

FED USGS **USGS40000269904**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-12 W142-1 KAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19670101
Well Depth:	789	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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M58
ESE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269888**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2052-09 W146-1 KAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19420630
Well Depth:	235	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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P59
NW
1/2 - 1 Mile
Lower

FED USGS **USGS40000269998**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-04 W145 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18890101
Well Depth:	212	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
P60 **NW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269999**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-11 W146-2 KAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19600912
Well Depth:	330	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	1	Level reading date:	1960-11-16
Feet below surface:	-1.37	Feet to sea level:	Not Reported
Note:	Not Reported		

P61 **NW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001128**

Well ID:	3-2053-004	Well Name:	Fort Shafter
Well Owner:	Directorate of Public Works, Environmental Division, DPW, U.S. Army Garrison		
Land Owner:	Not Reported	Pump Rate (g/m):	Not Reported
Year Drillled:	1889	Original Well Name:	Not Reported
Driller:	Not Reported	Well Construction Type:	Not Reported
Casing Diameter (in):	6	Ground Elevation (ft):	20
Well Depth (ft):	212	Solid Casing Depth:	167
Perforated Casing Depth:	Not Reported	Major Well Use:	Abandoned-Sealed
Inital Water Level (ft):	26.4	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	68
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-192
Solid Casing Bottom Elevation:	-147	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	01/01/1889
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

O62 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269834**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-38 W134 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported

Aquifer Type:	Not Reported	Construction Date:	19000701
Well Depth:	607	Well Depth Units:	ft
Well Hole Depth:	607	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1917-07-05
Feet below surface:	-15.11	Feet to sea level:	Not Reported
Note:	Not Reported		

P63
NW
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001135**

Well ID:	3-2053-011	Well Name:	Fort Shafter
Well Owner:	Directorate of Public Works, Environmental Division, DPW, U.S. Army Garrison		
Land Owner:	United States of America	Pump Rate (g/m):	1100
Year Drillled:	1960	Original Well Name:	Not Reported
Driller:	Layne International	Well Construction Type:	Not Reported
Casing Diameter (in):	12	Ground Elevation (ft):	21
Well Depth (ft):	330	Solid Casing Depth:	175
Perforated Casing Depth:	Not Reported	Major Well Use:	Military
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	11/17/1960	Test Pump Rate (g/m):	800
Test Drawdown Rate (ft):	3.6	Test Chloride Content (MG/L):	64
Test Water Temp:	20.8	Temp Unit:	C
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-309
Solid Casing Bottom Elevation:	-154	Year Installed:	2006
Pump Capacity (MM gal/day):	1.584	Pump Intake Depth:	26
Latest Head:	Not Reported	Latest WCR1 Report:	11/15/1960
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

P64
NW
1/2 - 1 Mile
Lower

FED USGS **USGS40000270000**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-10 Ft. Shafter, Oahu, HI		
Type:	Well	Description:	Former well no. W146 KALIH
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Hawaii volcanic-rock aquifers
Formation Type:	Koolau Volcanic Series, Lava Flows		
Aquifer Type:	Unconfined single aquifer	Construction Date:	19140101
Well Depth:	279	Well Depth Units:	ft
Well Hole Depth:	279	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	51	Level reading date:	2004-09-01
Feet below surface:	Not Reported	Feet to sea level:	19.08
Note:	A nearby site that taps the same aquifer was being pumped.		

Level reading date:	2004-08-02	Feet below surface:	Not Reported
Feet to sea level:	18.79		
Note:	A nearby site that taps the same aquifer was being pumped.		

Level reading date:	2004-07-12	Feet below surface:	Not Reported
Feet to sea level:	18.96	Note:	Not Reported
Level reading date:	2004-06-01	Feet below surface:	Not Reported
Feet to sea level:	18.72	Note:	Not Reported
Level reading date:	2004-05-03	Feet below surface:	Not Reported
Feet to sea level:	18.23		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	2004-04-01	Feet below surface:	Not Reported
Feet to sea level:	18.20		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	2004-03-01	Feet below surface:	Not Reported
Feet to sea level:	17.85	Note:	Not Reported
Level reading date:	2004-02-02	Feet below surface:	Not Reported
Feet to sea level:	17.67	Note:	Not Reported
Level reading date:	2004-01-27	Feet below surface:	Not Reported
Feet to sea level:	17.56	Note:	Not Reported
Level reading date:	2003-12-02	Feet below surface:	Not Reported
Feet to sea level:	16.82	Note:	Not Reported
Level reading date:	2003-11-03	Feet below surface:	Not Reported
Feet to sea level:	16.77		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	2003-10-01	Feet below surface:	Not Reported
Feet to sea level:	16.67		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	2003-09-03	Feet below surface:	Not Reported
Feet to sea level:	16.67	Note:	Not Reported
Level reading date:	2003-08-01	Feet below surface:	Not Reported
Feet to sea level:	16.73	Note:	Not Reported
Level reading date:	2003-07-01	Feet below surface:	Not Reported
Feet to sea level:	16.99	Note:	Not Reported
Level reading date:	2003-06-04	Feet below surface:	Not Reported
Feet to sea level:	17.13	Note:	Not Reported
Level reading date:	2003-05-01	Feet below surface:	Not Reported
Feet to sea level:	17.61	Note:	Not Reported
Level reading date:	2003-04-01	Feet below surface:	Not Reported
Feet to sea level:	17.79	Note:	Not Reported
Level reading date:	2003-03-03	Feet below surface:	Not Reported
Feet to sea level:	17.55	Note:	Not Reported
Level reading date:	2003-02-03	Feet below surface:	Not Reported
Feet to sea level:	17.85	Note:	Not Reported
Level reading date:	2003-01-03	Feet below surface:	Not Reported
Feet to sea level:	17.80	Note:	Not Reported
Level reading date:	2002-12-02	Feet below surface:	Not Reported

Feet to sea level:	17.87	Note:	Not Reported
Level reading date:	2002-11-01	Feet below surface:	Not Reported
Feet to sea level:	17.63	Note:	Not Reported
Level reading date:	2002-10-01	Feet below surface:	Not Reported
Feet to sea level:	17.45	Note:	Not Reported
Level reading date:	2002-09-03	Feet below surface:	Not Reported
Feet to sea level:	17.55	Note:	The site was being pumped.
Level reading date:	2002-08-01	Feet below surface:	Not Reported
Feet to sea level:	17.61	Note:	The site was being pumped.
Level reading date:	2002-07-03	Feet below surface:	Not Reported
Feet to sea level:	17.84	Note:	The site had been pumped recently.
Level reading date:	2002-06-03	Feet below surface:	Not Reported
Feet to sea level:	18.07	Note:	The site was being pumped.
Level reading date:	2002-05-01	Feet below surface:	Not Reported
Feet to sea level:	17.85	Note:	The site had been pumped recently.
Level reading date:	2002-04-01	Feet below surface:	Not Reported
Feet to sea level:	18.15	Note:	The site was being pumped.
Level reading date:	2002-03-01	Feet below surface:	Not Reported
Feet to sea level:	18.10	Note:	The site was being pumped.
Level reading date:	2002-02-11	Feet below surface:	Not Reported
Feet to sea level:	18.25	Note:	The site was being pumped.
Level reading date:	2002-01-02	Feet below surface:	Not Reported
Feet to sea level:	18.08	Note:	The site had been pumped recently.
Level reading date:	2001-12-04	Feet below surface:	Not Reported
Feet to sea level:	17.62	Note:	The site was being pumped.
Level reading date:	2001-11-01	Feet below surface:	Not Reported
Feet to sea level:	17.41	Note:	The site had been pumped recently.
Level reading date:	2001-10-02	Feet below surface:	Not Reported
Feet to sea level:	17.14	Note:	The site was being pumped.
Level reading date:	2001-09-04	Feet below surface:	Not Reported
Feet to sea level:	17.09	Note:	The site was being pumped.
Level reading date:	2001-08-01	Feet below surface:	Not Reported
Feet to sea level:	17.11	Note:	The site was being pumped.
Level reading date:	2001-07-02	Feet below surface:	Not Reported
Feet to sea level:	17.45	Note:	The site had been pumped recently.
Level reading date:	2001-06-01	Feet below surface:	Not Reported
Feet to sea level:	17.45	Note:	The site was being pumped.
Level reading date:	2001-05-02	Feet below surface:	Not Reported
Feet to sea level:	17.69	Note:	The site was being pumped.
Level reading date:	2001-04-03	Feet below surface:	Not Reported
Feet to sea level:	17.79	Note:	The site was being pumped.

Level reading date:	2001-03-01	Feet below surface:	Not Reported
Feet to sea level:	18.03	Note:	The site was being pumped.
Level reading date:	2001-02-02	Feet below surface:	Not Reported
Feet to sea level:	17.86	Note:	The site had been pumped recently.
Level reading date:	2001-01-03	Feet below surface:	Not Reported
Feet to sea level:	18.13	Note:	The site had been pumped recently.
Level reading date:	2000-12-01	Feet below surface:	Not Reported
Feet to sea level:	18.20	Note:	The site had been pumped recently.
Level reading date:	2000-11-03	Feet below surface:	Not Reported
Feet to sea level:	17.95	Note:	Not Reported
Level reading date:	2000-10-03	Feet below surface:	Not Reported
Feet to sea level:	17.89	Note:	The site had been pumped recently.
Level reading date:	2000-09-20	Feet below surface:	Not Reported
Feet to sea level:	17.79	Note:	The site had been pumped recently.
Level reading date:	2000-01-31	Feet below surface:	Not Reported
Feet to sea level:	19.03	Note:	The site had been pumped recently.
Level reading date:	1915-12-01	Feet below surface:	-8.00
Feet to sea level:	Not Reported	Note:	Not Reported

P65
NW
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001134**

Well ID:	3-2053-010	Well Name:	Fort Shafter Monintor
Well Owner:	Directorate of Public Works, Environmental Division, DPW, U.S. Army Garrison		
Land Owner:	United States of America	Pump Rate (g/m):	0
Year Drillled:	1914	Original Well Name:	Not Reported
Driller:	Roscoe Moss Hawaii Inc	Well Construction Type:	Not Reported
Casing Diameter (in):	6	Ground Elevation (ft):	20
Well Depth (ft):	279	Solid Casing Depth:	168
Perforated Casing Depth:	Not Reported	Major Well Use:	Observation
Inital Water Level (ft):	28	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	82
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	21.6	Temp Unit:	C
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-259
Solid Casing Bottom Elevation:	-148	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	1/1/1914
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
P66 **NW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001137**

Well ID:	3-2053-013	Well Name:	Fort Shafter
Well Owner:	Directorate of Public Works, Environmental Division, DPW, U.S. Army Garrison		
Land Owner:	United States of America	Pump Rate (g/m):	1100
Year Drillled:	1995	Original Well Name:	Not Reported
Driller:	Roscoe Moss Hawaii Inc	Well Construction Type:	Percussion
Casing Diameter (in):	15	Ground Elevation (ft):	20
Well Depth (ft):	290	Solid Casing Depth:	180
Perforated Casing Depth:	Not Reported	Major Well Use:	Military
Inital Water Level (ft):	19.8	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	5/2/1995	Test Pump Rate (g/m):	1100
Test Drawdown Rate (ft):	2.3	Test Chloride Content (MG/L):	114
Test Water Temp:	20.6	Temp Unit:	C
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-270
Solid Casing Bottom Elevation:	-160	Year Installed:	1997
Pump Capacity (MM gal/day):	1.584	Pump Intake Depth:	61
Latest Head:	Not Reported	Latest WCR1 Report:	5/19/1995
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Q67 **SW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269856**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1953.03A	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19790801
Well Depth:	15	Well Depth Units:	ft
Well Hole Depth:	15	Well Hole Depth Units:	ft

Q68 **SW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269857**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1953.03B	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19790801
Well Depth:	15	Well Depth Units:	ft
Well Hole Depth:	15	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation	Database	EDR ID Number
Q69 **SW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269858**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1953.03C	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19790801
Well Depth:	15	Well Depth Units:	ft
Well Hole Depth:	15	Well Hole Depth Units:	ft

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70 **North** **1/2 - 1 Mile** **Higher**	**HI WELLS**	**HI1100000001118**

Well ID:	3-2052-009	Well Name:	Ft Shafter
Well Owner:	Directorate of Public Works, Environmental Division, DPW, U.S. Army Garrison		
Land Owner:	United States of America	Pump Rate (g/m):	Not Reported
Year Drillled:	1942	Original Well Name:	Not Reported
Driller:	W. Mullin	Well Construction Type:	Not Reported
Casing Diameter (in):	12	Ground Elevation (ft):	202
Well Depth (ft):	235	Solid Casing Depth:	210
Perforated Casing Depth:	Not Reported	Major Well Use:	Abandoned-Sealed
Inital Water Level (ft):	25	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-33
Solid Casing Bottom Elevation:	-8	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	1/1/1942
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

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71 **WSW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001136**

Well ID:	3-2053-012	Well Name:	Kalihi
Well Owner:	Gaspro	Land Owner:	First Hawaiian Bank
Pump Rate (g/m):	Not Reported	Year Drillled:	1967
Original Well Name:	Not Reported	Driller:	Layne International
Well Construction Type:	Rotary	Casing Diameter (in):	6
Ground Elevation (ft):	6	Well Depth (ft):	789
Solid Casing Depth:	588	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	21.3
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	2712	Date Tested:	Not Reported

Test Pump Rate (g/m):	150	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	21.1
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-783	Solid Casing Bottom Elevation:	-582
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1967	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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R72
ENE
1/2 - 1 Mile
Higher

HI WELLS **HI1100000001123**

Well ID:	3-2052-014	Well Name:	Kapalama 1
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	1050	Year Drillled:	1997
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Rotary	Casing Diameter (in):	14
Ground Elevation (ft):	196	Well Depth (ft):	346
Solid Casing Depth:	246	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	22.3
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	83	Date Tested:	4/2/1997
Test Pump Rate (g/m):	1232	Test Drawdown Rate (ft):	1.5
Test Chloride Content (MG/L):	88	Test Water Temp:	21.6
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-150	Solid Casing Bottom Elevation:	-50
Year Installed:	2000	Pump Capacity (MM gal/day):	1.512
Pump Intake Depth:	232	Latest Head:	Not Reported
Latest WCR1 Report:	1/6/1997	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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R73
ENE
1/2 - 1 Mile
Higher

HI WELLS **HI1100000001122**

Well ID:	3-2052-013	Well Name:	Kapalama 2
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	Honolulu Board of Water Supply, BWS		
Pump Rate (g/m):	1050	Year Drillled:	1996
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Rotary	Casing Diameter (in):	14
Ground Elevation (ft):	189	Well Depth (ft):	339
Solid Casing Depth:	239	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	22.3
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	2/27/1997
Test Pump Rate (g/m):	1450	Test Drawdown Rate (ft):	1
Test Chloride Content (MG/L):	94	Test Water Temp:	21.7
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-150	Solid Casing Bottom Elevation:	-50
Year Installed:	2001	Pump Capacity (MM gal/day):	1.512

Pump Intake Depth:	224	Latest Head:	Not Reported
Latest WCR1 Report:	11/25/1996	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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74
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40000269830**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1953.01	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19710701
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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S75
SSW
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000973**

Well ID:	3-1952-034	Well Name:	Kapalama
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1959
Original Well Name:	Not Reported	Driller:	Layne International
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	15	Well Depth (ft):	85
Solid Casing Depth:	60	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Lost	Inital Water Level (ft):	4
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	750	Test Drawdown Rate (ft):	31.4
Test Chloride Content (MG/L):	18850	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-70	Solid Casing Bottom Elevation:	-45
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1959	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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S76
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40000269821**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-34 W130 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19590410

Well Depth:	85	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

T77
SE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000949**

Well ID:	3-1952-010	Well Name:	Kapalama
Well Owner:	T. Ishimoto	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1901
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	22	Well Depth (ft):	251
Solid Casing Depth:	91	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	30.2
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	112	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-229	Solid Casing Bottom Elevation:	-69
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1901	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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S78
SSW
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000974**

Well ID:	3-1952-035	Well Name:	Kapalama
Well Owner:	Kamehameha Schools	Land Owner:	Kamehameha Schools
Pump Rate (g/m):	Not Reported	Year Drillled:	1960
Original Well Name:	Not Reported	Driller:	Samson/Smock
Well Construction Type:	Not Reported	Casing Diameter (in):	16
Ground Elevation (ft):	15	Well Depth (ft):	250
Solid Casing Depth:	20	Perforated Casing Depth:	205
Major Well Use:	Unused	Inital Water Level (ft):	12.9
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	11600	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-235	Solid Casing Bottom Elevation:	-5
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1960	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
S79 **SSW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000975**

Well ID:	3-1952-036	Well Name:	Kapalama
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1967
Original Well Name:	Not Reported	Driller:	Layne International
Well Construction Type:	Not Reported	Casing Diameter (in):	16
Ground Elevation (ft):	15	Well Depth (ft):	80
Solid Casing Depth:	46	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Lost	Inital Water Level (ft):	0.3
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	11311	Date Tested:	Not Reported
Test Pump Rate (g/m):	525	Test Drawdown Rate (ft):	27
Test Chloride Content (MG/L):	16500	Test Water Temp:	26.7
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-65	Solid Casing Bottom Elevation:	-31
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1967	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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T80 **SE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269854**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-10 W127 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19010101
Well Depth:	251	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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T81 **ESE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000948**

Well ID:	3-1952-009	Well Name:	Kapalama
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1901
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	9
Ground Elevation (ft):	21	Well Depth (ft):	127
Solid Casing Depth:	65	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	31.9
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	122	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported

Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-106	Solid Casing Bottom Elevation:	-44
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1901	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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82
NW
1/2 - 1 Mile
Lower

FED USGS **USGS40000269997**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2053-07 W151 KALIH	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	18980101
Well Depth:	248	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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T83
ESE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269863**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-09 W126 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19010101
Well Depth:	127	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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S84
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40000269819**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-35 W130-1 KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19600901
Well Depth:	250	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
S85 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269820**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-36 W130-2 KAP	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19670601
Well Depth:	80	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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T86 **SE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000944**

Well ID:	3-1952-005	Well Name:	Kapalama
Well Owner:	Kamehameha Schools	Land Owner:	Not Reported
Pump Rate (g/m):	Not Reported	Year Drillled:	1900
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	7
Ground Elevation (ft):	22	Well Depth (ft):	130
Solid Casing Depth:	64	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	32
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	123	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-108	Solid Casing Bottom Elevation:	-42
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1900	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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T87 **SE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269853**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-05 W125 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19000101
Well Depth:	130	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
T88 **SE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000943**

Well ID:	3-1952-004	Well Name:	Kapalama
Well Owner:	Kapuna Appartments, LLC	Land Owner:	Kapuna Appartments, LLC
Pump Rate (g/m):	0	Year Drillled:	1900
Original Well Name:	Not Reported	Driller:	L. McCandless
Well Construction Type:	Not Reported	Casing Diameter (in):	8
Ground Elevation (ft):	16	Well Depth (ft):	150
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	30.1
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	118	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	22.5
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-134	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1900	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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89 **NW** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000001131**

Well ID:	3-2053-007	Well Name:	Fort Shafter
Well Owner:	Directorate of Public Works, Environmental Division, DPW, U.S. Army Garrison		
Land Owner:	Not Reported	Pump Rate (g/m):	Not Reported
Year Drillled:	1898	Original Well Name:	Not Reported
Driller:	L. McCandless	Well Construction Type:	Not Reported
Casing Diameter (in):	8	Ground Elevation (ft):	39
Well Depth (ft):	248	Solid Casing Depth:	Not Reported
Perforated Casing Depth:	Not Reported	Major Well Use:	Abandoned-Sealed
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-209
Solid Casing Bottom Elevation:	Not Reported	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	01/01/1898
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
T90 **SE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269850**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-04 W124 KAPAL	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19000101
Well Depth:	150	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

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U91 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000980**

Well ID:	3-1952-041	Well Name:	HCC O-1
Well Owner:	Honolulu Community College		
Land Owner:	State of Hawaii	Pump Rate (g/m):	Not Reported
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	2	Ground Elevation (ft):	9
Well Depth (ft):	39	Solid Casing Depth:	5
Perforated Casing Depth:	39	Major Well Use:	Abandoned-Lost
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-30
Solid Casing Bottom Elevation:	4	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

U92 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000981**

Well ID:	3-1952-042	Well Name:	HCC O-2
Well Owner:	Honolulu Community College		
Land Owner:	State of Hawaii	Pump Rate (g/m):	Not Reported
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	2	Ground Elevation (ft):	9
Well Depth (ft):	39	Solid Casing Depth:	5
Perforated Casing Depth:	39	Major Well Use:	Abandoned-Lost
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0

Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-30
Solid Casing Bottom Elevation:	4	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

U93
SSE **HI WELLS** **HI1100000000978**
1/2 - 1 Mile
Lower

Well ID:	3-1952-039	Well Name:	HCC Aqua Cltr A
Well Owner:	Honolulu Community College		
Land Owner:	Not Reported	Pump Rate (g/m):	40
Year Drillled:	1983	Original Well Name:	Not Reported
Driller:	Frederick Page (Fred Page Drilling International, Inc.)		
Well Construction Type:	Percussion	Casing Diameter (in):	18
Ground Elevation (ft):	9	Well Depth (ft):	35
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Sealed	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-26	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	1982	Pump Capacity (MM gal/day):	0.057
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1983	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

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U94
SSE **HI WELLS** **HI1100000000979**
1/2 - 1 Mile
Lower

Well ID:	3-1952-040	Well Name:	HCC P-1
Well Owner:	Honolulu Community College		
Land Owner:	State of Hawaii	Pump Rate (g/m):	Not Reported
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	6	Ground Elevation (ft):	9
Well Depth (ft):	34	Solid Casing Depth:	10
Perforated Casing Depth:	34	Major Well Use:	Abandoned-Lost
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-25
Solid Casing Bottom Elevation:	-1	Year Installed:	Not Reported

Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

U95
SSE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000984**

Well ID:	3-1952-045	Well Name:	HCC O-5
Well Owner:	Honolulu Community College		
Land Owner:	State of Hawaii	Pump Rate (g/m):	Not Reported
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	2	Ground Elevation (ft):	9
Well Depth (ft):	39	Solid Casing Depth:	5
Perforated Casing Depth:	39	Major Well Use:	Abandoned-Lost
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-30
Solid Casing Bottom Elevation:	4	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

U96
SSE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000000985**

Well ID:	3-1952-046	Well Name:	HCC O-6
Well Owner:	Honolulu Community College		
Land Owner:	Not Reported	Pump Rate (g/m):	0
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	1	Ground Elevation (ft):	9
Well Depth (ft):	31	Solid Casing Depth:	Not Reported
Perforated Casing Depth:	Not Reported	Major Well Use:	Observation
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-22
Solid Casing Bottom Elevation:	Not Reported	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
U97 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000982**

Well ID:	3-1952-043	Well Name:	HCC O-3
Well Owner:	Honolulu Community College		
Land Owner:	State of Hawaii	Pump Rate (g/m):	Not Reported
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	2	Ground Elevation (ft):	9
Well Depth (ft):	39	Solid Casing Depth:	5
Perforated Casing Depth:	39	Major Well Use:	Abandoned-Lost
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-30
Solid Casing Bottom Elevation:	4	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

U98 **SSE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**HI1100000000983**

Well ID:	3-1952-044	Well Name:	HCC O-4
Well Owner:	Honolulu Community College		
Land Owner:	State of Hawaii	Pump Rate (g/m):	Not Reported
Year Drillled:	1987	Original Well Name:	Not Reported
Driller:	Walter Lum	Well Construction Type:	Rotary
Casing Diameter (in):	2	Ground Elevation (ft):	9
Well Depth (ft):	39	Solid Casing Depth:	5
Perforated Casing Depth:	39	Major Well Use:	Abandoned-Lost
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-30
Solid Casing Bottom Elevation:	4	Year Installed:	Not Reported
Pump Capacity (MM gal/day):	Not Reported	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	5/15/1987
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
U99 **SSE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269815**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-40 HON COMM COLLEGE P-1 dup1		
Type:	Well	Description:	Not Reported
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19870512	Well Depth:	34
Well Depth Units:	ft	Well Hole Depth:	35
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1987-05-12
Feet below surface:	9.0	Feet to sea level:	Not Reported
Note:	Not Reported		

U100 **SSE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269816**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-41 HON COMM COLLEGE		
Type:	Well	Description:	Not Reported
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19870515	Well Depth:	39
Well Depth Units:	ft	Well Hole Depth:	39
Well Hole Depth Units:	ft		

U101 **SSE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269817**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-46 HON COMM COLLEGE		
Type:	Well	Description:	Not Reported
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19870515	Well Depth:	31
Well Depth Units:	ft	Well Hole Depth:	31
Well Hole Depth Units:	ft		

Map ID Direction Distance Elevation	Database	EDR ID Number
U102 **SSE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269814**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-44 HON COMM COLLEGE		
Type:	Well	Description:	Not Reported
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19870515	Well Depth:	39
Well Depth Units:	ft	Well Hole Depth:	39
Well Hole Depth Units:	ft		

U103 **SSE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269813**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-1952-42 HON COMM COLLEGE		
Type:	Well	Description:	Not Reported
HUC:	20060000	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19870515	Well Depth:	39
Well Depth Units:	ft	Well Hole Depth:	39
Well Hole Depth Units:	ft		

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 >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 96819

Number of sites tested: 4

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	-0.475 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	0.050 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.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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.

State Wetlands Data: Wetlands Inventory
Source: Office of Planning
Telephone: 808-587-2895

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 Service (NRCS)
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 Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, 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.

STATE RECORDS

Well Index Database
Source: Commission on Water Resource Management
Telephone: 808-587-0214
CWRM maintains a Well Index Database to track specific information pertaining to the construction and installation of production wells in Hawaii.

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

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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Appendix E

Appendix E

DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

Draft

Archaeological Literature Review and Field Inspection Report and Cultural Assessment for the Interstate Route H1 Widening Project Kalihi and Kapālama Ahupuaʻa, Honolulu (Kona) District, Oʻahu TMK Section: [1] 1-3 H1 ROW

Prepared for
Jacobs
on behalf of the
Hawaiʻi Department of Transportation (HDOT)

Prepared by
Scott Belluomini, B.A.,
and
David W. Shideler, M.A.

Cultural Surveys Hawaiʻi, Inc.
Kailua, Hawaiʻi
(Job Code: KALIHI 43)

June 2021

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Management Summary

Reference	Archaeological Literature Review and Field Inspection Report and Cultural Assessment for the Interstate Route H1 Widening Project, Kalihi and Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK Section: [1] 1-3 H1 ROW (Belluomini and Shideler 2021)
Date	June 2021
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: KALIHI 43
Investigation Permit Number	CSH completed the fieldwork component of this study under archaeological fieldwork permit number 20-07, issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-13-282.
Agencies	SHPD, Hawai‘i Department of Transportation Highways Division (HDOT)
Project Proponent	HDOT
Project Funding	HDOT
Project Location	The project area is primarily within the HDOT H1 Freeway Right-of-Way (ROW) between the Ola Lane overpass on the west and the Kalihi Street overpass on the east. There are small additional portions of the project area on the north or *mauka* (toward the uplands) side near the Gulick Avenue overpass and extending west to Kalihi Stream and at the Kalihi Street overpasses. There are small additional portions of the project area on the south or *makai* (toward the sea) side near the Gulick Avenue overpass and the Kalihi Street overpasses. The project area lies mostly within Kalihi Ahupua‘a, extending slightly into Kapālama Ahupua‘a at the east (Kalihi Street) end, within central urban Honolulu (Kona) District, O‘ahu. The project area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) topographic quadrangle (Figure 1). Following a September 2020 submittal of this study, five small sections were added to the project with a total additional area of 0.49 acres. Two sections were added on the southeast of the Gulick Avenue portion of the project area directly *mauka* and *makai* of the H1 Freeway. Two sections were added along the Richard Lane portion of the project area, one to the northwest *mauka* of the H1 and one to the south *makai* of the H1. A very small discontinuous addition was made for an ITS trench crossing of North King Street just southeast of the Middle Street intersection.
Land Jurisdiction	HDOT, State Department of Education, City and County of Honolulu Department of Transportation Services, City and County of Honolulu Department of Parks and Recreation

Project Area Geographic Extent	The project area consists primarily of the H1 ROW from the southeast side of Kalihi Street *makai* overpass over the H1 Freeway northwest to the east side of the Ola Lane overpass. On the southeast end the project area includes the present large cloverleafs including on-ramps, off-ramps, and overpasses associated with the H1, Likelike Highway and Kalihi Street on both the *mauka* and *makai* sides of the H1. There is a significant expansion of the project area on the *mauka* side to include a portion of Gulick Avenue with the *makai* side of Kalihi Waena Elementary School to the west and a portion of a private parcel adjacent to the east. On the *makai* side of the H1 at Gulick Avenue another expansion takes in a portion of Gulick Avenue and the adjacent portion of Kalihi-Waena Neighborhood Park and a portion of the Hawaiian Pentecostal Full Gospel Assembly church property. At the H1 crossing over Kalihi Stream and the adjacent and parallel Richard Lane there expansion of the project area on the *mauka* side includes a portion of Richard Lane, the Kalihi Stream Channel, and an adjacent driveway to the west. On the *makai* side of the Richard Lane overpass there is an expansion of the project area *makai* along Richard Lane and the adjacent west side of Kalihi Stream. A discontinuous section of the project area is a crossing of North King Street just southeast of the intersection with Middle Street.
Project Acreage	The project area studied is approximately 22 acres (8.90 hectares). The actual area of project-related ground disturbance is anticipated to be a small fraction of this.
Built Environment	The project area follows the H1 Freeway as it cuts through west/central urban Honolulu. The Bernice Pauahi Bishop Museum, YMCA of Honolulu-Kalihi Branch, and Kalihi-Pālama Public Library are just east of the east end of the project area. Adjacent areas include single family homes, several churches such as the Kalihi Union Church, Kalihi Waena Elementary School, Kamehameha Community Park, and Kalihi Waena Neighborhood Park. The discontinuous section crossing North King Street is east of the Middle Street intersection.
Potential for Historic Architecture	The Gulick Avenue overpass was built in 1959 and other overpasses and the H1 itself may be historic properties. While there are many older buildings adjacent to the project area, none are understood to be in the project area per se. It is understood that Mason, Inc. is carrying out a companion study of neighboring architectural historic properties.
Natural Environment	The project area is approximately a kilometer inland from the closest point of the natural coastline, understood as in the vicinity of where Nimitz Highway crosses Kalihi Stream. Kalihi Stream is a perennial stream that bisects the project area. Annual rainfall at the “Insane Asylum” station just to the southeast is 919 mm and at the “Kalihi Stream” station just to the north is 1,046 mm (Giambelluca et al. 2013) suggesting an annual rainfall in the project area of very close to 1,000 mm (39.4 inches). This is

	marginal for non-irrigated agriculture. The soils are clays and clay loams including (generally from west to east), Honouliuli clay, 0 to 2% slopes (HxA) in small areas at the west and southeast end, Makiki stony clay loam, 0 to 3% slopes (MIA) on much of the west half, Ewa silty clay loam, 6 to 12% slopes (EaC) in the central area, and Kaena clay, 2 to 6% slopes (KaB) on most of the east end. Most of the H1 Freeway portion of the project area was excavated deeply through this densely urban portion of Honolulu so as to allow for *mauka-makai* connections at grade. The slopes are landscaped in *naupaka* (*Scaevola* sp.), *pōhinahina* (*Vitex rotundifolia*), lawn with *haole koa* (*Leucaena glauca*), and other exotic grasses and weeds in less maintained perimeter areas. The project area crosses one stream, perennial Kalihi Stream that has been channelized. Kamehameha Community Park is a relatively large open space park on the *mauka* side and Kalihi Waena Neighborhood Park is a small park on the *makai* side. The extensive cloverleaf complex at the east end is largely in mowed lawn with monkey pod (*Samanea saman*) and other exotic shade trees.
Project Description and Related Ground Disturbance	The project would increase the number of eastbound through lanes within the project limits from three to four. Details of any possible project development are not known by CSH at this time. Possible development could include re-working of the sides of the H1 Freeway but such work would most likely be largely within the existing road cuts far below the level of the natural, potentially culture-bearing ground surface. The project area is evaluated as having been very extensively altered by excavation in the process of prior road construction—particularly for the construction of the H1 ca. 1959. Part of the project includes trenching for an ITC cable crossing perpendicular to North King Street to connect to an existing electrical cabinet on the southwest side. This crossing is located just southeast of the intersection between North King Street and Middle Street.
Historic Preservation Regulatory Context	This is a state/municipal “governmental” project needing review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-275. This document is intended to support the proposed state (HDOT) project’s historic preservation review under HRS §6E-8 and HAR §13-275. It is intended to support any project-related historic preservation consultation with stakeholders, such as state and county agencies and interested Native Hawaiian Organizations and community groups. This study is intended to support an HAR §13-275-3 request for an SHPD letter of determination. CSH produced an *Archaeological Literature Review and Field Inspection (LRFI) Report for the Interstate Route H1 (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* (Hammatt and Shideler 2011) addressing a similar project area. Given the passage of time and a different project area the present study was indicated.

Document Purpose	This investigation was designed—through detailed historical, cultural, and archaeological background research and a field inspection of the project area—to determine the likelihood that cultural resources/historic properties may be affected by the project and, based on findings, consider cultural resource management recommendations. This document is intended to facilitate the project’s planning and support the project’s historic preservation and environmental review compliance.
Fieldwork Effort	Fieldwork was accomplished on 21 May and 24 May 2020 by David W. Shideler, M.A. This work required approximately 0.5 person-days to complete. The perimeter of the project area was traversed extensively on foot (where safety and access avoiding private property permitted) and was also traversed by car.
Background Research Methods	Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library at the University of Hawai‘i at Mānoa, 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 historical 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 2020).This research provided the environmental, cultural, historic, and archaeological background for the project area.
Background Research Summary	Clearly the project area along Kalihi Stream (called “Kahoewai”) was a vibrant Hawaiian community in the late 1840s and the layout of Land Commission Awards probably reflected a pattern of residences and agriculture that extended back into pre-Contact times. As early as 1919 there were many homes built in the project area with the density of homes increasing into the 1950s. A review of historic photographs and the results of fieldwork indicate the excavation that occurred in most of the present project area in 1959 for H1 Freeway construction was massive and would have removed many of the archaeological historic properties as may have been present.
Prior Archaeological Studies Summary	While the project vicinity has been relatively well studied in the archaeological literature, it appears no traditional Hawaiian sites or burials or discoveries of human skeletal remains have been reported in the archaeological literature within approximately 400 m of the project area. There are architecturally important structures (the Bishop Museum Complex, historic fire stations, Farrington High School) in the vicinity but these would not appear to suggest related subsurface deposits of import far from the designated site.

Background Summary and Predictive Model	The main consideration arising from this study is how deep and wide and pervasive the excavation for the road cut for the H1 Freeway was in 1959. It appears the vast majority of the project area was cut down below any culture-bearing sediments in the 1959 highway construction. The less impacted areas are as at the east end at the Kalihi Street clover-leaf connections, at the *makai* side of the Kalihi Waena Elementary School portion of the project area, and at the Kalihi-Waena Neighborhood Park portion of the project area but these too were regarded as having been massively impacted by grading. Particular attention was given to the project crossing of Kalihi Stream, which was a foci of taro cultivation.
Evaluation of Cultural Impact	The cultural resources in the vicinity of the project area are considered in terms of archaeological resources, burials, earth resources, stream resources, plant resources, trails, and *wahi pana* (storied places). This study of cultural impacts presents data from available sources and seeks to use dissemination of this study to elicit feedback on any cultural resources or practices as may be impacted by this project. Based on the information examined, it appears unlikely that this project will have any adverse impact on cultural resources or practices—particularly given the extensive nature of prior ground disturbance in the project area.
Potential for Project Effect on Archaeological Historic Properties	In the course of the literature review and fieldwork no historic properties were identified within the project area. The testimony for Land Commission Award (LCA) 818:2, a parcel known as “Pohakuloa” awarded to George Beckley (see Appendix A), references a “new bridge abutment” (new ca. 1849) that is believed to be within 10 m of the project area. This LRFI supports an identification effort be conducted for the project. However, the exact locations of project subsurface impacts are currently unknown, therefore it is recommended that archaeological monitoring for identification purposes along Kalihi Stream is indicated for the potential adverse impact to cultural and agricultural deposits and bridge and path remnants associated with the mid-1800s enterprises documented along Kalihi Stream (as indicated in an 1883 Brown map and LCA records). It is recommended that HDOT submit an HAR §13-275-3 request for an SHPD letter of determination and include this study as a supporting document.

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Section 1 Introduction

1.1 Project Background

At the request of Jacobs and on behalf of the Hawai‘i Department of Transportation Highways Division (HDOT), Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this *Archaeological Literature Review and Field Inspection Report and Cultural Assessment for the Interstate Route H1 Widening Project, Kalihi and Kapālama Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK Section: [1] 1-3 H1 ROW*.

The project area is primarily within the HDOT H1 Right-of-Way (ROW) between the Ola Lane overpass on the west and the Kalihi Street overpass on the east. There are small additional portions of the project area on the north or *mauka* (toward the uplands) side near the Gulick Avenue overpass and extending west to Kalihi Stream and at the Kalihi Street overpasses. There are small additional portions of the project area on the south or *makai* (toward the sea) side near the Gulick Avenue overpass and the Kalihi Street overpasses. The project area lies mostly within Kalihi Ahupua‘a, extending slightly into Kapālama Ahupua‘a at the east (Kalihi Street) end, within central urban Honolulu (Kona) District, O‘ahu. Following a September 2000 submittal of this study, five small sections were added to the project with a total area of 0.5 acres. Two sections were added to the southeast of Gulick Avenue directly *mauka* and *makai* of the H1 Freeway. Two sections were added along Richard Lane, one to the west *mauka* of the H1 and one to the south *makai* of the H1. A discontinuous addition was made crossing North King Street just southeast of Middle 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), a tax map key (Figure 2), and a 2016 aerial photograph (Figure 3).

The project will increase the number of eastbound through lanes within the project limits from three to four. The H1 Freeway in the Honolulu area is regularly congested during the morning and afternoon commute periods, and frequently congested during the middle of the day. Previous studies of traffic patterns on H1 have evaluated various measures to reduce congestion, including the addition of an eastbound lane on H1 to improve traffic flow. These studies concluded that, based on modeling results, the addition of a lane and shoulder from Ola Lane to Kalihi Street Overpass would produce significant benefits in both the morning and afternoon peak periods.

During construction of the H1 Widening: Ola Lane to Kalihi Street Overpass Project, HDOT’s construction contractor would mobilize by first establishing one or more staging areas for equipment, material storage, and field offices. The staging area, or areas, may be sited either within the existing HDOT ROW, or on nearby property (specifically the *makai* side of Kalihi Waena Elementary School and/or a portion of Kalihi-Waena Neighborhood Park) pursuant to an agreement with the current landowner. The HDOT ROW within the Kalihi interchange area would be a logical place to establish a staging area as there is available land within the project limits.

Mainline freeway construction would involve site preparation with associated grading and may include excavation, moving earth, and installing materials with graders, backhoes, front-end loaders, and dump trucks. Construction of the project may require the demolition and reconstruction of several retaining walls, bridges, and interchange ramps. Demolition activities may involve the use of jackhammers, hoe-rams, concrete cutters, and excavators.

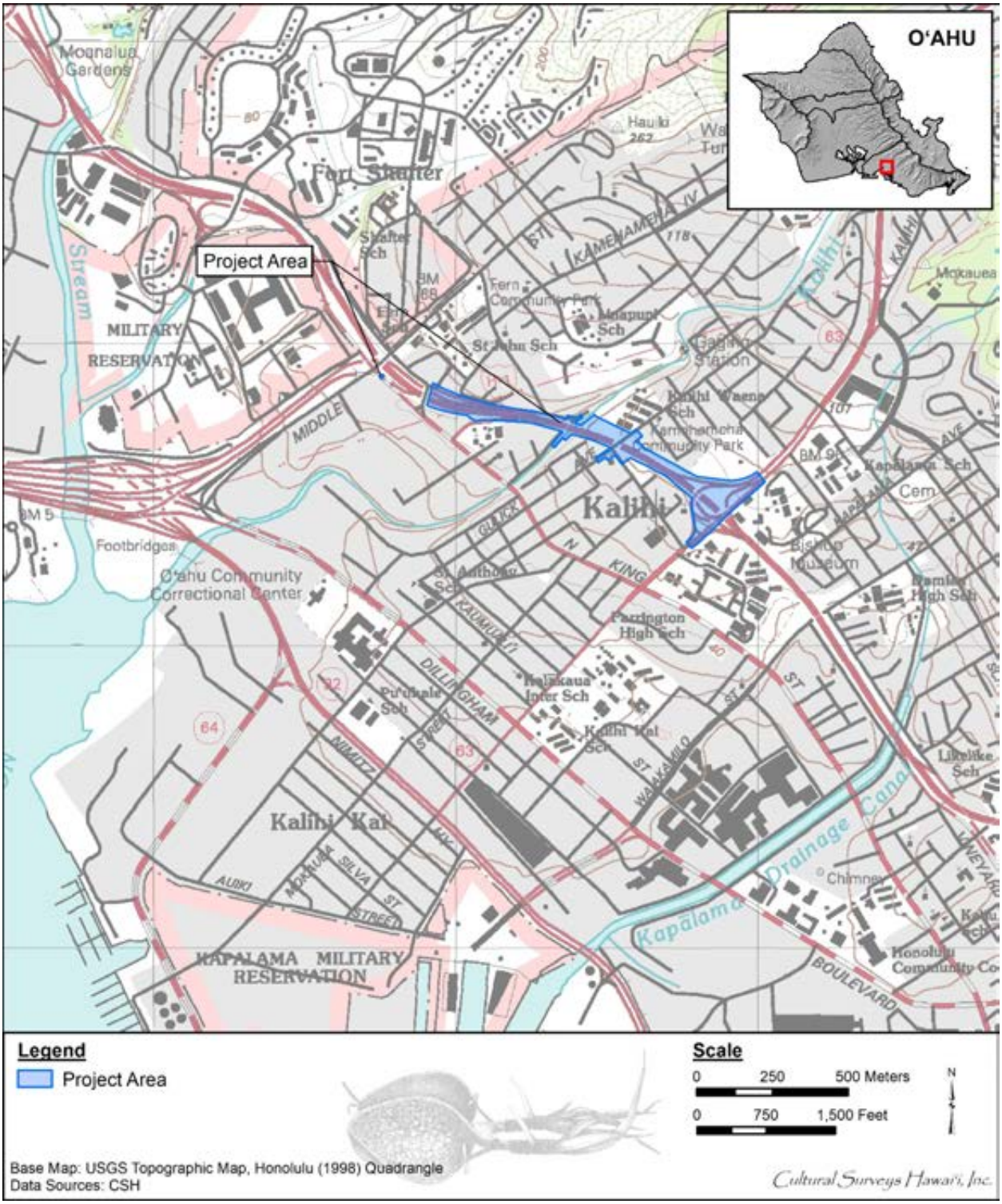

Figure 1. Portion of the 1998 Honolulu USGS 7.5-minute topographic quadrangle showing the project area

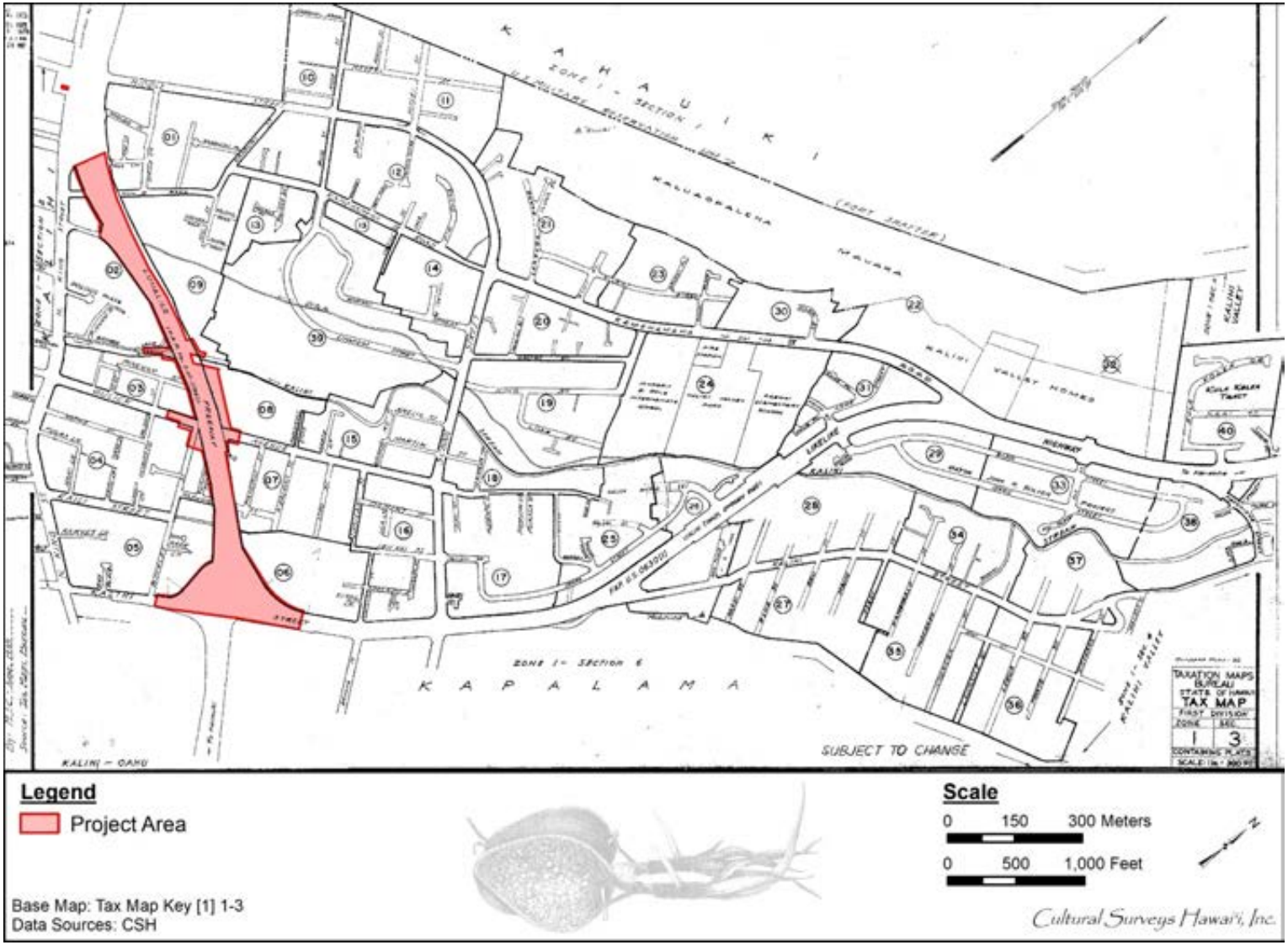

Figure 2. TMK: [1] 1-3 showing current project area (Hawai‘i TMK Service 2014)

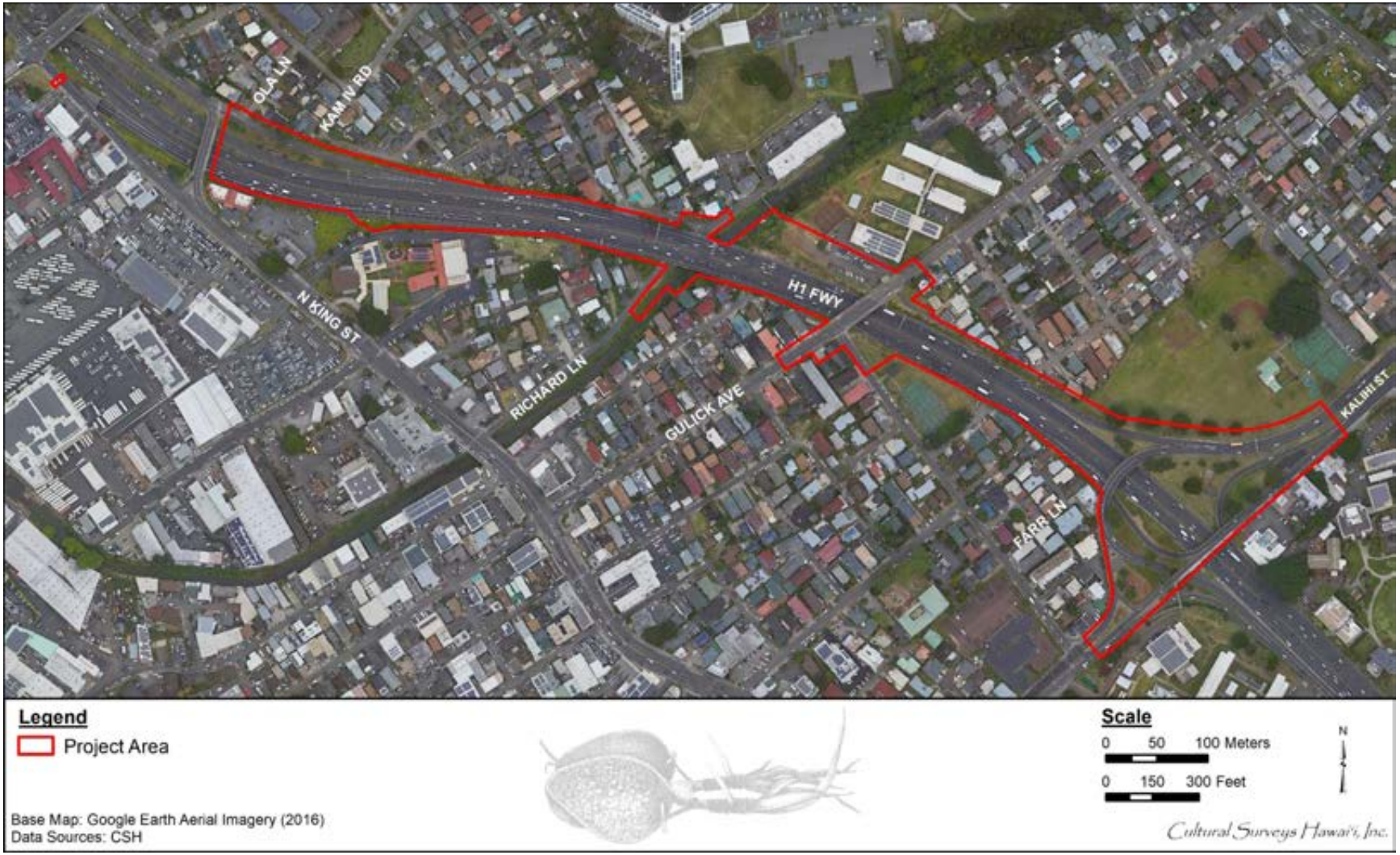

Figure 3. 2016 aerial photograph showing the project area (Google Earth 2016)

Construction on the mainline freeway and adjoining road improvements may involve installation and/or modifications of utilities, lighting, ITS facilities, signing, and traffic signals; grading; installation of drainage facilities; and paving. Construction of the new retaining walls, noise walls, bridges, and interchange ramps may require pile-driving, concrete form work, rebar structure work, girder placement, and concrete pumping trucks. In some areas construction may require fill and slope stabilization, such as soil compaction.

1.2 Document Purpose

This investigation was designed—through detailed historical, cultural, and archaeological background research and a field inspection of the project area—to determine the likelihood that cultural resources/historic properties may be affected by the project and, based on findings, consider cultural resource management recommendations. This document is intended to facilitate the project’s planning and support the project’s historic preservation and environmental review compliance. This study is intended to support an Hawai‘i Administrative Rules (HAR) §13-13-275-3 request for a State Historic Preservation Division (SHPD) letter of determination.

CSH previously produced a study entitled *Archaeological Literature Review and Field Inspection (LRFI) Report for the Interstate Route H1 (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* (Hammatt and Shideler 2011) addressing a similar project area. Given the passage of time and a different project area, the present study was indicated.

1.3 Environmental Setting

1.3.1 Natural Environment

The project area is approximately a kilometer inland from the closest point of the natural coastline, understood as in the vicinity of where Nimitz Highway crosses Kalihi Stream. Kalihi Stream is a perennial stream that bisects the project area. Annual rainfall at the “Insane Asylum” station just to the southeast is 919 mm and at the “Kalihi Stream” station just to the north is 1,046 mm (Giambelluca et al. 2013) suggesting an annual rainfall in the project area of very close to 1,000 mm (39.4 inches). This is marginal for non-irrigated agriculture. The soils are clays and clay loams including (generally from west to east), Honouliuli clay, 0 to 2% slopes (HxA) in small areas at the west and southeast end, Makiki stony clay loam, 0 to 3% slopes (MIA) on much of the west half, Ewa silty clay loam, 6 to 12% slopes (EaC) in the central area, and Kaena clay, 2 to 6% slopes (KaB) on most of the east end (Figure 4).

Honouliuli series soils are described as follows:

> This series consists of well-drained soils on coastal plains on the island of Oahu in the Ewa area. These soils developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. Elevations range from 15 to 125 feet. […] These soils are used for sugarcane, truck crops, orchids, and pasture. The natural vegetation consists of kiawe, koa haole, fingergrass, bristly foxtail, and Bermudagrass. [Foote et al. 1972:43]

Honouliuli clay, 0 to 2% slopes soils are further described as follows:

> This soil occurs in the lowlands along the coastal plains. Included in mapping were small areas of fine-textured alluvium soils that have a stony subsoil […]

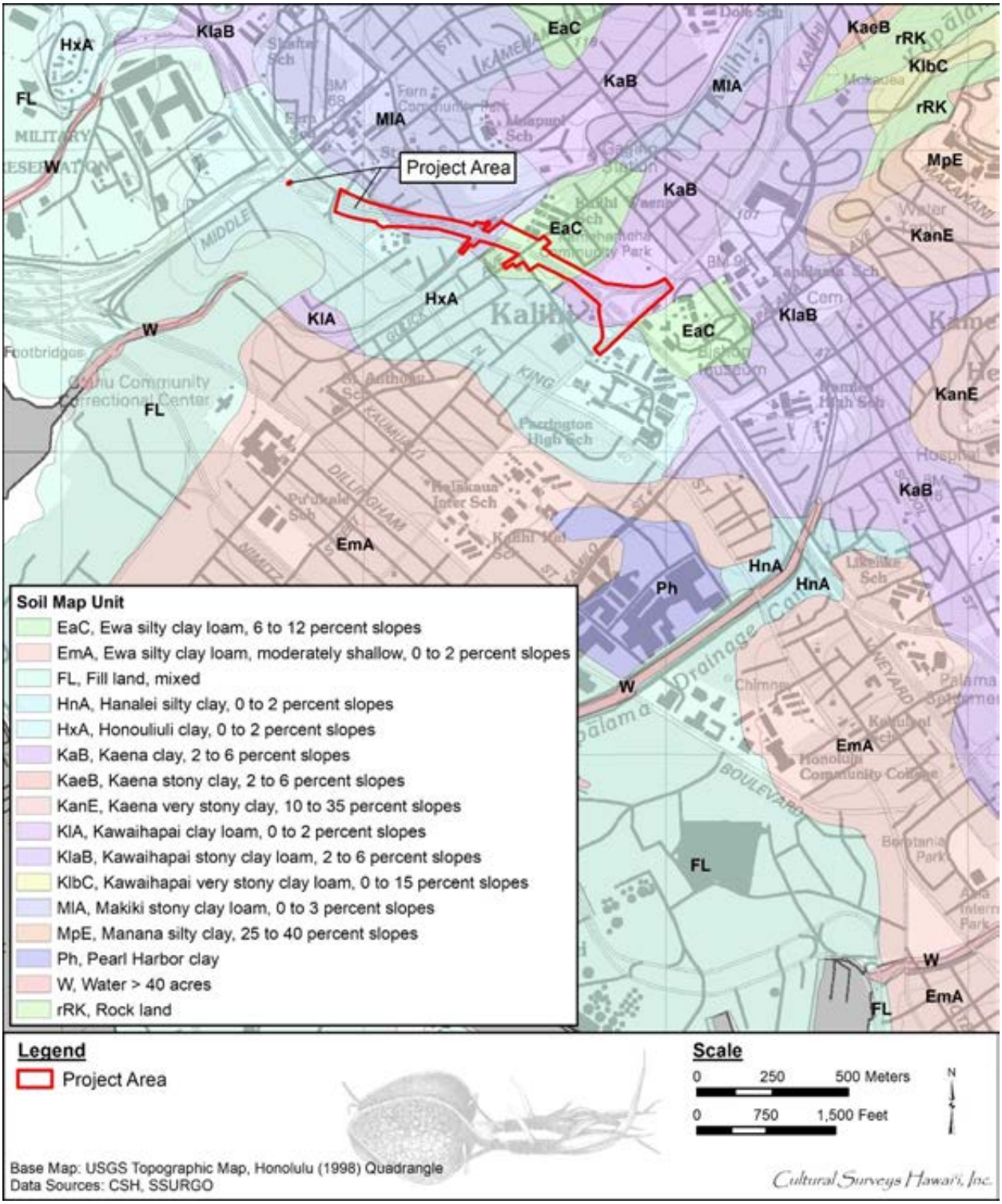

Figure 4. Portion of the 1998 Honolulu USGS 7.5-minute topographic quadrangle with overlay of geological zones, showing predominance of Fill soil in the current project area (USDA SSURGO 2001)

> Permeability is moderately slow. Runoff is slow, and the erosion hazard is no more than slight […] Workability is slightly difficu1t because of the very sticky and very plastic clay. The shrink-swell potential is high. [Foote et al. 1972:43]

Makiki series soils are described as follows:

> This series consists of well-drained soils on alluvial fans and terraces in the city of Honolulu on the island of Oahu. These soils formed in alluvium mixed with volcanic ash and. cinders. They are nearly level. Elevations range from. 20 to 200 feet […] These soils are used almost entirely for urban purposes. [Foote et al. 1972:91]

Makiki stony clay loam, 0 to 3% slopes soils are further described as having “enough stones to hinder cultivation. The stones are angular and make up about 15 percent of the soil by volume. The depth to basalt or cinders varies from 20 to 60 inches” (Foote et al. 1972:92).

Ewa series soils 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. […] These soils are used for sugarcane, truck crops, and pasture. The natural vegetation consists of fingergrass, kiawe, koa haole, klu, and uhaloa. [Foote et al. 1972:29]

Ewa silty clay loam, 6 to 12% slopes soils are further described as “On this soil, runoff is slow to medium and the erosion hazard is slight to moderate. Included in mapping were a few small. areas that are strongly sloping” (Foote et al. 1972:30).

Kaena series soils are described as follows:

> This series consists of very deep, poorly drained soils on alluvial fans and talus slopes on the islands of Oahu and Kauai. These soils developed in alluvium and colluvium from basic igneous material. They are gently sloping to steep and are commonly stony. Elevations range from 50 to 150 feet […] These soils are used for sugarcane, truck crops, pasture, and homesites. The natural vegetation consists of kiawe, klu, lantana, koa haole, and fingergrass. [Foote et al. 1972:49]

Kaena clay, 2 to 6% slopes are further described as “On this soil, runoff is slow and the erosion hazard is slight” (Foote et al. 1972:50).

Most of the H1 Freeway portion of the project area was significantly excavated through this densely urban portion of Honolulu so as to allow for *mauka-makai* connections at grade. The slopes are landscaped in *naupaka* (*Scaevola* sp.), *pōhinahina* (*Vitex rotundifolia*), lawn with *haole koa* (*Leucaena glauca*), and other exotic grasses and weeds in less maintained perimeter areas. The project area crosses one stream, perennial Kalihi Stream that has been channelized. Kamehameha Community Park is a relatively large open space park on the *mauka* side and Kalihi Waena Neighborhood Park is a small park on the *makai* side. The extensive cloverleaf complex at the east end is largely in mowed lawn with monkey pod (*Samanea saman*) and other exotic shade trees.

1.3.2 Built Environment

The project area follows the H1 Freeway ROW as it cuts through west/central urban Honolulu. There is a substantial expansion of the project area at the southeast end to include on-ramps and off-ramps at the Likelike Highway and Kalihi Street interchange with the H1. There is a significant expansion of the project area on the *mauka* side to include adjacent portions of Gulick Avenue and the southwest side of Kalihi Waena Elementary School. On the *makai* side there are expansions of the project area to include adjacent portions of Gulick Avenue and Kalihi-Waena Neighborhood Park.

The Bernice Pauahi Bishop Museum, YMCA of Honolulu-Kalihi Branch, and Kalihi-Pālama Public Library are just east of the east end of the project area. Adjacent areas include single family homes, several churches such as the Kalihi Union Church, Kalihi Waena Elementary School, Kamehameha Community Park, and Kalihi Waena Neighborhood Park.

Section 2 Methods

2.1 Field Methods

Fieldwork was accomplished on 21 May and 24 May 2020 by David W. Shideler, M.A. This work required approximately 0.5 person-days to complete. The perimeter of the project area was traversed extensively on foot (where safety and access avoiding private property permitted) and was also traversed by car.

2.2 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 2020).

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.

Section 3 Legendary and Traditional Background

3.1 Winds, Rains, and Seas of Kalihi and Kapālama

Each small geographic area 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.

> Kukalahale is of Honolulu,
> ‘Ao‘oa is of Māala,
> ‘Ōluniu is of Kapālama,
> Haupe‘epe‘e is of Kalihi,
> Ko-momona is of Kahauiki
> [Nakuina 1990:43]

The rains of O‘ahu are also mentioned by Halemano, who composed a chant lamenting his heartbreak over his wife, who had deserted him for another man:

> *Kuu wahine mai ka ua popo kapa o Kalihi*
> *Ke ahai la ma ka kua ka malu;*
> *Ke nounou mai la e ka Waahila,*
> . . .
> *Nana wale ke aloha i Honouliuli,*
> *Kokolo kehau he makani no Lihue,*
> *He lino wahahee na ka la i Kaena,*
> *Ua hao—amai la e ka unulau o lalo,*
> *Anuanu loko huihui i ke aloha,*
> *Aloha ka wahine ka hoa noho o ia kula panoa.*
>
> Translation:
>
> My lover from the Kalihi rain, where the clothes are bundled up,
> Where the back is the only sheltered spot;
> It is being pressed by the Waahila [rain in Mānoa];
> . . .
> Love looks in from Honouliuli,
> The dew comes creeping; it is like the wind of Lihue,
> Like a false gleaming of the sun at Kaena,
> For it is being destroyed by the Unulau wind [tradewinds] from below,
> Causing coldness within made so by love of thee,
> For I love thee, my companion of that parched plain.
>
> [Fornander 1919:5(2):252–253]

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 eastern

end of Waikīkī to the western boundary of the Kona district at Moanalua Ahupua‘a, the seas were as follows:

> A sea for surf swimming is Kahaloa [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 1880:390]

3.2 Upland Kalihi—Kalihi Waena and Kalihi Uka

Upland Kalihi Valley is bisected by Hakaio Ridge, which divides the valley into Kamana-nui on the north watered by Kalihi Stream and the narrower Kamana-iki on the south, watered by Kamanaiki Stream. A 1883 map of upper Kalihi Valley shows some of the locations mentioned in the following legends and stories. Additional information on the locations of certain sites of Kalihi from Sterling and Summers *Sites of O‘ahu* has also been added to this map (Figure 5).

3.2.1 The Goddess Haumea in Upland Kalihi

The goddess Haumea is thought of as the progenitor of the Hawaiian *ali‘i* (chiefly class) and all Hawaiians (Malo 1951:5). She is a sister of the gods Kāne and Kanaloa and the mother of the Hawaiian goddess Pele and her sisters and brothers. Kalihi Valley was the first earthly residence of Papa, the human form of the goddess Haumea (Beckwith 1970:276).

> In her human body as Papa, Haumea lives on Oahu as the wife of Wakea; in her spirit body as Haumea she returns to the divine land of the gods in Nu‘umealani [a legendary place] and changes her form from age to youth and returns to marry with her children and grandchildren. Some place these transformations on Oahu at the heiau of Ka-ieie (The pandanus vine) built for her worship in Kalihi valley. [Beckwith 1970:278]

According to Beckwith (1970:278), the *heiau* (place of worship) at which Papa transformed into Haumea was Ka‘ie‘ie Heiau in Kalihi Valley. In a version of the legend by the early Hawaiian historian Samuel Kamakau (1991:134), he places the transformation at the mythical *heiau* of Halepapa in Nu‘umealani. As Papa was transforming into a young woman, the people of Moanalua discovered her and, in embarrassment, Papa moved to live in the *mauka* area of Kalihi, never to transform again. She lived there with one of her sons, who she did not marry, named Ki‘o. He was “named for the deposits (*ki‘o*) of gum on the *kukui* trees above Kalihi” (Kamakau 1991:134).

Haumea was known for her regeneration abilities, whether this is manifested as food for the people or the powers or female reproduction to secure the existence of humankind. Because of these regenerative powers, she is often considered the goddess of childbirth (Beckwith 1970:283).

Haumea could also withhold the abundance of food. In the Legend of Pupu-hulu-ena (Thrum 1925:92-95), a man named Kula‘uka built a bird suit made of *‘ie‘ie* vines in order to steal Haumea’s grandchild.

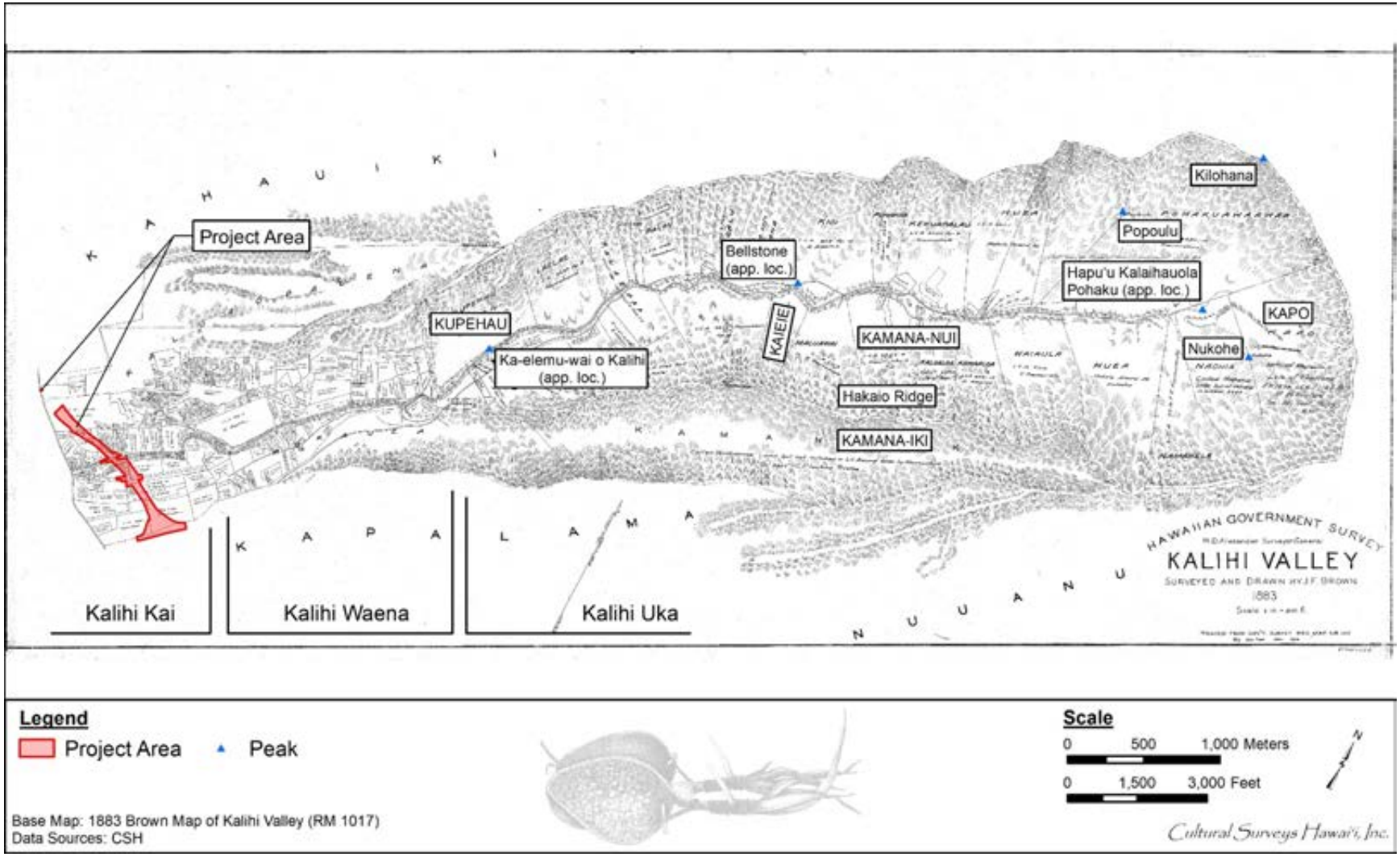

Figure 5. 1883 Hawaiian Government Survey map of Upper Kalihi Valley by J.F. Brown, showing peaks, streams, *‘ili* (small land division) names, and traditional place names discussed in the report text

> […] *kuko kona naau e loaa ka moopuna a Haumea ia ia, nolaila, kii mai la oia i Oahu, ua hele nae ua [?] moopuna la a Haumea i uka o Waipio—Lelepua.* [Kamakau, *Ka Nūpepa Kū‘oko‘a*, 12 August 1865]
>
> […] he greatly desired to secure to himself Haumea’s grandchild, so he came to her Kalihi quarter, but the grandchild had gone above to Lelepua. [Translation in Thrum 1925:92]

He then flew to Lelepua (an *‘ili* of Waipi‘o in ‘Ewa) and stole the child. Haumea followed, traveling along the “dark way of Kāne.” To delay Haumea, Kula‘uka dropped a stone, and Haumea followed the stone to earth, thinking it was her grandchild. “When about to catch it, the thundering noise from below occurred; it was the Kawa-luna stone.”

In anger at the deceit, Haumea took away all of the food of the islands, leaving only some *kī* (ti; *Cordyline terminalis*) and *pōpolo* (black nightshade; *Solanum nigrum*) for her own retainers at Waimānalo, in the Ko‘olau District of O‘ahu. The legend continues as two clever men from Kaua‘i, one named Pupuhuluena (or Pupuhuluana), travel to O‘ahu to end the famine and find the retainers and the last of the food. They land at Wai‘anae and find Pakui, Haumea’s retainer, but he lies and tells them that there is no food on O‘ahu. The Kaua‘i men travel on to ‘Ewa, but find no food. Pakui recommended that they take the coastal trail along the southeast coast of O‘ahu, but at Leiolono and Waiko‘ae (in Kalihi Ahupua‘a), the smell of cooked food in an *imu* (earth oven) wafts upward over the Ko‘olau mountains. They decide instead to take the inland trail over Nu‘uanu Pass to travel to the windward side of the island.

> *Hoole aku la no laua nei me ka i aku no hoi, E aho maua mauka o Nuuanu, akahi no ka hoi ka holo mai nei o ke ala o ka hakai popolo. Pane aku la no ua wahi kanaka nei ma ke ano hunahuna, Aole ai o Koolau, aohe no hoi he kanaka, a o ke ala hakai popolo a olua e honi la, he pua kamakahala ia no Nuuanu, pa ia ae la e ka ahihi, pohole ka pua i ka makani, i ka hooluliia e ke Kiowao, kuhihewa ai ka malihini he ala no ka hakai popolo.* [Kamakau, Ka Nūpepa Ku oko‘a, 12 August 1865]
>
> This they [the Kaua‘i men] refused, with the answer indeed: ‘Better the upper road of Nuuanu,’ for the fragrance of the cooking popolo had reached them. Pakui, by way of hidden meaning, said: ‘Koolau has no food, nor indeed any people, and the fragrance of the cooking popolo you two fancy is in the Kamakahala blossom of Nuuanu, which, chafed by the ahihi vine, bruises the flower in the wind vibrated by the cool misty air; strangers mistake it for the fragrance of the cooking popolo.’ [Translation in Thrum 1925:94]

The two Kaua‘i men found Haumea’s retainers and their hidden food at Waimānalo. The retainers were at first reluctant to share the food, but, Pupuhuluana, one of the Kaua‘i survivors, demonstrated his strength by seizing and uprooting Ku-maka-lehua, an *‘ōhia* tree at the cleft of Nu‘uanu. This tree was so large that when uprooted, the branches reached all the way to Kailua on the coast. After this display of power, the two groups then worked together to bring food back to the islands, traveling to ‘Ololoimehani, which was the ancestral land of Haumea and the other gods, according to David Malo (2006:Ch. 4.1). In the ancestral lands, they gathered “potatoes, taro, bananas, sugar cane, ape, ti, yams, poi, pia, breadfruit, starch, [mountain] apples, coconuts,

edible ferns, and all kinds of food and of fruit and seed," and took them to the Hawaiian Islands for replanting (Thrum 1925:92–95).

There are many variations of the legend of Haumea living in a human form in the upland area of Kalihi Valley and saving her husband, Wākea, by escaping into a tree. Many different versions of this legend exist; the main story remains the same, but there are variations on the names of the married couple, the location of the tree, the fate of the husband, and the results of Haumea's action. Haumea is sometimes referred to as Papa or Walinu‘u, Wākea is Mākea, Puna, or Puna‘aikoae, and the chief who captures the husband is Kumuhonua, Leleho‘omao, or Kou. In some versions of the tale, Wākea had three wives, Walinu‘u, Kalamainu‘u (a lizard goddess) and Haumea.

In one version (Poepoe nd: 1), Papa (Haumea) is the woman and Wākea is her husband, who:

> *O Wakea, he kane oia a he kanaka maoli no oia, a o keia Wakea no he kane oia na Papa i oleloia o Haumea, a ua haalele aku laua i na kukulu o Kahiki, a au mai no na kaiaula o ka pae aina Hawaii a nononoho ae la i ka pali o Kilohana e kupali la ma ka awawa o Kalihiuka ma ke kukulu hikina akau, ma ke kukulu komohana hoi o na ko‘a mokumoku o Heeia, i ke au hoi i okikilo loa. […]*
>
> *I ka hoea ana o keia mau ‘kupuna’ ma keia kakai pali, ua kukulu iho la laua i hale no laua maluna pono o ia wahi, (ma kahi o kela puu ano haahaa ma ka akau o ka puu e ku oioi la ma ka palena luna loa o ke alanui e hele ia nei e na kamahele makaikai o keia au,) a hoolilo iho la ia wahi i home no laua e hoohala ai i na la wela o ke kau ame na kulu paka ua eleelo o ka hooilo.* [Poepoe n.d.]
>
> They left the borders of Kahiki [legendary Hawaiian homeland] in the days long past, and became the parents of the Hawaiian people, and lived on the hill of Kilohana which stands high up in the valley of Kalihi, upland on the north-east side, on the cliff which rises west of the place where were the coral beds of Heeia.
>
> When these ancestors of ours came to live on these heights they built a house for themselves in that depressed place on the right side of the hill which stands up in a peak on the mauka boundary of the road taken by visitors at this time. Here they passed the hot days of summer and the time of drenching showers of the rainy season. [Condensed translation by Martha Beckwith n.d.; HEN II:150]

One day when Haumea was away at the shore gathering crabs and seaweed, the Honolulu chief named Kumuhonua accused her husband of poaching and intended to burn him for this crime. Haumea hurried back to the valley, meeting the men of Kumuhonua who had tied her husband to a large breadfruit tree near Waikahalulu pool in Nu‘uanu, which is currently neighboring the bridge crossing Nu‘uanu Stream. Haumea quickly opened a door into the breadfruit tree and escaped with her husband (Poepoe n.d., translation in Beckwith 1970:281).

In Westervelt's (1963:28–36) first version, the chief of the area is called Leleho‘omao, who accused Wākea of trespassing and captured him to burn him in an *imu* (oven) and take him to Pākākā Heiau (once near Fort Street in Honolulu) as a sacrifice. The woman, this time called Papa, again escaped with her husband through a breadfruit tree at Nini, coming out the other side and running up Kalihi Valley. As they ran, Papa shredded her *pā‘ū* (skirt) made of vines, which became the beautiful beach morning glory flowers of Kalihi Valley.

The chief, Leleho‘omao, believed the two were still inside the tree, but when he demanded that his men chop down the tree, they immediately died when wood chips and splattered tree sap touched them. A priest named Wohi was summoned, who explained that the woman must have been Papa. On the advice of Wohi, the workmen made offerings to the goddess and spread coconut oil over their bodies. With these preparations, they could then chop the tree. From the wood they made an idol named Kāmehaikana, which was worshiped on O‘ahu. The wood of the idol, as it was made from the legendary breadfruit tree, was also poisonous. At some point, the idol was moved to Maui where Kamehameha came into possession of the idol, and adopted it as a personal god. The idol had “the ability to aid worshippers in winning land and power from other people and wisely employing the best means of firmly establishing their own government, thus protecting and preserving the kingdom” (Westervelt 1963:33–34), a very appropriate god for the conqueror and overall ruler of the Hawaiian Islands.

John Papa ‘Ī‘ī presents additional information on this idol. In rituals for the god Lono (*kapu loulu*), there were three female images shown to the participants: Kalamainu‘u (also called Kihawahine), a *mo‘o* (lizard spirit); Haumea, known as Kāmeha‘ikana; and Walinu‘u, first wife of Puna‘aikoae (Wākea). The image of Kalamainu‘u was scarred in the eyes and the image of Walinu‘u had a broken nose. This is because all three women at one time had been married to Puna‘aikoae and they had fought over him in their human forms. The images mirrored the damages borne in the jealous fight (‘Ī‘ī 1959:44).

In Westervelt’s (1998:152–162) second version, the husband and wife are named Puna and Haumea. The chief of Kalihi, named Kou, killed Puna and hung his body from a breadfruit tree at the Waikahalulu pool “just below the steep diving rocks of the Nuuanu stream.” Haumea ran to the breadfruit tree, dropped her *pā‘ū*, and entered the tree. The *pā‘ū* took root and turned into a large *akala* (Hawaiian raspberry) plant. The body of Puna fell to the ground, where it was eaten by one of the dogs belonging to Kou. When the dog returned to the house of Kou, it attacked and killed the chief. Westervelt (1998:162) believed this was a later (historic) version of the original legend.

In Kamākau‘s version (1991:11–13), the couple are Kāmeha‘ikana (Haumea) and Mākea (Wākea). From He‘eia where the goddess is gathering seaweed and crabs, she runs back up the Nu‘uanu trail to meet the captors of her husband, who are taking him to Pākākā Heiau to be sacrificed. She met the men at Nini “at the leaping place (*kawa*) of the pool of Wai-ka-halulu in Nu‘uanu.” The couple escaped through the breadfruit tree and then went down to Ka‘oehuehu, at the junction of Waikahalulu and Pūehuehu (Waolani) streams. It was there Kāmeha‘ikana threw off her skirt made of beach morning glory vines. Kamakau states, “It grows there to this day—a wondrous thing, for this is a plant seen only at the seashore” (Kamakau 1991:12).

Mary Pukui (1951:137) says “Crabs are sometimes seen at the edge of a little pool at Kilohana and seaweed and beach morning-glory vines still grown where Papa dropped them as she ran to save Mākea.”

In Thrum’s (1923:196) version, the couple were Walinu‘u (Haumea) and Puna, or Punaa‘aikoae (Wākea), and the man was caught in the chief’s banana patch, taken to Honolulu, strangled, and then placed up in the breadfruit tree on the northerly side of Waikahalulu Falls.

In a version of the legend in the Hawaiian language newspaper *Kū‘oko‘a*, the skirt of Haumea, wife of Wakea, is a *pa‘u* of banana leaves. A *mele* (chant) for Haumea references this story and her residence in Kalihi.

> Haumea was a woman in the uplands of Kalihi,
>
> Lived in Kalihi and went to the sea,
>
> Entered the breadfruit called uu [*sic*],
>
> Gained another body for herself, the breadfruit
>
> The body of the breadfruit, the trunk of the breadfruit was she,
>
> The breadfruit branch was Kamehaikana,
>
> Kamehaikana was she, many her names,
>
> In them all was embodied Haumea.
>
> [Story of Makali‘i, *Kū‘oko‘a*, 13 January 1922; translated in Beckwith 1970:282–283]

In the Hawaiian creation chant, the Kumulipo, the breadfruit tree is placed at Laumiha.

> Haumea became a woman of Kalihi in Koolau,
>
> Lived in Kalihi on the edge of the cliff of Laumiha,
>
> Entered a growing tree, she became a breadfruit tree,
>
> A breadfruit-tree body, a trunk and leaves, she had […]
>
> [Kalākaua, Kumulipo, p. 62, translation after Daniel Ho‘olapa; cited in Beckwith 1970:282]

Papa and Wākea continued to live in Kalihi Valley. Downstream from their home were two stones which had *‘e‘epa* (extraordinary) powers. To prevent any trouble, Hawaiians traveling up the valley would leave *lei* (garlands) at the stones. If they did not do so, the mischievous *‘e‘epa* (gnomes) would dip branches from the *lehua* tree into the water and then sprinkle the stones, causing mist and a hard rain to fall. This gave rise to the proverb, *Ka ua poo lipilipi o Kalihi*, “Here is the sharp-headed rain of Kalihi” (Westervelt 1963:35–36).

Poepoe (n.d.:65) gives a different interpretation of this saying. He tells of the story of two lovers who hid in the forest in Kalihi Valley from their parents. It began to rain, but each time they came out from their hiding place to see if the weather had cleared, the rain still continued to fall. This continued for several days as they slept in the forest, and when they finally awoke:

> He ua ai no ko hilo aohe nae he hana ino i ke poo o kanaka elike aela me ko Kalihi ka hoolipilipi i ke poo o ke kalohe, e ole nae ho laua, o ia ai ia ua akamai i ke kalai poo – Ka Ua Poolipi-lipi-o-Kalihi. [Poepoe n.d.:12]
>
> When at length they awoke, their heads were sharpened and flattened from sleeping so long while the rain fell day and night. Hence that rain at Kalihi is called ‘the rain that sharpens the head at Kalihi,’ ‘Ka ua poolipilipi-o-Kalihi.’ Ttranslation in McAllister 1933:90]

Mary Pukui (1983:169, #1572) presents the same story for this proverb, but translates the phrase, *Ka ua ko‘i-lipilipi o Kalihi* as “the adz rain of Kalihi.”

In a continuation of the legend of Wakea and Haumea, after their escape from the breadfruit tree and the men of the chief Kumuhonua, they went to live at Palikū, the cliff that divides Ko‘olaupoko and Ko‘olauloa districts, on windward O‘ahu. The chief tried to raise an army to recapture them. The Kona chiefs came to his call, but the Ko‘olau people refused, as the couple had been kind to them.

> When Kumuhnua declared war again, the Koolau men under Kali‘u came up to Nuuanu and Kalihi. In the battle, Kumuhonu’s hip was pierced with a spear and [he was] killed near a pool. The place is called Pahu-kikala (Pierce-hip) to this day. Wakea became chief of the whole island of Oahu. [*Hoku o Hawaii*, 12 March 1928]

Sterling and Summers (1978:326–327) place this pool in Kalihi, but do not give any further information on its location.

3.2.2 The Goddess Kapo in Upland Kalihi

Haumea is the mother of Pele and her sister Kapo (Kapo‘ulakīna‘u). When the pig-god Kamapua‘a tried to rape Pele, her sister Kapo detached her vagina (*kohe*) and sent it flying so that Kamapua‘a would chase it. It landed on Koko Head in O‘ahu and later Kapo hid it in Kalihi Valley, which she made her home (Beckwith 1970:187).

According to Westervelt (1963:34), Kapo was born from Papa and Wakea as they were living in Kalihi Valley. The spirit form of Haumea created Kapo from her eyes. Her habitation was *kapu* (tabu), where no birds would sing (Beckwith 1970:186). Kapo became a guardian of Kalihi Valley, standing near a stone at the base of a hill called Kapo. There are no hills called Kapo labeled on historic or modern maps, but a hill called Pu‘u Nukohe is shown southeast and downslope of Kilohana on most maps. The “*kohe*” (“vagina”) portion of the name may be a reference to the goddess Kapo. Kapo is also the name of the *‘ili* that surrounds the peak of Pu‘u Nukohe.

According to Joseph Poepoe:

> *I ka haalele ana o ke kamahele i ka luna o Kilohana, a iho mai no ka huli ma ka aoao komohana e nana mai ai ia kai nei o ke kaona, a i ka hoea ana ilalo i ka honua, e huli aku kona nanaina i ka aoao hikina i kekahi pali e ku kilakila mai ana me kona piko e poia mau ia ana e ka ohu, a hoohele loa iho kona nanaina ma kona hulina-alo o kahikoia ana e na uluwehiwehi o ka nahele me na omaka wai aiai e oili mai ana me he mau omaka waiu la, a ma kekahi kahua palahalaha kupono mai ke kumu mai o ka pali he mau sekakia [sic] paha ka mamao, e ikeia ana kekahi pohaku ano kupanaha no i ka nana iho, he kulana o ka hale ke ike iho, aka mamua nae me he kala hale la ke ano, a mahope hoi me he hiu ia la; ua kiekie o mua a ua haahaa o hope a hiki i ka nalowale loa ana iloko o ka lepo. Ma kona hapa waiho wale maluna o ka ili lepo, he ehiku kapuai a oi kona loa, a he aneane ekolu kapuai kona luala. O ua pohaku la, oia no o Kapo e oleloia nei, a ke waiho nei ia pohaku a hiki i keia la.*

> *Wahi a kekahi mau kamaaina o ia awawa e ola nei a hiki i keia au hou, ua hoike maopopo mai lakou i ko lakou ike ulia wale ana no i keia wahine i kekahi manawa lailai o ka la i ke awakea ma keia kahua no i oleloia aela maluna.* [Poepoe n.d.:9]
>
> Translation:
>
> Going toward the town after leaving the upland of Kilohana, the visitor goes down to the valley. When he reaches it he may turn to look to another hill standing proudly with this peak always covered with mist. Looking a little way down its side, he sees a jungle of growth with waterfalls trickling like milk down it sides to the base of the pali. There is visible a peculiar stone shaped something like a house in front and a fish tail behind. It is about seven feet long and three wide. That stone is said to be tabu and it is there to this day. […]
>
> Some natives of that pali living today say that they have met this woman [Kapo] at noon when the sun is shining brightly at this spot mentioned above. [Condensed translation by Martha Beckwith n.d.; HEN II:153]

3.2.3 Pōhaku and Other Storied Places of Kalihi

Moving downhill from Kilohana, Joseph Poepoe (n.d.:69) pointed out a hill the same height of Kapo, called Ka-moho-ali‘i (labeled Popoulu on some maps). This hill is named for the brother of the goddesses, Kapo and Pele.

> *I ka haalele ana aku o na nanaina i keia kahua i hoikeia ae la, a huli pono aku ke alo i ka pali laumania e ku kiekie mai ana ma ka aoao akau, ua aneane no elike ke kiekie me ka pali me ka aoao o Kapo. O keia pali, o Kamohoaliii ia. O ke kaikunane ponoi no keia o Kapo, a o Kapoulakinau hoi, ka mea i hanauia mai mai ka piko poo mai o Haumea, a oia ponoi no ke kaikunane aloha loa o Pele, ka mea iaia ke ahi i ka auneki i ka manawa i kaua ai me Kama a o Kamapuaa hoi.* [Poepoe n.d:10]
>
> Translation:
>
> Look now at the sides of the steep cliff to the right equal in height with the side of Kapo. This hill is Kamohoalii. This is own brother of Kapo. He was born from the top of the head of Haumea. He is the beloved brother of Pele, the one who saved the fire when she battled with Kamapuaa [Condensed translation by Martha Beckwith, HEN:II:154]

Westervelt (1963:35) gives additional information on this brother. Some of the children of Haumea (Papa) were born from her body. First was Kapo, who was born from her eyes.

> Papa looked away from Kapo and there was born from her head a sharp pali, or precipice, often mist-covered; this was Ka-moho-alii. Then Pele was born. She was the one who had mighty battles with Kamapuaa, the pig-man, who almost destroyed the volcano Kilauea. It was Ka-moho-alii who rubbed sticks and rekindled the volcanic fires for his sister Pele, thus driving Kamapuaa down the sides of Kilauea into the ocean. [Westervelt 1963:35]

Two stones, named Hapu‘u and Kalaihauola, on each side of Kalihi Stream, are associated with the mysterious *‘e‘epa* that would cause rain if the proper offerings were not left near these stone. Joseph Poepoe says,

> *Ua oleloia he mau wahi eepa ka keia mai ke awawa mai o Nuuanu ka auwana ana mai ame ka nui iho o na eepa e ae, i auhee mai ka mamuli o ka hooili kaua ana o na eepa o Nuuanu a hee kekahi poe o lakou, a noho hoi laua nei i a uka o Kalihi, a aia la ihea kahi poe eepa o lakou*. [Poepoe n.d.10]
>
> They [Hapu‘u and Kalaihauola] were said to be mysterious people from this side of the valley of Nuuanu. They left Nuuanu with others of their kind because there was war in Nuuanu and some fled. Some settled in the uplands of Kalihi. [Condensed translation by Martha Beckwith, n.d.; HEN:II:154]

Poepoe (n.d.:10) located the stone where the road crosses over the stream for the second time. McAllister (1933:89) places these stones “near the head of the valley, about a mile beyond the end of the present road […] one on each side of the stream.” Catherine Summers says they were located at the foot of Pu‘u Nukohe (Sterling and Summers 1978:324). They were bulldozed in 1953 during the construction of the approach road to the Wilson Tunnel. A newspaper account of their destruction gives additional information on the *pōhaku*.

> The reason why the stones were so important is that they were believed to have been placed in the Kalihi-uka spot by the Eepa people, small folks related to the Menehunes who were driven out of Nuuanu Valley when the gods resided near the Country Club.
>
> The stones were called Hapuu and Kalaihauola and were believed to be the embodiment of two kupua goddesses. The stones stood in an area of pools of spring water. One pool was icy cold, others warm. Hawaiian mothers brought their newborn babes to the spot and bathed them in the warm spring. [Taylor 1954]

Taylor (1954) identified these pools as the same area called “Ka-puka-wai-o-Kalihi,” the “water door of Kalihi.” A pool in Kalihi Valley is shown in a photograph taken by Brother Bertram, somewhere between 1883-1905 (Figure 6), but the location of this particular pool is uncertain.

As the gods Kāne and Kanaloa traveled around the islands and in Kalihi they began to look along the hillside for *‘awa* (root used for ceremonial drink). They found the *‘awa* but could not find any water to mix it with.

> This [the spear] he [Kāne] took in his hands and stepped out on the bed of lava which now underlies the soil of that region. He began to strike the earth. Deep went the point of this staff into the rock, smashing and splintering it and breaking open a hole out of which water leaped for them to mix with their prepared awa. This pool of fresh water has been known since the days of old as Ka-puka-Wai-o-Kalihi (The water door of Kalihi). [Westervelt 1963:40]

At the base of the foothills is “Ka-elemu-wai-o-Kalihi or, as it was formerly termed, “Puka-kukae-wai-o-Kalihi.” This may also be the same place as Ka-puka-wai-o-Kalihi, where the god Kāne struck a rock to make a spring.

Figure 6. Photograph of “Kalihi Falls,” taken between 1883-1905 (Bertram Collection, Hawai‘i State Archives)

Puka-kūkae-wai-o-Kalihi translates as “The anus of Kalihi.” The rock is in the middle of the stream; it is shaped like buttocks, and has a hole through it. When the water in the stream is low, the water will flow through this hole. Poepoe claims it was Kamehameha himself who named this rock. Supposedly, chiefs used to visit the Kupehau area (Bishop Museum Site 412),where this stone is located, to gather the delicious *poi* made there. Kamehameha came to the area to rest after a battle and saw the rock.

> *I na alii e nanea ana i ka olu o ka ili i ka wai, a ma kekahi wahi paihihi uuku e kolili mai ana ka wai, ua o aku la o Kamehameha i kona nanamanalima ma kahi a ka wai e kolili mai la, a ia manawa oia i hoopuka ae ai i keia mau hualolelo: ‘Kahaha. Elemu no ka hoi kahi wai o Kalihi.’*
>
> Kamehameha stuck his finger into the hole and said, ‘Kahaha! The water of Kalihi comes from an anus!’ and from that day the name stuck to the place. [Poepoe n.d.:12; translated in McAllister 1933:90]

This led to a derisive proverb for Kalihi after Kamehameha’s conquest of O‘ahu, as noted by Mary Pukui:

Puka kūkae wai o Kalihi. Through an anus appears the water of Kalihi.

[Pukui 1983:299, #2728]

Various other fabulous *pōhaku* (rock) and rock formations (Papanuiaimoku, Ioleloa, Komohoali‘i, Hapu‘u, Kalaihauola) appear to have been located in the upper portion of Kalihi Valley.

Papa-nui-aimoku is described as a large stone buried halfway into the ground on a gradual slope “on the seaward side of the old trail, a little below the Kalihi pumping station” by an informant in 1919. The informant recalled the origin of the stone: “Kekalukalu-o-Kewa, a Kauai chief came to Oahu. He called to this stone to come up out of the ground. It came up. The hollow, below the pumping station was where it stood” (Kekalukaluokewa 1911).

A bell stone, which is a stone that makes a loud ringing noise when struck, was once located at 3550 Kalihi Valley Road. Catharine Summers said it was moved to the Bishop Museum in 1954 (Sterling and Summers 1978:323).

A long stone in the wall surrounding the Catholic cemetery was called ‘Iole-loa, named after a supernatural rat (*‘iole*=rat, *loa*=long) of Kalihi Valley (Pukui 1953).

Near the Kamehameha Schools was once a cave called Ke‘anaka‘manō, 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 Kamanaiki 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 lave 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. On the long trip of Pele’s family to Hawai‘i, it was Kamohoali‘i who acted as the navigator. Don Mitchell (1993), who said that earthquakes in 1900 caused the collapse of the cave, 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]

3.2.4 Legend of Kahalaopuna and Upland Kalihi Valley

Kalihi Valley is briefly mentioned in the *Legend of Kahalaopuna*. Kahalaopuna, or Kahala, was a noted beauty of Mānoa Valley. In jealousy over the words of two admirers who claimed Kahala had been unfaithful, her fiancé, Kauhi, bade her leave her home in Mānoa and follow him to the uplands. He killed the girl there, but she was revived by her spirit guardian (*aumakua*), an owl (*pueo*). After her revival, her fiancé demanded that she follow him several more times, each time moving farther away from Mānoa and each time killing her. In some versions, Kauhi kills Kahala five times: at ‘Aihualama Peak at Mānoa; on the ridge between Mānoa and Nu‘uanu; at the valley in west Nu‘uanu called Waiolani; at Kilohana Peak in Kalihi; and finally at the pass through the Wai‘anae mountains identified as Pōhākea in ‘Ewa (Kawaharada 1999:24).

> *Ma keia hele ana o laua, ma ka uka pili kanaka ole, ma uka o Pauoa a me Waolani, malaila, a ma uka o Kalihi, pela ko laua hele ana a Manana moe laua.* […] *A oe ae, hele aku la laua a hiki i Pohakea* […]
>
> In going they took the upper road where people seldom passed, passing along Pauoa and Waolani, then along upper Kalihi and so on to Manana, where they spent the night. […] On the next day they resumed their way until they came to Pohakea […] [Fornander 1918:5(1):188–189]

Similarly the accounts of Kalākaua (1888:515; Kahalaopuna, The Princess of Manoa), Nakuina (1998:125), and Patton (1932:44) place Kahalaopuna’s traverse of Kalihi at the head of Kalihi Valley, often near Kilohana Peak.

At Pōhākea, Kauhi buried her under a tree, so that the owl could not reach her. A traveling young man found the girl and was able to revive her by magical means. The story usually ends with a confrontation where Kahala is proven innocent of the charges of infidelity and the two slanderous admirers and her fiancé are punished for their cruelties to her (Nakuina 1998:125).

3.2.5 Other Visitors to Upland Kalihi

Kalihi is mentioned in passing in several legends and historical accounts. The chief of Waialua sent his retainer Kekupua and other workmen to search for a koa tree from which to carve a voyaging canoe. They could not find a suitable tree on the windward side of the island, and so they moved to the leeward side, passing near Kilohana in Kalihi Valley to Waolani in Nu‘uanu Valley. Here they rested in a cave at Pu‘unui for the night. While resting, they heard a humming noise, and in the morning were surprised to see a large platform built near the cave. The chief’s men returned to Waialua to tell about their unsuccessful search and the strange events of the night. The chief realized the humming noise was the sound of the *menehune*, the Hawaiian little people, working. He instructed his men to return to Pu‘unui and wait for the humming to stop. When it stopped he told them, the *menehune* will have completed the construction of his canoe. The men followed the chief’s instructions, and when the humming stopped, they saw a canoe ready to be pulled down to the coast. The canoe was named Kawa‘a (canoe)-a-Kekupua, in honor of the faithful retainer (Thrum 1998:114–116).

The pig-god Kamapua‘a once journeyed from his home at Kapolei in ‘Ewa to request fish from the O‘ahu chiefs to satisfy his brother’s craving. He traveled with his companion, Kuolokele:

> *Ua hele mai la laua a hiki i Moanalua, ke hele ala ka la e ahiahi, nolaila, ua hooman aku la no laua i ka hele ana a hiki i Kahauiki, a hele aku la no laua nei a hiki i Kalihi, ma ia wahi kapoo ko laua nei la.* [*Ka Leo o Ka Lahui*, 4 August 1891; reprinted in Akana 2004:73]
>
> They traveled until arriving at Moanalua. The sun was moving to evening so they continued to travel until Kahauiki, and they went up until Kalihi where the sun set. [Translation in Akana 2004:70]

There are a couple of accounts of armies passing through Kalihi, including Lonoikaika passing through in his attack against Kūali‘i (Fornander 1917:4[2]:410; History of Kuali‘i). In a chant for the high chief Kūali‘i, paramount chief of the Hawaiian Islands from 1720 to 1740 (Cordy 2002:19), the lands under his authority are listed as though someone is traveling around the island of O‘ahu. The chant also seems to be a play on words, as a portion of the definition of the place name also appears in the stated action (e.g., zigzagging down the edge, *lihi*, of Kalihi):

Let us abide in the hollow—of Moanalua;	*E noho kaua i ka lua—o Moanalua*;
We will bend the hau—at Kauahuiki;	*Hoopiopio hau kaua—o Kahauiki*;
And go zigzagging down the edge—of Kalihi;	*Hookeekee lihi kaua—o Kahlihi*;
Let us go up for lama-in Kapalama;	*E pii kaua i ka lama—o Kapalama*;
Then bundle and fasten on the back—at Hononunu;	*E nunu a paa hoawe—o Hononunu*;
There my hair is anointed—at Waikiki; […]	*Kiki kuu oho ilaila—o Waikiki;* […]

[Fornander1917:4(2):400–401, History of Kuali‘i]

In 1795, Kaiana, a Kaua‘i chief who had been an ally of Kamehameha, switched sides and joined the forces of the Kalanikūpule, ruler of O‘ahu and Maui. Kalanikūpule’s forces climbed over the Kalihi pass to fight against the invading armies of Kamehameha in 1795 (Kalākaua 1888:407), but were then pushed back and slain at the battle of Nu‘uanu Pali. In this invasion, no actual battles were fought in Kalihi.

Kalihi did bear the brunt of military action around 1809/1810. In that time, the chief Kuakini “absconded” with Kuwahine, the wife of Kalanimōkū, Kamehameha’s war chief. To force Kalanimoku to return her, Kamehameha helped Kalanimōkū burn the houses of villages from Waikīkī to ‘Ewa until the wife was retrieved.

> […] *a ma hope aku nā luna puhi hale. Ua ho‘omaka ‘ia ma Honolulu a me Waikīkī ke puhi ahi, a hele ma nā kaha o Wai‘alae e ho‘opuni ma Ko‘olau. A ma Honolulu, ho‘omaka, me ke koe ‘ole o kekahi hale a Kapālama, a Kalihi, a Kahauiki, a Moanalua; a komo i loko o ‘Ewa ke puhi, a pau kekahi hapalua o ‘Ewa i ke puhi ‘ia i ke ahi. Ua hō‘ike ‘o Kuwahine a ua ho‘opau ‘ia ke puhi ‘ana i ke ahi. Ua kapa ‘ia ‘o Kepuhiahiokūwahine.* [Kamakau 1996:178; originally published in *Nā Kūpepa Kū‘oko‘a*, 17 August 1867]
>
> <u>Translation:</u>
>
> He [Kamehameha] sent messengers about to have all property removed from the houses and then proceeded to set the houses on fire, beginning at Honolulu and Waikiki, one gang going by way of Waialae and along to Ko‘olau, the other toward Kapalama, sparing nothing, then on to Kalihi, Kahauiki, Moanalua, and into ‘Ewa.

> After one half of ‘Ewa was destroyed Ku-wahine was restored, and the house-burning ceased. This was called the ‘Ku-wahine burning.’ [Kamakau 1992:197]

3.3 Kapālama Ahupua‘a

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*. 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 a duenna. 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 place. This chiefess was Kapālama, the grandmother of Lepe-a-Moa. A chief of Kaua‘i, named Keahu, 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 Akua-pehu-ale (god of swollen billows), who forced them to hide in the uplands of Kaua‘i. His 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, Lepe-a-moa was born as a chicken with feathers the color of many birds. 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 parents of Lepe-a-moa had another child, a son called Kauilani, who was so strong that he was able to defeat the *kupua* who had threatened his parents. After this defeat, he went to O‘ahu to find his sister, searching for the rainbow sign of her presence. He found the compound of Kapālama, who advised him to hide in Lepe-a-moa’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 Lepe-a-moa lived with her brother thereafter, taking care of his children (Westervelt 1923:164–184).

Additional stories are told of Kauilani and his magical sister Lepe-a-moa. In one story, the Maui chief, Maui-nui, 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. Kākuhihewa had heard about the hero Kauilani and asked him if he could find some way to defeat the Maui rooster. When Kauilani agreed, Kakuhihewa gave him his daughter in marriage. Kauilani 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 Lepe-a-moa won. The daughter of the king had a child, called Kamano, who Lepe-a-moa took back to Kapālama to care for (Westervelt 1923:227–245).

In the Legend of Palila, a hero named Palila had a war club that could magically carry him far distances in a single flight. He came to the plain of Keahumoa in ‘Ewa to participate in the athletic games given by the O‘ahu king Ahupua‘a. The residence of this chief was said to be at Kalaepōhaku, near Wailuakio in Kapālama (Fornander 1918:5[1]:142, Legend of Palila). Kalaepōhaku Peak is near the intersection of School and Alaneo Street (west of the Kapālama Drainage Canal, Figure 7).

Niuhelewai at Kapālama (the former natural stream channelized as the Kapālama Drainage Canal), located seaward of King Street (Fornander 1917:4[3]:530, Legend of Kaulu; Fornander 1918:5[2]:368, Legend of Kaulu) was associated with the deity Haumea and the hero, Kaulu, who was known for his great strength. Kaulu passed through Niuhelewai and challenged Haumea to a fight on the following day. That night he borrowed the magic nets of Makali‘i and surrounded her house. When Haumea could not break through these nets and fell asleep in exhaustion, Kaulu burned down her house, killing her.

Niuhelewai (see Figure 7) was also the location for a famous battle between Kahahawai, the war chief of Kahekili, king of Maui, and the O‘ahu ruling chief Kahāhana. Fornander (1919:5[2]:498, Famous Men of Early Days) states in a footnote 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 of O‘ahu around the years 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 ‘lii 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.*
>
> Translation:
>
> When Kahekili was reigning as king of Maui, and Kahahana was king of Oahu, it was during this period that Kahahawai with a number of warriors came to make war on Oahu. In this battle the people of Oahu 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 1919:5(2):498–499, Famous Men of Early Days]

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*, “Waipio‘o of the secret rebellion” (Pukui 1983:319, #2918). 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*

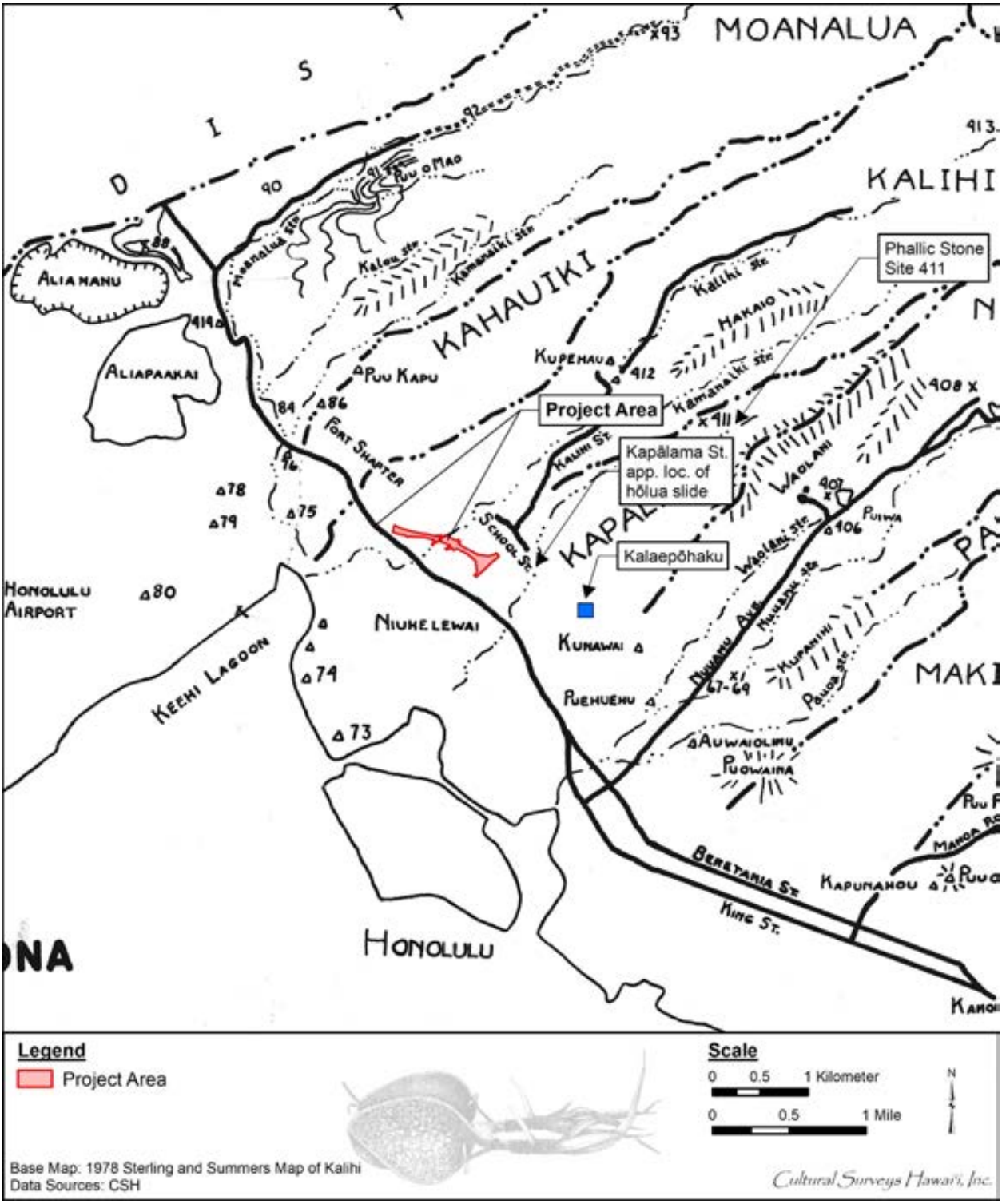

Figure 7. Portion of map from Sterling and Summers (1978), showing the project area; map indicates the location of some place names, including Niuhelewai, Bishop Museum Site 411, a phallic stone

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,* 30 March 1867]

Translation:

[…] 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 Oahu chiefs were killed and the chiefesses tortured. [Kamakau 1992:138]

Section 4 Historic Background

4.1 Kalihi Ahupua‘a in the Early Historic Period

By the time the islands were found by European explorers, Kalihi Valley had a large resident population supporting themselves by extensive agricultural developments along the valley floodplains. Evidence of the religious and political aspects of Hawaiian society are noted in the descriptions of various Kalihi *heiau*, trails connecting Kalihi to other O‘ahu population centers and island districts, and fishponds along the shoreline where Kalihi Stream meets Ke‘ehi lagoon.

Otto von Kotzebue’s journal and map of Honolulu provide one of our earliest written accounts of the environs of seaward Kalihi ca. 1817. The following account is of a trip toward Pearl Harbor commencing near the mouth of Nu‘uanu Stream:

> The way now lies to the west, through a beautifully cultivated valley, which is bounded towards the north by romantic scenery of woody mountains, and on the south by the sea. The artificial taro fields, which may justly be called taro lakes, excited my attention. Each of them forms a regular square of 160 feet, and is enclosed with stone all round like our basins. This field, or rather this pond […] contains two feet of water. In the spaces between the fields, which are from three to six feet broad, there are very pleasant shady avenues, and on both sides bananas and sugar cane are planted. […] [T]he fish which are caught in distant streams thrive admirable when put into them. In the same manner as they here keep river-fish, they manage in the sea with sea-fish, where they sometimes take advantage of the outward coral reefs, and draw from them to the shore a wall of coral stone. Such a reservoir costs much labor, but not so much skill as the taro fields, where both are united, I have seen whole mountains covered with such fields, through which the water gradually flowed; each sluice formed a small cascade, which ran through avenues of sugarcane, or banana into the next pond, and afforded an extremely picturesque prospect. Sugar plantations and taro fields alternately varied our way, with scattered habitations, and we had gone unawares five miles to the large village of Mouna Roa [Moana-lua] […] [Kotzebue 1967:339–341]

Kotzebue’s map of Honolulu (Figure 8), although somewhat schematic, shows large taro fields (and trees) on both sides of the mouth of Kalihi Stream extending to the coast. The Kotzebue map also appears to show a network of fishpond walls sealing off the shallows near the mouth of Kalihi Stream. If the fishpond wall to the southwest of Kalihi Stream, corresponding to the wall of the Loko Weli fishpond, is drawn fairly accurately, then the coastal area may have been mostly impounded coastal shallows in 1817. While Kotzebue appears to show no houses amongst the taro *lo‘i* (irrigated taro patches) at the mouth of Kalihi Stream, he does show four huts on the islet (Moku Moa) just offshore. The path shown is likely the main trail traveled by Kotzebue himself.

John Papa ‘Ī‘ī describes the trail (around the year 1810) from Nu‘uanu to Moanalua:

> 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, up to the other side of Kapalama, to the plain of Kaiwiula; on into Kahauiki and up to the other side; turned right to the houses of the Portuguese people. [‘Ī‘ī 1959:95]

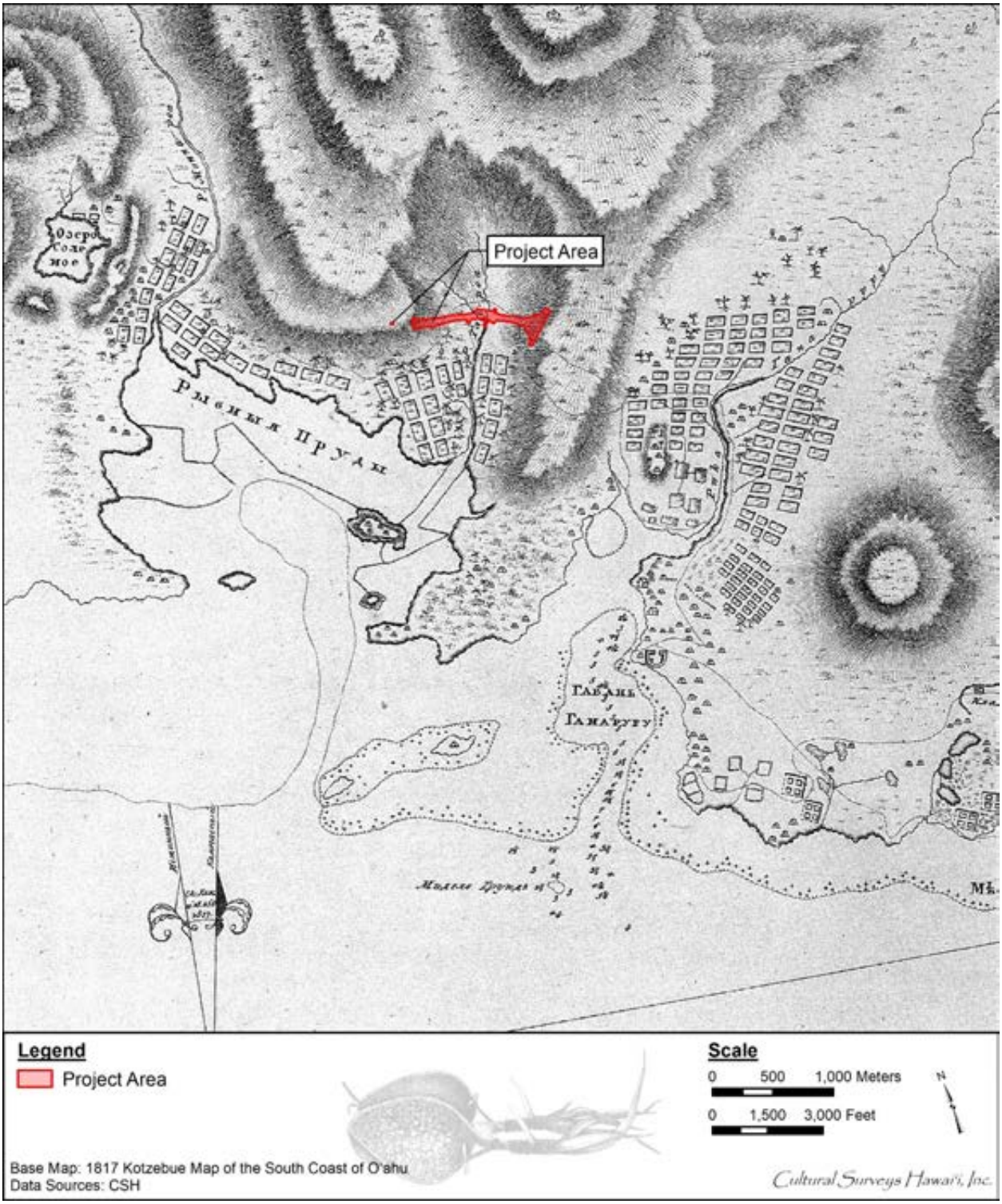

Figure 8. Portion of 1817 map of South O‘ahu, by Otto von Kotzebue of the Russian ship *Rurik*, showing density of habitations and agriculture around Kalihi Stream (this early map should be understood as a “sketch”)

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‘uanu Stream, a relatively uncultivated plain as the trail traversed Kapālama and Kaiwi‘ula, and then more *lo‘i* on Kalihi Stream.

E. Craighill Handy noted the presence of these taro fields still existing in the 1930s. These fields would have been mainly in Kalihi Kai and Kalihi Waena.

> Extensive terraces covered all the flatland in lower Kalihi Valley for approximately 1.25 miles on both sides of the stream. Above this the valley is too narrow for terraces for a mile or more; but in upper Kalihi there are numerous small areas that were developed in terraces. [Handy 1940:79]

F.D. Bennett (1840) offered the following account of Kalihi Valley ca. 1834:

> The valley of Kalihi succeeds to that of Anuuana [Nu‘uanu], but is less bold and diversified in its scenery. Human dwellings and cultivated lands are here very few, or scattered thinly over a great extent of, probably, the finest soil in the world. The commencement of the valley is a broad pasture-plain, the tall grass waving on every side, and intersected by a foot-path, reminding one forcibly of the rural scenes which precede the hay-harvest in England. Kalihi has a pass to the vale of Kolau similar to the pari [pali] of Anuuana, though more precipitous, and only employed by a few of the islanders who convey fish from Kolau to Honoruru. […] [F.D. Bennett 1840:1:202]

Numerous taro pond-fields, or *lo‘i*, were claimed during the Māhele, particularly along the Kalihi and Niuhelewai streams, which were the east and west boundaries of Kalihi. However, on the flat of Kaluapuhi where Kalihi Kai meets the ocean, there is no indication of taro *lo‘i* or fresh water sources. E.S. Craighill and Elizabeth Handy described Kalihi in the time of native planters:

> Kalihi had a shallow seaside area, now the shore of Kalihi Basin, that was, like that of Moanalua, ideal for the building of fishponds, of which there were six. On the flatlands below the valley there were extensive terraces on both sides of the stream, while along the stream in the lower valley there were numerous areas with small terraces. The interior valley was rough and narrow and not suitable *for lo‘i,* but it would have been good for sweet potatoes yams, wauke, and bananas which probably were planted there. [Handy and Handy 1972:475]

Several early photographs show habitations near Kalihi Stream (Figure 9 and Figure 10).

The United States Fish Commission Report for 1903 (Cobb 1905:748) lists 12 fishponds located on the periphery of Ke‘ehi Lagoon which were in operation in 1901, with a total of 857 acres. Cobb lists the acreage of the five Kalihi Ponds as follows:

Kalihi Fishponds	Acreage
Apili	28
Pāhounui	26
Pāhouiki	14
Auiki (partially filled)	12
Ananoho	52

Figure 9. Circa 1884 photograph of thatched houses in Kalihi Valley (colorized in Photoshop software for contrast) (Hawai‘i State Archives)

Figure 10. Photograph of Kalihi Valley, taken between 1883-1905 (Bertram Collection, Hawai‘i State Archives)

These fishponds are shown on an 1890 map of Honolulu by M.D. Monsarrat (see Figure 14). The Hawaiian word *apili* means “caught, snared, or stuck.” The land around the fishpond in Kalihi once belonged to the Adams family. It was there that Captain Alexander Adams had his famous gardens, which was quite a place of resort for strangers and whale men, about 1850. The fishpond is yet famous for the superior flavor of its fish, particularly the *awa* (milkfish), which, eaten raw, is esteemed a rare treat by native epicures (*Saturday Press*, Dictionary of Hawaiian Localities, 28 July 1883).

Alexander Adams was a Scotsman who came to the Hawaiian Islands in 1811 on the Boston trading vessel, the *Albatross*. He became a friend to Kamehameha I, who made him the captain of his personal fleet of ships. In 1816, he sailed the *Kaahumanu* to Kaua‘i to expel the Russians from their forts on that island. In 1817 he sailed to Canton on the *Forrester* to sell a load of sandalwood for the king. During Kamehameha II’s reign, he encouraged the king to allow the first American missionaries to stay in the Islands and helped design the Hawaiian flag, placing the Union Jack in one corner. In 1823, he became the first official pilot for Honolulu Harbor, a job he held for 30 years, as noted by George Simpson in 1842. Simpson was a representative of the Hudson’s Bay Company, which set up a trading company in Hawai‘i in the 1820s.

> On coming in sight of Honolulu […] we had made signals for a pilot by hoisting our colors and very shortly two came off to us. [Steven] Reynolds, an American, boarding the Joseph Peabody, and ‘Old Adams,’ and English tar […] taking the Cowlitz in his charge. ‘Old Adams,’ who knows his work well, is very tenacious of his official dignity; and we are told that when he was last autumn piloting the Vincennes, he flared up at some interference or other on the part of Commodore Wilkes, called his boat along-side and left the vessel, and her commander’s superior judgment to boot, in the lurch. [Taylor 1922:175]

In 1844 Adams retired to an over 300-acre section of taro land in Kalihi, granted to him by Kamehameha I and confirmed during the Māhele. On this land, he grew fruit and entertained lavishly (Daws 1968:126; Day 1984:1).

The American diplomat David Lawrence Gregg was invited several times to dine at Adams’ estate in Kalihi during his visit to the Islands in 1853–1858 to explore the possibility of annexing of the Islands to the United States.

> Monday, July 31, 1854 […] Mechanic Fire Engine Co. No. 2 gave a ‘Luau’ or dinner at Capt. Alexander Adams in Kalihi Valley, about 2½ miles distant, at which I was present by invitation. The table was loaded in profusion, with pigs, turkeys, chickens, fruits, and every thing else useful or desirable on such occasions. […] Wednesday, August 9, 1854. […] Went to Kalihi at 1½ o‘clock P.M. and dined there. The affair was a regular ‘luau’ given on the anniversary of the death of Capt. Adam’s son who died last year of the small pox. Several hundred people were present. [King 1982:174, 178]

Salt pans were depicted in various historic maps of the Kalihi region. In an 1870s map of Moanalua and Kahauiki, the salt pans are shown just south of Kalihi Stream adjacent to Loko Apili. A 1922 fire control map shows salt beds inside Apili Pond. There is also direct reference to the salt pans of Kaihikapu, a large fishpond on the west side of Ke‘ehi Lagoon (McAllister,

1933:93). Royal Patent 2388, issued to a person named Meeks, notes there were salt ponds adjacent to Apili Fishpond called “Punaula” (Waihona ‘Aina 2020). “Talk story” with one Nahinu descendant suggests the Nahinu ‘Ohana (family) was harvesting salt on their land. Mr. Ah Tou, claims that Nahinu used to have salt ponds where white salt was made (personal communication, G. Ah Tou, 25 June 2002). Others from the Nahinu family remember salt making as part of traditional practice of the general area. Mrs. Snowden recalls visiting relatives in Moanalua where everyone ate the local gray salt. Having grown up on Kaua‘i, where red salt was the norm, the gray salt looked “dirty” (personal communication, B. Snowden, 16 July 2002). George Kaeliwai, who grew up in Kalihi Kai, mentioned the Lee Family, who ran the salt flats down at Pu‘uhale (personal communication, G. Kaeliwai, 16 July 2002; from informant interviews in Bushnell and Hammatt 2002).

4.2 Kalihi Ahupua‘a in the Mid-1800s and the Māhele

Records of Land Commission Awards (LCAs) associated with the Kuleana Act of 1850 allow us to reconstruct something of the land use pattern in Kalihi at that time. Undoubtedly residential patterns had changed from pre-Contact times as a result of massive depopulation owing to introduced diseases on the one hand and in-migration into greater Honolulu from outlying areas on the other hand. The pattern of land holdings ca. 1850 suggests the majority of Hawaiians in the *ahupua‘a* (traditional land division) were living relatively close to Kalihi Stream, inland of present day Dillingham Boulevard and particularly in the “Kaluaopalena” area north of the present project area (Figure 11 and Figure 14). Coastal habitation was somewhat less than might have been expected. This may have been because the coast was exposed to occasional storm surf, high winds, tsunami, and hurricanes or it may have reflected a cultural pattern in which relatively few people lived close to fishponds. It may simply have been an avoidance of the low-lying coastal mudflats which were close to the water table.

The Waihona ‘Aina database (Waihona ‘Aina 2020) lists 219 *kuleana* (title) claims for Kalihi; of these 113 were awarded. The locations of some of these claims, in relation to the project area in Kalihi, can be seen on the 183 Brown map (Figure 12). As the map shows, virtually the entire project area is covered with Land Commission Awards, some large—such as the awards to Alexander Adams, George Beckley, and M. Nahinu—and others about 1 acre in size or less. At least 14 portions (*‘āpana,* or lots) of LCAs fall within the boundary of the project area as summarized in Table 1. A sample of several Land Commission Awards are presented in detail in Appendix A. The awards generally consisted of small lots of four to seven “patches” for irrigated *kalo* (taro) cultivation, *kula* (land used for dryland cultivation or for pasture) land, and house lots. Some of the awards mention adjacent streams or *‘auwai* (irrigation ditches).

Lands in Kalihi Kai were principally awarded to very notable people, including advisors to the Kamehameha line or to royalty themselves, most likely on account of the abundant fishponds in the locality. Queen Kalama was awarded a house lot in Puuhale, Kalihi Kai (LCA 2038) adjacent to Loko Auiki. Kalama Kapakahaili, a descendant of the Moana family from Hawai‘i Island, was married to Kauikeaouli, Kamehameha III (Kamakau 1992:341). As Dowager Queen, Kalama was awarded some of the richest lands in the kingdom, including Waikahalulu water rights, fronting Honolulu (Kame‘eleihiwa 1992:264).

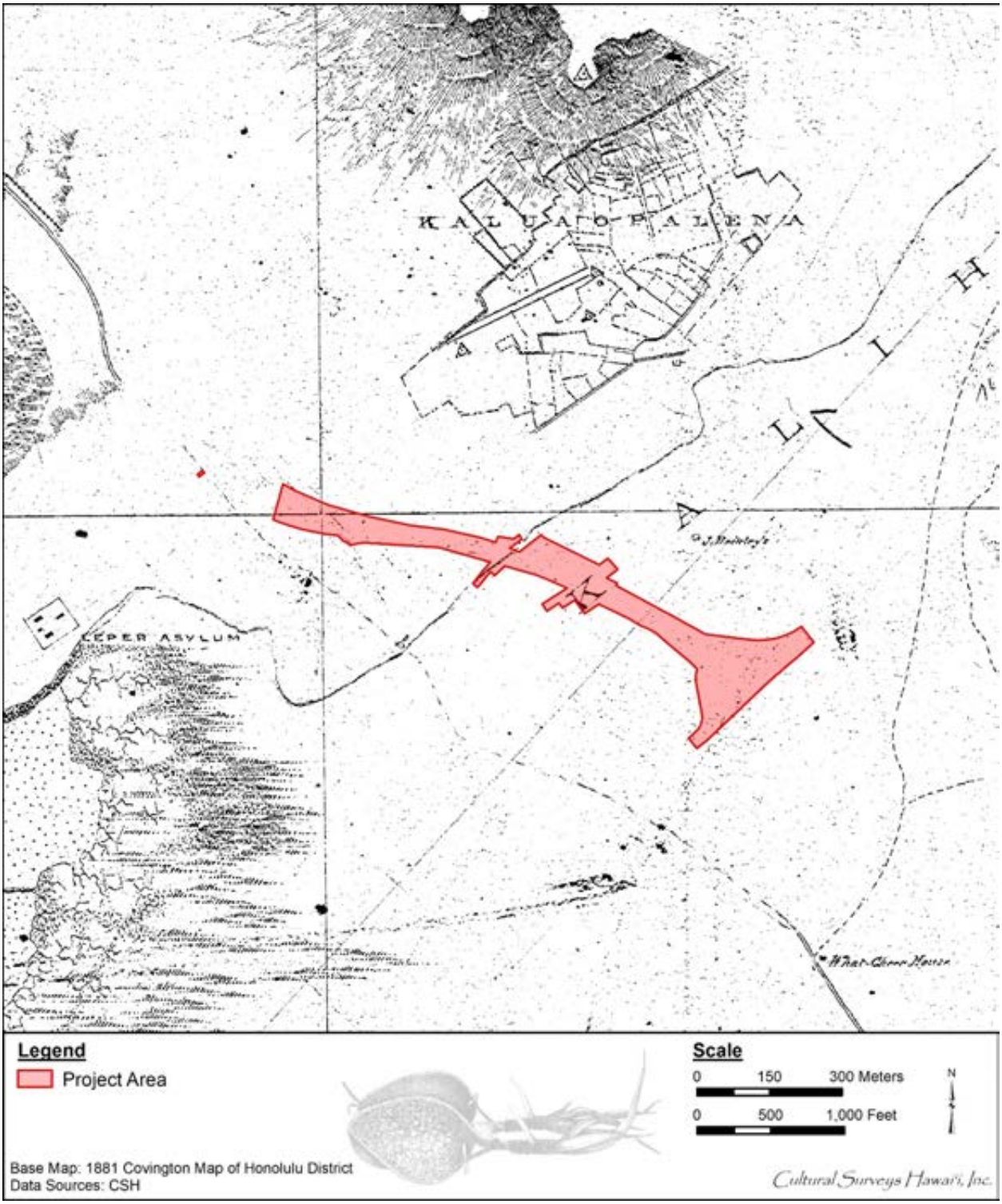

Figure 11. Portion of 1881 Covington map of Honolulu District showing the project area

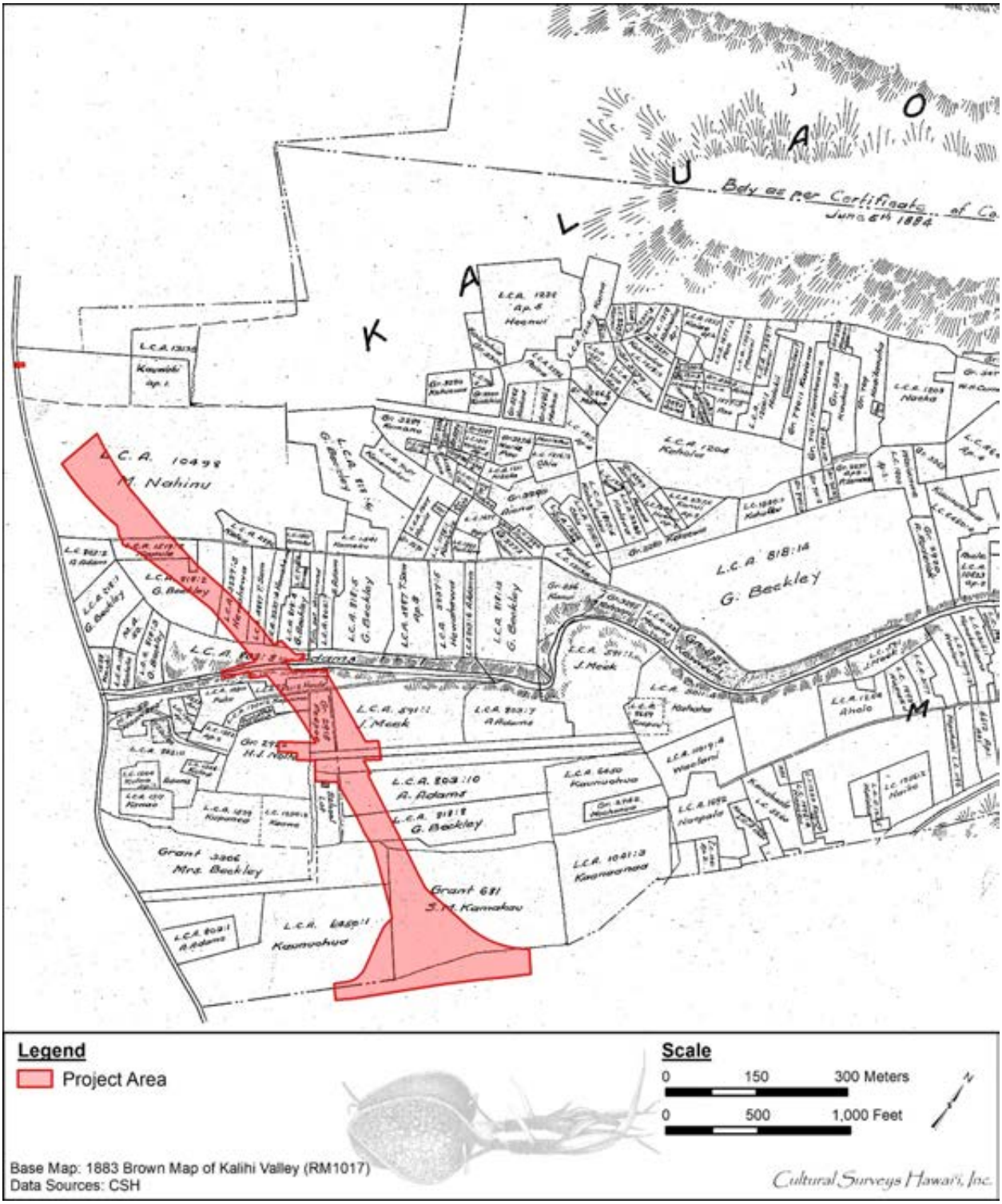

Figure 12. Portion of 1883 Brown map of Kalihi Valley (RM 1017) showing the project area

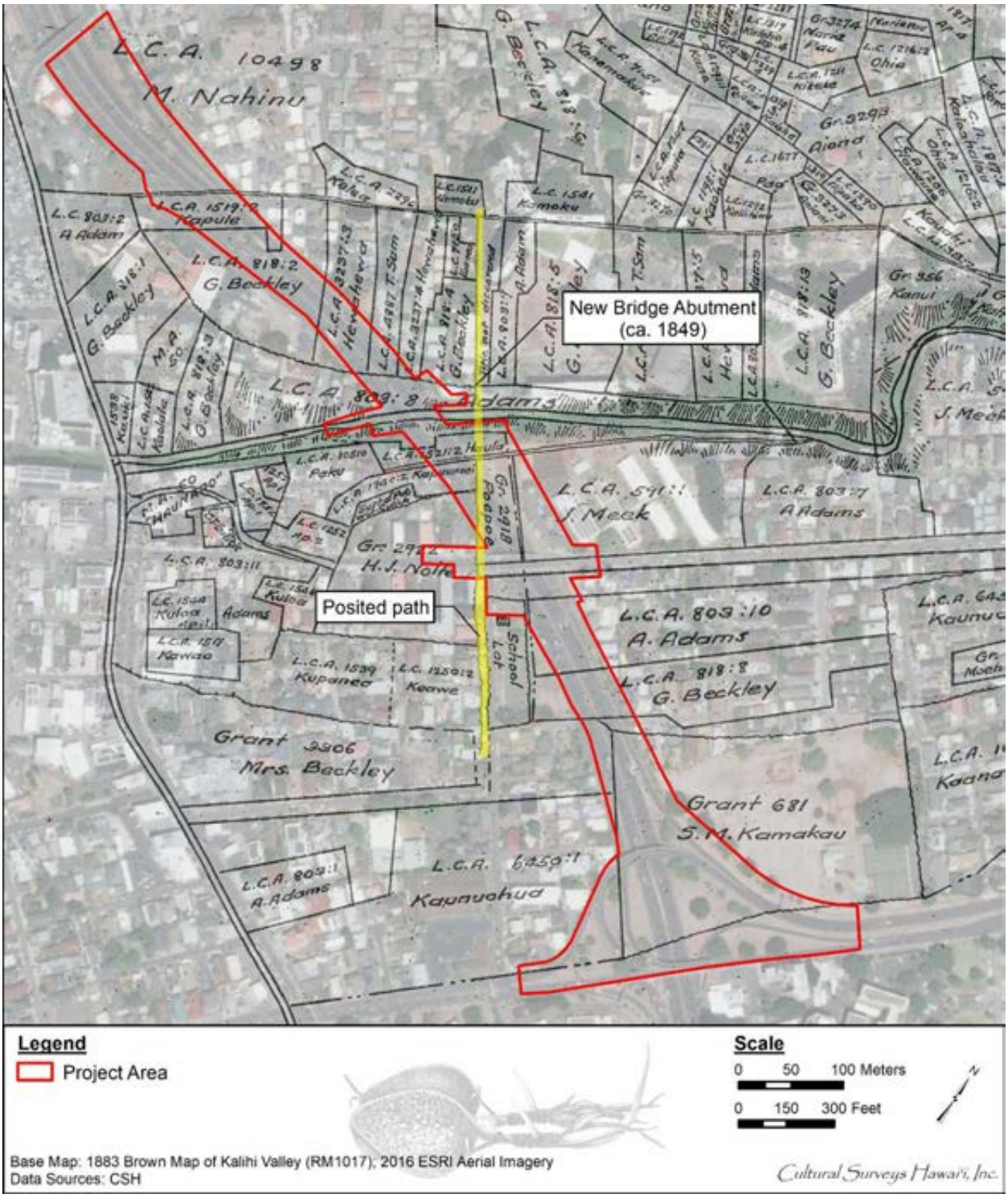

Figure 13. Portion of 1883 Brown map of Kalihi Valley (RM 1017) showing the indicated location of a “new bridge abutment” (ca. 1849) on the southeast corner of George Beckley’s LCA 818:4 and the posited alignment of a path that would have crossed the stream connecting with the school lot (base map: 2016 ESRI)

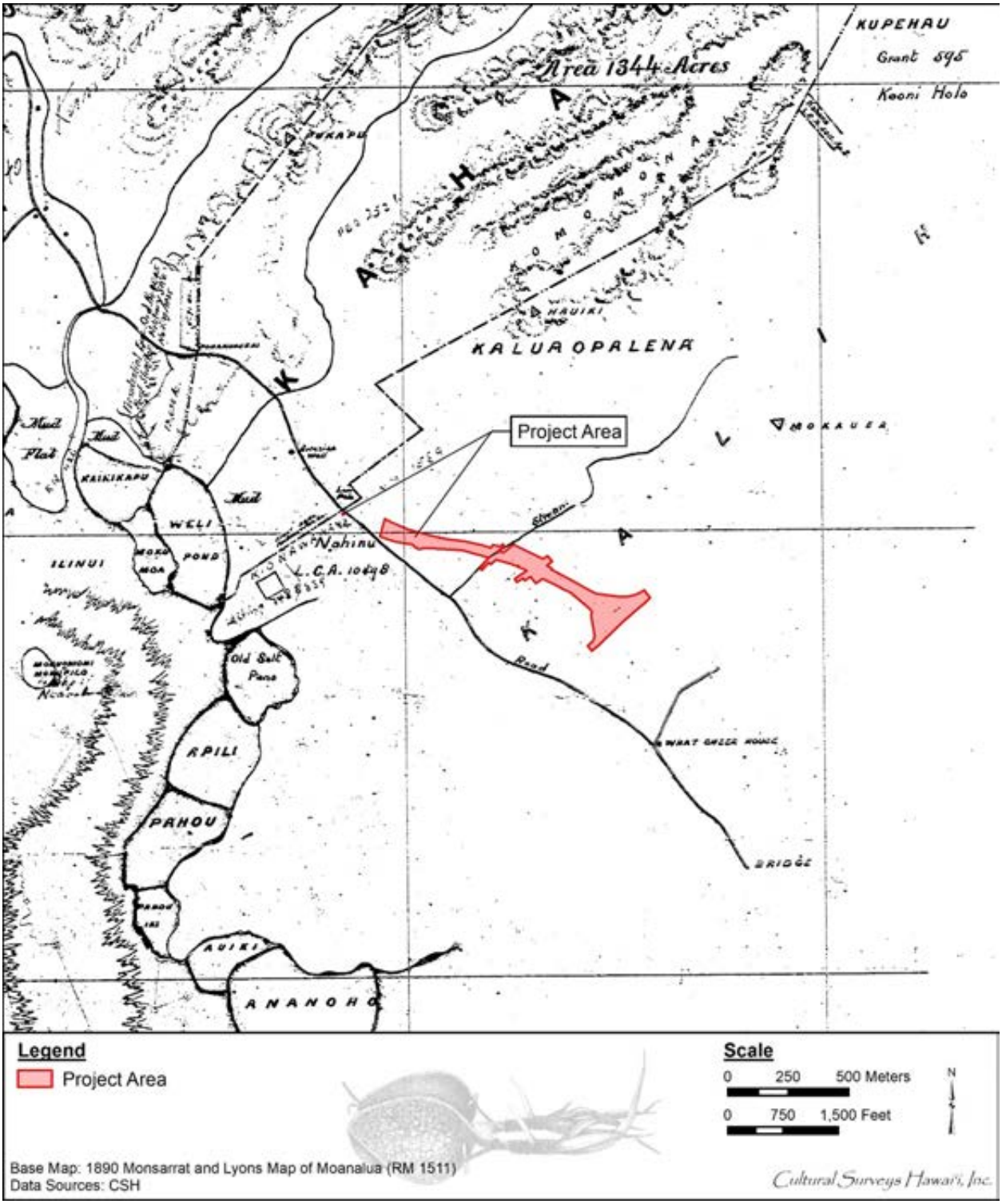

Figure 14. Portion of 1890 Monsarrat and Lyons map of Moanalua (RM 1511) showing the project area and the array of fishponds at the coast

Table 1. Land Commission Award (LCA) data

LCA #	Awardee	Location	Summary of Land Use
591:1	J. Meek	Kalihi	One *lo‘i*
803:8	Adams	Kalihi	*Lo‘i*, pastures (*kula* land), and *loko* (fishpond) (292.41 acres)
803:10	Adams	Kalihi	
818:2	G. Beckley, heirs of	Kalihi	One farm with fishing grounds called Kaliheawa, Beckley claimed many (13?) small parcels near Kalihi Stream near the present project area
818:4	G. Beckley, heirs of	Kalihi	
818:8	G. Beckley, heirs of	Kalihi	
1519:2	Koikumuole for Kapule	Kekuaali‘ili‘i, Kalihi	*Mo‘o‘āina*, bounded to the north by *konohiki* land, east by *kō‘ele* land, south by *konohiki* land, and west by the land of Alika
1521:2	Haula	Kalihi, *‘ili* of Niau	17 *lo‘i* and one house
1740:4	Kapuunoni	Kalihi	*Kahuahale* (“House foundation or site”)
3237:3	Hewahewa	Kalihi	No description of land use in award
3237A	Hewahewa	Kalihi	
4887	T. Sam	Kalihi, *‘ili* of Kaaleo	Four *lo‘i* and two houses
6450:1	Kaunuohua for W.L. Moehonua	Kalihi, *‘ili* of Mokauea,	Huge lands claimed with a 265-acre ‘Āpana 1 claim extending from far off-shore into “*kula o Kaiwiula*” with a *mauka* neck extending north of *Ala Aupuni* (King St) into the east end of the present project area; no description of land use in award
10498	M. Nahinu	Kalihi	Six *pō‘alima* (land worked for the *ali‘i*) *kalo* patches and one pasture

Another high ranking *ali‘i*, Kaunuohua, received land in Kalihi during the Māhele. Kaunuohua was a female descendant of a high ranking *ali‘i* of Hawai‘i Island, Kalaninui‘īamamao, father of Kalani‘ōpu‘u. She was also Kamehameha IV (Alexander Liholiho)’s guardian. Though she had many lands prior to the Māhele, or the division of lands in 1848, most of these were lost. The three exceptions were Pu‘ulena in Waikīkī, Mokauea in Kalihi, and Kalaupapa on Moloka‘i (Kame‘eleihiwa 1992:249). The huge Mokauea ‘Ili portion of her land claims in Kalihi (LCA 64505: ‘Āpana 1) extended into the southeast portion of the project area (by Kalihi Street, *makai* of the H1 Freeway) (Barrère 1994:286).

Hewahewa, a descendant from the Paoa priestly class who served three of the Kamehamehas, was awarded the *‘ili* of Kaluapulu in Kalihi, which included fishponds at Kalihi Kai (Kamakau 1992; LCA 3237). A second *kahuna* (priest; expert) of the same Hewahewa line, Nahinu, was also awarded lands in Kalihi, near the outlet of the Kalihi Stream (Bushnell and Hammatt 2002:6). Nahinu also served as *konohiki* (foreman) for Kalihi Kai during the time of the Māhele (Landrum and Klieger 1991:22–23). Kamakau mentions the two *kahuna* as contemporaries skilled in diagnosis of illness:

> Boki returned and lived at his place at Beretania and devoted himself to medicine, in which he was proficient, and all those joined him who were skilled in placing pebbles [in diagnosis], such as Kaao, Kuauau, Kinopu, Kahiole, Nahinu, Kekaha, Hewahewa, and their followers and other kahunas besides. [Kamakau 1992:291]

Apparently, *kahuna* were given lands near fresh water because it was important for them to practice their *ho‘oponopono* (spiritual consultations) there (Bushnell and Hammatt 2002:6).

Other large landowners, besides Captain Alexander Adams (awarded 300 acres), included George Beckley (68 acres) and Hapakuka Hewahewa who was a *konohiki* (land steward) for the high *ali‘i* (133 acres in the *‘ili* of Mokauea). Beckley, like Adams, had served under Kamehameha I and II, as a harbor pilot and as the commander of the Honolulu fort from 1816. He died in 1826, but his heirs were awarded 70 acres. The account for George Beckley’s LCA 818:4 (see Appendix A) references a “new bridge abutment” (ca. 1849). The posited alignment of a path that would have crossed the bridge over Kalihi (Kahoewai) Stream connecting with the school lot to the southeast would have crossed the present project area (see Figure 13).

Early immigrants like Adams and Beckley were also given lands in Kalihi Waena. In the early nineteenth century, Captain Adams grew a wide variety of fruits on his upper Kalihi estates. In the late nineteenth century and early twentieth century, Kalihi Valley was still noted for its fruit cultivation. An 1880 visitor to the Islands described one such visit to an orchard in the back of Kalihi Valley:

> What a deepening delight it was when, having left the city and the beaten road and crossed the opening uplands, we plunged into the valley itself, and now with a dash through the guava-bushes or the tall grass interwoven with ferns, now between cliffs where the candle-nut trees clung like goats or went bounding past us as we shot by them on our horses, now fording a stream, now scampering over a hillock, now hugged so closely by crowding forest-trees that we seemed in danger of being swept from our horses, now reaching a brief interval of clearing and speeding our beasts to the woods again, on we went, the valley growing thicker in foliage, darker

> and more damp as we west on, and at last, when the only possible remaining pathway seemed to run up a tree, we found ourselves close upon the Morris hermitage! Clearly our exile would prove no anchorite, for his dwelling was luxurious in vegetation. All the profitable fruits of the land were growing in abundance around him. Oranges hung like starry worlds in the firmament above us. Bananas in every stage of greenness hung from their upright staves, surrounded by waving pennons of prodigious leaves. Limes and loquots filled the intervals or the orchard, and all around were other tropical trees whose fruit was not yet in its season. […] At the departure of the steamer from Honolulu, Mr. Morris would go down to ship his fruit for the States, and attend to the little shopping his narrow household required. [Chaney 1880:21–22]

Various other crops were also grown in Kalihi Valley. Around 1828 and 1829, an Englishman named John Wilkerson tried to set up a sugar plantation in Mānoa, also planting a few coffee trees. Slips from these trees were also planted in Niu and Kalihi valleys (Kuykendall 1938:173).

4.3 Kapālama Ahupua‘a in the Early Post-Contact Period

The extreme east end of the project area is within the *ahupua‘a* of Kapālama, situated between the *ahupua‘a* of Nu‘uanu to the east and Kalihi to the west. Although Kapālama is not a major river valley like Nu‘uanu 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* system, and the protected shoreline and fringing reef would have allowed for ease of ocean access to the productive near-shore fisheries. Handy (1940:79) reports, “Kapalama 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.”

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 set aside several large tracts, including tracts in Kapālama, to grow crops for their own use and for trade with visiting ships. The Hawaiian historian, Samuel Kamakau (1992:190), noted, “After the pestilence had subsided the chiefs again took up farming, and Kamehameha cultivated land at Waikiki, Honolulu, and Kapalama, and fed the people.”

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]

4.4 Kapālama Ahupua‘a in the Mid-1800s and 1900s

In the 1790s, after Kamehameha had conquered O‘ahu, Kapālama is specifically mentioned, along with Nu‘uanu, Manoa, and Waikiki, as having been “farmed” by Kamehameha: “He also lived in Honolulu, where his farms at Kapalama, Keoneula, and other places became famous, These tasks Kamehameha tended to personally, and he participated in all the projects” (‘I‘ī 1959:69)

The desirability of Kapālama Ahupua‘a is evidenced in that Kamehameha “kept of himself” the *ahupua‘a* during the post-1795 division of O‘ahu lands (Kame‘eleihiwa 1992:59). Kapālama remained with the Kamehameha Dynasty through his grandchildren Moses Kekuāīwa, Victoria Kamāmalu and Lot Kamehameha, eventually becoming part of the Bernice Pauahi Bishop Estate.

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 founding of schools to educate Hawaiian children (Mitchell 1993:9).

Subsequent to the Māhele award for the bulk of the *ahupua‘a*, individual *kuleana* lots were awarded pursuant to the 1850s Kuleana Act. Roughly 100 *kuleana* lots were awarded in Kapālama, with the bulk of these *kuleana* located on the flood plain to the southeast of the present project area and including house and *lo‘i* for the cultivation of *kalo* (taro). By the late 1800s, rice and pineapple cultivation had replaced taro in the former *lo‘i* of Kapālama (Figure 15). This area east of Houghtailing Road was clearly intensively utilized for both permanent habitation and agriculture.

4.5 Kalihi-Kapalāma in the Twentieth Century

4.5.1 Residential and Commercial Development of Kalihi and Kapālama

In the twentieth century, the coastal and central sections of Kalihi and Kapālama became a suburb of Honolulu. The lower areas, within the current project area, were often grouped together as Kalihi-Kapālama or Kalihi-Pālama. Thus the twentieth century developments of these two *ahupua‘a* will be discussed together. Historic maps document the traditional Hawaiian landscape of Kalihi-Kapālama and the development of the project area road corridors during the second half of the nineteenth century and the first decades of the twentieth century.

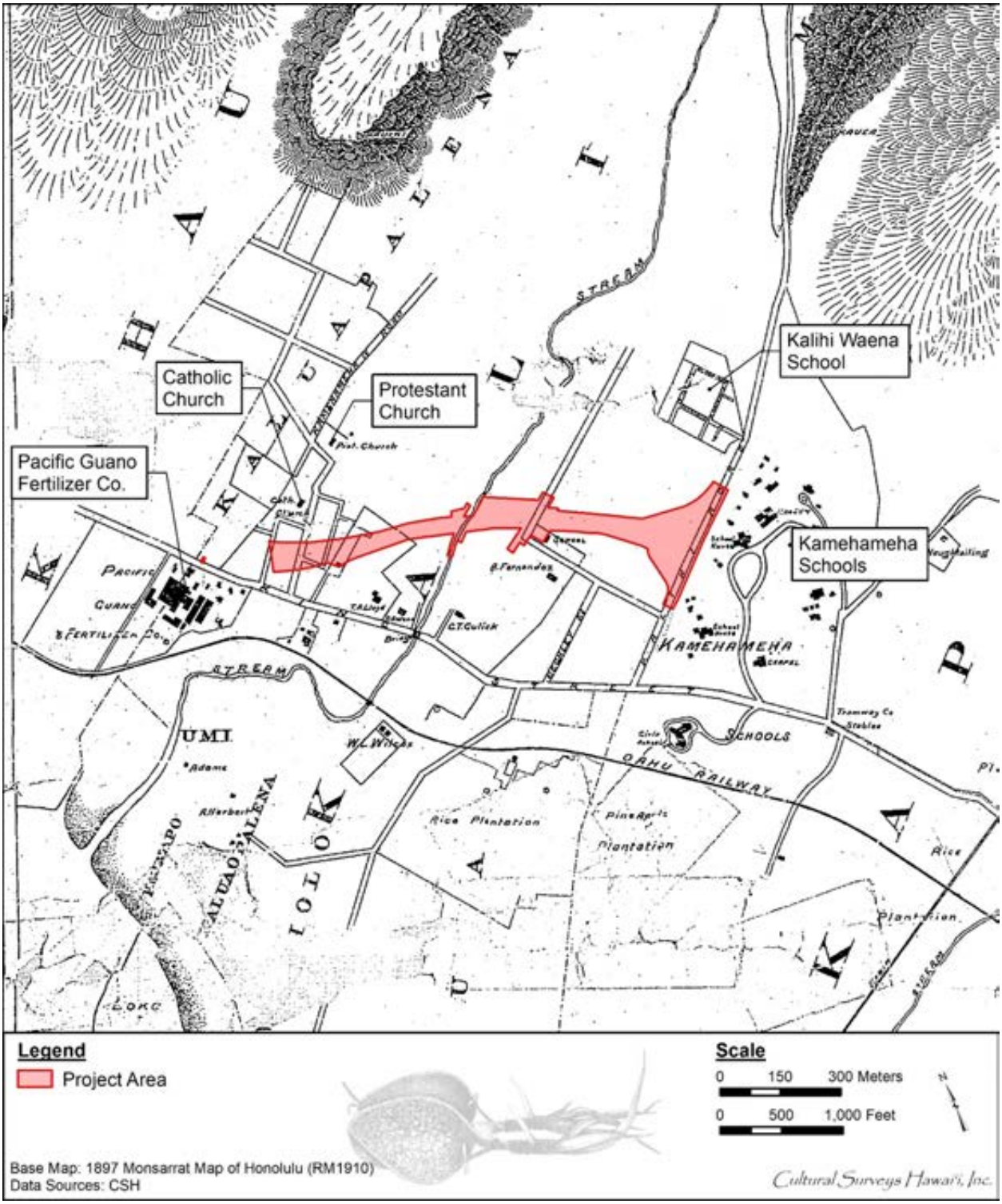

Figure 15. 1897 M.D. Monsarrat map of Honolulu (RM 1910) showing the project area

An 1897 map of Honolulu by M.D. Monsarrat (see Figure 15) indicates the Kalihi-Pālama area is considered the western edge of the greater Honolulu urban area. King Street is the main east-west thoroughfare, paralleled by the tracks of the Oahu Railway and Land Company (OR&L), and Kamehameha IV and Kalihi are the main *mauka-makai* roads. The fishponds on the Kalihi coast are still in use, but the area inland has been converted from taro fields to rice fields. Outside the project area on the west is the complex for the Pacific Guano Fertilizer Company, which provided many jobs for residents. Outside the project area to the east is the location for the first campus of the Kamehameha Schools, later the location of Bishop Museum. Within the project area, two churches are pictured, a “Catholic Church” on ‘Ōmilo Lane and a “Protestant Church” on Hiu Street just north of the west end of the project area. The establishment of churches before the year 1900 is important not only for the historical significance, but also because there may be undocumented burials near these churches; these two churches appear sufficiently *mauka* to be non-issues for the present project.

Clearly the Kalihi Road and Gulick Avenue cross streets in the project area were established quite early (see Figure 15, Figure 16, and Figure 17) and by 1919 there are many homes developed within the project area (Figure 18). Portions of several roads (and their associated housing developments) established by 1920 (including Kamehameha IV Road, Walter Lane, Beckley Street, and Nakuina Street) would be demolished by freeway construction (Figure 19). The density of homes would gradually increase throughout the twentieth century into the 1950s (Figure 20 through Figure 26).

4.5.2 H1 Freeway History

As the project area lies primarily if not entirely within the confines of the H1 Freeway ROW, it is appropriate to give a little background of the freeway’s history. It appears construction for the freeway 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 H1 Freeway, it was the first time federal money was to be used in Hawai‘i for a segment to be included in the interstate highway system. Prior to 1960 the H1 Freeway was called the Lunalilo Freeway. The website AARoads has compiled a timeline for the H1 Freeway construction (see Table 2). AARoads 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” (AARoads 2020).

The H1 is depicted as “under construction” on the 1959 USGS map (Figure 27). The precise location of a 1959 photograph of H1 Freeway excavation/construction (Figure 28) is not altogether clear; it is suggested as representative of the extent of the excavation that occurred in most of the present project area. The 1963 USDA aerial photograph (Figure 29) shows the newly constructed freeway configuration. The project vicinity is much the same in 1978 (Figure 30) and up to the present.

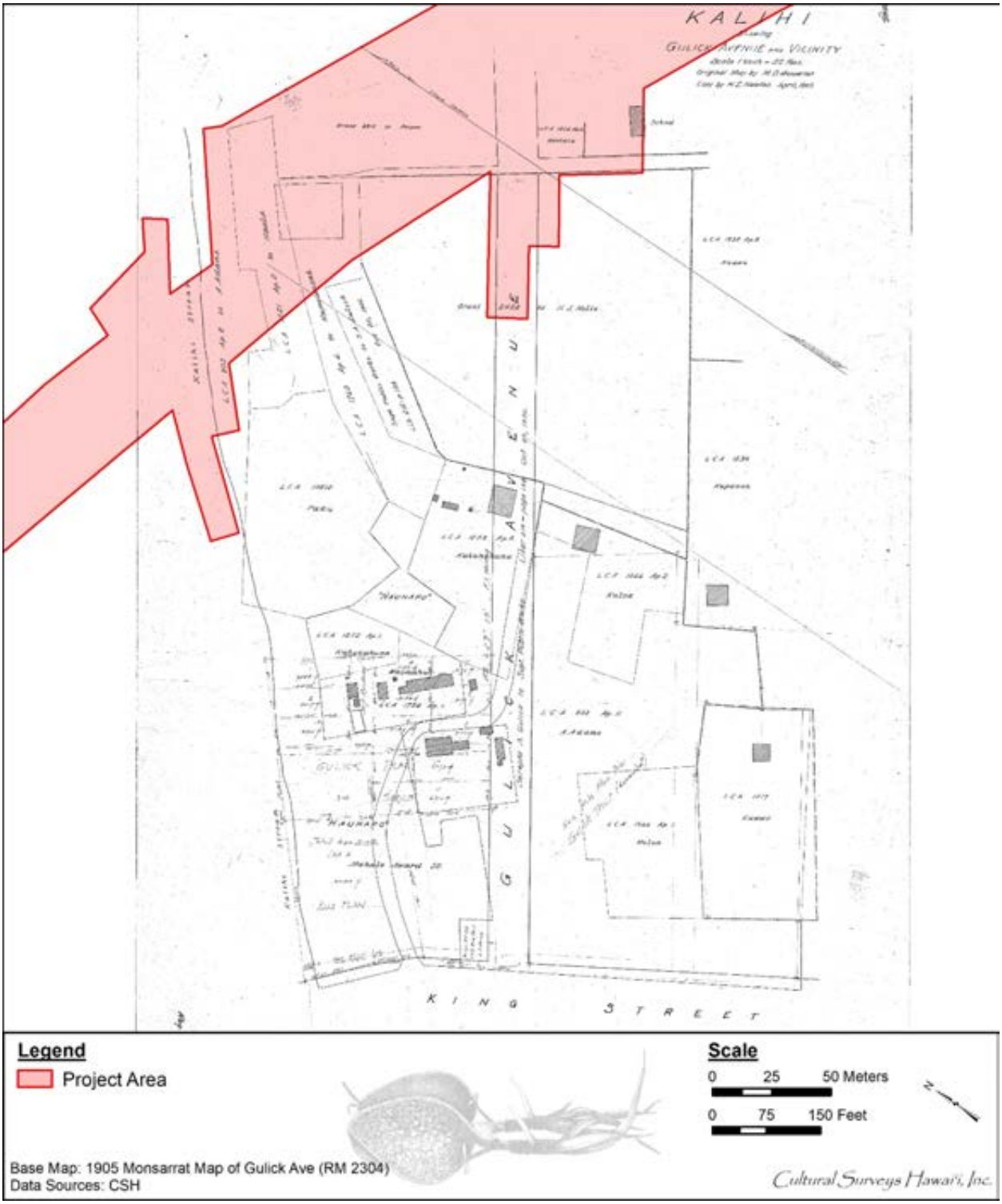

Figure 16. Portion of 1905 Monsarrat map of Gulick Avenue (RM 2304) showing the central portion of the project area

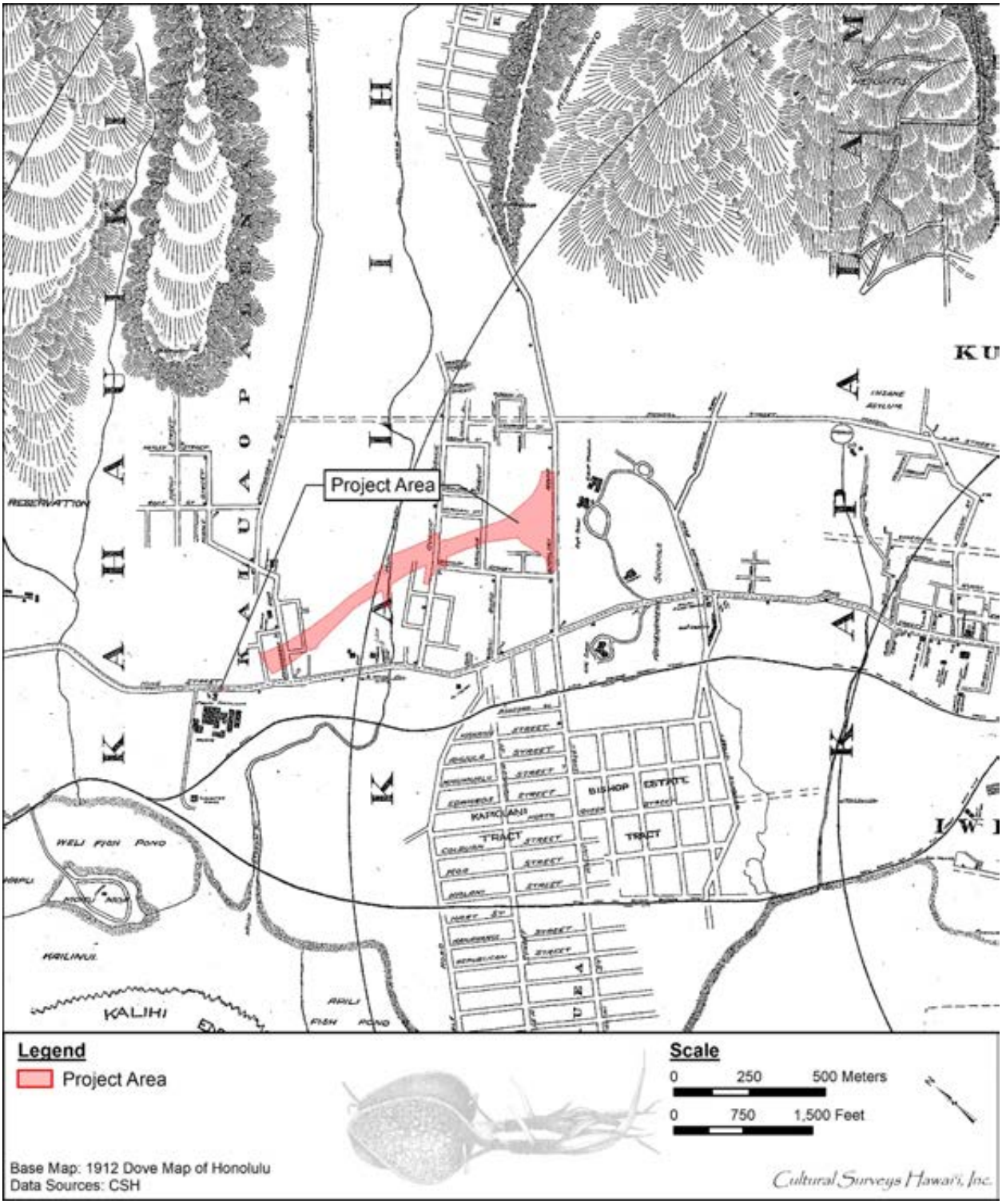

Figure 17. Portion of 1912 Dove map of Honolulu showing the project area

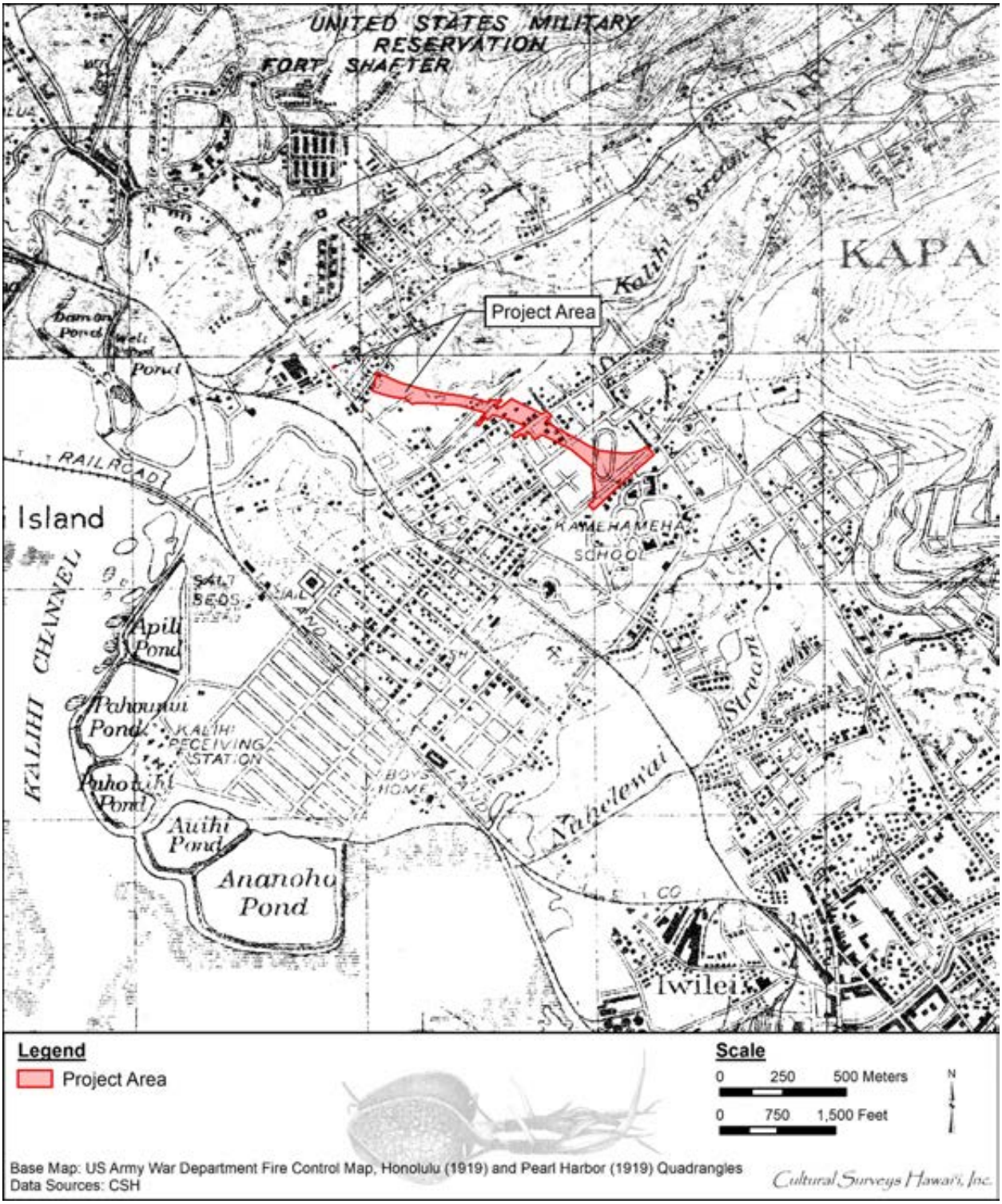

Figure 18. Portion of 1919 U.S. Army War Department fire control map, Honolulu and Pearl Harbor quadrangles of O‘ahu, showing the project area

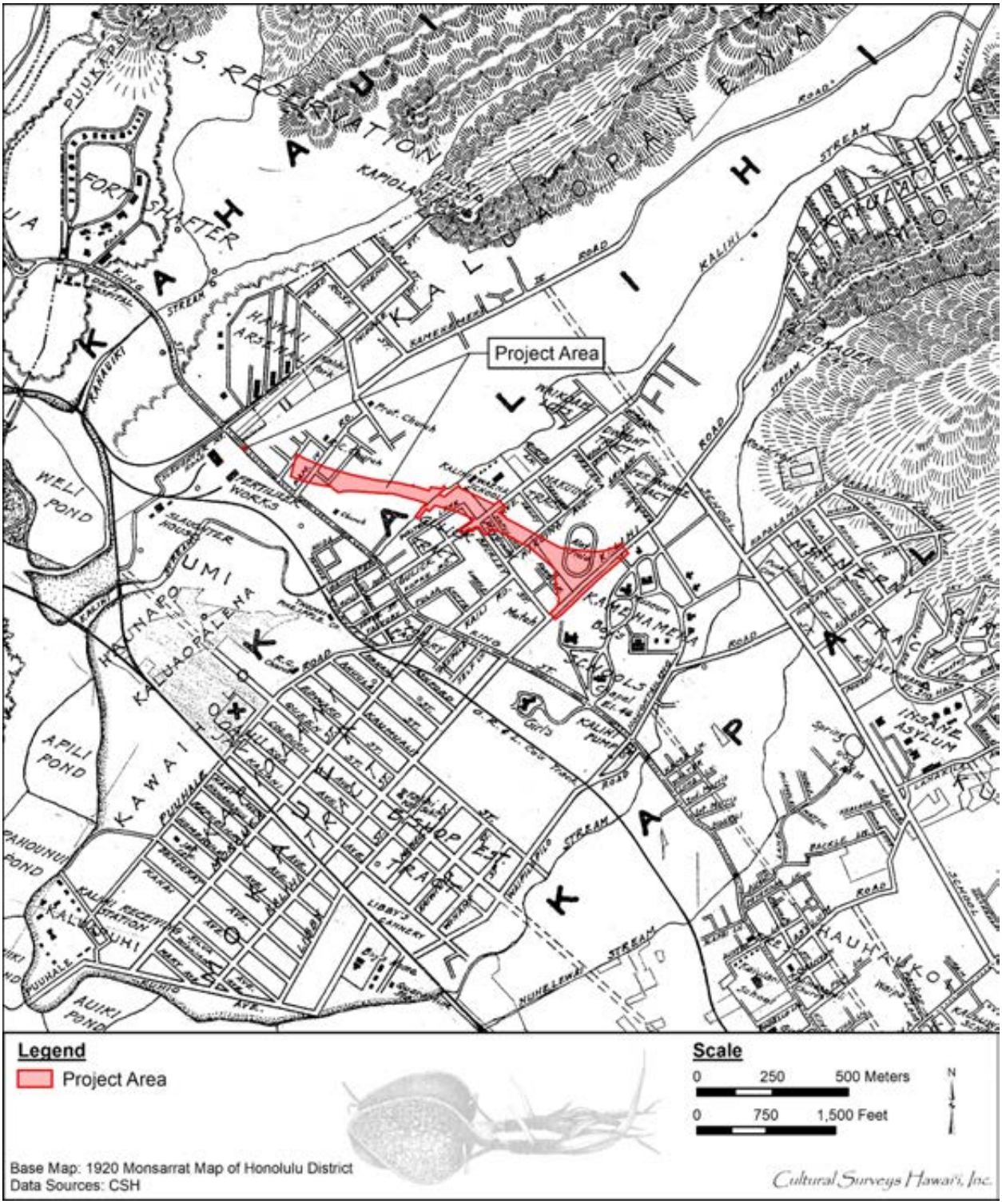

Figure 19. Portion of 1920 Monsarrat map of Honolulu District showing the project area

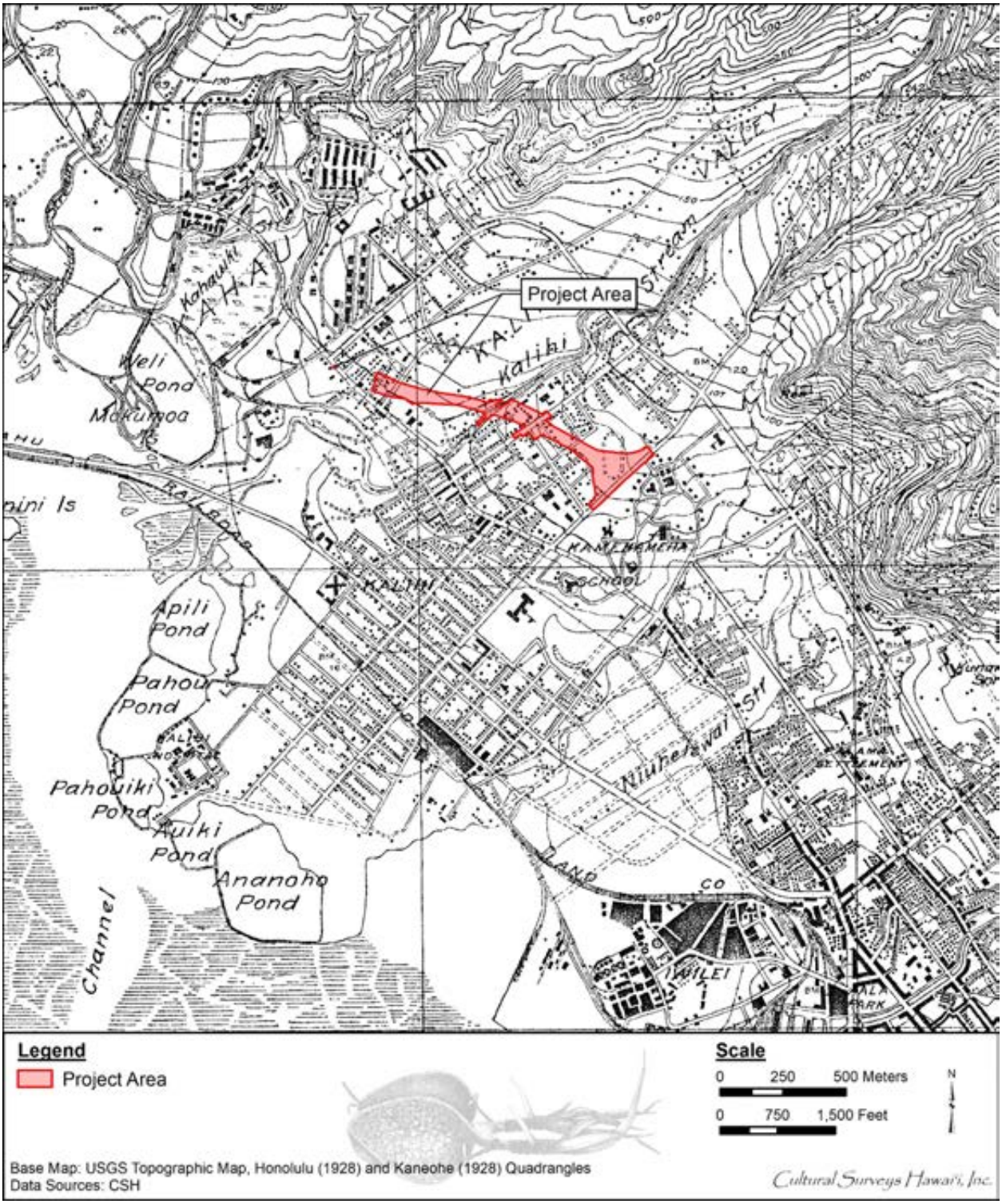

Figure 20. Portion of 1928 Honolulu and Kaneohe USGS topographic quadrangles showing the project area

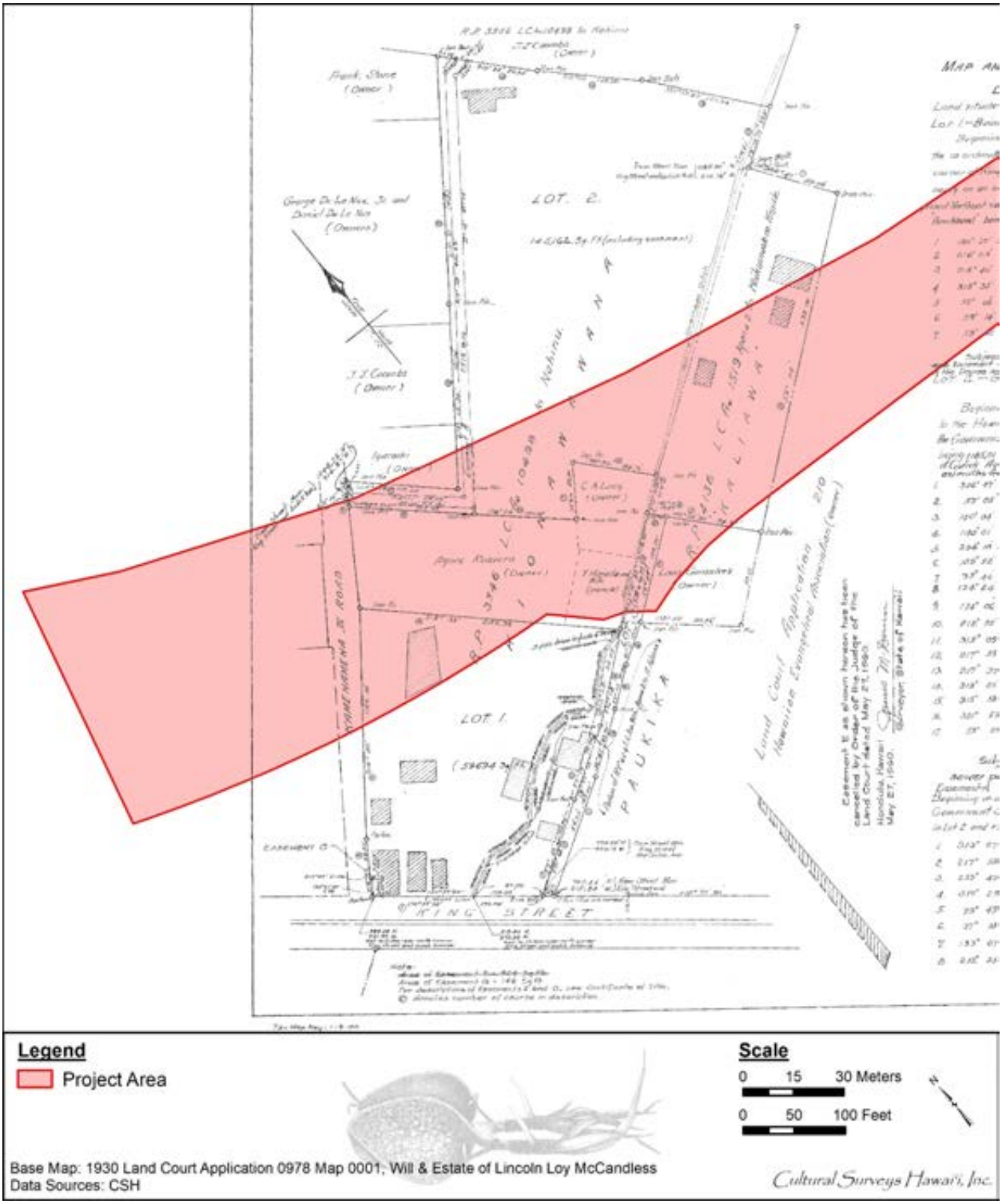

Figure 21. Portion of 1930 Land Court Application 0978 Map 0001, Will & Estate of Lincoln Loy McCandless showing the west end of the project area

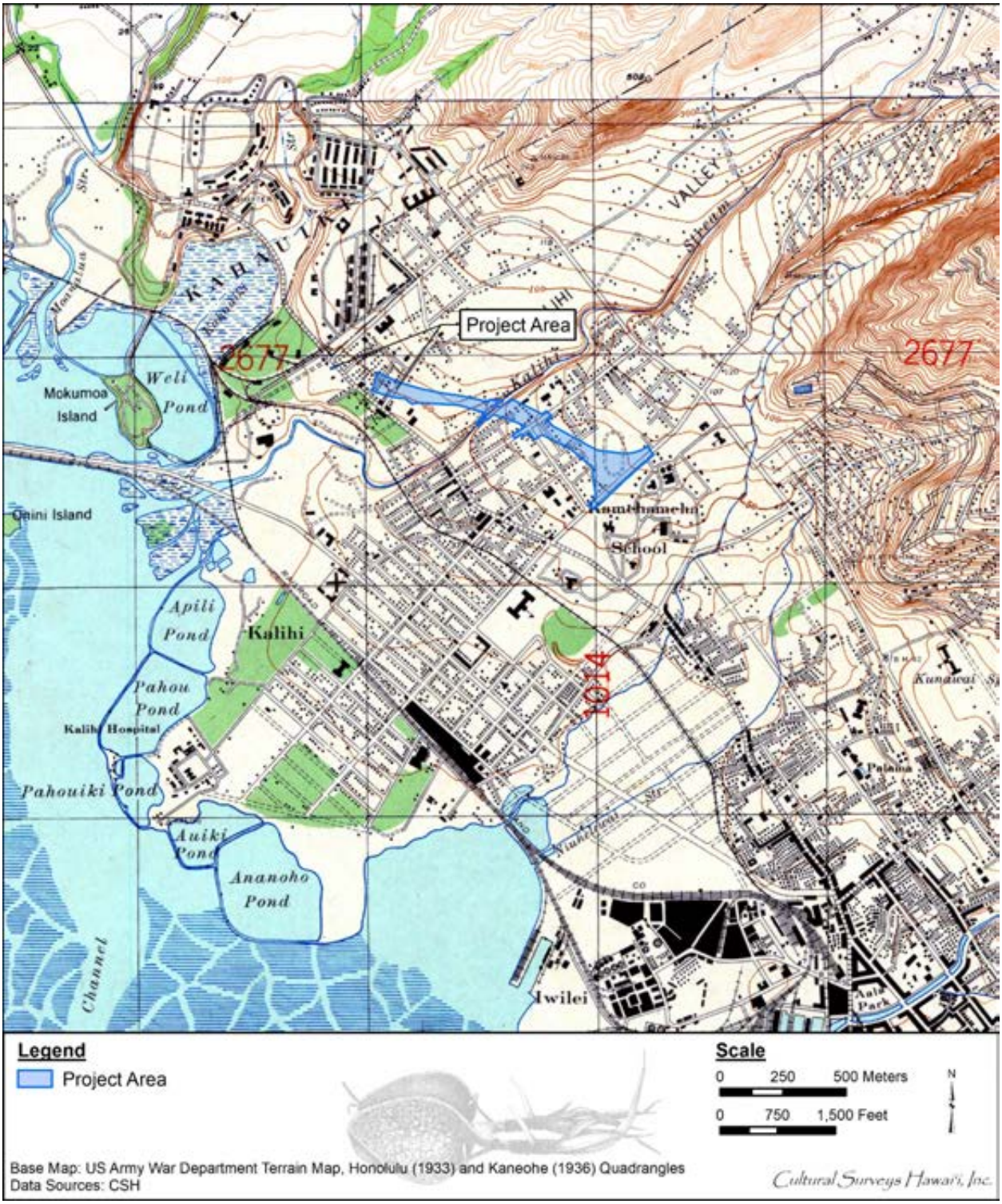

Figure 22. Portion of 1933/1936 U.S. Army War Department terrain map, Honolulu (1933) and Kaneohe (1936) quadrangles showing the project area

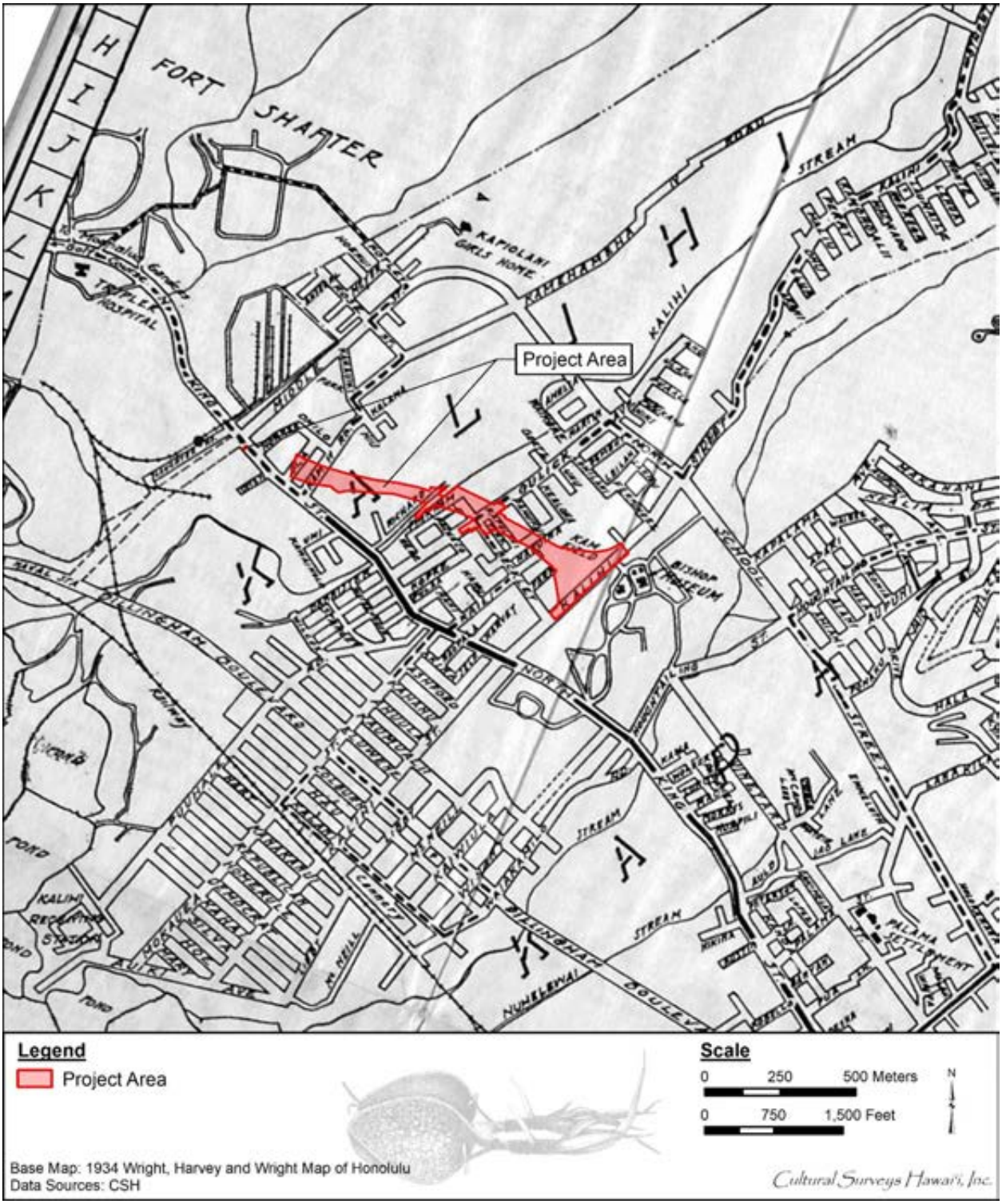

Figure 23. Portion of 1934 Wright, Harvey, and Wright map of Honolulu showing the project area

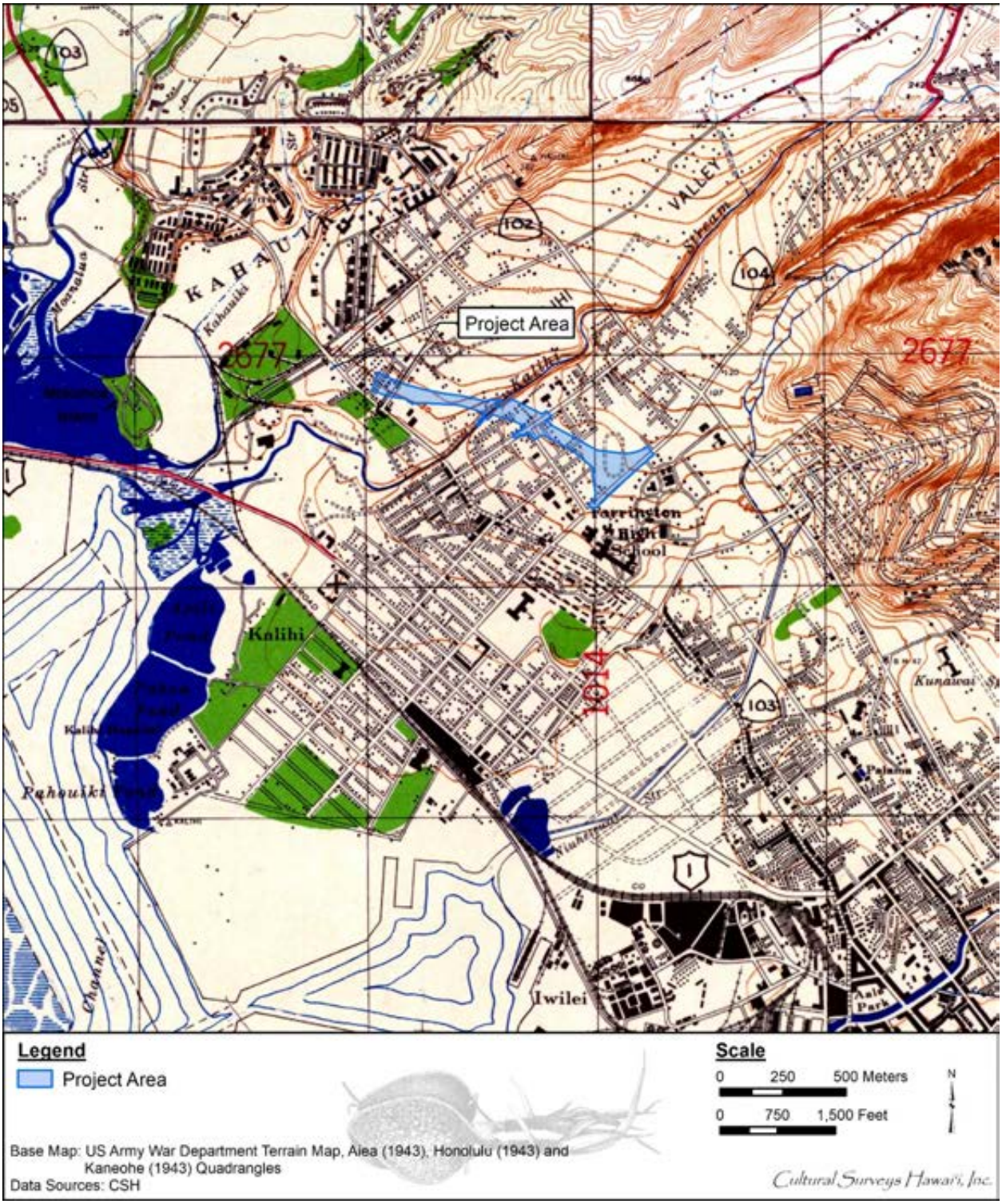

Figure 24. Portion of 1943 U.S. Army War Department terrain map, Aiea, Honolulu, and Kaneohe quadrangles showing the project area

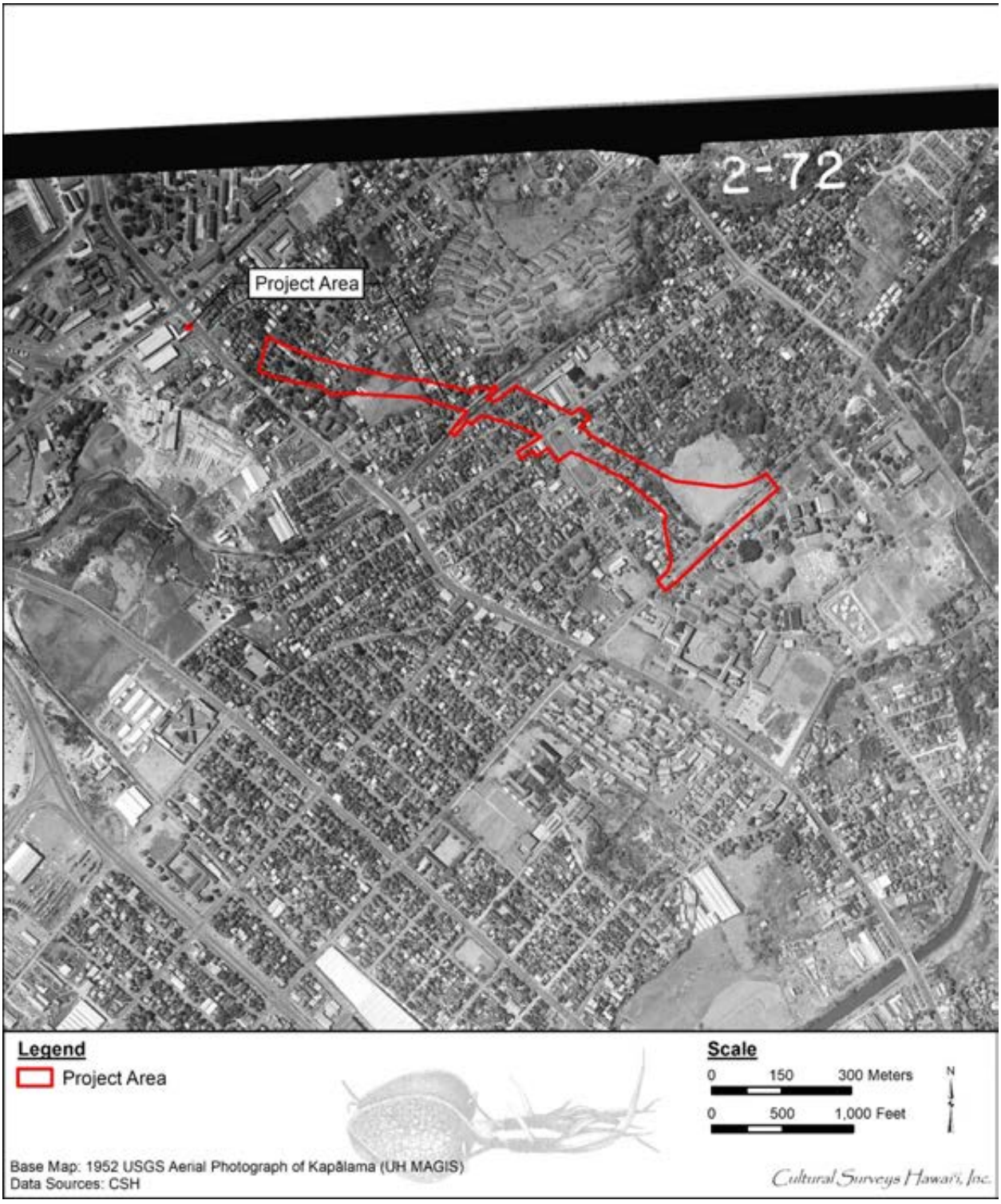

Figure 25. 1952 USGS aerial photograph of Kapālama (UH MAGIS) showing the project area

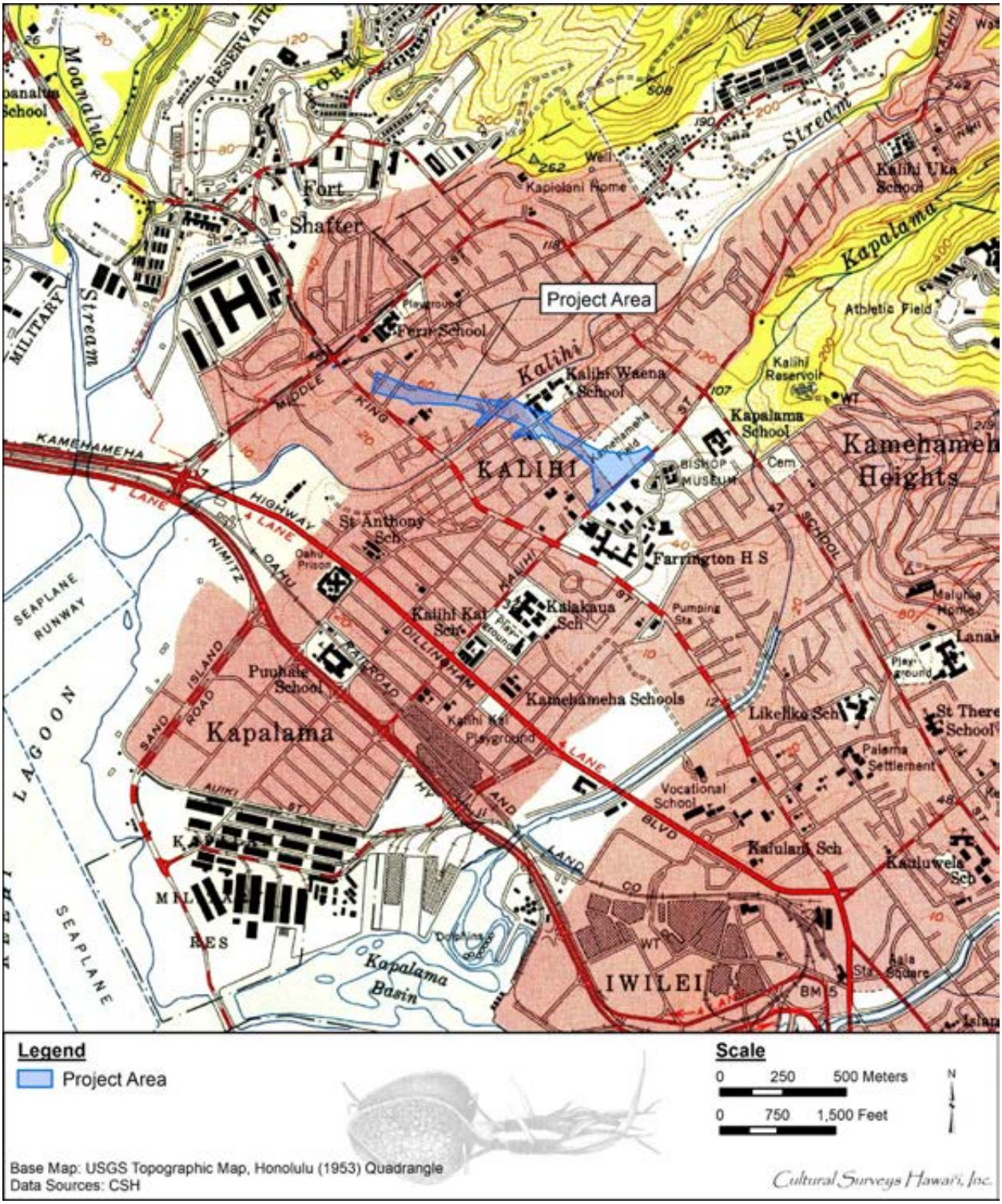

Figure 26. 1953 USGS topographic map, Honolulu Quadrangle showing the project area

Table 2. Construction timeline of the Hawaii 72 Freeway, later renumbered as H1 (AARoads 2020)

Year	Development
1953	First section of the Mauka Arterial opened. The Mauka arterial was approximately a mile section around University Avenue, present-day Mile 24.
1959	At statehood, the first section of what is now called the Lunalilo Freeway open between Punahou Street (Mile 23) and King Street (Mile 25). Maps show a proposed route from Punahou Street west to Middle Street (present H1/H201 interchange) including the present project area.
1960	Freeway extended west to Ke‘eaumoku Street (approximately 1/2 mile west of Punahou Street). A section of present-day H201 opened thru Fort Shafter, signed as Hawaii 72. Sections from Fort Shafter east to Houghtailing Street (Exit 20B) and the Pali Highway interchange (exit 21A/B) under construction.
1961	Open sections are Pu‘uloa Road (present-day H201) to Houghtailing Street (Exit 20B), the Pali Highway interchange, and Ke‘eaumoku Street to King Street.
1964	The section from Kapahulu Street (Mile 25) east to Koko Head Ave (Exit 26A) under construction.
1965	Kapahulu Street to Koko Head Ave open. There is a gap in existing freeway sections between King Street and Kapahulu Street; this short 1/2 mile section is under construction.
1967	H1 first appears on maps, cosigned with Hawaii 72. The freeway is continuous from Pu‘uloa Road east to Pele Street (just east of Pali Highway, Hawaii 61), as well as the existing sections from Ke‘eaumoku Street to King Street and Kapahulu Street to Koko Head Ave. The western section between Kunia Road and Kamehameha Highways (Exits 5 through Exit 8A) is open, with the section between Miles 0 and 5 under construction.
1968	The gap between King Street and Kapahulu Street is opened. H1 is extended east to its present terminus east of Kilauea Ave. There is still a gap between Pele Street and Ke‘eaumoku Street.
1972	H1 is open from Kamehameha Highway (Western terminus) to Kaimakani Street, immediately west of the Hālawa interchange. The Hawala interchange and sections of H1 to Middle Street are proposed. From Middle Street east to Kilauea Ave is completed freeway. Hawaii 72 is truncated at the eastern end of H1; the orphaned section between Pu‘uloa Road and Middle Street is re-signed as Hawaii 78.
1986	H1 is completed between Nimitz Highway and Middle Street (Miles 18–19), completing H1. The through lanes of H1 east use the Middle Street tunnel, completed in 1961 for the Middle Street off-ramp.

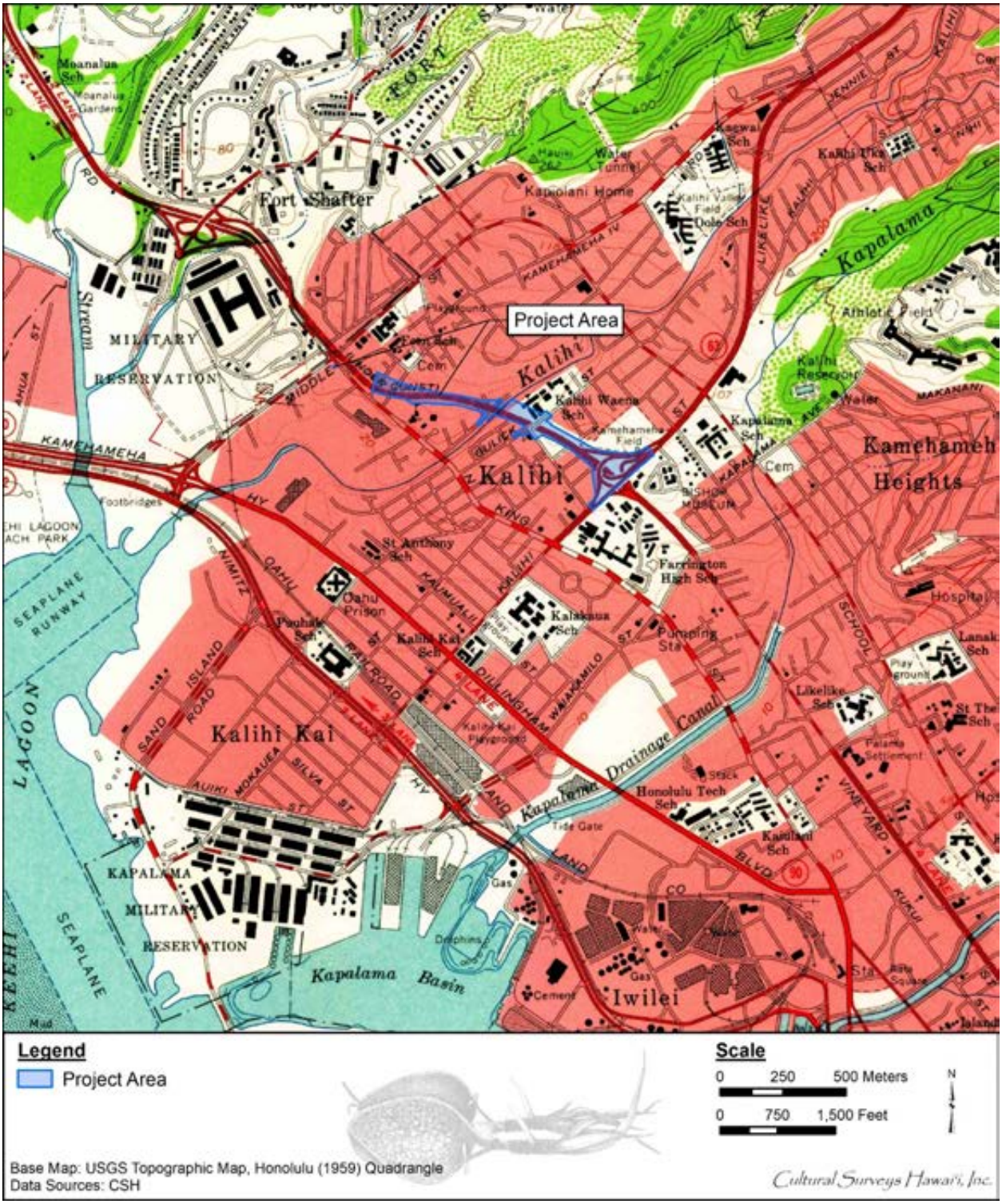

Figure 27. 1959 Honolulu USGS topographic quadrangle showing the project area

Figure 28. While the precise location of this 1959 photograph of H1 Freeway excavation/construction is not altogether clear, it is representative of the excavation that occurred in most of the present project area (*Honolulu Star-Bulletin* 1959)

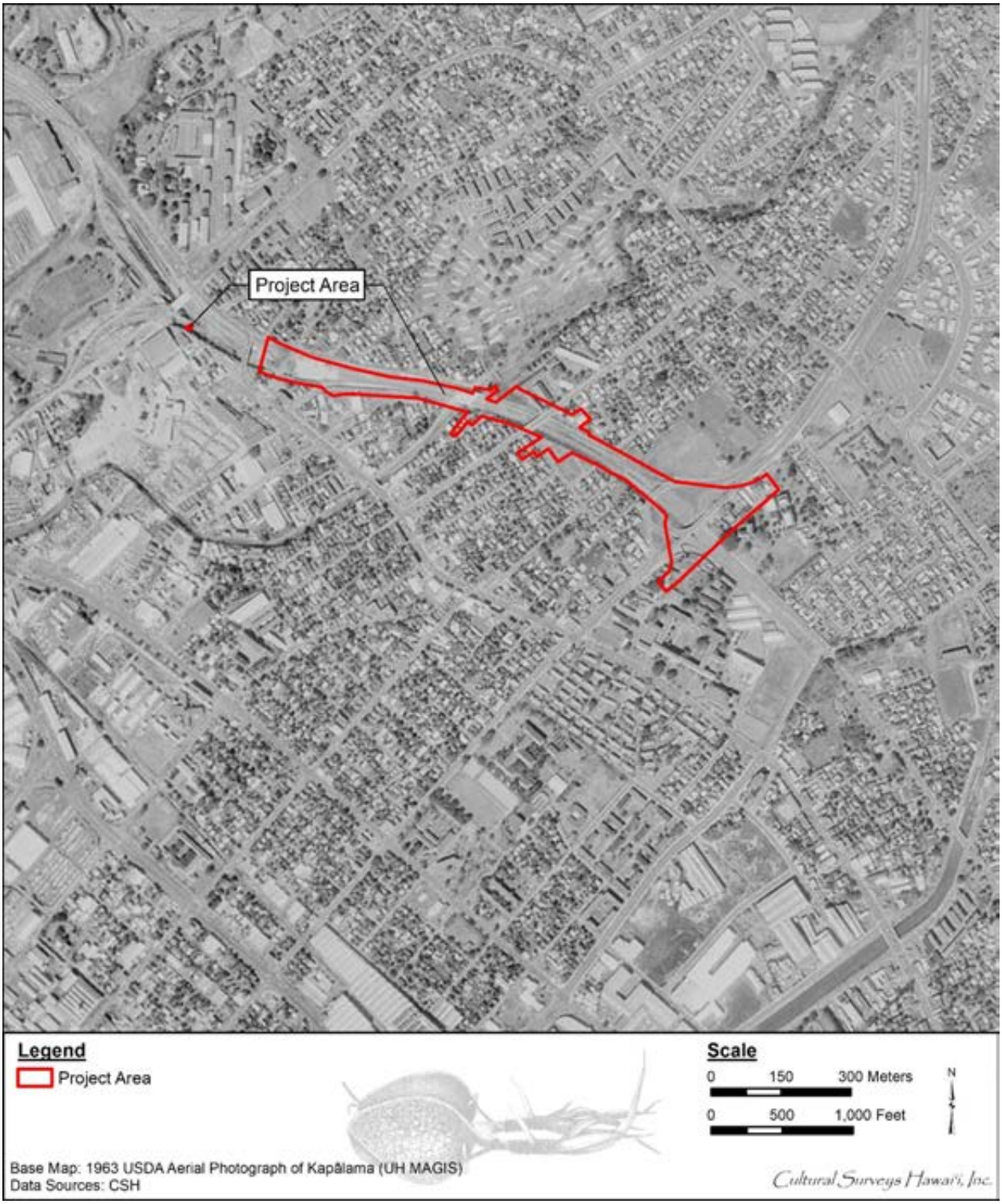

Figure 29. 1963 USDA aerial photograph of Kapālama (UH MAGIS) showing the project area

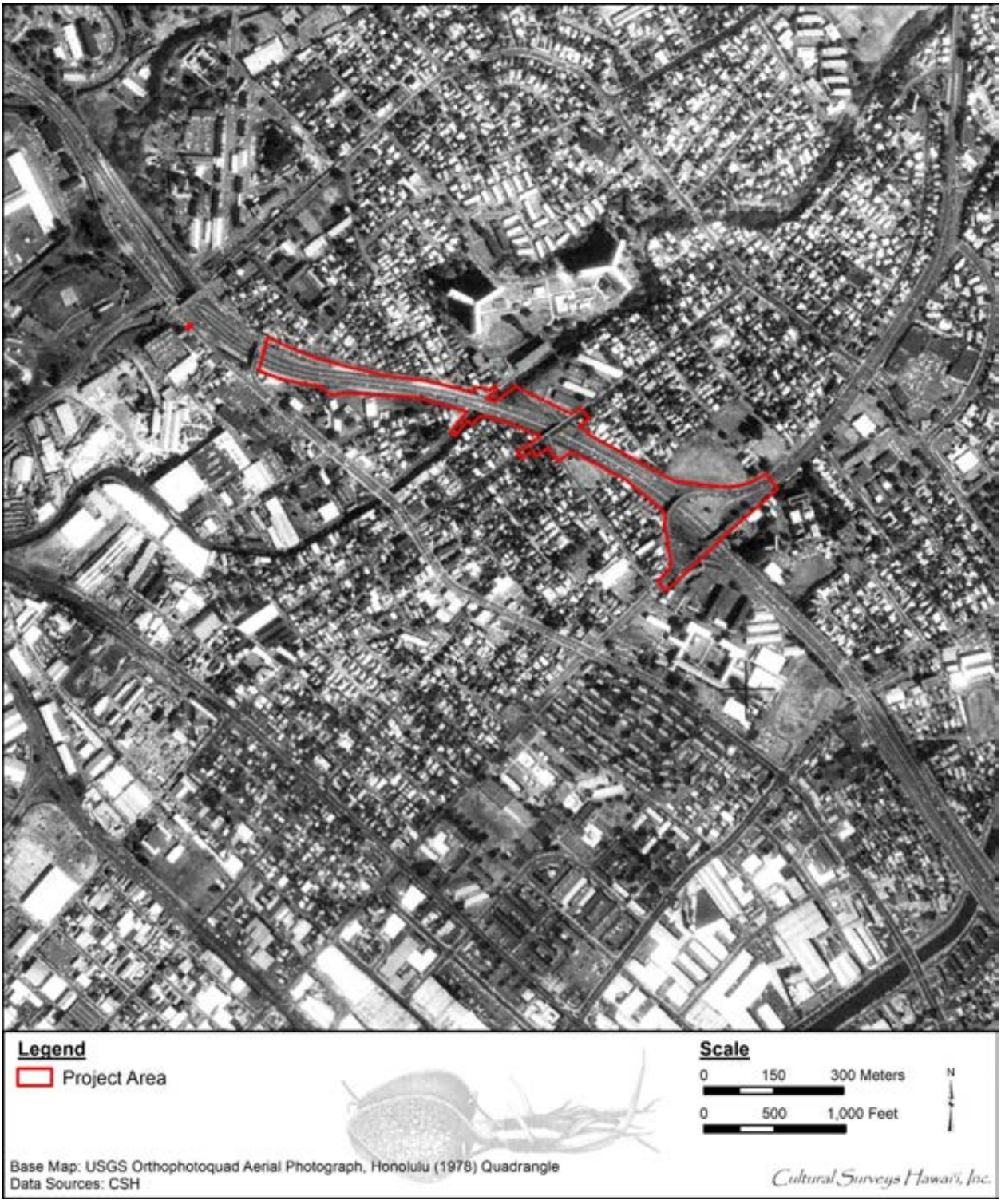

Figure 30. 1978 USGS orthophotoquad, Honolulu Quadrangle showing the project area

Section 5 Previous Archaeological Studies

Previous archaeological studies conducted within the vicinity of the project area are depicted in Figure 31 and are summarized in Table 3. Previously identified historic properties in the vicinity of the project area are depicted in Figure 32 and are summarized in Table 4. A summary of early archaeological studies is provided below followed by a review of modern archaeological studies.

5.1 Early Archaeological Studies

5.1.1 Thrum 1908

Many of the earliest recorded archaeological sites in the coastal areas were fishponds and *heiau*. Thrum (1908:41) briefly discusses three *heiau* in Kalihi giving the following information:

> Ka‘ie‘ie […] Kalihi-uka, on premises of Dr. Huddy; of ho‘ouluai [agricultural] class. Haumea its deity. Parts of foundation only remain.
>
> Ka‘aleo […] Kalihi-kai. No particulars ascertained.
>
> Haunapo […] Kalihi-kai. No particulars ascertained.

The names of the three *heiau* are the same names as three *‘ili* in Kalihi, so this may give us some clue to their general location. No early maps show a *heiau* in Hāunapō ‘Ili and no Māhele documents mention a *heiau*, so this *heiau* was likely destroyed before the mid-nineteenth century.

5.1.2 McAllister 1933

McAllister (1933) seemingly designated all of Kalihi Valley as his Site 71 and presents the following information.

> Kalihi Valley. If any archaeological remains yet exist in Kalihi Valley, they are not known to the Hawaiians. David Kama, who is caretaker of the water reserve, tells me that he has heard the drums on nights of Kane, above his house, but he has never found the heiau.[McAllister 1933:88–91]

McAllister reiterates the information on *heiau* provided by Thrum and notes he has “been unable to obtain additional information” (McAllister 1933:88). McAllister recorded five fishponds in Kalihi Kai (that he lumps under two site numbers), Ananoho and Auiki (Site 73) and Pāhouiki, Pāhounui, and Apili (Site 74) (McAllister 1933:9091).

In *Sites of O‘ahu* (Sterling and Summers 1978:319–321), there are references to a presumed phallic rock (Site 411), a *hōlua* or sledding slide, and an agricultural *heiau*. Each site was at one time observed by an archaeologist.

A rock or *pōhaku* (Bishop Museum Site 411), 5 feet 8 inches long and 5 feet high, in the shape of a crouching animal when viewed from the west, was located opposite Violet Street on the west side of the ridge of Kapālama valley (see Figure 7).

> According to the informant, William J. Vierra of 1582 Wailele Street, age 49 years, it was venerated by the Hawaiians. He first saw it in 1911 when it was pointed out to him by an older brother and Hawaiians. He claims the Hawaiians laid their mats

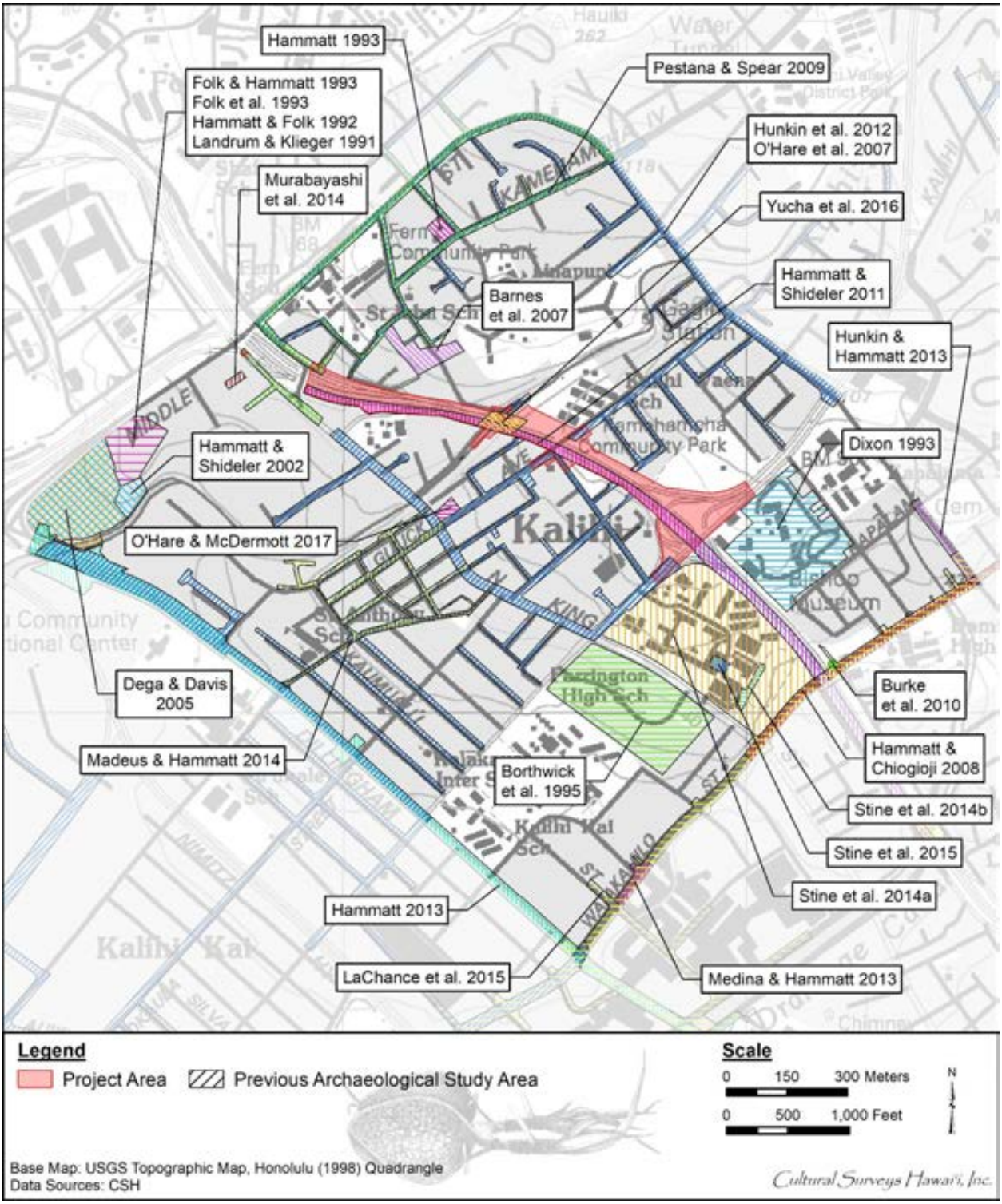

Figure 31. Previous archaeological studies conducted within the vicinity of the project area

Table 3. Previous archaeological studies in the vicinity of the project area

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Thrum 1906	Temple (*Heiau*) studies	Archipelago-wide including Kalihi and Kāpalama	Thrum (1906:41) mentions Puea Palama as a sacred shrine and Oomaunahele and Paepaenuileimoku as *heiau* of Kapālama “known only in tradition”; Thrum mentions Kaieie Heiau in Kalihi-uka and Kaoleo and Haunapo Heiau in Kalihi-kai
McAllister 1933	Archaeological reconnaissance survey	Island-wide	McAllister discusses Site 71 (appears to include entirety of Kapālama, Ahupua‘a with emphasis on Kuwili Fishpond) and Site 72 (appears to include entirety of Kalihi Ahupua‘a), with two additional sites designating Kalihi fishponds (Site 73 for Ananoho fishpond and Site 74 including three adjoining ponds, Pahouiki, Pahounui, and Apili)
Landrum and Klieger 1991	Archaeological literature review and field inspection	SW corner of Kalihi Ahupua‘a, 711 Middle St	Historic research indicates project area adjacent to large coastal fishpond (Weli Pond) and area of salt pans (filled in historic period)
Hammatt and Folk 1992	Burial treatment plan	SIHP # -4525, 711 Middle St	Plan contains description of three historic burials (SIHP # -4525) found in area once possibly an established cemetery; addressed finds documented by Folk et al. (1993)
Dixon 1993	Archaeological monitoring	Great Lawn at Bishop Museum	Touches on SIHP # -1353 “Bishop Complex”; no evidence of pre-Contact occupation or utilization of area observed
Folk and Hammatt 1993	Mitigation plan	SIHP # -4525, 711 Middle St	Addressed finds documented by Folk et al. (1993)
Folk et al. 1993	Archaeological survey with extensive backhoe testing	SIHP # -4525, 711 Middle St	One historic property identified; SIHP # -4525, post-Contact cultural layer containing three human burials, two of which in coffins

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Hammatt 1993	Historical search	SW Kalihi, Kam IV and Rose St	Gives historical context for two inadvertent burials found during excavations for new chapel; burials (SIHP # -4735) associated with Hawaiian Latter Day Saints (LDS) church built between 1914 and 1927
Borthwick et al. 1995	Archaeological inventory survey	Kapālama	No subsurface features found during excavation of 16 trenches on a 14-acre project area
Hammatt and Shideler 2002	Archaeological inventory survey	Middle St Transit Center	One historic site found during field check, a rock and concrete wall (no SIHP assigned); wall shown in this area on LCA map dated 1929
Dega and Davis 2005	Archaeological inventory survey	Middle St Transit Center	One historic property identified (SIHP # -6683), a subsurface historic refuse pit and material remains associated with a slaughterhouse
Barnes et al. 2007	Archaeological literature review and field inspection	2.14-acre “Combs Estate” Kalihi Ahupua‘a, TMK: [1] 1-3-009:029	No historic properties identified, considers Church of St. John Baptist cemetery located directly across street
O’Hare et al. 2007	Archaeological literature review and field inspection	Kalihi-Kapalama and Nu’uanu	Identified four areas of concern: 1) traditional Hawaiian fishponds and salt beds, 2) traditional Hawaiian habitation and agricultural features, 3) traditional Hawaiian burials and historic burials, and 4) historic schools, churches, and hospitals; no historic properties identified during field component of study
Hammatt and Chiogioji 2008	Archaeological inventory survey	Kalihi-Beretania Water Main; various streets	Confirmed areas affected by proposed water main work were along asphalt areas; two early 20th century bridges recommended for architectural evaluation

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Pestana and Spear 2009	Archaeological monitoring	Kalihi, TMKs: [1] 1-2-015 and 016; 3-1-001: various parcels	No pre-Contact Hawaiian cultural material identified; isolated deposits of historic debris and artifacts (i.e., glass bottles, ceramic) identified in previously disturbed subsurface contexts
Burke et al. 2010	Archaeological monitoring	Houghtailing St by H1, Kapālama Ahupua‘a, TMK: [1] 1-6-023:066	No historic properties identified; subsurface deposits consisted of landscaping fill above either naturally deposited sediments (including bedrock) or imported gravel fill
Hammatt and Shideler 2011	Archaeological literature review and field inspection	Interstate Route H1 (EB) Widening, Ola Lane Overpass to Vineyard Blvd, TMKs: [1] 1-3, 1-6	Recommended archaeological monitoring in specific areas; no historic properties identified during field component of study
Hunkin et al. 2012	Archaeological monitoring	Kalihi, Kapālama, Nu‘uanu, Pauoa, and Makiki Ahupua‘a	No significant finds for Kalihi portion of project
Hammatt 2013	Archaeological inventory survey	City Center (Section 4) of Honolulu High-Capacity Transit Corridor Project incl. Dillingham Blvd	Identified SIHP # -7425 a subsurface fire feature remnant (*imu*) *mauka* of OCCC
Hunkin and Hammatt 2013	Archaeological monitoring	Kalihi Valley Sewer System project, Kapālama Ahupua‘a, TMK: [1] 1-6-025:049	No historic properties identified
Medina and Hammatt 2013	Archaeological monitoring	Waiakamilo Rd and McNeill St Intersection, TMKs: [1] 1-5-023:008, 009; 1-5-024:001; 1-5-026:001	No historical properties or human remains encountered as result of construction activities; no undisturbed natural sediments observed during excavations

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Madeus and Hammatt 2014	Archaeological literature review and field inspection	Kalihi Water Systems Improvements Part III, TMKs: [1] 1-2-011:026–046, 095–118	Possible historic property, designated Site T-07312014-1 identified during field inspection of project area; site consists of curb (Feature A) and sewer manhole (Feature B)
Murabayashi et al. 2014	Historic properties assessment	Loves Bakery bldg telecommunications facility, TMK: [1] 1–2–016:029	No historic properties identified
Stine et al. 2014a	Archaeological literature review and field inspection	Farrington High School, TMKs: [1] 1-6-003:047, 048, 082, 083, 999 and 1-6-021:005 por.	Two historic properties identified: SIHP # -9768, Wallace Rider Farrington High School, placed on Hawai‘i Register of Historic Places (HRHP) in 1993; SIHP # -7555 consists of subsurface remnants of Bishop Memorial Chapel; chapel foundations observed during high school renovation efforts in 2011 and placed on HRHP in 2013; former location of chapel marked with brick alignment in open grassy area between two wings of main school building
Stine et al. 2014b	Archaeological monitoring	Farrington High School; Kapālama Ahupua‘a	No significant cultural material or human remains observed during monitoring of three excavations
LaChance et al. 2015	Archaeological literature review and field inspection	Awa St Wastewater Pump Station and Force Main project, TMKs: [1] 1-5-002-003, 006–010, 012, 013, 015, 017, 020–024, 026, 027, 029, 030, 032, 033, 039 and 1-6-003–005, 015, 021, 023, 025: various parcels	No historic properties identified; notes project area contains multiple LCAs which can dramatically increase potential for subsurface historic properties including cultural layers related to wetland agriculture and Hawaiian habitation, and trash pits related to historic residence and commerce in Kapālama
Stine et al. 2015	Archaeological monitoring	Farrington High School; Kapālama Ahupua‘a	Building foundation of former Bishop Memorial Chapel (SIHP # -7555) encountered subsurface in excavations during monitoring

Reference	Type of Study	Location	Results (SIHP # 50-80-14****)
Yucha et al. 2016	Archaeological monitoring	H-1 from Middle St in Kalihi to Ward Ave in Nu‘uanu	No historic properties identified during archaeological monitoring
O’Hare and McDermott 2017	Archaeological literature review and field inspection	American Savings Bank proposed Kalihi property purchase, TMK: [1] 1-3-003:026	No historic properties identified; notes potential subsurface archaeological features and/or deposits within project area include burials, both pre-Contact and historic, taro *lo‘i* soils and features, and historic trash deposits or foundations dating to early 19th century and later

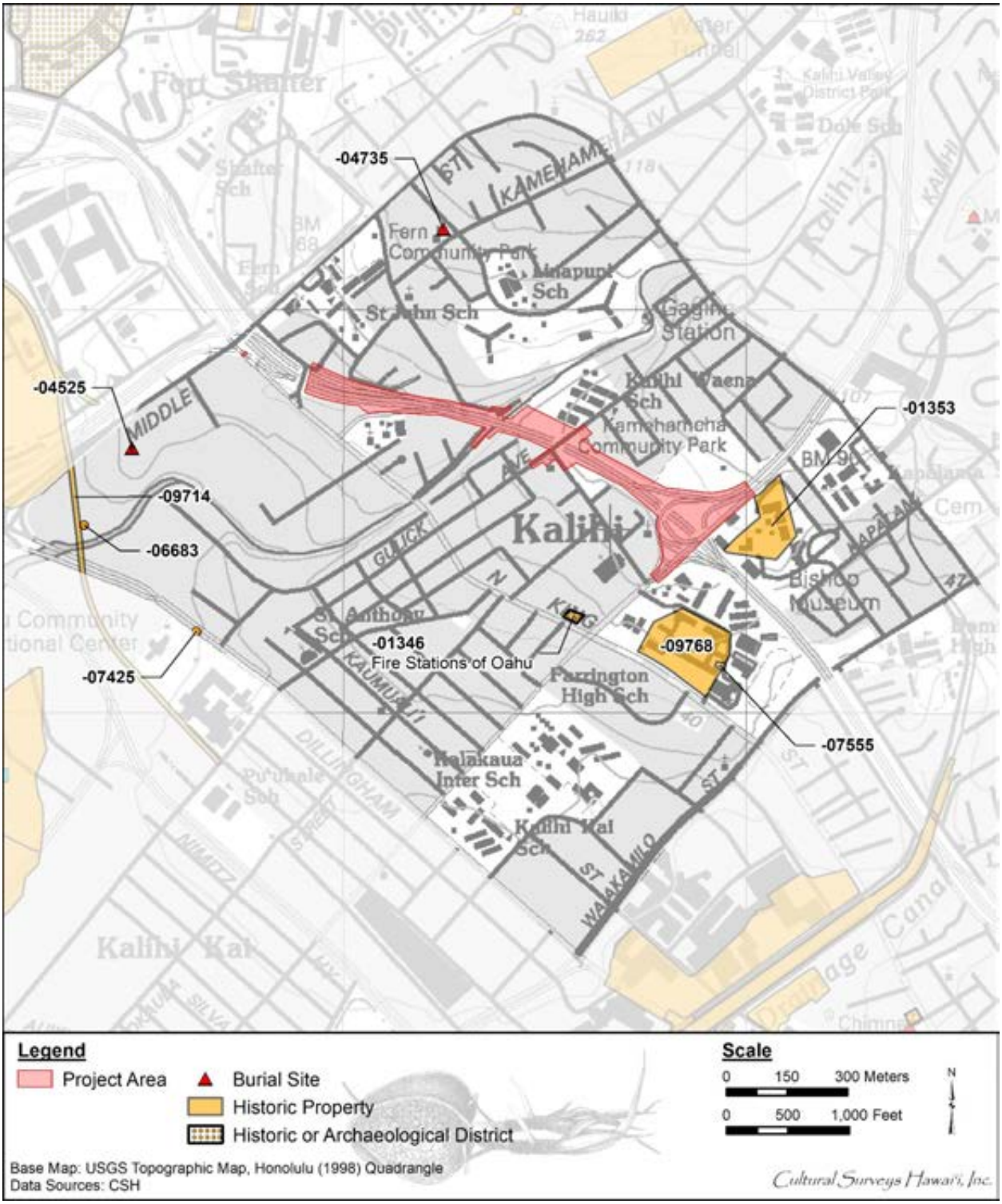

Figure 32. Previously identified historic properties in the vicinity of the project area (base map: Google Earth 2013)

Table 4. Previously identified historic properties in the vicinity of the project area

SIHP # 50-80-14	Formal Type/ Name	Description	Reference
1346	Kalihi Fire Station	Built 1924	National Register of Historic Places (NRHP) Form * Fire Stations of Oahu (Hibbard and Napoka 1979)
1353	Bishop Museum Complex	Built 1891-1928	NRHP Form * Bernice Pauahi Bishop Museum (Wright and Mitchell 1980), Dixon 1993
4525	Cultural layer and human burials	Post-Contact (three historic burials, two in coffins)	Hammatt and Folk 1992; Folk and Hammatt 1993; Folk et al. 1993
4735	Human burials	Pre- and/or post-Contact (two burials associated with 1914-1927 church lot)	Hammatt 1993
6683	Subsurface historic refuse pit; slaughterhouse remains	Post-Contact	Dega and Davis 2005
7425	Subsurface fire feature remnant (*imu*)	Pre-Contact, single *imu* or earth oven, ‘Ūlei charcoal submitted for radiocarbon analysis which yielded two possible date ranges, with calibrated 2-sigma date of AD 1440 to AD 1530 (61.6%)	Hammatt 2013
-7555	Bishop Memorial Chapel remnants	Built 1897; demolished 1954	Stine et al. 2014b; Stine et al. 2015
9714	OR&L Railroad ROW	Specific dates 1889, 1895, 1947, 1950; associated with Charles H. Kleugel, George P. Denison, and Ben F. Dillingham	NRHP Form* OR&L ROW (Knaus 1983); Roberts et al. 2002 (outside area of study)
9768	Wallace Rider Farrington High School	Built 1939	NRHP Form* Farrington, Wallace Rider, High School (Nettles 1993), Stine et al. 2014b; Stine et al. 2015

*National Register of Historic Places—Registration Form

> on top of the ridge between Kapālama Valley and Kamanaiki Valley by the ledge there, and spent all day worshipping the stone from a distance. They left sugar cane refuse which they had chewed for their lunch. In the opinion of Kenneth P. Emory, this is a phallic rock. The stone was visited on Jan.20, 1954 […] Mr. Vierra also stated that this stone was visited by the ‘bell stone’ in Kalihi in the form of mist. [Catherine C. Summers in Sterling and Summers 1978:321]

A *hōlua* slide was reported from “back of the Kamehameha School” (see Figure 7 for approximate location) by Nathaniel B. Emerson, in a note in his 1898 translation of David Malo’s *Ka Mo‘olelo Hawai‘i.*

> The course of an old-time holua slide is at the present writing clearly to be made out sloping down the foot-hills back of the Kamehameha School. The track is of such a width, about 18 feet, as to preclude the possibility of two sleds traveling abreast. It is substantially paved with flat stones, which must have held their position for many generations. The earth that once covered them as been mostly washed away. [Malo 1951:224; note by N. B. Emerson]

The outline of the slide, by then indistinct, was pointed out to the archaeologist J.F.G. Stokes in 1900 by William Brigham, first director of the Bishop Museum; however, in 1953 the ethnologist Kenneth P. Emory could not confirm the location. In a letter, Emory states,

> On Wednesday afternoon, December 24, 1952, I, with two of my students, walked over the face of the slope where the slide must have existed. We found that the entire slope had been plowed or bull-dozed at one time or another and not a trace of what could be interpreted as a remnant of the slide. From the photograph it would seem to have emerged about the vicinity of Kapalama Street. [Sterling and Summers 1978:321]

Thrum mentions three *heiau* in his list of temples on the island of O‘ahu. “Oomaunahele and Paepaenuileimoku are names of Kapālama heiaus known only in tradition.” The third is Puea, which is “a noted place to which offerings were taken; probably only a sacred shrine. Long since removed” (Thrum 1908:41).

A *heiau* was found on the Kapālama Heights campus of the Kamehameha Schools in 1961 by a bulldozer working near the preparatory school gymnasium. Whether this is a fourth *heiau* for Kapālama, or is one of the three *heiau* listed above, is unknown.

> Dr. Kenneth Emory, staff anthropologist for the Bishop Museum, said that the heiau, measuring about 40 feet by 30 feet, was used 150 to 200 years ago by Hawaiians to pray for rain and good crops.
>
> ‘We call it an agricultural heiau,’ he said. ‘It’s not one of human sacrifice. […]’
>
> Next to the main platform of the heiau are two stone burial mounds. One is round, about 1 feet in diameter. The other is oblong, 15 feet long and four feet wide. [*Honolulu Advertiser* 21 May 1961]

5.2 Modern Archaeological Studies in the Vicinity

5.2.1 Landrum and Klieger 1991, Hammatt and Folk 1992, and Folk et al. 1993, Folk and Hammatt 1993

Several studies were undertaken to fulfill the requirements of an environmental impact assessment for the proposed development of a City and County of Honolulu Bus Repair Shop Facility on Middle Street in Kalihi. A literature review study concluded the project area was used extensively for habitation and agriculture from the pre-Contact period through the late 1800s (Landrum and Klieger 1991). An archaeological inventory survey (AIS) by CSH excavated 19 backhoe trenches and found three burials and a cultural layer which were assigned SHPD Site No. 50-80-14-4525 (Folk et al. 1993:28). Based on recommendations in the AIS, a burial treatment plan was written to address the human remains found (Hammatt and Folk 1992) and a mitigation plan was written to address any potential impacts during facilities construction (Folk and Hammatt 1993).

5.2.2 Dixon 1993

Archaeological monitoring at the Bishop Museum (Dixon et al. 1993) 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 designated State Inventory of Historic Places (SIHP) # 50-80-14-1353 (reported as Bishop Museum site number 50-Oa-A6-26).

5.2.3 Hammatt 1993

During construction of a new chapel, two human burials were found (SIHP # -4375). CSH uncovered a report on the background history of the project area, specifically on evidence of an early LDS (Latter Day Saints [Mormon]) church and cemetery remembered by an informant. Maps indicated a church had been built on the property sometime between 1914 and 1927 but there was no evidence a historic cemetery was associated with this church. The researchers suggested the remains could have been interred in the pre-Contact period, in the early historic period before construction of the 1920s church, or interred in informal association with the 1920s LDS church.

5.2.4 Borthwick et al. 1995

CSH conducted an archaeological inventory survey in 1995 for a 13.96-acre Kamehameha Homes project in Kapālama (Borthwick et al. 1995). Subsurface testing included 16 backhoe trenches dispersed across the project parcel. No significant archaeological sites or features were observed. Subsurface survey confirmed previous development projects within the subject parcel had extensively modified the landscape.

5.2.5 Hammatt and Shideler 2002; Dega and Davis 2005

Several studies were undertaken based on sites identified and information collected during the investigations for the Bus Repair Shop Facility. Two of these studies included an archaeological

assessment (no finds AIS) which recommended a program of subsurface testing (Hammatt and Shideler 2002), and a follow-up inventory survey with subsurface testing (Dega and Davis 2005). Scientific Consultant Services, Inc. (SCS) was contracted to perform the archaeological inventory survey with subsurface testing. Evidence of pre-Contact cultural activity was inconclusive, however, evidence of historic-era industrial activity was abundant and was designated SIHP # -6683 (Dega and Davis 2005:42).

5.2.6 Barnes et al. 2007

CSH (Barnes et al. 2007) prepared an archaeological field inspection and literature review report for the 2.14-acre “Combs Estate” (TMK: [1] 1-3-009:029). No archaeological sites were identified during the brief field inspection, however, it was noted that the Church of St. John the Baptist cemetery was located directly across the street from the project area on the opposite side of Kamehameha IV Road. The history of the church and cemetery was evaluated and it was concluded that early maps do not indicate the cemetery was once any larger than it is today. Therefore, based on the background historical and archaeological research, and the field checks, the possibility of finding buried cultural habitation deposits, subsurface habitation features, and/or burials was concluded to not be high and no further archaeological work for the project was recommended.

5.2.7 O’Hare et al. 2007

CSH (O’Hare et al. 2007) prepared a field inspection and literature review report for the Kalihi-Kapālama portion of the Kalihi/Nu‘uanu Sewer Rehabilitation project that covered a large area generally extending from Auiki Street on the south (*makai*) to Perry Street on the north (*mauka*); Sand Island Access Road and Meyers Road to the west; and Hart Street and Kalihi Street to the east. Background historical and archaeological research identified four types of possible sites for the project areas: 1) traditional Hawaiian fishponds and salt beds; 2) traditional Hawaiian habitation and agricultural sites; 3) traditional Hawaiian and historic burials; and 4) historic schools, churches, and hospitals.

5.2.8 Hammatt and Chiogioji 2008

CSH (Hammatt and Chiogioji 2008) carried out an AIS 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 project area but the study emphasized the need to consider the Judd Street and Nu‘uanu Avenue bridges as historic properties. Background research showed the project area to be part of an expansive agricultural system during the pre- and early post-Contact period. As the project 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 project area.

5.2.9 Pestana and Spear 2009

SCS conducted archaeological monitoring along several residential streets in Kalihi for the replacement of existing water mains, water lines, and appurtenances (Pestana and Spear 2009). No pre-Contact Hawaiian cultural material was found in any of the monitored sections of the project area, although isolated deposits of historic debris and artifacts (i.e., glass bottles, ceramic artifacts) were identified in previously disturbed subsurface contexts. Pestana and Spear noted significant

historic resources may still be present in subsurface deposits in the vicinity and recommended all future ground disturbing activities in their project area and its environs be subject to archaeological monitoring (Pestana and Spear 2009:ii).

5.2.10 Burke et al. 2010

In 2010, CSH completed an archaeological monitoring program for a Traffic Management System PH 1 project (Burke et al. 2010). Background research identified no sites but suggested a potential for early historic remains. Subsequent field monitoring documented no significant finds within the project area.

5.2.11 Hammatt and Shideler 2011

In 2011, CSH completed a literature review and field inspection for the H1 Highway Widening project between the Ola Lane Overpass and the Vineyard Boulevard off-ramp in Kalihi and Kapālama (including much of the present project area). The vicinities of the Kalihi Stream Bridge and the Kapālama Canal Bridge were foci of concern. In order to widen the road in this section, it was understood to be necessary to excavate along the footings and piers of the bridges and possibly into the channel walls of the two streams. The archaeologists recommended archaeological monitoring be done during the project, especially near the bridges, due to concerns for 1) possible impact to the H1 Freeway itself as a possible historic property; 2) possible damage to the Kalihi and Kapālama Stream channelization walls, which are more than 50 years old and show craftsmanship, a distinctive style, and integrity; and 3) potential disturbance of the original ground surface below fill layers, especially in areas such as a bridge footings, piers, and stream retaining walls.

5.2.12 Hunkin et al. 2012

CSH completed monitoring for the Kalihi-Nu‘uanu Sewer project which affected 58 streets in a 1,028-acre project area extending from Middle Street in Kalihi to Pi‘ikoi Street in Makiki. 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. No results in the lower Kalihi project area were reported as no monitoring was conducted there (Hunkin et al. 2012:40).

5.2.13 Hammatt 2013

CSH (Hammatt 2013) documented archaeological inventory survey 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 including 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 area (T-054 through T-082). The incinerated trash deposits were encountered within three test excavations (T-064, T-066, and T-067) located within the Honolulu Community College campus at the corner of Dillingham Boulevard and Kokea Street.

5.2.14 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 project 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 project 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.

5.2.15 Medina and Hammatt 2013

CSH (Medina and Hammatt 2013) prepared an archaeological monitoring report for Waiakamilo Road and McNeill Street intersection traffic signals improvements. No historical properties or human remains were encountered as a result of construction activities. No undisturbed natural sediments were observed during excavations. Observed stratigraphy during monitoring included locally procured silty clay loam fill with an average of 35% coral cobbles and pebbles atop the limestone coral bedrock.

5.2.16 Madeus and Hammatt 2014

CSH (Madeus and Hammatt 2014) prepared a literature review and field inspection report for a Kalihi Water Systems Improvements Part III project. Background historical and archaeological research identified three site types as may be associated with that project area: 1) traditional Hawaiian habitation and agricultural sites; 2) traditional Hawaiian and historic burials; and 3) post-Contact deposits. Based on a concentration of LCAs in the central portion of Kalihi, a potential for encountering any or all of these site types exists.

A possible site, Site T-07312014-1, was identified during the field inspection of the project area consisting of a curb (Feature A) and a sewer manhole (Feature B).

5.2.17 Murabayashi et al. 2014

T.S. Dye & Colleagues, Archaeologists, Inc. (Murabayashi et al. 2014) carried out a historic properties assessment for a proposed VZW HON Loves Telecommunications, TMK: [1] 1-2-016:029. No field inspection of the proposed site was conducted. The study concluded no historic properties exist within the area of potential effect for direct effects of the proposed facility and that the undertaking would have no visual effect on historic properties.

5.2.18 Stine et al. 2014a

CSH (Stein et al. 2014a) carried out an archaeological literature review and field inspection with cultural section study for a Farrington High School Master Plan project. Two historic properties were identified within the project area. SIHP # -9768, the Wallace Rider Farrington High School, was placed on the HRHP in 1993. SIHP # -7555 consists of the subsurface remnants of the Bishop Memorial Chapel. The chapel foundations were observed during high school renovation efforts in 2011 and placed on the HRHP in 2013. It was noted that the former location of the chapel is marked with a brick alignment in an open grassy area between two wings of the main school building. Several basalt blocks used as curbstones were assessed as likely to also be

a remnant of the chapel. It was noted that there are also several walls and gatepost pillars on the high school grounds that may be related to structures built for the Kamehameha Boys’ School. Some of the buildings for the Boys’ School became part of the Bernice Pauahi Bishop Museum (SIHP # -1353)

It was noted that historic documentation identifies the plain of Kaiwi‘ula (place name meaning “red bone”) as an area used to bury smallpox victims during an 1853 epidemic of the disease. There is no exact location for such burials, but the plain of Kaiwi‘ula is understood as near the main coastal trail, now part of the King Street alignment.

5.2.19 Stine et al. 2014b

CSH (Stein et al. 2014b) documented archaeological monitoring at the east side of the Wallace Rider Farrington High School campus (SIHP # -9768) for the replacement of electrical vaults and to locate an existing electrical line. Two excavations (Excavations 1 and 2), approximately 2 m square and 1 m deep, were located adjacent to the east side of the track field to replace two existing electrical handholds. Excavation 3, approximately 6 m square and 1 m deep, was located in the driveway behind the auditorium to locate an existing electrical utility for repairs. No new historic properties or significant cultural material or human remains were identified.

5.2.20 LaChance et al. 2015

CSH (LaChance et al. 2015) produced an archaeological literature review and field inspection report for an Awa Street Wastewater Pump Station and Force Main project including portions of Nimitz Highway, Pacific Street, Ka‘aahi Street, Kūwili Street, Pine Street, Sumner Street, Iwilei Road, Dillingham Boulevard, Kokea Street, Kohou Street, Kaumuali‘i Street, Houghtailing Street, Mo‘owa‘a Street, Colburn Street, Waiakamilo Road, and Alakawa Street. No surface historic properties related to traditional Hawaiian culture were observed within the project area corridors or in any area adjacent to the corridors. All sections of the project area displayed evidence of extensive excavation, grading, and fill to create straight, level or gradually sloping roadways. It was concluded that the level of ground disturbance for road construction and the installation of utilities make it less likely that undisturbed subsurface cultural properties are present within the corridor. Research revealed, however, that that project area contains multiple LCAs which can dramatically increase the potential for subsurface historic properties including cultural layers related to wetland agriculture and Hawaiian habitation, and trash pits related to historic residence and commerce in Kapālama.

5.2.21 Stine et al. 2015

CSH completed archaeological monitoring for a Farrington High School Renovations project within Building A Courtyard (Stine et al. 2015). The building foundation of the former Bishop Memorial Chapel (SIHP # -7555) was encountered during subsurface excavation. Additionally, 114 artifacts were collected from the debris layer associated with the demolition of the former Bishop Memorial Chapel.

5.2.22 Yucha et al. 2016

CSH conducted archaeological monitoring for a Hawai‘i DOT H1 resurfacing project, which extended from Middle Street in Kalihi Ahupua‘a to Ward Avenue in Nu‘uanu Ahupua‘a, between November 2013 and January 2014. CSH completed a report on the crossings at Kalihi Stream,

Kapālama Canal, and Nu‘uanu Stream in 2016 (Yucha et al. 2016). Archaeological monitoring was conducted only when excavations extended deeper than the overlying asphalt/concrete surfaces. Monitoring Project Areas 1 and 2, at the Kalihi Stream and Kapālama Canal crossings respectively, observed no excavations deeper than the existing asphalt/concrete surface. Stratigraphy was recorded in Monitoring Project Area 3 near the Nu‘uanu Stream crossing but no cultural layers were observed.

5.2.23 O’Hare and McDermott 2017

CSH (O’Hare and McDermott 2017) carried out an archaeological literature review and field inspection study for an American Savings Bank proposed Kalihi property purchase, (TMK: [1] 1-3-003:02). It was noted that there was once a *heiau* named Hāunapō, probably located somewhere within the *‘ili* of that name but it was likely long destroyed by the mid-nineteenth century. It was noted that pre- and/or post-Contact burials, historic coffin burials, and historic trash deposits have been recorded less than a kilometer to the west of their project area near Middle Street and that area of Kalihi was used for taro cultivation into the late nineteenth century, when it was then developed as a residential neighborhood. No historic properties were identified

Section 6 Results of Fieldwork

Fieldwork was accomplished on 21 and 24 May 2020 by CSH archaeologist David W. Shideler, M.A. This work required approximately ½ person-day to complete. Although it was understood that the proposed improvements are primarily for the eastbound (*makai*) lanes, significant portions of the project area are *mauka* of the westbound lanes and the entire project area was addressed.

The perimeter of the project area was traversed extensively on foot (where safety and access avoiding private property permitted) and was also traversed by car. An archaeologist's track log (yellow for the pedestrian inspection and red for the vehicular inspection) is shown on Figure 33 and Figure 34 includes a photo key to the following figures with the approximate location from which photographs were taken and the approximate direction of the views.

The photographic coverage and following discussion begins at the northeast end of the project area, proceeds to the southeast end, and then generally proceeds around the project area in a counter-clockwise direction, first along the *mauka* side of the project area and then along the *makai* side. The project area was first approached walking *makai* (southwest) on the southeast (Diamond Head) side of Kalihi Street (on the northwest side of the Bernice Pauahi Bishop Museum).

Photo A (see Figure 34 and Figure 35) provides a general view of the northeast end of the project area at *mauka*-bound Kalihi Street and the *mauka*-bound off-ramp from the H1. This area was perceived to have been significantly graded with a road cut already beginning for the drop down to the H1 ROW.

Photo B (see Figure 34 and Figure 36) provides a general view of the northeast end of the project area showing Kalihi Street *mauka*-bound and the *mauka* merge off the H1 on to Kalihi Street and a northeastern cloverleaf grassed "island." These several, relatively large grassed islands separating traffic lanes have clearly been graded and show different degrees of having been cut down below the natural ground surface. In the case of the Photo B grassed "island," the road cut was slight while in the case of the Photo C (see Figure 34 and Figure 37) northeastern cloverleaf grassed "island" there appeared to be a substantial road cut down to the *mauka*-bound off-ramp from H1.

Photo D (see Figure 34 and Figure 38) provides a general view of the east end of the project area from the Kalihi Street *makai*-bound overpass, looking toward the *makai*-bound Likelike Highway overpass. In general terms it is understood that these overpasses are essentially at the former natural grade and connect the ends of streets that were extant before the massive road cut. The entire view plane in Photo D is understood to have been cut below any culture-bearing sediments.

Photo E (see Figure 34 and Figure 39) provides a general view of the southeast end of the project area from Kalihi Street looking *mauka* toward the overpass. Most of this corner of the project area is believed to be close to the natural slope but it had clearly been extensively graded.

Photo F (see Figure 34 and Figure 40) provides a general view of the Kalihi Street *mauka*-bound overpass H1 interchange *makai* cloverleaf giving a feeling for how land alteration associated with H1 construction involved major fill episodes for ramp construction leading up to overpasses on the *makai* side of the interchange. The assessment was that the natural ground surface in this area had been massively reworked.

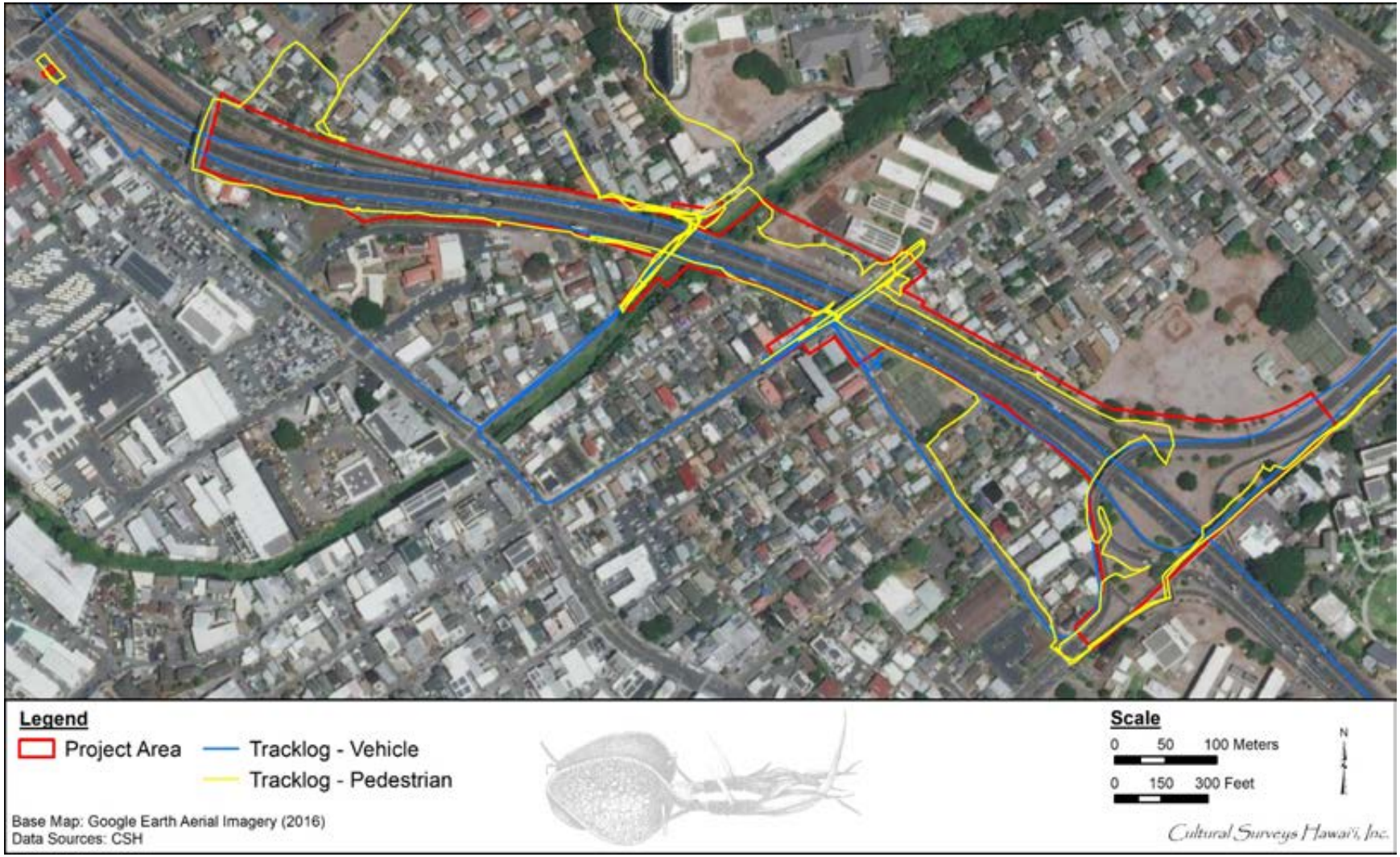

Figure 33. 2016 Google Earth aerial photograph of the project area showing the archaeologist’s track log

Figure 34. Aerial photograph with the current project area and wall feature indicated as well as locations and directions of the following field inspection photographs (base map: Google Earth 2016)

Figure 35. Photo A: General view of the northeast end of the project area at *mauka*-bound Kalihi Street at center, *mauka*-bound off-ramp from the H1 is at upper right, view *makai* toward H1 interchange, view to southwest

Figure 36. Photo B: General view of the northeast end of the project area at Kalihi Street *mauka*-bound at right, *mauka* merge off the H1 on to Kalihi Street at left, view *mauka* from the northeastern cloverleaf grassed “island,” view to northeast

Figure 37. Photo C: General view of the east end of the project area at Kalihi Street *mauka*-bound overpass (at upper left), *mauka*-bound off-ramp from H1 at upper right, view *makai* from the northeastern cloverleaf grassed “island,” view to southwest toward H1

Figure 38. Photo D: General view of the east end of the project area from the Kalihi Street *makai*-bound overpass, *makai*-bound Likelike Highway overpass in background, view to northwest along the H1

Figure 39. Photo E: General view of the southeast end of the project area from Kalihi Street looking *mauka* toward the overpass, *makai*-bound Kalihi Street at upper left, merge to H1 eastbound at right, view to northeast

Figure 40. Photo F: General view of the Kalihi Street *mauka*-bound overpass H1 interchange *makai* cloverleaf, H1 in center background, view to northwest

Photo G (see Figure 34 and Figure 41) provides an oblique view looking back (to the northeast) at the east end of the project area showing the extent of the width of the roadcut for the highway.

Photo H (see Figure 34 and Figure 42) provides another view of the east end of the project area documenting the extent of the road cut for the *mauka* on-ramp to the H1 westbound.

Photo I (see Figure 34 and Figure 43) provides a general view of the large *mauka* grassed "island" at the east end of the project, with the extent of the slope on the east side of the Likelike Highway *makai*-bound lane suggesting substantial cut and fill above and beyond just grading.

Photo J (see Figure 34 and Figure 44) provides a general view from Nakuina Street of the Likelike Highway merge lane to west-bound H1 traffic showing the massive extent of the highway road cut typically supported by high, vertical concrete walls.

Photo K (see Figure 34 and Figure 45) provides a view of the H1 from just east of the Gulick Avenue overpass showing the extent of the highway road cut on both sides.

Photo L (see Figure 34 and Figure 46) provides a view of the *mauka* Gulick Avenue portion of the project area leading down to the Gulick Avenue overpass, which was a rare portion of the project area that did not appear to have been significantly cut down below the original grade.

Photo M (see Figure 34 and Figure 47) provides a view of a large area on the *makai* side of Kalihi Waena Elementary School including a large area of parking lot and a large graded area of short mowed grass understood as part of the project area. Although this portion of the project area is indicated to be Ewa silty clay loam, the ground surface gave the impression of being hard pan with little likelihood of potentially culture bearing soft sediments. While *mauka* of the chain link fence line (understood as the *mauka* edge of the H1 ROW) there was little evidence of a cut, the area appeared to have been extensively graded.

Photo N (see Figure 34 and Figure 48) provides a view of the *mauka* side of the H1 crossing over Kalihi Stream and adjacent Richard Lane on the west side. Given the relatively deep V-shaped channel of Kalihi Stream, it was assessed that any adjacent cultural deposits were likely to have been extensively reworked, if not obliterated by 50-year floods.

Photo O (see Figure 34 and Figure 49) provides a view of *mauka* westbound H1 from west of Richard Lane showing the extent of the road cut, which while not as deep as other portions of the project area to the east and west, was judged to be cut well below any culture-bearing sediments.

Photo P and Photo Q (see Figure 34, Figure 50, and Figure 51) provide a pair of views of the Kaua Street H1 westbound off-ramp, Queen Lili‘uokalani Freeway west-bound off-ramp, and H1 from Kamehameha IV Road giving a feeling for the substantial depth and extent of the H1 roadcut in both directions.

Photo R (see Figure 34 and Figure 52) provides a view of the west end of the project area from the Ola Lane overpass, which is believed to be at the approximate level of the natural ground surface showing the substantial depth and extent of the highway road cut.

Photo S and Photo T (see Figure 34, Figure 53, and Figure 54) are another pair of west and east-looking photographs conveying the substantial depth and extent of the highway road cut at the west end of the project area.

Figure 41. Photo G: View of the east end of the project area showing extent of roadcut for the highway, Kalihi Street *makai*-bound overpass at upper right, view to northeast

Figure 42. Photo H: General view of the east end of the project area, *mauka* on-ramp to the H1 westbound, view to northeast

Figure 43. Photo I: General view of large *mauka* grassed “island” at the east end of the project area, Likelike Highway *makai*-bound at upper left, view to northeast

Figure 44. Photo J: General view of the H1 from Nakuina Street, Likelike Highway merge lane to west-bound traffic at center, showing the extent of the highway road cut, view to west

Figure 45. Photo K: View of the H1 from just east of the Gulick Avenue overpass showing extent of the highway road cut, view to southeast

Figure 46. Photo L: View of the Gulick Avenue overpass from the *mauka* edge of the project area, view to southwest

Figure 47. Photo M: View of the *makai* side of Kalihi Waena Elementary School portion of the project area from near Kalihi Stream, view to southeast

Figure 48. Photo N: View of the *mauka* side of the H1 crossing over Kalihi Stream (it is understood that the *mauka* expansion of the project area is on the east side of the stream), Richard Lane at right, view to southwest

Figure 49. Photo O: View of *mauka* westbound H1 from west of Richard Lane showing extent of road cut, view to west

Figure 50. Photo P: View of Kaua Street H1 westbound off-ramp (foreground), Queen Lili‘uokalani Freeway west-bound off-ramp (midground), and H1 (background) from Kamehameha IV Road showing extent of road cut, view to southwest

Figure 51. Photo Q: View of Kaua Street H1 westbound off-ramp (foreground), Queen Lili‘uokalani Freeway west-bound off-ramp (midground), and H1 (background) from Kamehameha IV Road showing extent of road cut, view to southeast

Figure 52. Photo R: View of the west end of the project area from the Ola Lane overpass showing extent of road cut, view to east

Figure 53. Photo S: View of the west end of the project area from the *makai* side of the H1 looking toward the Ola Lane overpass (midground) showing extent of road cut, view to northwest

Figure 54. Photo T: View of the west/central portion of the project area from the *makai* side of the H1, towers at Kuhio Park Apartments at left edge, view to northeast

Photo U (see Figure 34 and Figure 55) provides a view of the *makai* side of the H1 overpass over Richard Lane and Kalihi Stream (a view *mauka* companion to the *makai* view shown in Figure 48). It is understood that the *makai* expansion of the project area here includes Kalihi Stream. Given the relatively deep V-shaped channel of Kalihi Stream, it was assessed that any adjacent cultural deposits were likely extensively reworked, if not obliterated by 50-year floods.

Photo V (see Figure 34 and Figure 56) provides a view of the *makai* end of the Gulick Avenue portion of the project area. This was perceived as a rare portion of the project area that had not been subject to a deep road cut although it had clearly been graded.

Photo W and Photo Y (see Figure 34, Figure 57, and Figure 59) provide a pair of views to the northwest (‘Ewa) and to the southeast (Diamond Head) of the H1 from the Gulick Avenue overpass showing the substantial depth and extent of the H1 road cut.

Photo X (see Figure 34 and Figure 58) provides a view of the inscribed date “1959” on the south end of the Gulick Avenue overpass. Most of the existing H1 infrastructure of the project area is believed to date from that timeframe and hence to be features of a potential H1 (architectural) historic property.

Photo Z (see Figure 34 and Figure 60) provides a view of the Kalihi-Waena Neighborhood Park *makai* portion of the project area just southeast of the southwest end of the Gulick Avenue overpass. While perceived as a rare at natural grade portion of the project area, it had clearly been graded.

A draft of this study was submitted in September 2020 and subsequently five quite small additions (total area 0.49 acres) to the project area were added. Additional field inspection was undertaken of these five areas by CSH archaeologist David Shideler, M.A., on 17 May 2021. Two small areas were added along the east side of Gulick Avenue on the *mauka* and *makai* sides of the H1 overpass. The addition on the *mauka* side appears to include a private home but with a driveway and a dirt informal parking area on the *makai* side facing the H1 road cut (Figure 61). The add-on area on the *makai* side appears to include a Hawaiian Pentecostal Full Gospel Assembly Church and associated home (Figure 62).

Another pair of additions to the project area similarly bracket the H1 at Richard Lane and Kalihi Stream (which run parallel and quite close together). A chevron-shaped *mauka* expansion area extends northeast a short distance up Richard Lane/Kalihi Stream (Figure 63) and another small wing extends up what appears to be an adjacent private driveway to the west (Figure 64). Crossing under the H1 overpass over the stream and lane there is a small add-on area along where Richard Lane parallels Kalihi Stream approaching the H1 (Figure 65).

West of the main H1 project area an additional (fifth), discrete, small add-on project area is understood as intended for an ITS conduit crossing North King Street (which is only two lanes wide at this point) just east of Middle Street (Figure 66 and Figure 67). It is understood that this is to tie in to the existing electrical cabinet depicted in the photographs.

In summary, the field inspection served to document the massive H1 road cut that characterizes the vast majority of the project area. Certain relatively small portions of the project area (see Figure 35, Figure 39, Figure 46, Figure 47, Figure 56, and Figure 57) are close to natural grade but these were assessed as generally unlikely to bear intact cultural deposits. The immediate vicinity of

Kalihi Stream (see Figure 48 and Figure 65) was noted to have somewhat of an incised V-shaped cross-section suggesting a probability that any culture-bearing sediments may have been blown out in a 50-year flood. Clearly much of the actual H1 construction is over 50 years old (see Figure 58) and this portion of the H1 merits consideration as a historic property in and of itself (we understand a companion study of this portion of the H1 as a historic property is presently being carried out by Mason).

During the course of this project, the wall on the west side of Kalihi Stream (see Figure 34, Figure 68 and Figure 69) was considered as a potential historic property.

While the added on project areas are all very small, a concern is that the portion of the project along Kalihi Stream that may affect stream bank areas now seems very much greater. The initial project area along the stream was close to the freeway overpass infrastructure and was judged as more likely to have been disturbed than the added areas farther from the freeway overpass.

Figure 55. Photo U: View of the *makai* side of the H1 overpass over Richard Lane and Kalihi Stream (at right), view to northeast

Figure 56. Photo V: View of the *makai* end of the Gulick Avenue portion of the project area, view toward Gulick Avenue overpass, view to northeast

Figure 57. Photo W: View to the northwest (‘Ewa) of the H1 from the Gulick Avenue overpass showing extent of road cut, view to northwest

Figure 58. Photo X: View of inscribed date “1959” on south end of the Gulick Avenue overpass, view to southeast

Figure 59. Photo Y: View to the southeast (Diamond Head) of the H1 from the Gulick Avenue overpass showing extent of road cut, view to southeast

Figure 60. Photo Z: View of the Kalihi-Waena Neighborhood Park portion of the project area just southeast of the southwest end of the Gulick Avenue overpass, view to southeast

Figure 61. Photo AA: General view of the (4,299-sq-ft) project expansion area on the east side of Gulick Avenue, *mauka* of the freeway, view to southwest toward Gulick Avenue overpass (at upper right) and freeway cut (at upper center and left)

Figure 62. Photo BB: General view of the (4,325-sq-ft Hawaiian Pentecostal Full Gospel Assembly) project expansion area on the east side of Gulick Avenue, *makai* of the freeway, view to northeast, Gulick Avenue overpass (at upper left)

Figure 63. Photo CC: General view of the northeast portion of the Richard Lane (8,935-sq-ft) project expansion area on the *mauka* side of the H1, Kalihi Stream at upper left, view to southwest

Figure 64. Photo DD: General view of the northwest portion of the Richard Lane (8,935-sq-ft) project expansion area on the *mauka* side of the H1, Kalihi Stream in background, view to southwest

Figure 65. Photo EE: General view of the southwest portion of the Richard Lane (3,772-sq-ft) project expansion area on the *makai* side of the H1 (in background), Kalihi Stream at right, view to northeast

Figure 66. Photo FF: General view of the North King Street ITS trench crossing expansion area near Middle Street, view to northeast across North King Street toward the H1

Figure 67. Photo GG: General view of the North King Street ITS trench crossing expansion area near Middle Street, view to southwest across North King Street

Figure 68. View of wall (a potential historic property) along the northwest side of Kalihi Stream *mauka* of the freeway (at right), view to southeast

Figure 69. View of wall (a potential historic property) along the northwest side of Kalihi Stream *makai* of the freeway (at left), view to southeast

Section 7 Cultural Assessment

7.1 Introduction

7.1.1 Introduction to the Project Area

The Interstate Route H1 Widening project lies very largely within the ROW of the H1 Freeway that was excavated deeply below the natural ground surface in 1959 to allow for important cross-streets to remain at grade. Photographs to the west from the east end of the project area at the Kalihi Street overpass (see Figure 38), to the east and west of the relatively central Gulick Avenue overpass (see Figure 45 and Figure 57), and east from the west end of the project area at the Ola Street overpass (see Figure 52) convey the fact that most of the project area has been cut down 5 m or more below the natural ground surface. This excavation in 1959 would have removed any previous cultural or natural resources from this area.

There are relatively less disturbed areas in the cloverleaves and traffic islands at the Kalihi Street end (see photographs in the Figure 35 through Figure 43 series) but these areas also appear to have been significantly graded and these areas are within active H1 and Kalihi Street ROWs. At the Gulick Avenue *mauka* and *makai* project area extensions (see Figure 46 and Figure 56) the project area is close to the natural grade but these areas are entirely paved as Gulick Avenue and the adjacent curbs and sidewalks. The *makai* side of the Kalihi Waena Elementary School portion of the project area (see Figure 47) is close to grade but has been graded, is within a maintained short-grass lawn, and is within an active school yard. The Kalihi-Waena Neighborhood Park portion of the project area (see Figure 60) similarly is close to grade but has been graded, is within a maintained short-grass lawn, and is within an active park.

Thus the project area is regarded as unusual in the extent of the prior land alteration and the absence of any remnant of the natural and cultural landscape that existed prior to 1959.

7.1.2 Overview of Place in Hawaiian Culture

A detailed summary of the *Legendary and Traditional Background* of the project area within the context of Kalihi and Kapālama Ahupua‘a (an eastern sliver of the project area at Kalihi Street is in Kapālama) is presented in Section 3 of this study. The 1883 Brown map of Kalihi Valley (see Figure 12) depicts the pattern of LCAs within the project area and conveys the vibrant cultural landscape that existed there ca. 1850, probably reflecting patterns of land use going back centuries into pre-Contact times. Although several *haole* (Caucasian) who had been in service to the Kingdom are represented as landowners (Captain Alexander Adams, George Beckley, John Meek), the awardees of lands within the project area also include members of prominent *kahuna* lines (Hewahewa and Nahinu are discussed in Section 4.1). The project area is understood to have been mostly in agricultural lands (see Table 1) including both *lo‘i kalo* irrigated off Kalihi Stream and *kula* dryland areas with the major traditional Hawaiian habitation area at Kaluapalena just to the northwest where early Protestant and Catholic churches were developed (as shown on a 1897 Monsarrat map, see Figure 15). The main development of note for the Native Hawaiian community was the original (lower) Kamehameha Schools campus but this was in Kapālama just east of the project area. The development of portions of the project area by non-Hawaiian interests is already evident in the LCA record from ca. 1850 (see Table 1) and relatively early the project area began

to be developed in housing and enterprises of the wider, growing community. There were many homes developed in the project area by 1919 (see Figure 18) and the project area was mostly fully developed in homes by 1952 (see Figure 25). The project area was radically transformed by the excavation of a huge, deep and wide trench for the present H1 freeway alignment in 1959. Most of the natural ground surface of the project area was cut down 5 m or more at that time.

7.1.3 Overview of the Proposed Project

It is understood the project would increase the number of eastbound through lanes within the project limits from three to four. Details of any possible project development are not known by CSH at this time. Possible development could include reworking of the sides of the H1 Freeway but such work would most likely be largely within the existing road cuts far below the level of the natural, potentially culture-bearing ground surface. The project area is evaluated as having been very extensively altered by excavation in the process of prior road construction—particularly for the construction of the H1 ca. 1959. The two small relatively close to natural grade areas at the Kalihi Waena Elementary School and Kalihi-Waena Neighborhood Park portions of the project area also appear to have been significantly graded.

7.2 Cultural Resources in the Vicinity of the Project Area (portions of Kalihi and Kapālama Ahupua‘a)

The cultural resources in the vicinity of the project area are considered below in terms of archaeological resources, burials, earth resources, stream resources, plant resources, trails, and *wahi pana* (storied places).

7.2.1 Archaeological Resources

Previously identified historic properties in the vicinity of the project area are depicted in Figure 31 and are summarized in Table 4. While the project vicinity has been relatively well studied in the archaeological literature (Figure 30 and Table 3), it appears no traditional Hawaiian sites have been identified within approximately 400 m of the project area (see Figure 31). There was a *hōlua* slide and certain stones of renown in the general vicinity (Figure 7) but these appear not to have been in close proximity to the project area. There are architecturally important structures (the Bishop Museum Complex, historic fire stations, Farrington High School) in the vicinity but these would not appear to suggest related subsurface deposits of import far from the designated site. J. Gilbert McAllister concluded based on his fieldwork in 1931 that “If any archaeological remains yet exist in Kalihi Valley, they are not known to the Hawaiians” (McAllister 1933:88–91). While the veracity of the claim is uncertain, it does appear there were few traditional cultural properties in the urbanized, *makai* portion of the valley.

7.2.2 Burials

It appears no burials or discoveries of human skeletal remains have been reported in the archaeological literature within approximately 400 m of the project area (see Figure 31).

7.2.3 Earth Resources

The clays and clay loams of the project vicinity clearly supported traditional Hawaiian agriculture as indicated by the distribution and nature of LCAs in the historic record (Figure 12 and Table 1). That agricultural landscape is long gone. While notable stones were something of a

feature of Kalihi Valley, none of the famous stones appear to have been near the present project area (Figure 7).

7.2.4 Stream Resources

The project area crosses over perennial Kalihi Stream that was almost certainly drawn upon for irrigation water through a system of *‘auwai* in the vicinity. Kalihi Stream in the project area is heavily channelized (see Figure 48 and Figure 65). Today this portion of the stream appears to be in exclusively exotic vegetation.

7.2.5 Plant Resources

The margins of the project area are largely in mowed grass but there are extensive ornamental plantings of *naupaka* (*Scaevola* sp.), *pōhinahina* (*Vitex rotundifolia*), with *haole koa* (*Leucaena glauca*) and other exotic grasses and weeds in less maintained perimeter areas. The steep margins of the highway typically would be dangerous for any attempts to gather plant resources.

7.2.6 Trails

King Street, which runs roughly parallel to the project area to seaward (depicted on the 1881 Covington map, Figure 11), is understood to approximate the main traditional cross-*ahupua‘a* trail in the vicinity. Kalihi Street may have always been the primary route into the valley (as indicated on the 1897 M.D. Monsarrat map). The purpose of the project is to improve (vehicular) travel and the project is anticipated to have no adverse impact to traditional trails or access.

7.2.7 *Nā Wahi Pana*

This study has made an effort to develop information on traditional Hawaiian storied places or *wahi pana* in the vicinity including the Kaluapalena habitation area (see Figure 11), a *hōlua* slide, Kalaepōhaku, a phallic stone, and the Niuhelewai Stream as the locus of famous battles (see Figure 7). None of these is regarded as close to the present project area.

7.3 Conclusion

This brief study of cultural impacts presents data from available sources examined and seeks to use dissemination of this study to elicit feedback on any cultural resources or practices as may be impacted by this project. Based on the information examined, it appears unlikely that this project will have any adverse impact on cultural resources or practices—particularly given the extensive nature of prior ground disturbance in the project area as suggested by a 1959 photograph regarded as representative (see Figure 28).

Section 8 Summary and Recommendations

8.1 Summary

Clearly the project area was a vibrant Hawaiian community in the late 1840s and the layout of LCAs (see Figure 12) probably reflected a pattern of residences and agriculture that extended back into pre-Contact times. As early as 1919 (see Figure 18) there were many homes built in the project area with the density of homes increasing into the 1950s.

While the project vicinity has been relatively well studied in the archaeological literature (see Figure 31 and Table 3) it appears no traditional Hawaiian sites or burials or discoveries of human skeletal remains have been reported in the archaeological literature within approximately 400 m of the project area (see Figure 32). There are architecturally important structures (the Bishop Museum Complex, historic fire stations, Farrington High School) in the vicinity but these would not appear to suggest related subsurface deposits of import far from the designated site.

The main consideration arising from this study is how deep and wide and pervasive the excavation for the road cut for the H1 Freeway was in 1959 (see in particular Figure 38, Figure 44, Figure 50 through Figure 54, Figure 57, and Figure 59). It appears the vast majority of the project area was cut down below any culture-bearing sediments in 1959. The less impacted areas are at the east end at the Kalihi Street cloverleaf connections (see Figure 35 through Figure 37, Figure 39 and Figure 40), at the *makai* side of the Kalihi Waena Elementary School portion of the project area (see Figure 47), and at the Kalihi-Waena Neighborhood Park portion of the project area (see Figure 60) but these too were regarded as massively impacted by grading.

Particular attention was given to the project crossing of Kalihi Stream (see Figure 48, Figure 63, and Figure 65) but it was initially assessed that 50-year floods may have scoured out any culture-bearing sediments along the stream. The project area along the stream has, however, since been expanded significantly upstream and downstream and furthermore now extends well beyond the former area near the H1 that might reasonably have been expected to have been impacted by the freeway overpass construction. Furthermore, the additions now appear to potentially include ground disturbance in areas back significantly from the stream. These additions merited another look at the LCA data which indicates many land holdings near the stream. It appears the project now encroaches on another of George Beckley’s Kalihi parcels (LCA 818:4) relatively close (within 10 m) to where he references a new (ca. 1849) bridge abutment. It is possible remnants of this bridge endure in the project area; regardless, a bridge at this location enhances the image of a vibrant community and enterprise at this location. The south end of the bridge and connecting path leading to the school lot appear likely to have been in the present project area (see Figure 13).

A separate issue is the possible historic nature of the H1 itself (understood as dating to 1959) and some of its appurtenances like the Gulick Avenue overpass, also built in 1959 (see Figure 58). We understand these are being evaluated by an architectural historian in a companion study.

During the course of this project, the wall on the west side of Kalihi Stream (see Figure 68 and Figure 69) was considered as a potential historic property. An architectural Reconnaissance Level Survey Form (RLS) for the H1 Road Widening project (Mason 2021) was considered. That study provided a determination of eligibility for the lava rock and concrete mortar wall under HAR

Criteria a and c and recommended mitigation to consist of 1) Donation of the RLS to the Hawai‘i State Library, 2) that the wall should be documented (digital photographs by an SOI-qualified person hired by the contractor) prior to dismantling and after the repair-in-kind is completed, and 3) the salvaged lava rock should be reused and the final work, including mortar, should match the existing in composition and appearance (Mason 2021:4, 5). A State of Hawai‘i, Department of Transportation (HDOT) Draft Determination of Effect for this project (dated 15 May 2021) was consulted which concluded “The minor alteration of less than 12 square feet of west masonry wall below the bridge deck at Abutment #1 does not meet the criteria for adverse effect.” This study agrees with that analysis and summary determination.

8.2 Recommendations

This LRFI supports an identification effort be conducted for the project. However, the exact locations of project subsurface impacts are currently unknown, therefore it is recommended that archaeological monitoring for identification purposes along Kalihi Stream is indicated for the potential adverse impact to cultural and agricultural deposits and bridge and path remnants associated with the mid-1800s enterprises documented along Kalihi Stream (as indicated in an 1883 Brown map and LCA records). It is recommended that HDOT submit an HAR §13-275-3 request for an SHPD letter of determination and include this study as a supporting document.

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Appendix A LCA Data

LCA 591:1 to Meek, John

C. No 591 - Part 3. John Meek

This is a claim for Kalo land, situated in Kalihi Island of Oahu & stated by the Claimant to have been derived from Kamehameha 3 in the Year 1824.

From the Evidence taken by the Commission on the 24 November 1847, the Claimants title to this land appears to be equally well established with that of his other claims already awarded. A considerable delay has been occasioned in completing the present adjudication by a long-standing collision which involved part of this claim, subsisting between the Claimant, Beckleys heirs and Captain A. Adams, but which at length, by mutual concession and agreement, has been removed.

The present Claim is in 3 sections - each situated apart, and all of them in Kalihi. No 1 is called Waikoae of 16 acres 9/10 according to measurement by J. Metcalf - No 2 is Waikoae mauka of 1 acre 2/10; and No 3 is called Punaula of 2 Acres 3/10.

The long and peaceable possession of these several lots by the Claimant, with the minor exception relating to certain intersections of boundaries with other claims above referred to, but which have been amicably & finally adjusted, require a Confirmation by the Board of the present Claim, and I do accordingly award to the Claimant - John Meek - a freehold title less than allodial, to the several lands as they are described in the annexed Surveys of J. C. Metcalf - which he may commute for a fee-simple title, as the law prescribes.

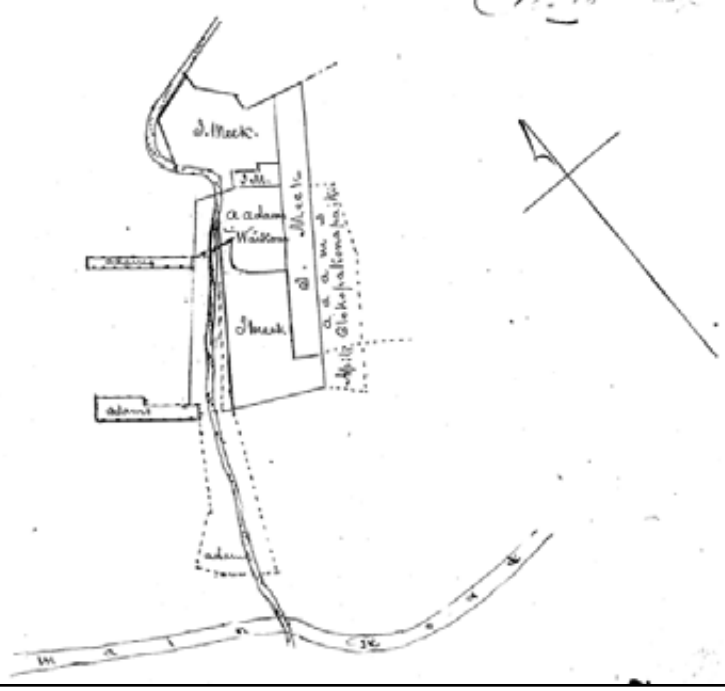
Native rights on any of these lots must be respected where

they may exist, in accordance with the laws, and as may be awarded hereafter upon examination by the Commission.

Section 1 - "Waikoae in Kalihi"

Commencing at Rock marked + on E. side of Kahoewai stream, joining the mauka boundary of Waikoae (Capt Adams) and running N. 54° W. 3 4/100 ch. across Kahoewai stream to rock + in wall at N. corner of Capt. Adams Waikoae. Thence S. 86° E. 1 7/100 Ch. down to stream again. Thence N. 29° 15' W. 3 7/100 ch. along up to bend of stream. Thence N. 13° E. 1 2/100 ch to bend of stream. Thence N. 37° E. 2 7/100 ch. to bend of stream. Thence N. 78 3/4° E. 5 1/2 Ch. along up River to N. corner of this land. Thence S. 4 1/2° W. 2 16/100 ch. along land called Naumuohena to angle. Thence S. 37 1/2 E. 2 27/100 ch. to angle. Thence S. 18° W 1 24/100 ch. to Rock by Aiuwai & Lauhala. Thence S. 69 3/4° E. 4 38/100 ch. along Naumuohena to Mauka E. Corner of this land. Thence S. 45 1/4° W. 8 28/100 Ch. along land called Makaawa to N. Corner of "Apiti" "Loko Kona paiki" (C. Adams) Thence S. 43 1/4° W. 17 2/100 Ch. along to W. Corner of "Apiti" "Loko Kona paiki" Thence N. 54° W. 6 7/100 ch. along Niau to opeh - angle. Thence N. 48 1/2 W 1 42/100 ch. to Kahoewai (Adams) Thence N. 44 1/2 E. 11 1/4 ch. along Kahoewai to bend of stream. Thence N. 52° E. 2 2/100 Ch. to rock marked + Corner. Thence S. 63 1/2° E. 61 Lks to water Course - angle. Thence S. 46 1/4 W. 1 2/100 Ch. along water course to stone wall. Thence S. 15 1/2° E. 1 2/100 Ch up to split basaltic rock. Thence S. 37 1/4° E 2 2/100 Ch. along wall to angle by path, Thence S. 49° E 1 7/100 ch to great wall. Thence N. 45 3/4 E. 3 27/100 Ch along great wall to slight angle. Thence N. 41 1/2 E. 2 7/100 ch. along great wall to E. corner of Capt Adams' Waikoae. Then direct to place of Commence.

Feb 21. 1848. Acres 16 2/10.



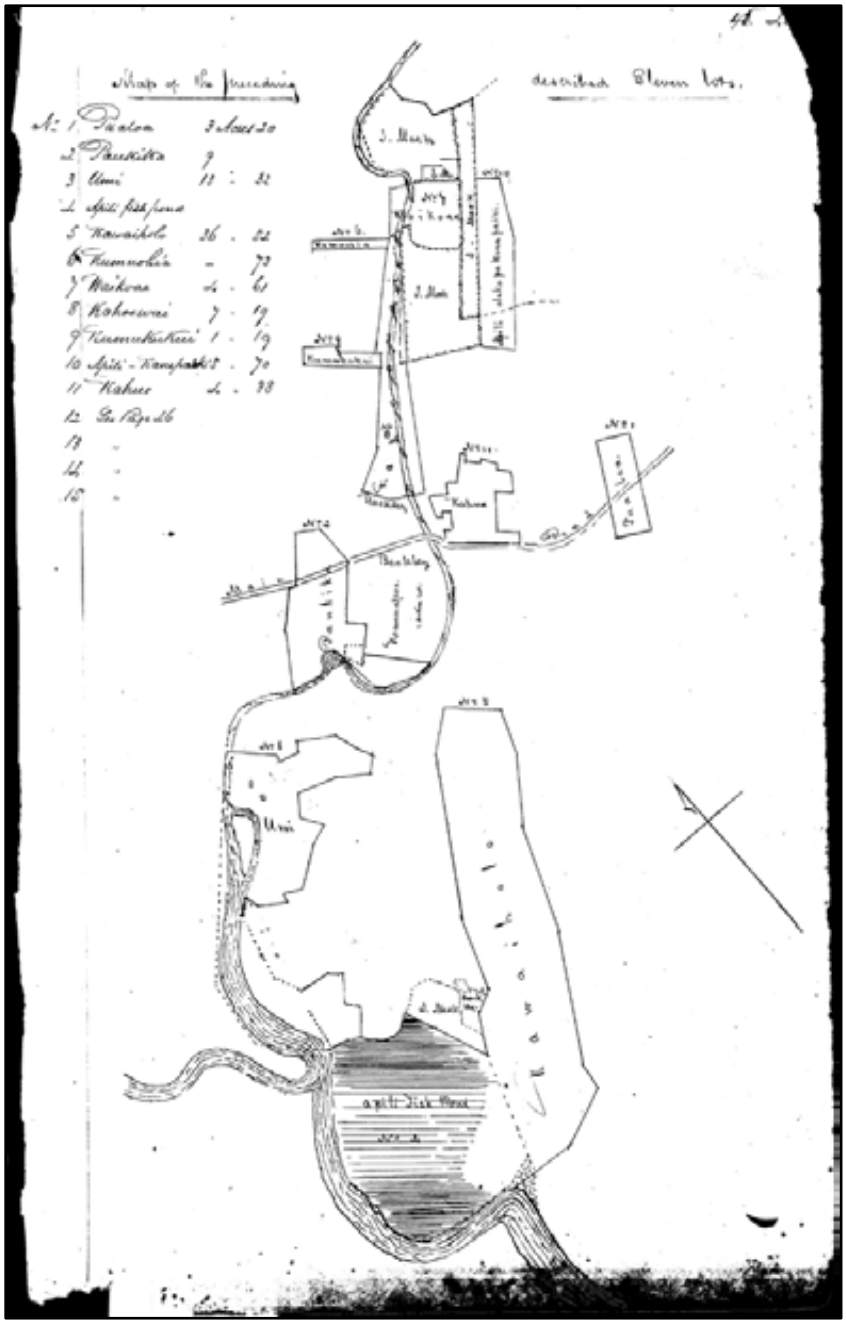
Summary for LCA 591:1 to John Meek

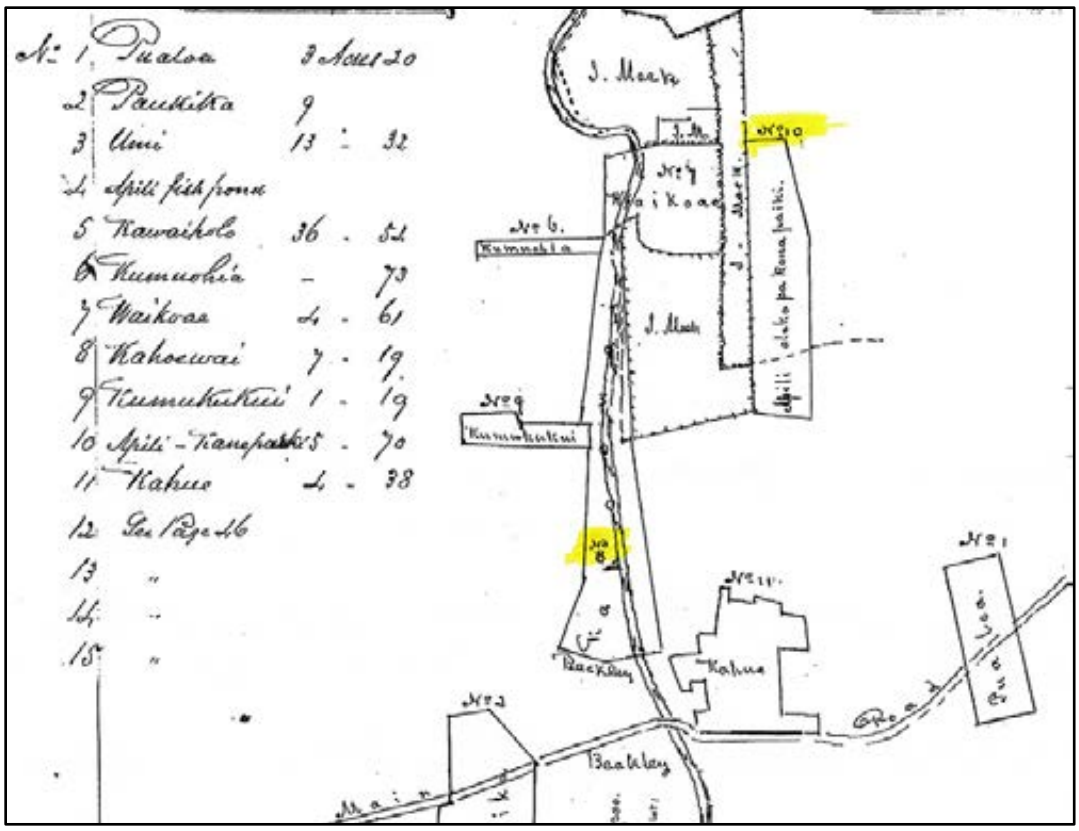
John Meek’s LCA 591:1 claim for “Kalo Land” was on the east side of Kalihi Stream on the *mauka* side of the central portion of the present project area. The account makes reference to his “collision” with the Beckley’s heirs and Captain Adams but it seems the parcel was amicably agreed to by all. The parcel was called “Waikoae”. He appears to consistently refer to the adjacent portion of Kalihi Stream as “Kahoewai Stream.”

LCA 803: 8 and 10 to Adams, Heirs of

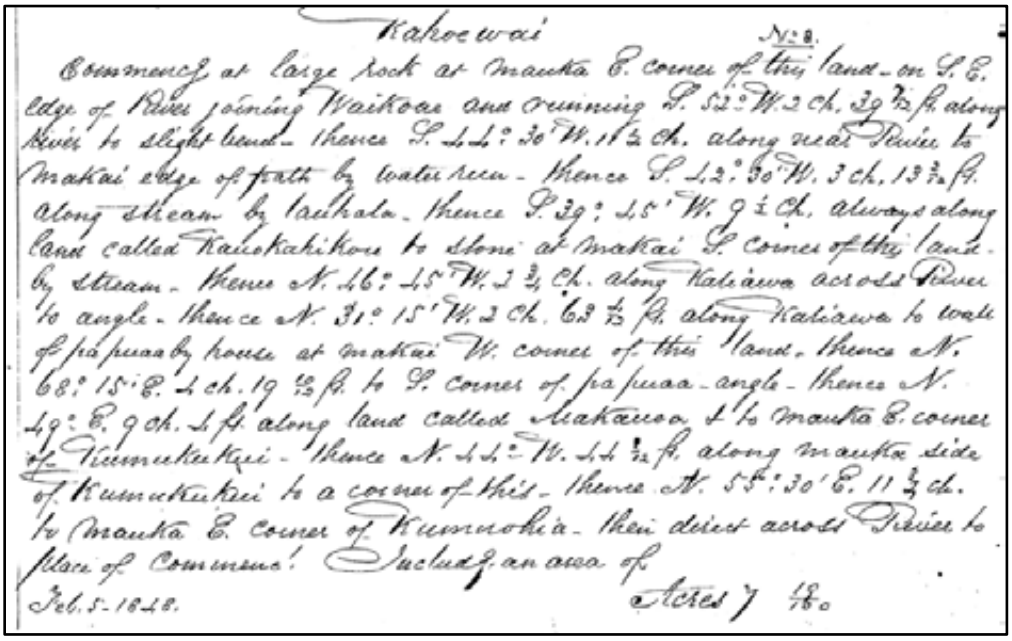
The Heirs of Adams claimed a number of parcels of which portions of two (parcels numbered 8 named Kahoewai and 10 named Apili oloko pa Kanepaiki) were in the present project area.

A map of 11 Adams parcels is shown below (for reference the “Main Road” approximates North King Street) with a close up view of the portion including the two parcels in the project area following.





LCA 803:8, named Kahoewai extended on both sides of Kalihi Stream (just *mauka* of the “Main Road”, approximating North King Street) where the present project area crosses the river, and is described below.



Kahoewai No: 8.

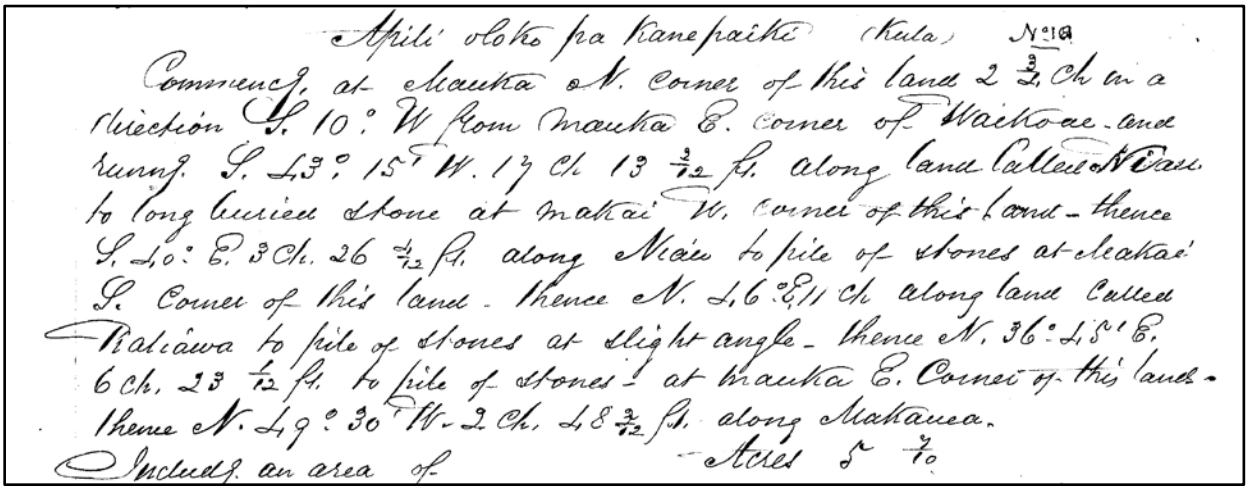
Commencg at large rock at mauka E. corner of this land – on S.E. edge of River joining Waikoaa and running S. 52° W. 2 ch. 39 7/12 ft. along River to slight bend – thence S. 44° 30' W. 11 1/2 ch. along near River to makai edge of path by water reen – thence S. 42° 30' W. 3 ch. 13 3/12 ft. along stream by lauhala – thence S. 39° 45' W. 9 1/2 ch. always along land called Kauokahikona to stone at makai S. corner of this land – by stream – thence N. 46° 45' W. 2 3/4 ch. along Kaliawa across River to angle – thence N. 31° 15' W. 2 ch. 63 1/12 ft. along Kaliawa to wall of papuaa by house at makai W. corner of this land – thence N. 68° 15' E. 4 ch. 19 10/12 ft. to S. corner of papuaa – angle – thence N. 49° E. 9 ch. 4 ft. along land called Niakauoa & to mauka E. corner of Kumukukui – thence N. 44° W. 44 8/12 ft. along mauka side of Kumukukui to a corner of this – thence N. 55° 30' E. 11 3/4 ch. to mauka E. corner of Kumuohia – then direct across River to place of Commenc'. Includg an area of

Feb. 5 - 1848. Acres 7 80

Summary for LCA 803:8 to Heirs of Adams

The Heirs of Adams Kahoewai parcel (LCA 803:8) mentions *lauhala* trees and a “path by a water run” on the east side of Kalihi Stream in the immediate vicinity of the project area. This is consistent with the 1883 Brown map that indicates an *‘auwai* close to, and running roughly parallel to Kalihi Stream. There is a reference to a pig pen (*pāpua‘a*) by a house near the southwest corner of his property near (but probably outside) the present project area

LCA 803:10, named “Apili oloko pa Kanepaiki”, located east of Kalihi Stream and crossing the east/central portion of the project area is described as follows is described as follows:


Apili oloko pa Kanepaiki (kula) No 10
Commencg. at Mauka N. Corner of this land 2 3/4 Ch in a direction S. 10° W from Mauka E. Corner of Waikoae and runng. S. 43° 15' W. 17 Ch 13 3/12 ft. along land called Niau to long buried stone at makai W. Corner of this land - thence S. 40° E. 3 Ch. 26 7/12 ft. along Niau to pile of stones at makai S. Corner of this land - thence N. 46° E. 11 Ch along land called Kaliawa to pile of stones at slight angle - thence N. 36° 45' E. 6 Ch. 23 1/12 ft. to pile of stones at mauka E. Corner of this land - thence N. 49° 30' W. 2 Ch. 48 3/12 ft. along Makaua.
Includg. an area of - Acres 5 7/10

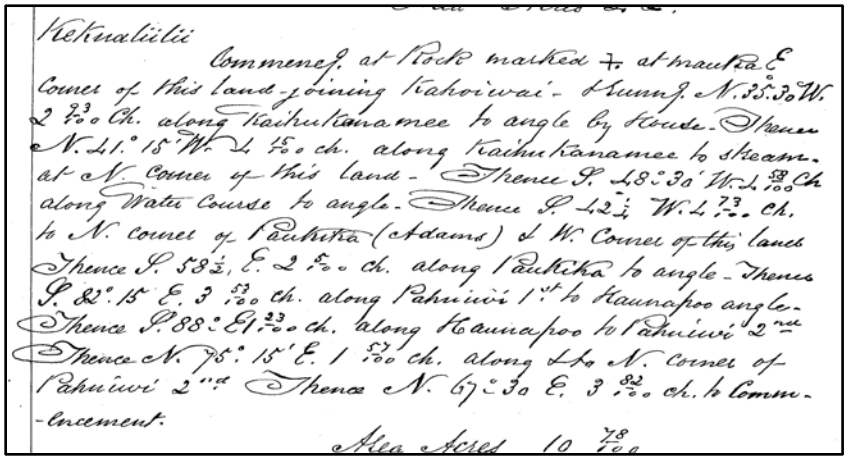
Summary for LCA 803:10 to Heirs of Adams

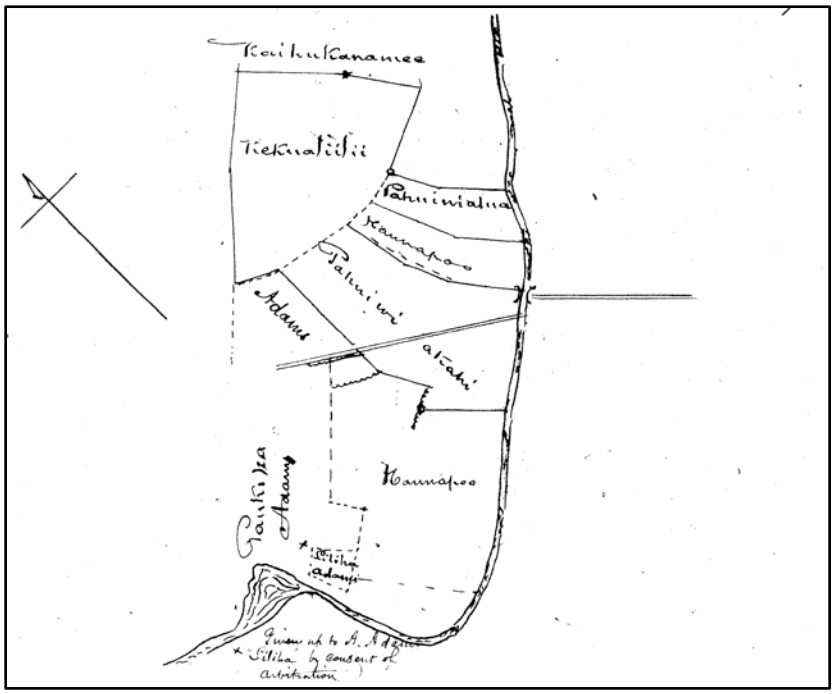
This is indicated to be a dryland (*kula*) parcel, which could have been used for dryland agriculture or just for pasture. There is a reference to the southwest (“*makai* W.”) corner (which would have been in the present project area to what appears to be “long buried stone.”

LCA 818 to Beckley G.

The heirs of George Beckley claimed many discrete parcels (13?) near Kalihi Stream in the vicinity of the project area. It appears he claimed three lands within the present project area, in the central west (LCA 818:2 known as “Kekuali‘ili‘i” and LCA 818:4 seemingly known as “Pohakuloa”) and central east (LCA 818:8) end.

LCA 818:2 Kekuali‘ili‘i

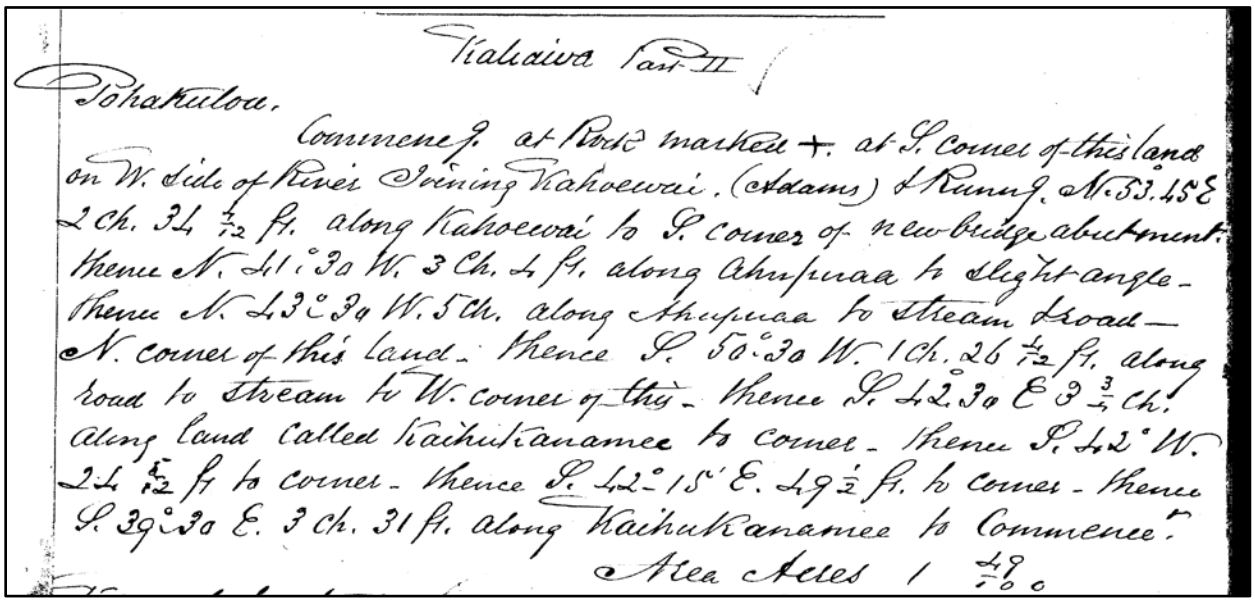

Kekualiilii
Commenc. at Rock marked + at mauka E
Corner of this land - joining Kahoiwai - & runn. N. 35°30' W.
2 93/100 Ch. along Kaihukanamee to angle by House - Thence
N. 41° 15' W. 4 15/100 ch. along Kaihukanamee to stream.
at N. Corner of this land - Thence S. 48°30' W. 4 58/100 Ch
along Water Course to angle - Thence S. 42¼ W. 4 73/100 ch.
to N. corner of Paukika (Adams) & W. Corner of this land
Thence S. 58½, E. 2 5/100 ch. along Paukika to angle - Thence
S. 82° 15 E. 3 53/100 ch. along Pahuiwi 1st to Haunapoo angle -
Thence S. 88° E 1 23/100 ch. along Haunapoo to Pahuiwi 2nd
Thence N. 75° 15' E. 1 57/100 ch. along & to N. corner of
Pahuiwi 2nd Thence N. 67° 30 E. 3 82/100 ch. to Comm-
-encement.
Area Acres 10 78/100



<u>Summary for LCA 818:2 to Heirs of</u> George Beckley

Of note is the reference to a “Water Course”, coming off of Kalihi Stream far inland, effectively forming the northwest side of the property. This is consistent with the 1883 Brown map depiction of a long, straight irrigation channel that would have crossed the west end of the present project area.

LCA 818:2 Pohakuloa

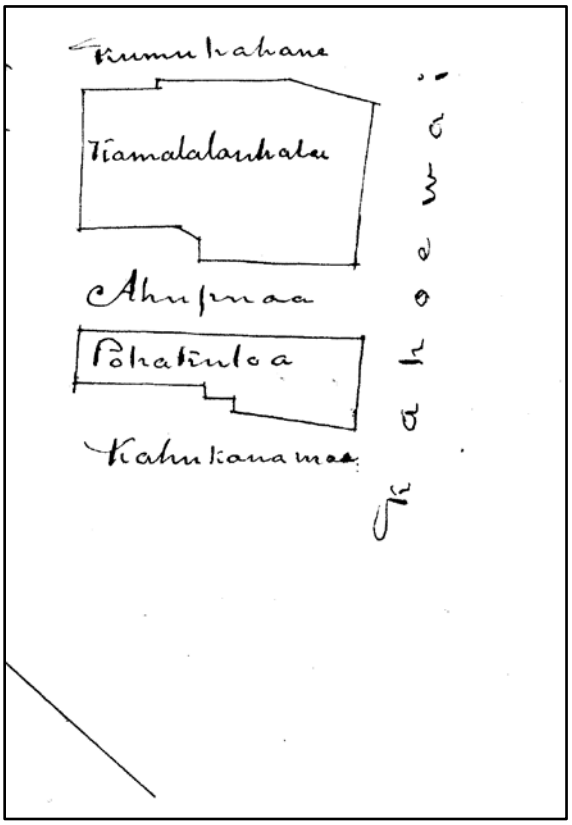


Kaliaiwa Part II

Pohakuloa.

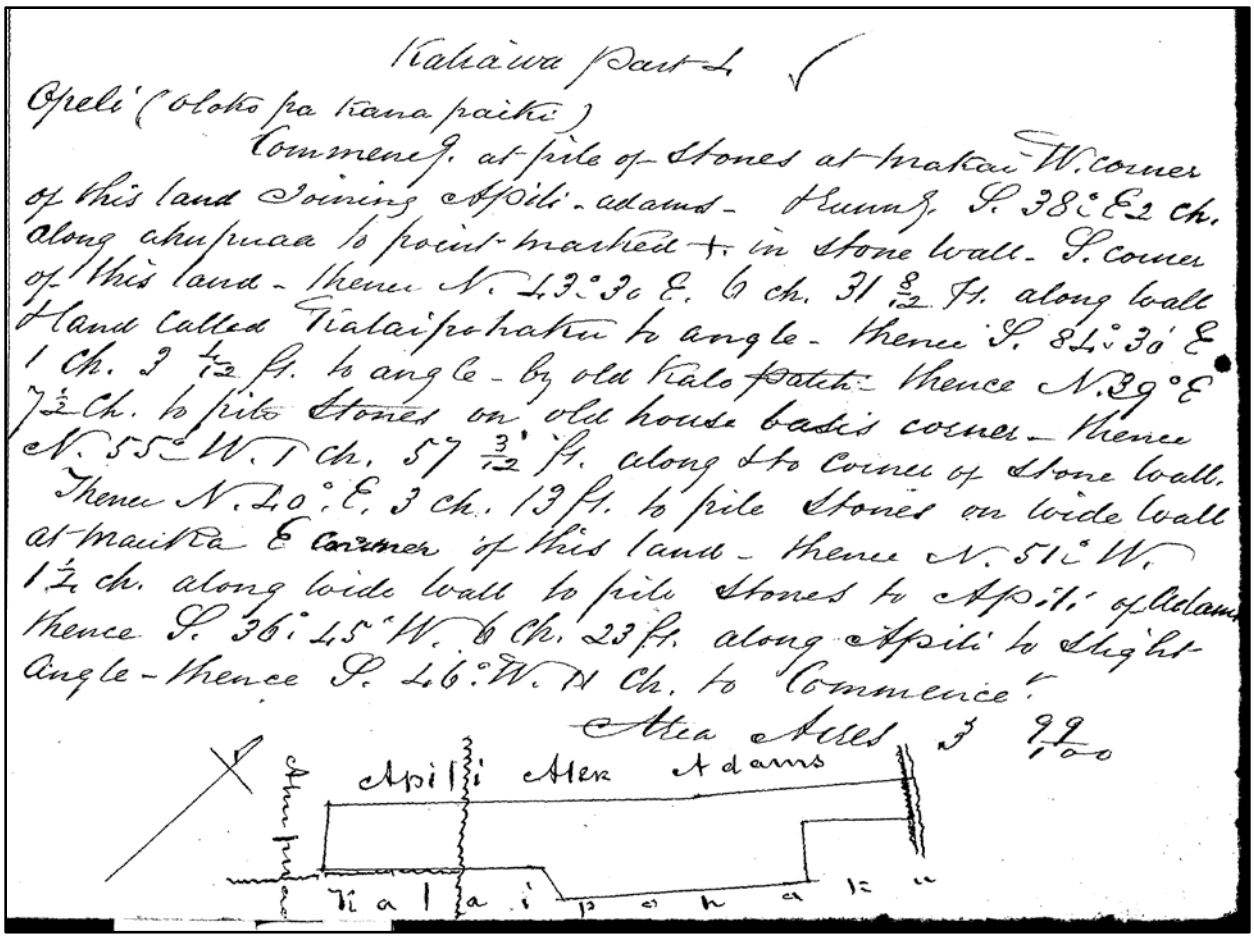
Commencing at Rock marked +. at S. Corner of this land on W. side of River Joining Kahoewai. (Adams) & Running N. 53. 45 E 2 Ch. 34 $\frac{5}{12}$ ft. along Kahoewai to S. Corner of new bridge abutment. thence N. 41° 30 W. 3 Ch. 4 ft. along Ahupuaa to slight angle - thence N. 43° 30 W. 5 Ch. along Ahupuaa to stream & road — N. corner of this land. thence S. 50° 30 W. 1 Ch. 26 $\frac{1}{12}$ ft. along road to stream to W. corner of this - thence S. 42° 30 E 3 $\frac{3}{4}$ Ch. along land called Kaihukanamee to corner - thence S. 42° W. 24 $\frac{5}{12}$ ft to corner - thence S. 42° 15' E. 49 $\frac{1}{2}$ ft. to corner - thence S. 39° 30 E. 3 Ch. 31 ft. along Kaihukanamee to Commence.

Area Acres 1 $\frac{49}{100}$



Summary for LCA 818:4 to Heirs of George Beckley

Of note is the reference to a new (ca. 1849) bridge abutment seemingly near the east corner of this parcel which was close to Kahoewai Kalihi Stream and would have been near the present project area.


Kalaiwa Part 4

Opeli (oloko pa kana paiki)

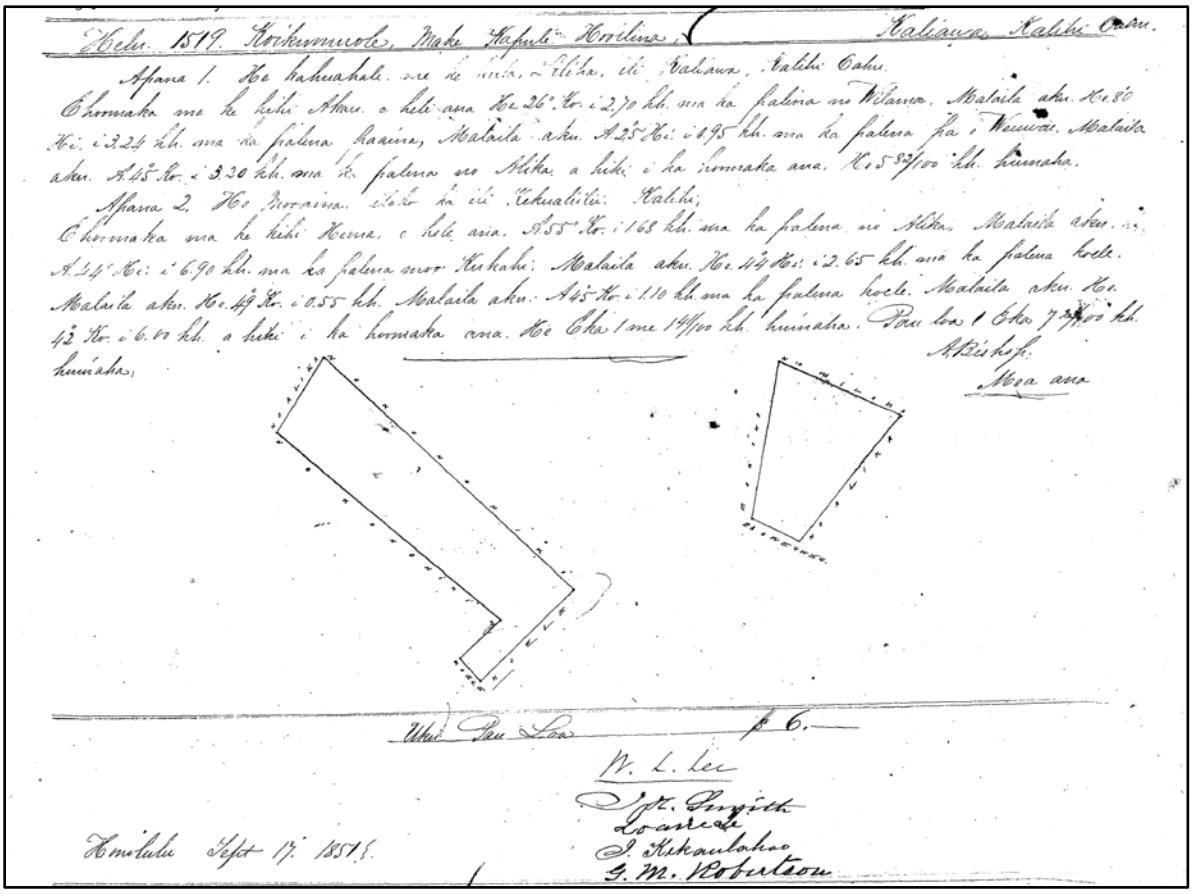
Commenc. at pile of stones at makai W. corner of this land joining Apili - adams - Runn. S. 38° E 2 ch. along ahupuaa to point marked + in stone wall - S. corner of this land - thence N. 43° 30 E. 6 ch. 31 8/12 ft. along wall & land called Kalaipohaku to angle - thence S. 84° 30' E 1 ch. 3 4/12 ft. to angle - by old Kalo patch - thence N. 39° E 7½ ch. to pile stones on old house basis corner - thence N. 55° W. 1 ch. 57 3/12 ft. along & to corner of stone wall. Thence N. 40° E. 3 ch. 13 ft. to pile stones on wide wall at mauka E corner of this land - thence N. 51° W. 1¼ ch. along wide wall to pile stones to Apili of Adams thence S. 36° 45' W. 6 ch. 23 ft. along Apili to slight angle - thence S. 46° W. 11 ch. to commence.

Area Acres 3 99/100

Summary for LCA 818:8 to Heirs of George Beckley

The eastern George Beckley parcel within the project area had a stone wall within the east/central project area and makes references to a bounding “old Kalo Patch” and an “old house”

LCA 1519:2 to Koikumuole for Kapule



Helu 1519 Koikumuole, make, Hapule, Hooilina Kalaiwa, Kalihi Oahu

Apana1. …

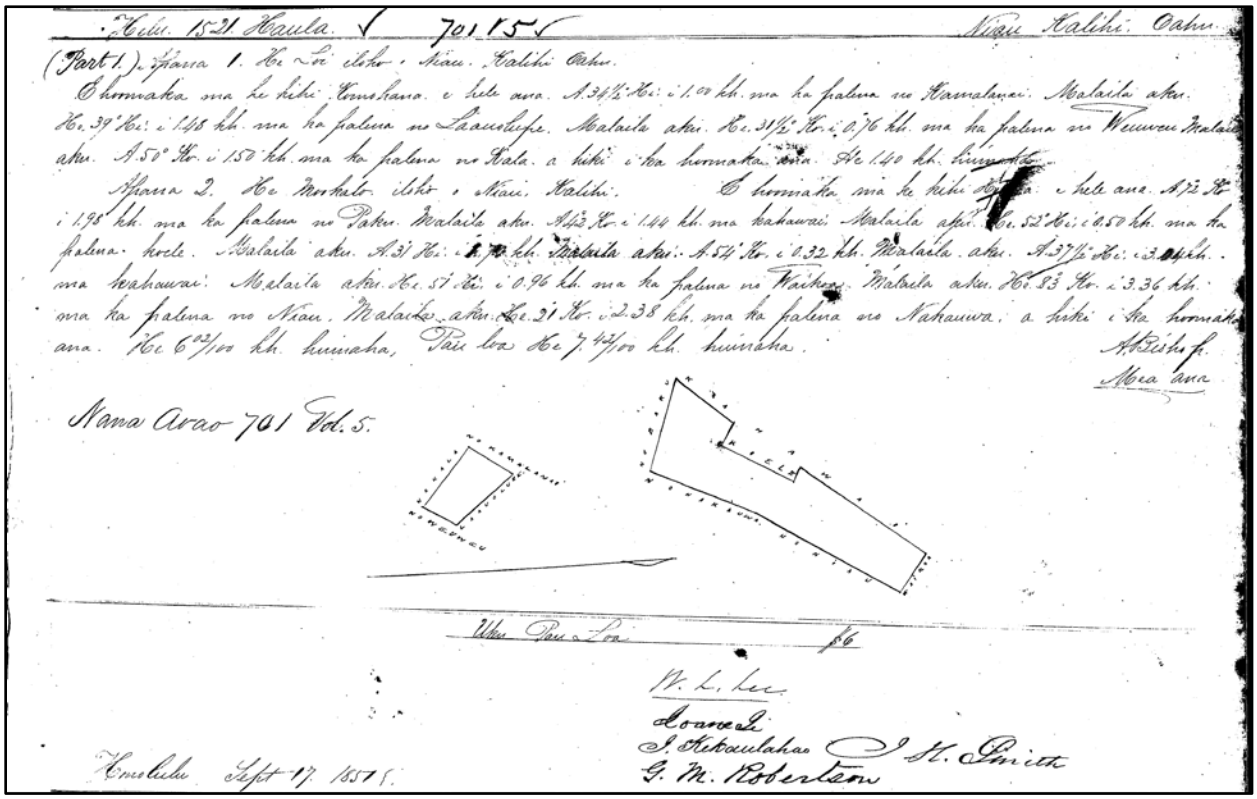
Apana 2. hemooaina iloko kaili Kekualiilii Kalihi

E hoomaka ma ke kihi Hema e hele ana A. 55° Ko. i 1.68 kh. ma ka palena no Alika, Malaila aku A 44° Hi. i 6.90 kh ma ka palena moo Kukahi, Malaila aku He. 44° Hi. i 2.65 kh ma ka palena koele Malaila aku He. 49° Ko. i 0.55 kh. Malaila aku A 45° Ko i 1.10 kh ma ka palena koele, Malaila aku He 42° Ko. i 6.00 kh a hiki i ka hoomaka ana He Eka 1 me 1 41/100 kh huinaha. Pau ka 1 Eka 7 2/100 kh huinaha A. Bishop
Mea ana
[Diagram in Original]
[Text in Diagram: No Alika, No Konohiki, No Konohiki, Koele, Koele,
Uku pau loa $6.00
W. L. Lee
G. M. Robertson
J. H. Smith
Honolulu Sept 17, 1851 J. Kekaulahao

Summary for LCA 1519:2 to Koikumuole for Kapule

It appears that Koikumuole claimed LCA 1519 parcels that belonged to the deceased (*make*) Kapule. LCA 1519 ‘Āpana 2 was a *mo‘oaina* or long narrow agricultural parcel located in the west end of the project area. Adjacent lands within the project area were under the jurisdiction of a *konohiki* (headman of an *ahupua‘a*) and *kō‘ele* (lands farmed by a tenant for a chief) lands .

LCA 1521:2 to Haula



Helu 1521 Haula 701 v 5 Niau Kalihi Oahu

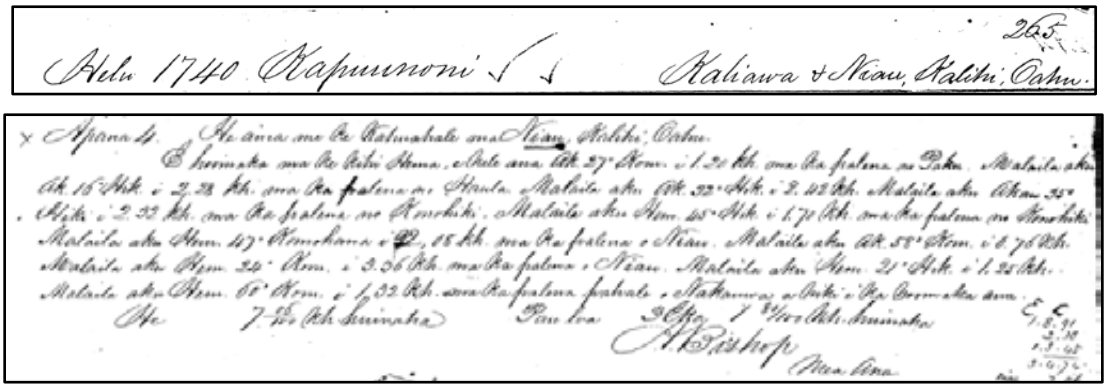
Apana 2 He Mookalo iloko o Niau, Kaihi. E hoomaka ma ke kihi Hema e hele ana A. 72 Ko. i 1.98 kh. ma ka palena no Paku Malaila aku. A. 42 Ko i 1.44 kh. ma kahawai. Malaila aku He 52 Hi i 0.50 kh. ma ka palena koele. Malaila aku A. 31 Hi i 1.70 kh Malaila kau A. 54 Ko. i 0.32 kh. Malaila kau A. 37 1/2 Hi i 3.04 kh. ma kahawai. Malaila aku He 51 Hi i 0.96 kh. ma ka palena no Waikoa Malaila aku He 83 Ko i 3.36 kh. ma ka palena no Niau. Malaila aku He 21 Ko i 2.38 kh. ma ka palena no Nakauwa a hiki i ka hoomaka ana He 6 02/100 kh. huinaha, Pau loa He 7 42/100 kh. huinaha *A. Bishop*
Mea ana

[Diagram in Original]
[Text in Diagram: *Kahawai, Koele, No Paku, Nohakauwa, No Niau, Waikoa, No Kamalani, No kala, Laaulupe, No Weuweu]*
Uku Pau Loa $6
W. L. Lee
Ioane Ii
J. Kekaulahao J. H. Smith
G. M. Robertson

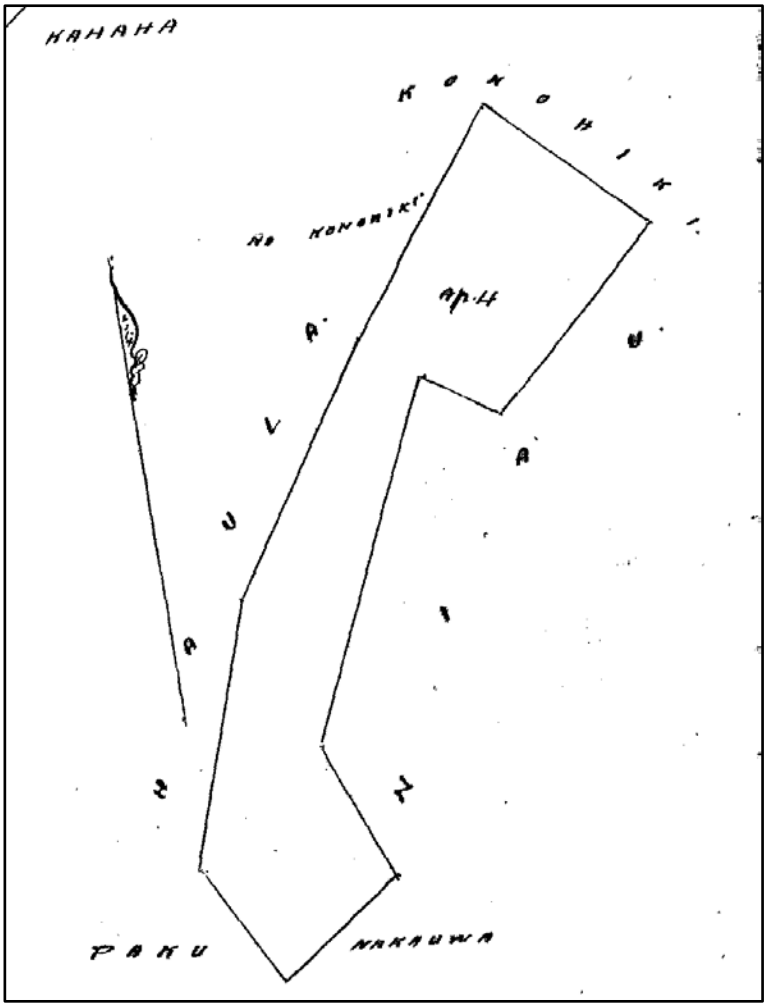
Summary for LCA 1521:2 to Haula

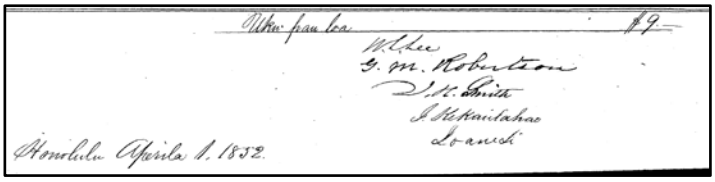
Haula claimed LCA 1521:‘Āpana 2 on the southeast side of Kalihi Stream in the central portion of the present project area. This was a narrow strip of taro land (*mo‘okalo*) with Kalihi stream (*kahawai*) on the northeast side. There was a small taro patch farmed by a tenant for a chief (*kō‘ele*) on the stream side. While the 1883 Brown map indicates there was an *‘auwai* on the west side, roughly paralleling Kalihi Stream, this is not mentioned or shown on the land claim map.

LCA 1740:4 to Kapuunoni


Helu 1740 Kapuunoni

Kaliawa & Niau, Kalihi, Oahu.




Honolulu April 1. 1852.

Apana 4. He aina me ke Kahuahale ma Niau, Kalihi, Oahu.
E hoomaka ma ke kihi Hema e hele ana Ak. 27° Kom. i 1.20 kh. ma ka palena no Paku. Malaila aku Ak. 16° Hik i 2.28 kh. ma ka palena no Konohiki. Malaila aku Hem. 45° Hik i 1.70 Kh. ma ka palena no Konohiki Malaila aku Hem 47° Komohana i 22 08 Kh ma ka palena o Niau. Malaila aku Ak. 58° Kom i 0.76 kh. Malaila aki Hem 24° Kom i 3.35 Kh ma ka palena o Niau. Malaila aku hem 21° Hik. i 1.25 Kh. Malaila aku hem 60° Kom i 1.32 Kh. ma ka palena pahale o Nakauwa a hiki i ka hoomaka ana. He 7 06/100 kh Huinaha Pau loa 3 Eka 1 80/100 Kh. Huinaha

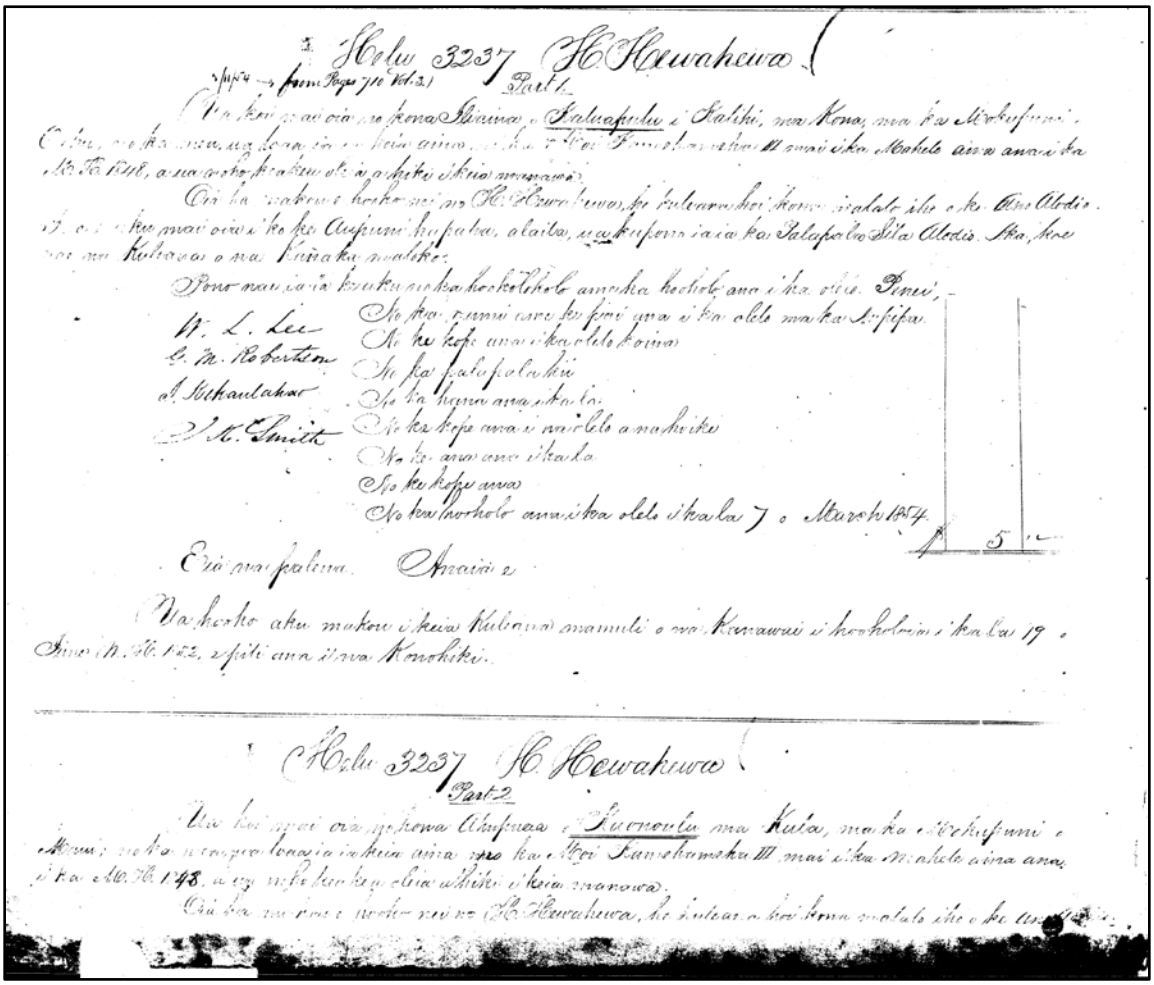
Text in diagram 4; *Konohiki, Niau, Nakauwa, Paku, Haula, No Konohiki*

Uku pau loa $9.-
W.L. Lee
G.M. Robertson
J.H. Smith
J. Kekaulahao
Ioane Ii
Honolulu Aperila 1, 1852

Summary for LCA 1740:4 to Kapuunoni

Kapuunoni claimed LCA 1740: ‘Āpana 4 on the southeast side of Kalihi Stream. The northeast portion of his claim was in the central portion of the present project area. His claim was for a *Kahuahale* (“house foundation or site”). There are two references to adjacent areas (probably taro lands) within the present project area as under the jurisdiction of a *konohiki* (headman of an *ahupua‘a*).

LCA 3237 to Hewahewa



Helu 3237 H. Hewahewa

Part 1

Na kuhi mai oia no kona Aina o Palupalu i Halaki, ma Kona, ma ka Mokupuni o Oahu, me ka nana ana, ma lona ia e kuhi aina ... ka i Koi Kauikeaouli III mai iloko Makahele aina ana i ka M. H. 1848, a na ... ka ... ola a ... ikeia manawa.

Oia ka makou e hoike nei no H. Hewahewa, he kuleana koi ikaika ... ola o ke Alii Alodia. I. ... ka mai oia i ke Aupuni kupaka, alaila, na kupono ia ia ka Palapala Sila Alodia. Ika, koe no na Kuleana o na Kuaaku malokoe.

Pono nae ia ia ke uku no ka hookolokolo ana o ka hoohalo ana i ka olelo. Penei,

W. L. Lee — No ka pauku ana ke kai pii ana i ka olelo ma ka Papepa
G. M. Robertson — No ke kope ana i ka olelo koina
J. Kekauonohi — No ka palapala ku
J. K. Smith — No ka hana ana i ka la
No ke kope ana i ka olelo a ma hoike
No ka ana ana i ka la
No ke kope ana
No ka hoohalo ana i ka olelo i ka la 7 o March 1854.

$ 5

Eia na palena. Ana ia e

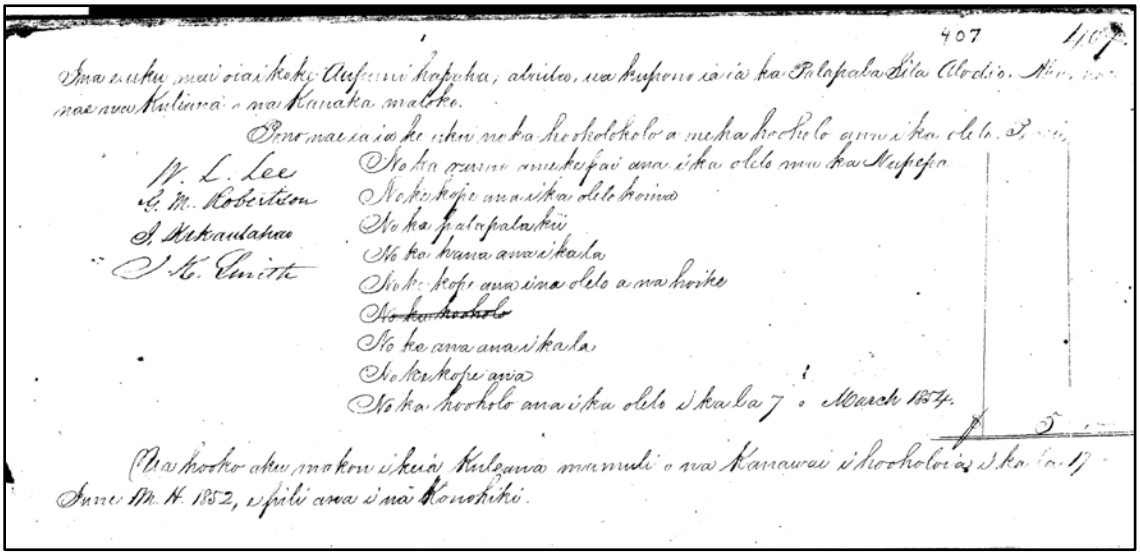
Na hoohalo aku makou i keia Kuleana mamuli o na Kanawai i hoohoiaia i ka la 19 o June M. H. 1852, e pili ana i na Konohiki.

Helu 3237 H. Hewahewa

Part 2

Na kuhi mai oia no kona Aupuni o Luaonulu ma Kula, ma ka Mokupuni o Maui; me ka nana loaa ia ia keia aina no ka i Koi Kauikeaouli III mai iloko Makahele aina ana i ka M. H. 1848, a ... ola ... ikeia manawa.

Oia ka makou e hoike nei no H. Hewahewa, he kuleana koi ikaika ola o ke Alii ...



407

Na uku mai oia i ke Aupuni kapaka, alaila, na kupono ia ia ka Palapala Sila Alodia. Aka, koe nae na Kuleana o na Kuaaku malokoe.

Pono nae ia ia ke uku no ka hookolokolo a me ka hoohalo ana i ka olelo. I. ...

W. L. Lee — No ka pauku ana ke kai pii ana i ka olelo ma ka Papepa
G. M. Robertson — No ke kope ana i ka olelo koina
J. Kekauonohi — No ka palapala ku
J. K. Smith — No ka hana ana i ka la
No ke kope ana i ina olelo a ma hoike
~~No ka hoohalo~~
No ke ana ana i ka la
No ke kope ana
No ka hoohalo ana i ka olelo i ka la 7 o March 1854.

$ 5

Na hoohalo aku makou i keia Kuleana mamuli o na Kanawai i hoohoiaia i ka la 19 June M. H. 1852, e pili ana i na Konohiki.

Helu 3237 H. Hewahewa

from Pages 710 Vol. 3. Part 1.

Ua koi mai oia no kona Iliaina o Kaluapulu i Kalihi, ma Kona, ma ka Mokupuni o oahu no ka mea ua loaa ia ia keia aina [?] ka Moi Kamehameha III mai i ka Mahele aina ana i ka M. H. 1848 a ua noho keakea oleia a hiki i keia manawa.

Oia ka makou e hooko nei no H. Hewahewa he kuleana hoi kona malalo iho o ke Ano Alodio. [?] [?] mai oia i ko ke Aupuni hapaha, alaila ua kupono ia ia ka Palapala Sila Alodio. Aka, koe nae na Kuleana o na Kanaka maloko.

Pono nae ia ia ke uku no ka hookolokolo a me ka hooholo ana i ka olelo. Penei.

	No ka rumi a me ke pai ana i ka olelo ma ka Nupepa
	No ke kope ana i ka olelo koina
W. L. Lee	*No ka palapala kii*
G. M. Robertson	*No ka hana ana i ka la*
J. Kekaulahao	*No ke kope ana i na olelo a na hoike*
J. H. Smith	*No ka ana ana i ka la*
	No ke kope ana
	No ka hooholo ana i ka olelo i ka la 7 o March 1854

Eia na palena Anaia e

$ 5.00

Ua hooko aku makou i keia Kuleana mamuli o na Kanawai i hooholoia i ka la 19 o Iune M. H. 1852, e pili ana i na Konohiki.

Helu 3237 H. Hewahewa

Part 2.

Ua koi mai oia no kona Ahupuaa o Kuonoulu ma Kula, ma ka Mokupuni o Maui, no ka mea ua loaa ia ia keia aina no ka Moi Kamehameha III mai i ka Mahele aina ana i na M. H. 1848 a ua noho keakea oleia a hiki i keia manawa.

Oia ka makou e hooko nei no H. Hewahewa he kuleana hoi kona malalo iho o ke An[?] Ina e uku mai oia i ko ke Aupuni hapaha, alaila, ua kupono ia ia ka Palapala sila Alodio. A[?] nae na Kuleana o na Kanaka maloko.

Pono nae ia ia ke uku no ka hookolokolo a me ka hooholo ana i ka olelo. Penei.

	No ka rumi a me ke pai ana i ka olelo ma ka Nupepa
W. L. Lee	*No ke kope ana i ka olelo koina*
G. M. Robertson	*No ka palapala kii*
J. Kekaulahao	*No ka hana ana i ka la*

J. H. Smith *No ke kope ana i na olelo a na hoike*

No ka hooholo

No ka ana ana i ka la

No ke kope ana

No ka hooholo ana i ka olelo i ka la 7 o March 1854

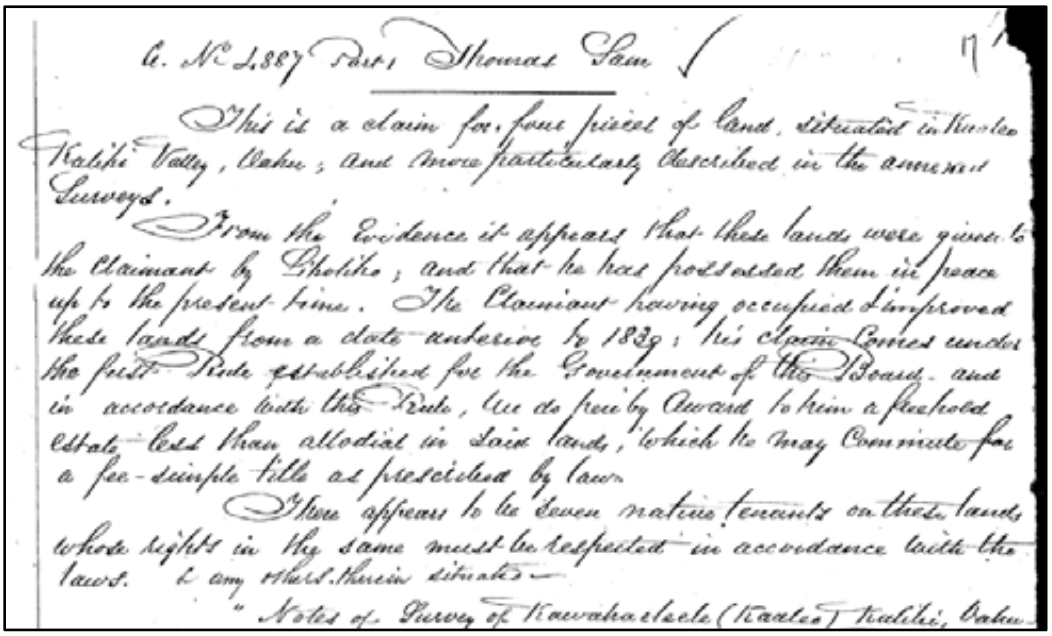
$ 5.-

Ua hooko aku makou i keia Kuleana mamuli o na Kanawai i hooholoia i ka la 19 o June M. H. 1842, e pili ana i na Konohiki.

Summary for LCA 3237 to Hewahewa

The name “Hewahewa” is associated with two separate parcels of LCA 3237 (parcels 3 and 4) shown as on either side of Thomas Sam’s LCA on the west side of Kalihi Stream. These were almost certainly also in *kalo* production but there are few specifics.

LCA 4887 to Sam, Thomas



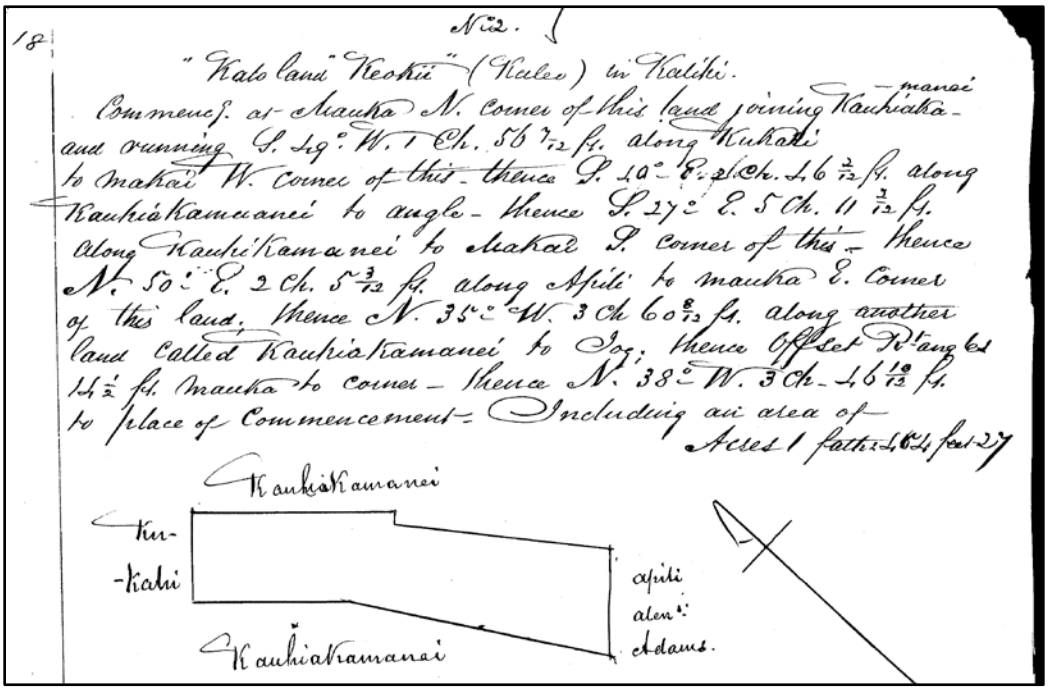
A. No. 4887 Part 1 Thomas Sam

This is a claim for four pieces of land, situated in Kualeo Kalihi Valley, Oahu; and more particularly described in the annexed Surveys.

From the Evidence it appears that these lands were given to the Claimant by Gholiho; and that he has possessed them in peace up to the present time. The Claimant having occupied & improved these lands from a date anterior to 1839; his claim comes under the first Rule established for the Government of this Board and in accordance with this Rule, we do perby Award to him a freehold estate less than allodial in said lands, which he may Commute for a fee-simple title as prescribed by law.

There appears to be seven native tenants on these lands whose rights in the same must be respected in accordance with the laws. & any others therein situated —

" Notes of Survey of Kawaharleele (Kualeo) Kalihi, Oahu



18

No. 2.

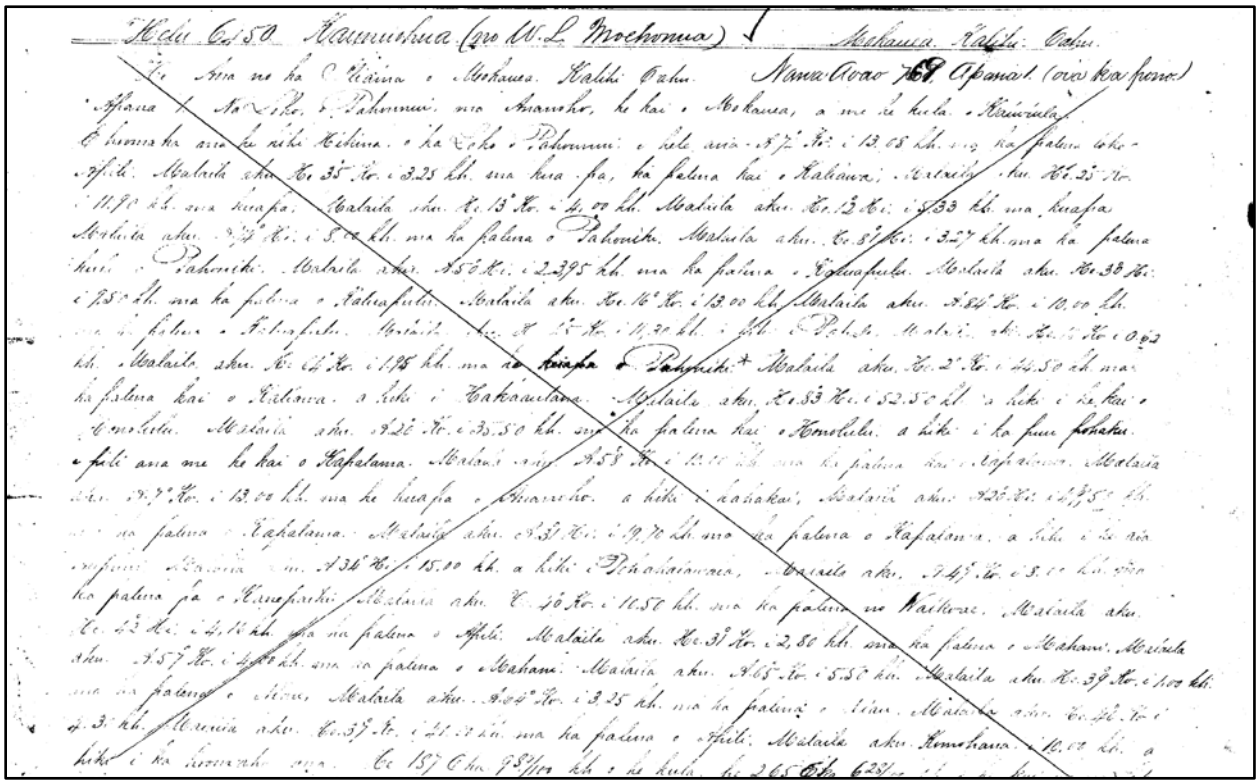
" Kalo land " Keokii " (Kaleo) in Kalihi.

Commencg. at Mauka N. corner of this land joining Kauhiaka-manei and running S. 49° W. 1 Ch. 56 7/12 ft. along Kukaki to makai W. corner of this - thence S. 40° E. 2 Ch. 46 2/12 ft. along Kauhiakamanei to angle - thence S. 27° E. 5 Ch. 11 7/12 ft. along Kauhikamanei to makai S. corner of this - thence N. 50° E. 2 Ch. 5 3/12 ft. along Apili to mauka E. corner of this land, thence N. 35° W. 3 Ch 60 8/12 ft. along another land called Kauhiakamanei to Jog; thence Offset Rt angles 14 1/2 ft. mauka to corner - thence N. 38° W. 3 Ch - 46 10/12 ft. to place of Commencement - Including an area of Acres 1 fath: 464 feet 27

Summary for LCA 4887 to Thomas Sam

LCA 4887 to Thomas Sam was in the central portion of the present project area just west of Kalihi Stream. He claimed four pieces of land of which the best fit appears to be his Piece No. 2 bounded by Adams land on the southeast with the same land designation (“Kauhiakamanei” [sp?] owner ?, land name ?) to the sothwest and northeast. This was *kalo* land seemingly named “Keokii.”

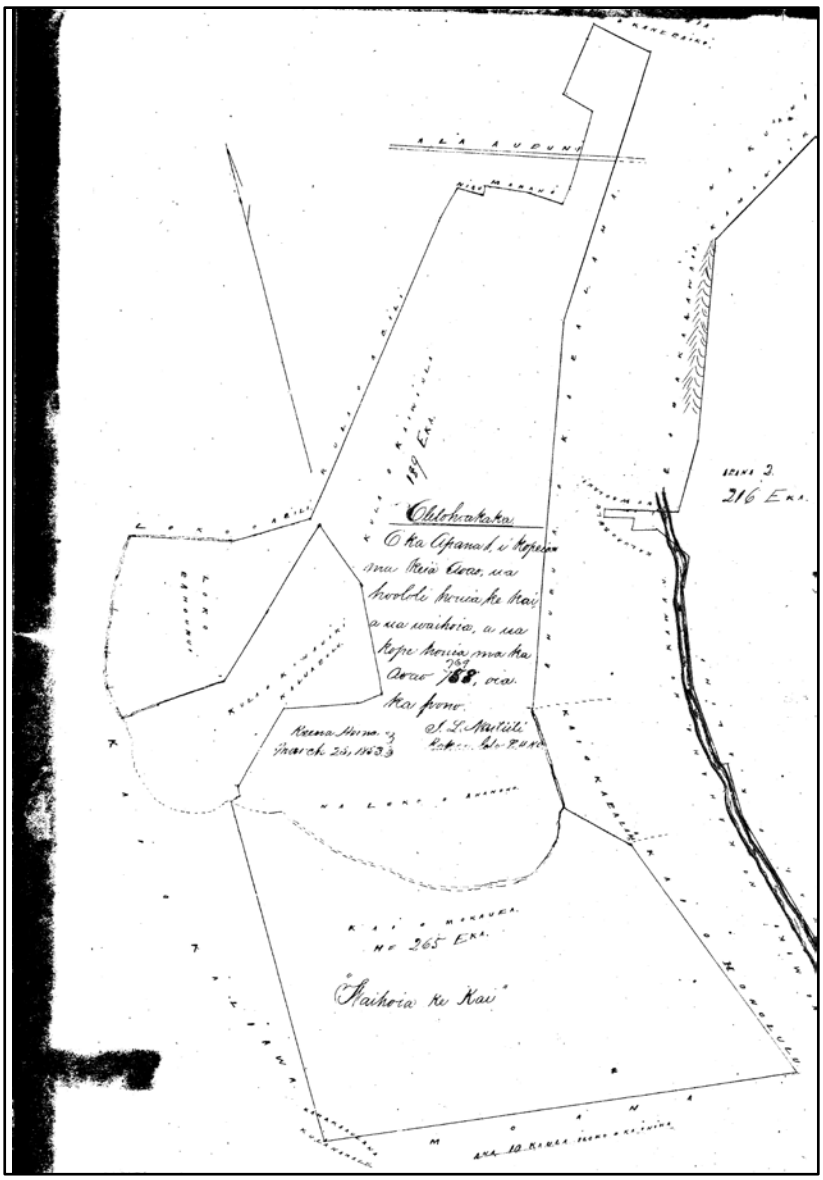
LCA 6450:1 to Kaunuohua for W.L. Moehonua



Helu 6450 Kaumuohua (no W. L. Moehonua) Mokauea, Kalihi, Oahu

~~He [?] no ka [?] o Mokauea, Kalihi, Oahu Nana Aoao 769 Apana 1 (oia ka pono)~~

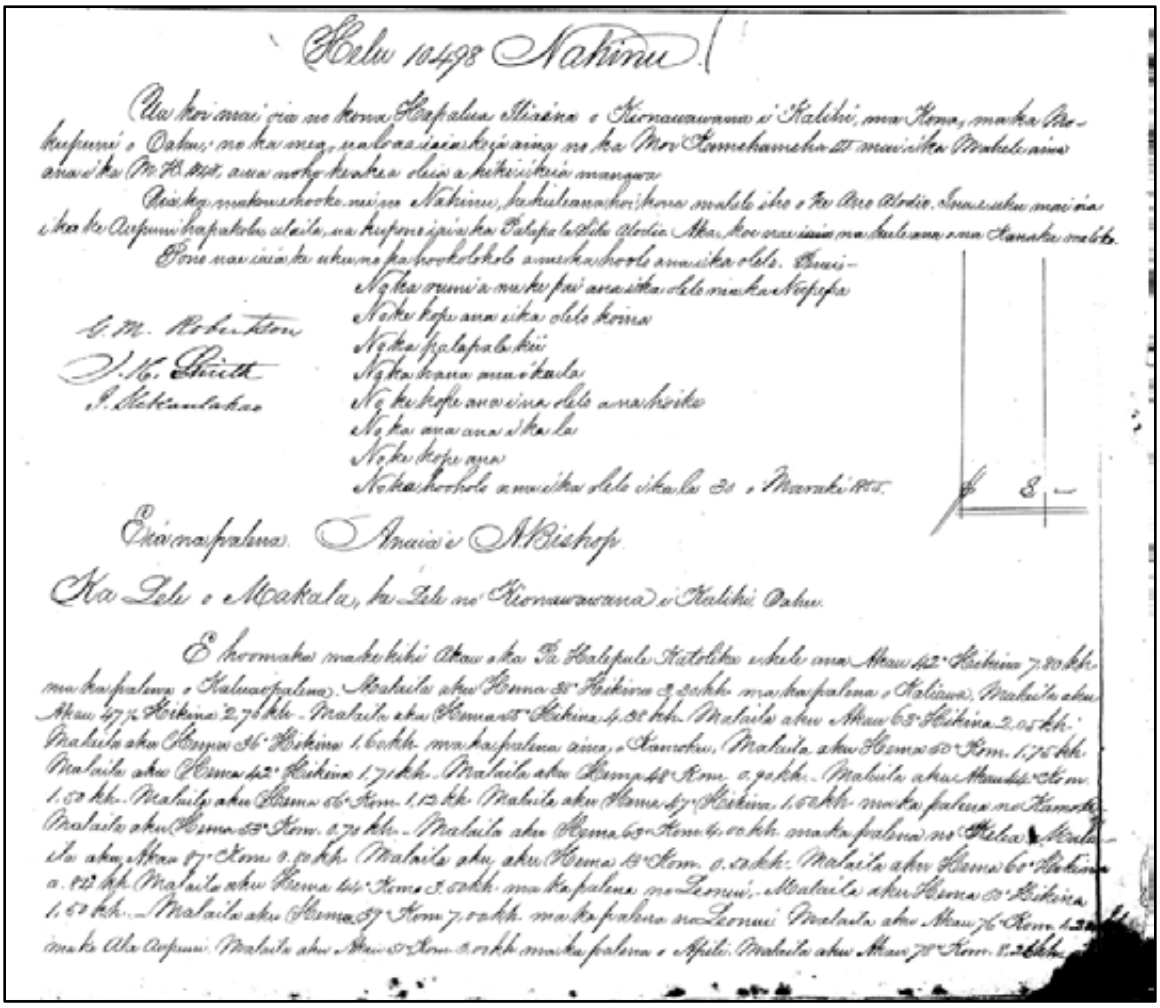
~~Apana 1 Ka Loko o Pahounui ma Ananoho, ke kai o Mokaueaa me ke kula Kalulula E hoomaka ma ke kihi Hikina o ka Loko o Pahounui e hele ana A. 7[?]° Ko. i 13.08kh. ma ka palena loko Apili, Malaila aku He. 35° Ko. i 3.25 kh. ma kua pa, ka palenakaio Kaliawa, Malaila aku Hi. 25 Ko. i11.90 kh. ma kuapa, Malaila akuHe. 13° Ko. i 4.00 kh.MalailaakuHe. 12° Hi. i 5.33 kh. Makuapa Malaila aku [?] Hi. i 8.00 kh. ma ka palena o Pahouiki, Malaila aku He. 81° Hi. i 3.27 kh. ma ka palena huli i Pahouiki, Malaila aku A. 50° Hi. i 23.95 kh. ma ka palena o Kaluapulu, Malaila aku He. 30° Hi. i 9.50 kh. ma ka palena o Kaluapulu, Malaila aku He. 16° Ko. i 13.00 kh. Malaila aku A. 84° Ko.i 10.00 kh. ma ka palena o Kaluapulu, Malaila aku A. 45° Ko. i 11.30 kh. [?] i [?], Malaila aku he. [?] Ko. i 0.62 kh., Malaila aku He. 64° Ko. i 1.95 kh. ma ko kuapa o Pahouiki* Malaila aku He. 2° Ko. i 44.50 kh. Ma ka palena kaio Kaliawa, a hiki i Hakaaulana, Malaila aku He. 83° Hi. i 52.50 kh. a hiki i ke kai o Honolulu Malailaaku A. 20° Ko. i 30.50 kh. ma ka palena kai o Honolulu a hiki i ka puu pohaku e pili ana me ke kai o Kapalama. Malaila aku A. 58° [?] i 10.00 kh. ma ka palena kaio Kapalama, Malaila aku [?] 7° Ko. i 13.00 kh. ma ke kuapa o Huanoho, a hiki i kahakai, Malaila aku A. 20° Hi. i [?] kh. ka palena o Kapalama, Malaila aku A. 31° Hi. i 19.70 kh. ma ka palena o Kapalama a hiki i [?] [?] [?] [?] A. 34° Hi. i 15.00 kh. a hiki i [?] , Malaila aku A. 41° Ko. o 8.00 kh ma ka palena pa o Kanepaiki Malaila aku He. 40° Ko. i 10.50 kh. ma ka palena no Naikoae, Malaila aku He. 42° Hi. i 4.16 kh ma ka palena o Apili, Malaila aku He. 31° Ko. i 2.80 kh. ma ka palena o Mahani, Malaila aku A. 57° Ko. i 4.00 kh. ma ka palena o Mahani, Malaila akuA. 65° Ko. i 5.50 kh. i Malaila aku He. 39° Ko. i 1.00 kh. ma ka palena o Mou, Malaila aku A. 64° Ko. i 3.25 kh. ma ka palena o [?] Malaila aku He. 46° Ko. I 4.30 kh. Malaila aku He. 37° Ko. i 41.00 kh. ma ka palena o Apili, Malaila aku Komohana i 10.00 kh. A hiki i ka hoomaka anaHe. 1876 Eka 9 80/100 kh. o ke kula he 2656 Eka 6 28/100 kh o ke kai [?].~~



Summary for LCA 6450:1 to Kaunuohua for W.L. Moehonua

LCA 6450:‘Āpana 1 to Kaunuohua was a huge land claim (basically for the *‘ili* of Mokauea) extending from the present project area far out to sea. It is unclear why the account was crossed out. The extreme northeast portion of the claim included the southeast portion of the present project area, south of the H1 at present day Kalihi Street (for reference, the annotation “*Ala Aupuni*” at the top of the figure is present day North King Street). The account is largely concerned with the coastal fishponds of Pahounui and Ananoho. The map has an annotation (at the top) in the vicinity of th4 east end of the present project area but it is unclear (“Kaneeiki” ?)

LCA 10498 to M. Nahinu



Helu 10498 Nahinu.

Ua koi mai ia ne kona Hapalua Hiaina o Konawawana i Kalihi, ma Koma, ma ka Aupuni o Oahu, no ka mea, ua loaa iaia keia aina, ma ke ka Mr Kamehameha III mai iaia Makele ana i ka M H. Mat, aua noho kaaka a elia a kekiikia manawa

Eia ka makou hooko ana Nahinu, ka kuleana hoi kona malalo iho o ka Aha Aloha. Ua ae aku mai ia i ka ka Aupuni ka pakolu o ele, na kupono ipuka Palapala Aloha Aha. Koi ana iaia ma kuleana o na Kanaka malalo.

Pono nae iaia ka ukuna pahookolokolo a me ka hoolaa ana i ka olelo. Penei –

Na ka nuu i a me ka pii ana i ka olelo ma ka Papapa
Na ka kapu ana i ka olelo kona
Na ka papalapalakii
Na ka kana ana i kala
Na ka kapu ana o ina olelo a ma hoike
Na ka ana ana i ka la
Na ka kapu ana
Na ka hoohola a me i ka olelo i ka la 30 o Mareki 1855.

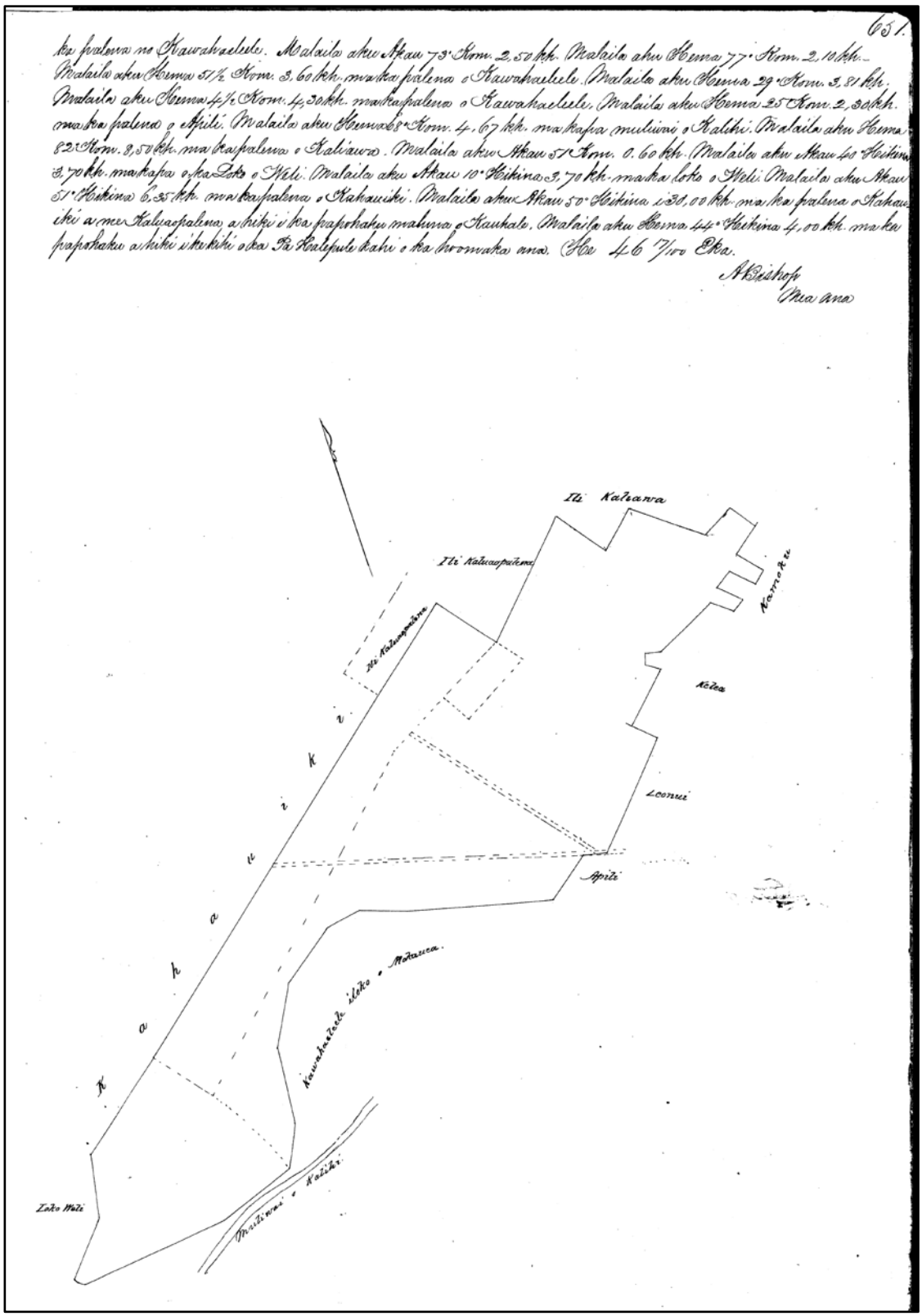
G. M. Robertson
J. K. Pitt
J. Kekauonohi

$8 –

Eia na palena. Amaia i N Bishop

Ka Pele o Makala, ka Pele no Konawawana i Kalihi Oahu.

E hoomaka mai ma ke kihi Akau o ka Pa Halepule Katolika i ka ele ana Akau 42° Hikina 7.00 kh. ma ka palena o Kaluaipalena. Malaila aku Homa 35° Hikina 9.25 kh. ma ka palena o Kaliawa. Malaila aku Akau 47½ Hikina 2.75 kh. Malaila aku Homa 15° Hikina 4.00 kh. Malaila aku Akau 65° Hikina 2.05 kh. Malaila aku Hema 36° Hikina 1.60 kh. ma ka palena aina o Kamoku. Malaila aku Hema 20° Kom. 1.75 kh. Malaila aku Hema 42° Hikina 1.71 kh. Malaila aku Hema 48° Kom. 0.90 kh. Malaila aku Hema 45° Kom. 1.50 kh. Malaila aku Hema 6° Kom. 1.12 kh. Malaila aku Hema 47° Hikina 1.60 kh. ma ka palena no Kamoku. Malaila aku Hema 55° Kom. 0.75 kh. Malaila aku Hema 60° Kom. 4.00 kh. ma ka palena no Pelea. Malaila aku Akau 67° Kom. 0.50 kh. Malaila aku Hema 19° Kom. 0.20 kh. Malaila aku Hema 60° Hikina 0.82 kh. Malaila aku Hema 66° Kom. 3.00 kh. ma ka palena no Lonui. Malaila aku Hema 30° Hikina 1.50 kh. Malaila aku Hema 67° Kom. 7.00 kh. ma ka palena no Lonui. Malaila aku Akau 76° Kom. 1.50 kh. ma ka Ala Aupuni. Malaila aku Akau 5° Kom. 0.10 kh. ma ka palena o Apile. Malaila aku Akau 78° Kom. 1.20 kh.


651.
ka palena no Kawahaeleele. Malaila aku Akau 73° Kom. 2,50 kh. Malaila aku Hema 77° Kom. 2,10 kh. Malaila aku Hema 51½ Kom. 3,60 kh. ma ka palena o Kawahaeleele. Malaila aku Hema 29° Kom. 3,81 kh. Malaila aku Hema 4½ Kom. 4,30 kh. ma ka palena o Kawahaeleele. Malaila aku Hema 25° Kom. 2,30 kh. ma ka palena o Apiti. Malaila aku Hema 68° Kom. 4,67 kh. ma kapa muliwai o Kalihi. Malaila aku Hema 82° Kom. 8,50 kh. ma ka palena o Kaliawa. Malaila aku Akau 51° Kom. 0.60 kh. Malaila aku Akau 40° Hikina 3,70 kh. ma kapa o ka Loko o Weli. Malaila aku Akau 10° Hikina 3,70 kh. ma ka loko o Weli. Malaila aku Akau 51° Hikina 6,35 kh. ma ka palena o Kahauiki. Malaila aku Akau 50° Hikina i 30,00 kh. ma ka palena o Kahauiki a me Kaluaopalena a hiki i ka papohaku maluna o Kauhale. Malaila aku Hema 44° Hikina 4,00 kh. ma ka papohaku a hiki i ke kihi o ka Pa Halepule kahi o ka hoomaka ana. He 46 17/100 Eka.
A Bishop
Mea ana
Ili Kaliawa
Ili Kaluaopalena
Kamoku
Ili Kaluaopalena
Kelea
Leonui
Apiti
Kahauiki
Kawahaeleele iloko o Mokauea.
Loko Weli
Muliwai o Kalihi.

Helu 10498 Nahinu

Ua koi mai oia no kona Hapalua aina o Kionawawana i Kalihi ma ka Mokupuni [mokupuni] o Oahu; no ka mea, ua loaa iaia keia Hapalua aina no ka Moi Kamehameha III mai i ka maheleaina ana i ka M.H. 1848, a ua noho keakea oleia a hiki i keia manawa.

Oia ka makou e hooko nei no Nahinu he kuleana kona malalo iho o ke ano Alodio. Ina e uku mai oia i ko ke Aupuni hapakolu alaila, ua kupono iaia ka palapala Sila Alodio. Aka, koe nae na kuleana o na kanaka maloko.

Pono nae iaia ke uku no ka hooholokolo ame ka hooholo ana i ka olelo. Penei-

	No ka rumi ame ke pai ana i ka olelo ma ka Nupepa
G.M. Robertson	*No ke kope ana i ka olelo koina*
J.H. Smith	*No ka palapala kii*
J. Kekaulahao	*No ka hana ana i ka la*
	No ke kope ana i ka olelo a na hoike
	No ke ana ana i ka la
	No ke kope ana
	No ka hooholo ana i ka olelo i ka la 30 o Maraki 1855 $8

Eia na Palena. Anaea e A. Bishop

Ka Lele o Makala, he Lele no Kionawawana i Kalihi, Oahu.

E hoomaka ma ke kihi Akau o ka Pa Halepule Kotolika e hele ana Aku 42° Hikina 7.80 k.h. ma ka palena o Kaluaopalena. Malaila aku Hema 38° Hikina 3.30 k.h. ma ka palena o Kaliawa. Malaila aku Akau 47 ½ Hikina 2.70 k.h. Malaila aku Hema 55° Hikina 4.38 k.h. Malaila aku Akau 63° Hikina 2.05 k.h. Malaila aku Hema 36° Hikina 1.60 k.h. ma ka palena aina o Kamoku. Malaila aku Hema 50° Kom. 1.75 k.h. Malala aku Hema 42° Hikina 1.71 k.h. Malaila aku Hema 48° Kom. 0.90 k.h. Malaila aku Akau 44° Kom. 1.50 k.h. Malaila aku Hema 56° Kom. 1.12 k.h. Malaila aku Hema 47° Hikina 1.50 K.h. maka palena no Kamoku Malaila aku Hema 53° Kom. 0.70 k.h. Malaila aku Hema 63° Kom. 40.. k.h. ma ka palea no Kelea. Malaila [malaila] aku Hema 53° Kom. 0.80. Malaila aku aku [sic] Hema 13° Kom. 0.50 k.h. Malaila aku Hema 60°Hikina a 84 k.h. Malaila aku Hema 44° Kom. 3.50 k.h. ma ka palena no Leonui. Malaila aku Hema 50° Hikina 1.50 k.h. Malaila aku Hema 39° Kom. 7.00 k.h. ma ka palena no Leonui. Malaila aku Akau 76° Kom. 1.20 ma ke Ala Aupuni. Malaila aku Akau 51° Kom. 3.00 k.h. ma ka palena o Apili. Malaila aku Akau 78° KOm. 8.26 k.h. ka palena no Kawahaeleele. Malaila aku Akau 73° Kom. 2.50 k.h. Malaila aku HEma 77° Kom. 2.10 Malaila aku HEma 51 ½ Kom. 3.60 k.h. ma ka palena o Kawahaeleele. malaila aku Hema 29° Kom. 3.81 k.h. Malaila aku Hema 4 ½ Kom. 4.30 k.h. ma ka palena o Kawahaeleele. Malaila aku HEma 25° Kom. 2.30 k.h. ma ka palena o Apili. Malaila aku HEma 8° Kom. 4.67 k.h. ma kapa muliwai o Kalihi. malaila aku Hema 82° Kom. 8.50 k.h. ma ka palena o Kaliawa. Malaila aku Akau 51° Kom. 0.60 k.h. Malaila aku Akau 40° Hikina 3.70 k.h. ma kapa o ka Loko o Weli. Malaila aku AKau 10° Hikina 3.70 k.h. ma ka loko o Weli. Malaila aku Akau 51° Hikin a6.35 k.h. ma ka palena o Kahauiki. Malaila aku Akau 50° Hikina i 30.00 k.h. ma ka palea o Kahauiki [Kahauiki] a me Kaluaopalena a hiki i ka

papohaku maluna o Kauhale. Malaila aku HEma 44° Hikina 4.00 k.h. ma ka papohaku a hiki i ke kihi o ka Pa Halepule kahi o ka hoomaka ana. He 46 17/100 Eka.

A. Bishop

Mea ana

[Diagram in Original]

[Text in Diagram: *Ili Kahana, Ili Kaluaopalena, Ili Kaluaopalena, Kamoku, Kelea, Leonui, Apili, Kahauiki, Kawahaeleele iloko o Mokauea, Loko Weli, Muliwai o Kalihi]*

Summary for LCA 10498 to M. Nahinu

The very large (46 acre) LCA 10498 to Nahinu includes the west end of the project area. The testimony provides little detail of land use but mentions a boundary with the edge of Leonui (presumably the name of a former land tenant) where the present project area crosses into his property. The account references by text and map the crossing of the *Ala Aupuni* (present N. King Street, south of the west end of the present project area)

Appendix F

DRAFT ENVIRONMENTAL ASSESSMENT

Interstate H1 Eastbound Improvements

Ola Lane Overpass to Likelike Highway Off-Ramp
Honolulu, Hawaii

Appendix F

Hawaii State Historic Preservation Division Reconnaissance Level Survey (RLS)

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS, OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

The six properties with HIRHP eligible resources are highlighted in gold.

*Unless otherwise noted, year built date is from C&C Honolulu, Real Property Assessment Div. These properties are generally ordered from west to east.

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3 002: 038 House of Finance	2310 N. King St.	Retail/Office Bldg. House of Finance (owner, Casamina)	2011. Bldg. permit records indicate that an orig 1964 bldg was demo'ed in 2007. New bldg 2011	No historic properties affected. Does not possess exceptional significance necessary for listing of property less than fifty years old.		
[1] 1-3-002: 037 First Hawaiian Bank	2250 N. King St.	Bank Bldg. First Hawaiian Bank.	1960	HI RHP Criterion c	Architect, Vladimir Ossipoff. Significant Hawaiian Modern bldg with modernist murals on exterior.	
[1] 1-3-002: 036 Kalihi Union Church	2192 N. King St.	Church Sanctuary Bldg. Kalihi Union Church.	1957	HI RHP Criterion c	Architect: Law & Wilson.	

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-002: 033 Velasco residence	1136 Richard Ln.	Residence Velasco residence.	1955. Bldg. permit records indicate a major addition/ alteration in 2013-15.	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-002: 034 Acosta residence	1142 Richard Ln.	Residence Acosta residence.	1900	HI SHPD Criterion c	Craftsman Style bungalow.	
[1] 1-3-002: 035 Manuel residence	1148 Richard Ln.	Residence Manuel residence.	1978	No historic properties affected. Does not possess exceptional significance necessary for listing of property less than fifty years old.		
[1] 1-3-002: 043 Vacant lot	Richard Ln.	Vacant lot St. of HI	dna	No historic properties affected. Vacant lot.		

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-002: 042 Vacant lot	Richard Ln.	Vacant lot St. of HI	dna	No historic properties affected. Vacant lot.		
[1] 1-3-002: 044 Linear lot with masonry wall.	Richard Ln.	Lava rock and concrete mortar wall. C&C Hon.	Unk Ca. 1930s	HI SHPD Criteria a,c	The extent of this structure below grade was not determined, but it should be treated as part of the wall. An approximate 22' section of the lava rock wall is to be removed to install a bridge support. This would result in an adverse impact to the structure.	
No TMK Kalihi Stream bed masonry wall.	Richard Ln.	Kalihi Stream bed Lava rock and concrete mortar wall. No TMK.	Unk Ca. 1930s	HISHPD Criteria a,c	The extent of this structure below grade was not determined, but it should be treated as part of the wall. An approximate 22' section of the lava rock wall is to be removed to install a bridge support. This would result in an adverse impact to the structure.	

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-003: 066 Rivera residence	1140 Pinkham St.	Residence Rivera residence.	1957	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-003: 036 Whiting residence	1146 Pinkham St.	Residence Whiting residence.	1988	No historic properties affected. Does not possess exceptional significance necessary for listing of property less than fifty years old.		
[1] 1-3-003: 068 Acoba residence	1153 Pinkham St.	Residences Acoba residences.	1947 1959	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-003: 004 Rafael residence	1154 Gulick Av.	Residence Rafael residence.	1959. Bldg. permit records indicate major alteration/ addition in 2005.	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-003: 003 HECO transformer	1158 Gulick Av.	Electrical transformer HECO	unk	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-003: 060 Domingo residence	1138 Gulick Av.	Residence Domingo residence	1968	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.	Gulick Av.	
[1] 1-3-003: 005 Pascua 1970 residence	1140 Gulick Av.	Residence Pascua 1970 residence	1970	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.	Gulick Av.	
[1] 1-3-003: 069 Pascua 2001 residence	1148 Gulick Av.	Residence Pascua 2001 residence	2001	No historic properties affected. Does not possess exceptional significance necessary for listing of property less than fifty years old	Gulick Av.	

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-004: 067 Caraang residence	1139 Gulick Av.	Residence Caraang residence	1984	No historic properties affected. Does not possess exceptional significance necessary for listing of property less than fifty years old	Gulick Av.	
[1] 1-3-004: 066 Hale Nanea	1145 Gulick Av.	Apartment bldg. (30 unit). Hale Nanea Apts.	1966	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event	Gulick Av.-	
[1] 1-3-004: 065 Pentecostal Gospel Church and residence bldg	1159 Gulick Av.	Church bldg. Residence bldg.	Ca. 1952 1978 (Hicks Homes)	No historic properties affected. Does not possess architectural or historical importance necessary for a religious property. Does not possess exceptional significance necessary for listing of property less than fifty years old	Gulick Av.	
No TMK Gulick Av. Overpass Bridge over H1	Gulick Av.	Overpass bridge Gulick Av. Bridge.	1959	No historic properties affected. Common bridge type, post-WWII concrete bridge exempted from Sec 106 adverse effects under 2012 ACHP Program Comment.	Gulick Av. Bridge built by J.M. Tanaka ("Highway Constr." HSB July 4, 1959. P. 9)	

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS, OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-008: 004 Kalihi Waena School	1240 Gulick Av.	Elementary School	1966	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event	Gulick Av. The Cafetorium Bldg (nearest the freeway) was built in 1966, Bradley & Wong, Inc. architects.	
[1] 1-3-007: 067 Lee residences	1221 Gulick Av.	Residences Lee residences (3)	1923 1923 1923	HI SHPD Criterion c	Gulick Av. Craftsman Style bungalow, leaded glass windows, single wall.	
[1] 1-3-004: 126 Small parcel in Kalihi Waena Neighborhood Park	Beckley St. Kalihi Waena Park	Neighborhood park C&C Hon.	dna	No historic properties affected. (Don Hibbard, "City and County of Honolulu Art Deco Parks and Playgrounds, National Register of Historic Places Documentation Form." 1988. P E3.)		
[1] 1-3-004: 123 Kalihi Waena Neighborhood Park	2020 Beckley St.	Neighborhood park St. of HI	Masonry walls along Beckley St. built ca. 1935. (Hibbard, 1988)	No historic properties affected. (Don Hibbard, "City and County of Honolulu Art Deco Parks and Playgrounds, National Register of Historic Places Documentation Form." 1988. P E3.)	Other than the 1935 walls, the park does not retain integrity. Ca. 1959 a portion of the original park was lost to freeway construction. Park building was built ca. 1975.	

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-004: 124 Parcel in Kalihi Waena Neighborhood Park	Nakuina St. Kalihi Waena Park	Neighborhood park C&C Hon.	dna	No historic properties affected. (Don Hibbard, "City and County of Honolulu Art Deco Parks and Playgrounds, National Register of Historic Places Documentation Form." 1988. P E3.)		
[1] 1-3-005: 012 Ventura residence	1225 Nakuina St.	Residence Ventura residence.	1966	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-005: 013 Vacant	Kaili St.	Small lot St. of HI.	dna	No historic properties affected. Vacant, paved part of the street.		
[1] 1-3-005: 008 Kaili St. roadway	Kaili St.	Linear lot that is Kaili St. Lee property.	dna	No historic properties affected. This TMK is the street. No buildings		

INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT

TMK **Name**	**Street Address**	**Resources Surveyed**	**Year Built***	**Determination of Eligibility**	**Notes**	**Photo**
[1] 1-3-005: 059 Garcia residence	1822C Beckley St. (Kaili St.)	Residence Garcia residence. .	1951	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-005: 014 Kamehameha Gardens	1218 Farr Ln.	Courtyard housing 8 residences	1969	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-005: 015 Tran residence	1216 Farr Ln.	Residence Tran residence.	1960	No historic properties affected. Lacks significance associated with architectural distinction. No known association with an important historic person or event.		
[1] 1-3-005: 053 Vacant lot	Farr Ln.	Small lot, vacant St. of HI	dna	No historic properties affected. Vacant lot.		

NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION
HAWAII REVISED STATUTES, §6E-8 CONSULTATION
INTERSTATE H-1 EASTBOUND (EB) IMPROVEMENTS,
OLA LANE OVERPASS TO LIKELIKE HIGHWAY OFF RAMP PROJECT
KONA DISTRICT, OAHU ISLAND, KALIHI AND KAPALAMA AHUPUAA
PROJECT NO. H1H1-01-09, STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION

Tax Map Key (TMK): (1) 1-3-002: 038, (1) 1-3-002: 037, (1) 1-3-002: 036, (1) 1-3-002: 033, (1) 1-3-002: 034, (1) 1-3-002: 035, (1) 1-3-002: 043, (1) 1-3-002: 042, (1) 1-3-002: 044, NO TMK KALIHI STREAM BED, (1) 1-3-003: 066, (1) 1-3-003: 036, (1) 1-3-003: 068, (1) 1-3-003: 004, (1) 1-3-003: 003, (1) 1-3-003: 060, (1) 1-3-003: 005, (1) 1-3-003: 069, (1) 1-3-004: 067, (1) 1-3-004: 066, (1) 1-3-004: 065, NO TMK GULICK AV. OVERPASS, (1) 1-3-008: 004, (1) 1-3-007: 067, (1) 1-3-004: 126, (1) 1-3-004: 123, (1) 1-3-004: 124, (1) 1-3-005: 012, (1) 1-3-005: 013, (1) 1-3-005: 008, (1) 1-3-005: 059, (1) 1-3-005: 014, (1) 1-3-005: 015, (1) 1-3-005: 053

DETERMINATION OF EFFECT

1.0 INTRODUCTION

The State of Hawaii, Department of Transportation (HDOT) proposes to improve approximately 0.7 mile of eastbound Interstate H-1 (H-1) in Honolulu, Oahu under the Interstate Route H-1 (EB) Improvements, Ola Lane Overpass to Likelike Highway Off-Ramp Project. The project limits extend from just east of the Ola Lane overpass over H-1 (approximately Milepost 18.9), to the off-ramp to Likelike Highway, Exit 20A (approximately Milepost 19.6).

The project involves widening of the H-1 freeway within the project limits to relieve eastbound congestion on the H-1 freeway at this key bottleneck, improve roadway design for traffic flow and safety, and maintain the section as a functional component of the urban transportation system for highway users.

The project widens the H-1 Freeway within the existing right of way. At many areas, the existing retaining wall is expected to be re-built. No impingement onto adjacent property is anticipated except with two minor exceptions: 1) at a narrow segment at the Kalihi Union Church the freeway curve might possibly be flattened by a few feet, requiring the taking of about forty square feet of property that is not near any buildings, 2) at the

masonry walls at both banks of Kalihi Stream, the anticipated widening of the H-1 bridge over the stream will require supports placed in the location of the existing walls.

The proposed widening is considered a federal undertaking and must comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). The project is also required to comply with State historic preservation law promulgated in Chapter 6E-8, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules, §13-275.

The Hawaii State Historic Preservation Division Reconnaissance Level Survey (RLS) for this project, prepared by Mason Architects, Inc. (dba MASON) in January 2021 and attached, identified six National and Hawaii State Register of Historic Places-eligible properties adjacent to the project area. MASON was also tasked with evaluating the effects of the undertaking on the historic resources within the survey area and the preparation of this Determination of Effect (DoE) letter. Concurrence with these findings will be confirmed in consultation with the State Historic Preservation Officer.

Qualifications of Historic Preservation Practitioners

Historic research and field work was completed by Dee Ruzicka of MAI in May 2020. Mr. Ruzicka is trained in architectural history and historic preservation. He has a B.A. in American History from the University of Hawaiʻi at Mānoa; a M.A. in American Studies with specialization in Historic Preservation; and a Graduate Certificate in Historic Preservation also from U H Mānoa. With his training and nineteen years of experience in architectural history, Mr. Ruzicka meets the professional qualification standards under Historic Architecture and Architectural History outlined in 36 CFR Part 61.

The work was performed under the supervision of Barbara Shideler, AIA, a principal of Mason Architects, Inc. of Honolulu and a licensed architect in the State of Hawaiʻi. She has a Bachelor's degree in Architecture (1988) and a Graduate Certificate in Historic Preservation (1992), both from the University of Hawaiʻi at Mānoa. Ms. Shideler has had course work in American architectural history, as well as more than thirty years of professional experience in the field. Ms. Shideler meets the professional qualification standards under Historic Architecture and Architectural History outlined in the Code of Federal Regulations. 36 CFR Part 61

Area of Potential Effect/Survey Area

The historic architectural Area of Potential Effect (APE) is illustrated I Figure 1.

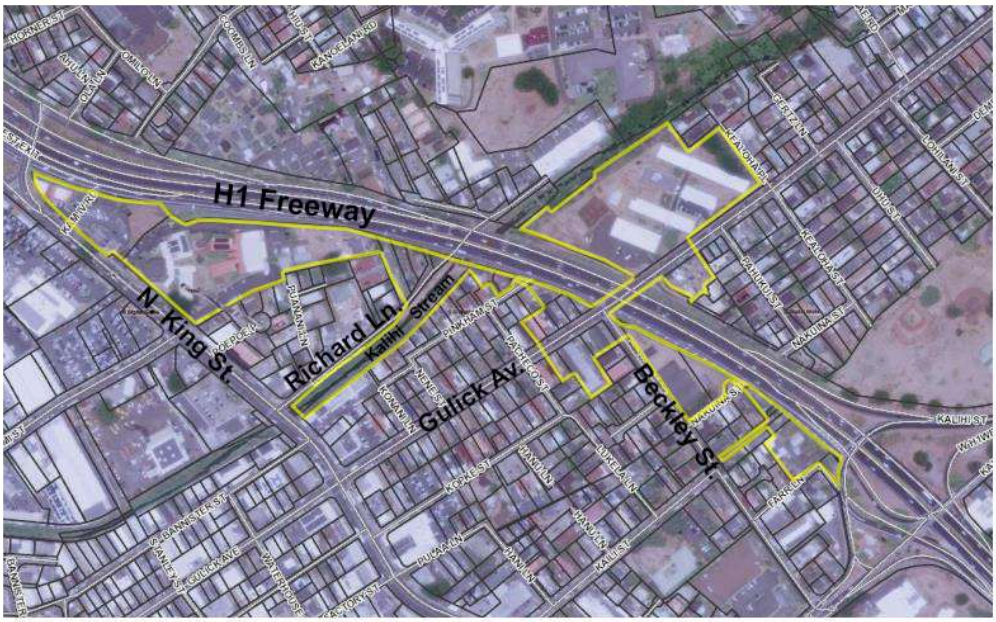


Figure 1: APE/ Survey area.

2.0 HISTORIC AND CULTURAL RESOURCES

2.1 Summary of Historic and Cultural Properties within the APE/ Survey area.

The RLS identified six historic resources that are eligible for listing on the National Register of Historic Places (NRHP) and the Hawaii Register of Historic Places (HRHP):

- First Hawaiian Bank, TMK (1) 1-3-002: 037
- Sanctuary at Kalihi Union Church, TMK (1) 1-3-002: 036
- Acosta Residence, TMK (1) 1-3-002: 034
- Kalihi Stream West Bank lava rock and concrete mortar wall, TMK (1) 1-3-002: 044
- Kalihi Stream East Bank lava rock and concrete mortar wall (no TMK)
- Lee Residences, TMK (1) 1-3-007: 067.

Other resources not eligible for listing on the NRHP or HRHP have been identified and are summarized in the RLS.

2.2 Exemptions from Section 106 Review

The H-1 Freeway is exempt from Section 106 review in accordance with the "Exemption Regarding Historic Preservation Review Process for Effects on the Interstate Highway System," approved by the ACHP and published in the Federal Register on March 10, 2005 (Vol. 70, No. 46, 11928). This exemption releases agencies from the responsibility of having to take into account the effect of undertakings on the Interstate System, except for a limited number of individual elements. As a result of this exemption, the H-1 Freeway and its associated feature, the concrete bridge over Kalihi Stream, were not evaluated in the RLS.

Another resource surveyed that is exempt from Section 106 review is the Gulick Avenue Overpass Bridge over H1, as it is addressed in the program comment for post-1945 common bridge types: "Advisory Council of Historic Preservation, Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges, 2012," issued by the ACHP on November 2, 2012 and published in the Federal Register on November 16, 2012 (Vol. 77, No. 222, 68790).

3.0 PROPOSED PROJECT AND EFFECTS

3.1 Overview

The project widens the H-1 Freeway within the existing right of way. At many areas, the existing retaining wall is expected to be re-built. With two minor exceptions (Kalihi Union Church and Kalihi Stream at H1 Bridge), no impingement onto adjacent property is anticipated.

3.2 Effects Pursuant to Section 106 of the National Historic Preservation Act

No Historic Properties Affected [36CFR Part 800.4(d)(1)]

First Hawaiian Bank	TMK (1) 1-3-002: 037
Acosta Residence	TMK (1) 1-3-002: 034
Lee Residences	TMK (1) 1-3-007: 067
Kalihi Union Church	TMK (1) 1-3-002: 036

The property at Kalihi Union Church will receive a minor alteration of less than 40 square feet of the parcel boundary along the Freeway. This will have no effect on the historic buildings.

No Adverse Effect [36 CFR Part 800.5(b)]

Masonry wall	No TMK	East bank of Kalihi Stream at H1 Bridge
Masonry wall	TMK (1) 1-3-002: 044	West bank of Kalihi Stream at H1 Bridge

The project will remove approximately 15 linear feet of each masonry wall to accommodate the proposed concrete overpass abutments and foundations. The top of the masonry wall at Abutment #1 on the west embankment adjacent to Richard Lane will require a notch of 2'-0" high by 6"-0" long to accommodate the new corbel for the bridge support column. The balance of the west embankment wall and the masonry wall at Abutment #2 on the east embankment will be reconstructed with the existing stone in accordance with the Secretary of the Interior's Standards for Rehabilitation. The minor alteration of less than 12 square feet of west masonry wall below the bridge deck at Abutment #1 does not meet the criteria for adverse effect.

3.3 Effects Pursuant to Chapter 6E-8, Hawaii Revised Statutes

No Historic Properties Affected—no effect on significant historic properties [HAR §13-275-7(a)(1)]

First Hawaiian Bank	TMK (1) 1-3-002: 037
Acosta Residence	TMK (1) 1-3-002: 034
Lee Residences	TMK (1) 1-3-007: 067
Kalihi Union Church	TMK (1) 1-3-002: 036

No Historic Properties Affected—minor changes to a building or structure will not affect its significant character [HAR §13-275-7(d)]

Masonry wall	No TMK	East bank of Kalihi Stream at H1 Bridge
Masonry wall	TMK (1) 1-3-002: 044	West bank of Kalihi Stream at H1 Bridge

4.0 SUMMARY DETERMINATION OF EFFECT

In summary, it is the opinion of the historical architect who reviewed the proposed project and have determined that the undertaking will result in:

No Historic Properties Affected (Section 106, NHPA and Chapter 6E-8, HRS)

For the First Hawaiian Bank, Acosta Residence, Lee Residences, and Kalihi Union Church.

No Adverse Effect (Section 106, NHPA)

No Historic Properties Affected (Chapter 6E-8, HRS)

For the masonry Walls of Kalihi Stream at H1 Bridge, east and west bank.