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AUG 8 2017

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
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DEPUTY DIRECTOR

IN REPLY REFER TO:
WW.PEA 17-113

July 24, 2017

Mr. Scott Glenn, Director
Office of Environmental Quality Control
Department of Health, State of Hawaii
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

RECEIVED
'17 JUL 26 A8:48
OFC. OF ENVIRONMENTAL QUALITY CONTROL

Dear Mr. Glenn:

SUBJECT: Kamehameha Highway Wastewater Pump Station (WWPS)
36" Force Main - Draft Environmental Assessment
Honolulu, Oahu, Hawaii
TMK: Portions of [1] 1-1-003: 004, 138, 204, 205, 206, 207,212, and 239; and 1-2-021: 035 and 036

The City and County of Honolulu, Department of Environmental Services (CCH-ENV) has reviewed the Draft Environmental Assessment (EA) for the subject project and anticipates a Finding of No Significant Impact determination. Please publish notice of availability of the Draft EA in the next available issue of the *OEQC Environmental Notice.*

We have enclosed a completed OEQC Publication Form and one hard copy of the Draft EA. The enclosed compact disc contains the Publication Form (MS WORD) and a PDF version of the Draft EA.

Should you have any questions, please contact Kim Suzuki from our Division Wastewater Engineering and Construction at (808) 768-8410 or our consultant, Tony Ali (CH2M HILL) at (808) 440-0208.

Sincerely,

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

Enclosures

18-034

AGENCY
PUBLICATION FORM

Project Name:	Kamehameha Highway Wastewater Pump Station Force Main System Improvements
Project Short Name:	Kamehameha Highway WWPS 36" Force Main
HRS §343-5 Trigger(s):	Use of State and County Lands and County Funds; Conservation District
Island(s):	Oahu
Judicial District(s):	Honolulu
TMK(s):	Portions of [1] 1-1-003: 004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036
Permit(s)/Approval(s):	Department of the Army Permit (Rivers and Harbors Act Section 10), Clean Water Act Section 401 Water Quality Certification, Special Management Area Permit, Conservation District Use Permit, NPDES, Occupancy and Use of State Highway Right of Way Permit, Community Noise Permit/Variance
Proposing/Determining Agency:	City and County of Honolulu, Department of Environmental Services
Contact Name, Email, Telephone, Address	Kim Suzuki, 808-768-8410 ksuzuki2@honolulu.gov 650 South King Street, 14th Floor Honolulu, HI 96813
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	CH2M HILL
Contact Name, Email, Telephone, Address	Tony Ali, 808-440-0208 Tony.Ali@ch2m.com 1132 Bishop Street, Suite 1100 Honolulu, HI 96813

Status (select one)	**Submittal Requirements**
__X__ DEA-AFNSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
_____ FEA-FONSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
_____ FEA-EISPN	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
_____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
_____ DEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
_____ FEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.

____ FEIS Acceptance Determination	The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
FEIS Statutory Acceptance	Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.
____ Supplemental EIS Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary

The City and County of Honolulu, Department of Environmental Services (ENV) proposes to construct a new 36-inch sewer force main between the Kamehameha Highway Wastewater Pump Station located adjacent to Keehi Lagoon Park and the Kapalama Interceptor Relief Sewer located in the Kalihi Kai industrial area off Sand Island Access Road. The new force main would provide a backup facility to divert flows if the active 42-inch force main fails. This diversion capability is required under the First Amended 2010 Wastewater Consent Decree. The total length of the new force main is estimated at 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by horizontal directional drilling (HDD) and 800 linear feet would be installed using open trench construction. No in-water construction activity is expected because the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. The project would also include temporary staging areas, bypass facilities, access roads, utility connections and relocations (as needed), and site restoration.

Short-term, construction-related impacts (noise, dust, and erosion) would occur, but the implementation of best management practices would minimize the effects to the environment. No State or federally protected wildlife species occur in the project area, but may transit the site. There are no eligible historic properties within the project area.

DRAFT ENVIRONMENTAL ASSESSMENT

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Honolulu, Hawaii

TMKs: Portions of [1] 1-1-003: 004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Submitted Pursuant to Hawaii Revised Statutes, Chapter 343

City and County of Honolulu
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, HI 96707

July 2017

DRAFT ENVIRONMENTAL ASSESSMENT

Kamehameha Highway Wastewater Pump Station Force Main System Improvements Honolulu, Hawaii

TMKs: Portions of [1] 1-1-003: 004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Submitted Pursuant to Hawaii Revised Statutes, Chapter 343

Prepared for:

City and County of Honolulu
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, HI 96707

Prepared by:

CH2M
1132 Bishop Street, Suite 1100
Honolulu, HI 96813

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A Natural Resources Survey and Wetlands Delineation for a Wastewater Force Main from Kalihi Kai to Keehi Lagoon Beach Park, Honolulu, Oahu, prepared by AECOS, Inc., June 2017

B Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main, prepared by CH2M Hill, June 2017

C Endangered Species Act Consultation
- Correspondence to U.S. Fish and Wildlife Service and National Marine Fisheries Service (dated April 3, 2017)
- Correspondence from U.S. Fish and Wildlife Service (dated April 28, 2017)
- Correspondence from Division of Aquatic Resources (dated April 24, 2017)

D Archaeological Literature Review and Field Inspection in Support of Consultation with the SHPD for the Kamehameha Highway Force Main Project, prepared by Hallett H. Hammatt, Gina M. Farley, and David W. Shideler (Cultural Surveys Hawaii, Inc.), June 2017

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Acronyms and Abbreviations

°F	degrees Fahrenheit
µg/m^3	microgram(s) per cubic meter
ACM	asbestos-containing material
AECOS	AECOS, Inc.
APE	Area of Potential Effects
bgs	below ground surface
BMP	best management practice
BWS	Board of Water Supply
CCH	City and County of Honolulu
CCTV	closed-circuit television
CDUA	Conservation District Use Application
CER	computerized environmental report
cfs	cubic feet per second
CIA	cultural impact assessment
CIPP	cast-in-place pipe
CSH	Cultural Surveys Hawaii
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dBA	A-weighted decibel(s)
DDC	Department of Design and Construction
DLNR	Department of Land and Natural Resources
DPP	Department of Planning and Permitting
DPR	Department of Parks and Recreation
DUF	Division of Urban Forestry
EA	environmental assessment
EFH	essential fish habitat
EIS	environmental impact statement
ENV	Department of Environmental Services
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HAR	Hawaii Administrative Rules
HART	Honolulu Authority for Rapid Transportation
HDD	horizontal directional drilling
HDOH	State of Hawaii Department of Health
HDOT	State of Hawaii Department of Transportation
HDPE	high-density polyethylene
HECO	Hawaiian Electric Company
HRS	Hawaii Revised Statutes
HRTP	Honolulu Rail Transit Project

KHz	kilohertz
LBP	lead-based paint
makai	oceanward
mauka	mountainward
MBTA	Migratory Bird Treaty Act
mgd	million gallon(s) per day
mph	mile(s) per hour
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O_3	ozone
OEQC	State of Hawaii Office of Environmental Quality Control
$PM_{2.5}$	particulate matter less than 2.5 microns
ppm	parts per million
PUC	Primary Urban Center
ROW	right-of-way
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
SMA	Special Management Area
SOEST	School of Ocean and Earth Science and Technology
TMDL	total maximum daily load
TMK	tax map key
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WQC	water quality certification
WWPS	wastewater pump station

Project Summary

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

TABLE PS-1

Project Summary

Project Name	Kamehameha Highway Wastewater Pump Station Force Main System Improvements, Honolulu, Hawaii
Short Project Name	Kamehameha Highway WWPS 36" Force Main
Proposing/Accepting Agency	City and County of Honolulu, Department of Environmental Services
Anticipated Determination	Finding of No Significant Impact under Hawaii Revised Statutes (HRS) Chapter 343
Tax Map Key(s)	Portions of [1] 1-1-003: 004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036 (Figure 1-3)
Existing Uses of the Project Corridor	Park (Keehi Lagoon Beach Park) and industrial-business mixed use. The underground portion of the force main would pass beneath Keehi Lagoon Beach Park, Keehi Memorial Park, Kahauiki Village (under construction), a future AM radio antenna (scheduled for construction in 2018), and Moanalua and Kalihi streams. The temporary pipe laydown area is within the Nimitz Highway right-of-way.
State Land Use	Urban District (land areas); Conservation District (sections of Moanalua and Kalihi streams where the new force main passes under)
Special Management Area	Yes
Land Use Designations in Primary Urban Center Development Plan	Industrial; Major Parks and Open Space (adjacent waterbodies)
Zoning	P-2 General Preservation District (Keehi Lagoon Beach Park) I-2 Intensive Industrial (Kalihi Kai industrial area)
Proposed Project	The proposed project would construct a new 36-inch sewer force main between the Kamehameha Highway Wastewater Pump Station located adjacent to Keehi Lagoon Park and the Kapalama Interceptor Relief Sewer located in the Kalihi Kai industrial area off Sand Island Access Road. The new force main would provide a backup facility to divert flows if the active 42-inch force main fails, as required under the First Amended 2010 Wastewater Consent Decree. The total length of the new force main is estimated at 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by horizontal directional drilling (HDD) and 800 linear feet would be installed using open trench construction. No in-water construction activity is expected because the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. The project would also include temporary staging areas, bypass facilities, access roads, utility connections and relocations (as needed), and site restoration.
Anticipated Impacts	Short-term, construction-related impacts (noise, dust, and erosion) would occur, but the implementation of best management practices would minimize the effects to the environment. No State or federally protected wildlife species occur in the project area, but may transit the site. Seabirds may be disoriented by outdoor lights; therefore, if construction activity occurs after sunset, all associated lighting would be properly shielded and aimed downward. There are no eligible historic properties within the project area.

CHAPTER 1

Introduction

1.1 Proposing Agency and Action

The City and County of Honolulu (CCH) Department of Environmental Services (ENV)[1] proposes to construct a new 36-inch-diameter sewer force main that would be approximately 3,100 feet long and provide flow diversion capability in the Kamehameha Highway Wastewater Pump Station (WWPS) force main system. This environmental assessment (EA) has been prepared in compliance with Hawaii Revised Statutes (HRS) Chapter 343 and Hawaii Administrative Rules (HAR) Title 11, Chapter 200, Environmental Impact Statement [EIS] Rules. ENV is the proposing agency and accepting authority.

Operations and maintenance of the new sewer force main would be also be performed by ENV as part of the CCH wastewater collection system.

1.2 Existing Conditions

The Kamehameha Highway WWPS force main is part of the existing CCH ENV wastewater system which provides municipal wastewater collection, treatment, and disposal service for the primary urban center. More specifically, this portion of the municipal system is within the East Mamala Bay service area, covering the airport, Mapunapuna, Salt Lake, and Moanalua areas. Outflows are processed through the Sand Island Wastewater Treatment Plant.

The Kamehameha Highway WWPS is located at the mountainward (*mauka*) edge of Keehi Lagoon Beach Park. When it was constructed and began operations in 1959, a 36-inch concrete cylinder pipe force main conveyed raw sewage from the WWPS. In 1997, CCH constructed a 42-inch force main to replace the original pipe. The 1997 force main now serves as the active primary force main, and the original 36-inch force main has been abandoned in place. The 36-inch and 42-inch force mains are located in an easement that extends from separate valve vaults near the WWPS, passes *mauka* of the tennis courts, and crosses Moanalua and Kalihi streams, attached to parallel utility bridges. The abandoned 36-inch force main is carried on the *mauka* bridge and the 42-inch force main is carried on the oceanward (*makai*) bridge. These mains connect to the Kapalama Interceptor Relief Sewer located in the Kalihi Kai industrial area via surge manholes on the eastern side of Kalihi Stream. An area of approximately 7.9 acres was included in the study area for this EA.

1.3 Project Purpose and Need

The purpose of the project is to improve the Kamehameha Highway WWPS force main system in accordance with the Force Main Flow Diversion Plan mandated by the First Amended 2010 Wastewater Consent Decree (Civ. No. 94-00765-DAE-KSC). The decree is an agreement reached between the federal (U.S. Environmental Protection Agency) and state governments (State of Hawaii Department of Health [HDOH]) and CCH.

Force mains in Honolulu are a critical link in the network of pipes that convey sewage to the CCH wastewater treatment plants. As in other cities, municipal sewage is collected and transported from its origin through a combination of gravity sewers and force mains to the ultimate discharge at the wastewater treatment plant. Gravity sewers use pipe slope and gravity to transport sewage flows. Force mains are pressurized using pumps to lift sewage across areas where gravity flow cannot be maintained, such as across a body of water, or to lift sewage up from a topographic low point. Gravity pipes can usually carry sewage

[1] Project planning and design was initiated by the Department of Design and Construction (DDC). In 2016, the electorate approved a City Charter amendment to transfer the planning, engineering, design, construction, and improvement of all of the ENV's wastewater and solid waste system projects from DDC to ENV. As part of the transfer of responsibilities, this environmental assessment and the Chapter 343, HRS environmental review process has been assumed by ENV. Earlier correspondence and references to DDC reflect the administrative structure prior to the Charter amendment.

flow during the repair process; however, because the force main operates under pressure, repair on an active force main is not always feasible.

Consequently, the Consent Decree requires that large force mains, including the Kamehameha Highway Force Main, have the capability to divert flows to minimize the release of wastewater to the extent practicable in the event of force main failure. The purpose of this project is to provide the mandated diversion capability. It is not considered a project to increase capacity that would support substantial new growth or development. The system is not designed to handle flows in both force mains operating simultaneously.

1.4 Purpose of the Environmental Assessment

This EA discloses the environmental and cultural impacts that may result from the project's implementation, and identifies 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, HAR Chapter 11-200, and other environmental compliance requirements. The proposed project triggered the need to comply with the rules and regulations for environmental review because the project would use County and State lands and County funds and a portion of the project area is located within the Conservation District.

1.5 Public Comment on the Environmental Assessment

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 OEQC initiates a 30-day review and comment period.

Request for Comments

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

Name: Tony Ali, Project Manager
Address: CH2M
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Email: tony.ali@ch2m.com

1.6 Permits, Approvals, and Compliance Required or Potentially Required

The permits and approvals in the following sections are expected to be required before project implementation.

1.6.1 Federal

- Department of the Army Permit (Section 10 of the Rivers and Harbors Act), U.S. Army Corps of Engineers (USACE)
- Section 7 Consultation (Endangered Species Act [ESA]), U.S. Fish and Wildlife Service (USFWS); National Marine Fisheries Services (NMFS)

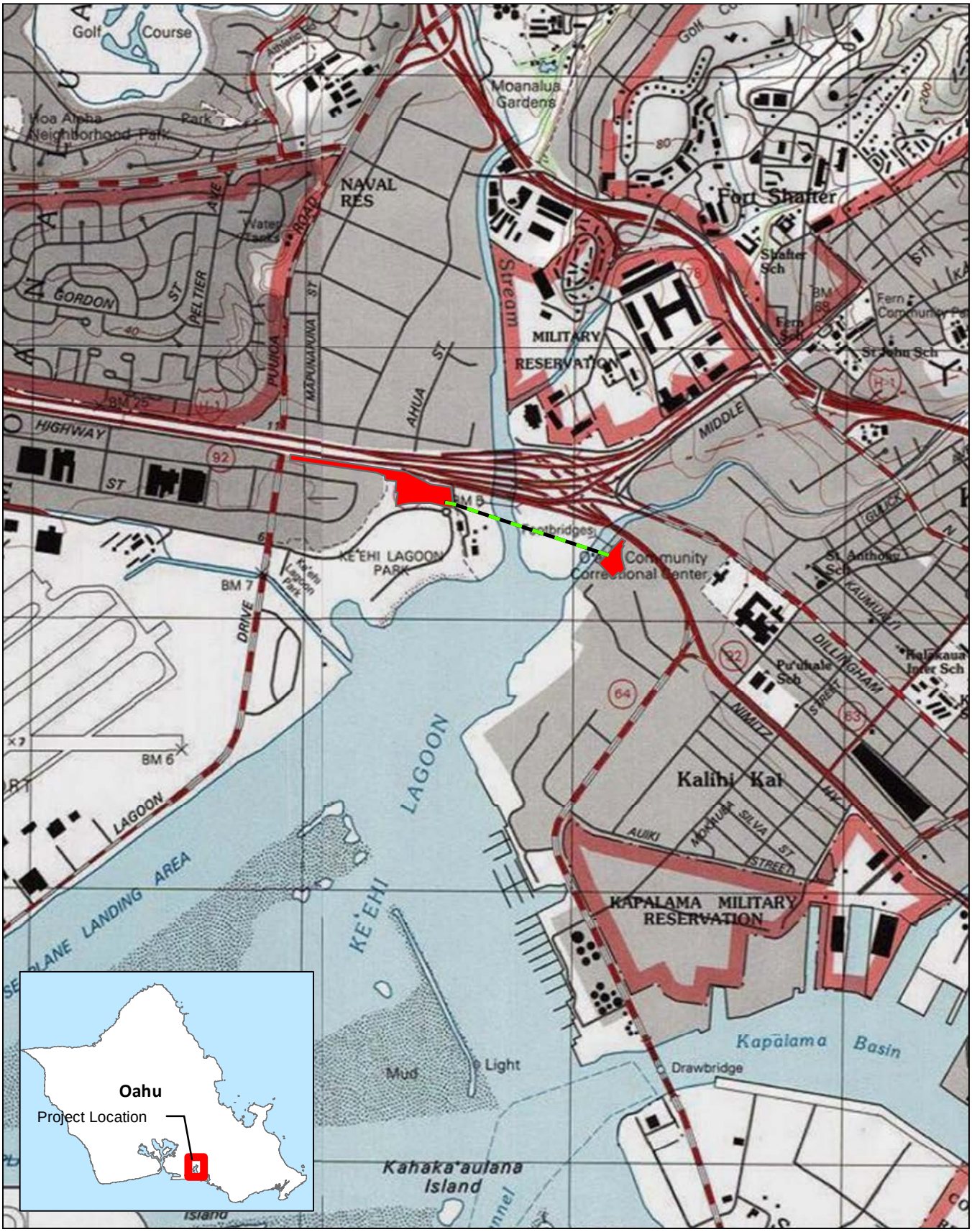
1.6.2 State

- Section 401 Water Quality Certification, HDOH
- National Pollutant Discharge Elimination System (NPDES) Permit, HDOH
- Coastal Zone Management (CZM) Consistency Review, Office of Planning, Hawaii Department of Business, Economic Development, and Tourism

- Historic Preservation Review (HRS, Chapter 6E), State Historic Preservation Review Division, Hawaii Department of Land and Natural Resources (DLNR)
- Conservation District Use Permit, Office of Conservation and Coastal Lands, DLNR
- Occupancy and Use of State Highway Right-of-Way (ROW) Permit
- Community Noise Permit/Variance, HDOH

1.6.3 City and County

- Special Management Area (SMA) Permit, CCH Department of Planning and Permitting (DPP)
- Industrial Wastewater Discharge Permit, CCH ENV
- Compliance with floodplain management requirements, CCH DPP
- Grading, grubbing, stockpiling, and other construction permits, CCH DPP



LEGEND

Horizontal Directional Drilling

Project Area

Note: Locations are approximate.

0 500 1,000

Approximate Scale in Feet

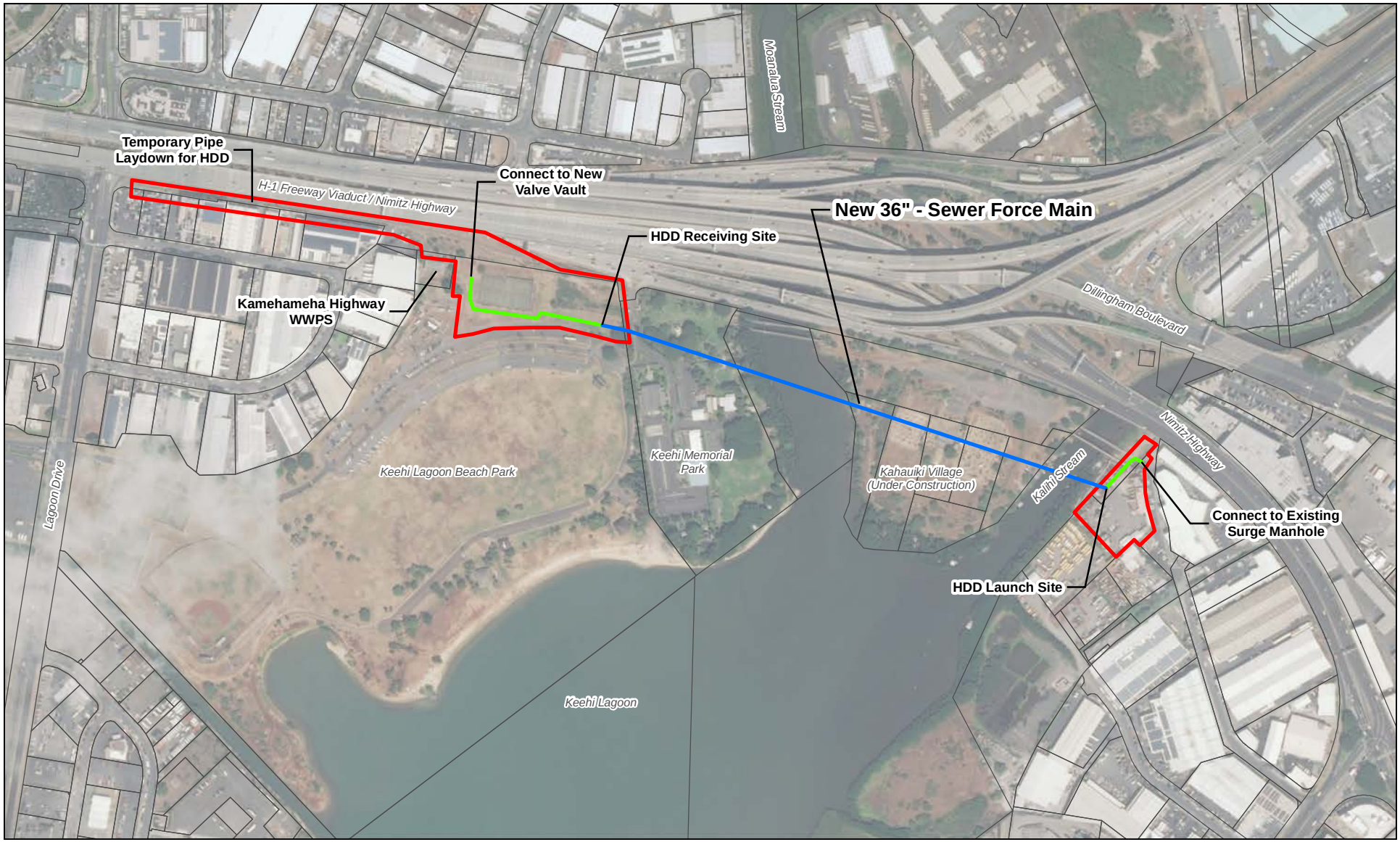
FIGURE 1-1

Project Location Map

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

UNK \\NALA\PROJ\GIS_LIBRARY\CCH_PUBLIC_WORKS\MAPS\REPORT\FINAL_REPORT\FIG1-1_PROJECT_LOCATION_USGS.MXD RMANGAN 7/20/2017 11:47:14 AM



LEGEND

- Project Area
- TMK
- HDD
- Open Trenching (Cut and Cover)

Note: Locations are approximate.

N

0 275 550

Approximate Scale in Feet

FIGURE 1-2

Project Area Map

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

UNK \\NALA\PROJ\GIS_LIBRARY\CCH_PUBLIC_WORKS\MAPS\REPORT\FINAL_REPORT\V2\FIG1-2_PROJECT_AREA.MXD RMANGAN 7/20/2017 1:10:14 PM

LEGEND

- Project Area
- Horizontal Directional Drilling
- TMK

Note: Locations are approximate.

N

0 275 550

Approximate Scale in Feet

FIGURE 1-3
TMK Map
Kamehameha Highway Wastewater Pump Station Force Main System Improvements
Oahu, Hawaii

UNK \\NALA\PROJ\GIS_LIBRARY\CCH_PUBLIC_WORKS\MAPS\REPORT\FINAL_REPORT\V2\FIG1-3_TMK_MAP.MXD RMANGAN 7/20/2017 12:28:14 PM

CHAPTER 2

Project Description

2.1 Project Location

The project location for the new 36-inch force main covers a linear area or alignment that extends from the Kamehameha Highway WWPS on the outskirts of Keehi Lagoon Beach Park to the Kalihi Kai light industrial area. The project location includes four main components:

1. The launch site on the east end of the alignment is located within an urban area of light industrial and commercial businesses. This would be the command center for drilling operations. This site was selected in relation to the HDD alignment, available space, and proximity to the sewer connection point. (Photos 1 and 2)
2. The receiving site, located within Keehi Lagoon Beach Park, is the target for underground tunneling. Key considerations in selecting this site were access to the WWPS; avoidance of the existing 36-inch and 42-inch force mains and their respective valve vaults; and available space for pipe fusion, laydown, and pullback. (Photos 3 through 5)
3. The HDD alignment would pass under Keehi Memorial Park, Moanalua Stream and Kalihi stream, and the peninsula between the two streams. The alignment was selected based on analysis of subsurface conditions, avoidance of constraints such as existing buildings and utilities, and design limitations on horizontal and vertical curves and bends.
4. The temporary laydown area along Nimitz Highway is where the pipe string would be staged for pullback through the tunnel. The long strip of land would maximize the length of pipe that can be preassembled prior to insertion into the tunnel with one intermediate fuse expected. (Photos 6 and 7)

Project site photos are provided below.

Photo 1. Proposed launch site located east of Kalihi Stream, looking west.

Photo 2. Surge manhole on east side of project alignment in the Kalihi Kai industrial area.

Photo 3. Underground force main valve vaults; west of Keehi Lagoon Beach Park tennis courts (west side of project alignment), looking east.

Photo 4. Proposed open trench construction approximately 30 feet makai of the tennis court fence line (connection to the WWPS valve vault), looking east.

Photo 5. Vicinity of proposed receiving site in Keehi Lagoon Beach Park, looking east.

Photo 6. Proposed pipe laydown staging area mauka of the WWPS, looking east.

Photo 7. Proposed corridor for temporary pipe laydown, looking east.

2.1.1 Surrounding Land Uses

The proposed project is located in the vicinity of the Keehi Lagoon estuary in the Honolulu District of Oahu. The western end of the project alignment is located adjacent to the Kamehameha Highway WWPS on the outskirts of Keehi Lagoon Beach Park. The 70-acre park is operated and maintained by the City Department of Parks and Recreation (DPR). The eastern end of the project alignment is located within the Kalihi Kai industrial area. The land is owned by the State of Hawaii and managed by the Department of Land and Natural Resources, Land Division. Tenants in the industrial area are a mix of light industrial and commercial businesses, including construction equipment rental, building material suppliers, and trucking and transportation.

The tunnel portion of the force main would pass under two streams—Moanalua Stream and Kalihi Stream—which drain portions of the Moanalua, Fort Shafter, Mapunapuna, and Kalihi areas. The underground pipe would also pass under Keehi Memorial Park (formerly referred to as the DAV Hall) and a peninsula between the two streams. The peninsula had been occupied by a paintball facility but in 2015, the State-owned land was made available for development of emergency housing through a project known as Kahauiki Village. Construction is currently underway and the first 25 units are scheduled for occupancy by the end of 2017.

2.1.2 Utilities

In addition to the existing sewer infrastructure, the following providers operate utilities in the project area:

- Hawaii Gas – 16-inch underground gas line and pipe cleaning station *mauka* of the WWPS
- Hawaiian Electric Company – electrical conduit and manhole adjacent to Nimitz Highway
- Hawaiian Telcom – conduit to pay phone *makai* of tennis courts; telecommunications conduit and manhole adjacent to Nimitz Highway

2.2 Proposed Project

Based on preliminary engineering, the new force main is estimated to extend for a total of 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by HDD and 800 linear feet would be installed using open trench construction. The portions of open trench construction are estimated to include approximately 200 feet on the eastern and 600 feet on the western ends, and would connect the force main to the existing sewer system. No in-water construction activity is expected because the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. The proposed alignment and profile are shown in Figure 2-1.

The new pipe proposed to be installed using HDD would be constructed of an industrial grade plastics pipe (such as high density polyethylene [HDPE] or fusible polyvinyl chloride) with an inner diameter of 36 inches to match the diameter of the existing, abandoned force main, and a design capacity of 33 million gallons per day (mgd). The outer diameter of the pipe would be 40-44 inches, depending on final pipe selection. The sections of pipe to be installed using open trench construction would be 36-inch HDPE or polyvinyl chloride pipe.

In addition to the pipeline alignment, major components of the project would include the following:

- **Launch Site**. The launch site is where the drill rig and ancillary equipment would be set up and drilling for the new pipeline would begin. The drill head would advance from this location westward to the receiving site. When the tunnel has been bored, the new HDPE pipe (laid out at the receiving end) would be pulled back through the tunnel. The proposed launch site would be located in the industrial yard directly east of Kalihi Stream and is expected to occupy an area of approximately 25,000 square feet. Figure 2-2 shows a standard layout including the drill rig, field power unit, a mud system for mixing and recycling, and storage areas. Final equipment configuration would be determined on site.
- **Receiving Site**. The receiving site would be located in the northeast corner of Keehi Lagoon Beach Park (east of the tennis courts) and is expected to occupy an area of approximately 20,000 square feet.

- **Temporary Layout of Pipeline**. To construct the HDD portion of the pipeline, the 2,300-foot-long fused pipe would need to be laid out in preparation for pull back through the bored hole. It is preferable to avoid stopping the pull back to accommodate an intermediate weld because there is a risk that the in-ground portion of pipe could become trapped in place, thereby complicating further advance. The current plan is to lay down the new pipe in two sections side by side, adjacent to Nimitz Highway (Figures 2-3 to 2-6). The pipe segments would not encroach into the Lagoon Drive intersection.
- **Valve Vaults.** Valve vaults are connection points that allow flows to be isolated from or directed to either of the force mains after the project is completed. A new valve vault would be constructed for the new 36-inch force main on the Ewa (or west) side of the tennis courts and just south of the valve vault for the 42-inch force main. Additionally, the existing valve vault for the 42-inch force main would be reconstructed to address deterioration, provide more robust containment, and extend facility life. The valve vault for the 42-inch main would be reconstructed in place.
- **Staging Areas and Construction Access**. With the exception of temporary layout of the pipeline, all equipment staging and material storage would occur within the construction area at the launch and receiving sites. Access to the launch site would be through the industrial business area off Sand Island Access Road. Access to the receiving site would be through the Keehi Lagoon Beach Park driveway and parking lot.

2.2.1 Construction Activities

2.2.1.1 Construction

Horizontal Directional Drilling Tunneling

Approximately three-fourths of the new sewer force main would be installed by HDD, a construction method with a relatively small footprint that seeks to minimize impacts to environmental resources on the surface. The underground tunnel follows an arc line using advanced technology and technicians guiding a drill head electronically to ensure the angle, depth, and exit point in the engineering plans.

Installation of a pipeline by HDD is generally accomplished in three stages (Figure 2-7). The first stage consists of directionally drilling a small diameter pilot hole along the designed directional path. The second stage involves reaming or enlarging the pilot hole to a diameter suitable for installation of the pipeline. Multiple reaming passes may be required to reach the desired hole diameter. The third stage consists of pulling the pipeline back into the enlarged hole.

The directional drilling process involves a non-hazardous drilling fluid primarily made up of water and bentonite, and often referred to as mud. Bentonite is a naturally occurring, non-toxic and inert substance. Drilling fluid is injected into the tunnel to lubricate and stabilize the hole and to remove soil cuttings. Throughout the process, the drilling fluid is cleaned and recycled. Liquid material is recycled for use by the tunnel boring machine. Solids are taken off-site for testing and stockpiling, then disposed of at a site approved by CCH.

Inadvertent Returns

The HDD process has the potential for loss or seepage of drilling fluid through the subsurface material through which the drill passes. In some cases, the drilling fluid may be forced to the surface resulting in an inadvertent return. Reasons for seepage may include, for example, voids and fractures or very soft deposits—which is why this situation is sometimes called a “frac-out.” Signs of seepage are surface indicators (plumes if occurring in water) or loss of circulation of the drilling fluid.

There is a greater potential for drilling fluid seepage at the entry and exit locations of the crossing due to shallow depth and loose near-surface soils. The likelihood of inadvertent return decreases as the depth of the pipe increases. A required contingency plan would include measures for prevention and containment, response, and clean-up and correction. For this project, launch and exit locations are on dry land where drilling fluid seepage can be easily detected and contained.

Photo 8. Example of tunneling equipment.

Open Trench Construction

At both ends of the HDD-installed pipe, the force main would be extended to connect to the existing sewer system by open trench construction. To accommodate the new sewer pipe, trenches are expected to be 10 to 12 feet wide and approximately 15 feet deep. This common method involves removing surface material, excavating a trench to the design width and depth, installing the pipe, then backfilling the trench with graded material and compacted. To provide long-term support for the new sewer main and minimize the impact of future settlement, construction techniques would be employed to stabilize the soil.

Temporary cover may be installed as work progresses. When work is completed, the area would be restored with permanent pavement or landscaping.

Dewatering

The presence of a high water table would require dewatering to provide a reasonably dry construction area. Some form of temporary structure would be necessary to provide containment; for example, trench boxes or sheetpile walls will be used to stabilize the trench walls. Interlocking sheet piles may be required to limit groundwater intrusion through the trench side walls. Exterior well points may be used to reduce the groundwater level to less than the depth of the trench. Pumps would then extract water from the work area, treated, and properly disposed of on-site or off-site. The dewatering plan would be submitted for regulatory review and approval.

Construction Equipment

Construction equipment anticipated to be used include the following:

- Drill rig
- Excavators
- Bulldozers
- Front end loaders
- Pile drivers

- Cranes
- Dump trucks
- Pavement saw cutters
- Slurry separation plant (including shakers, screens, cyclones)
- Dewatering pumps and hoses
- Generators

Additional equipment would be used as necessary. The majority of the construction materials would likely come from areas near Honolulu or shipped to the city through Honolulu Harbor.

2.2.1.2 Access to the Construction Area

- **Launch Site (east).** Access to the launch site would be via Sand Island Access Road and Hoonee Place. There is a private driveway to the launch site off Hoonee Place.
- **Receiving Site (west).** Access to the receiving site within Keehi Lagoon Park would be via the main park entrance off Lagoon Drive and through the internal park driveway.

2.2.1.3 Safety and Security

The potential for criminal activity—from graffiti and defacement to theft—was a concern mentioned by property owners and neighbors during the early consultation process. Safety and security of jobsite personnel, equipment, and building materials would be addressed through project planning and security protocols. Vandal-resistant fencing, locks, and gates would be installed as appropriate. During HDD operations, 24-hour hour security guards are expected to be deployed. The Contractor would work with property owners to mitigate risk and reduce the exposure of existing assets.

2.2.2 Properties Affected by the Project

Sewer Easements. CCH is in the process of acquiring right-of-entry for construction and a permanent 25-foot wide utility easement for future access to and maintenance of the sewer force main. Table 2-1 lists the temporary and permanent effects on nearby properties. TMKs are identified in Figure 2-3.

TABLE 2-1
Properties Affected

TMK	Landowner	Land Use	Project Requirement
1-1-003: 004	State of Hawaii	Keehi Memorial Park	Utility easement
1-1-003: 204	State of Hawaii	Kahauiki Village	Utility easement
1-1-003: 205	State of Hawaii	Kahauiki Village	Utility easement
1-1-003: 206	State of Hawaii	Kahauiki Village	Utility easement
1-1-003: 207	State of Hawaii	Kahauiki Village Future AM Radio Tower	Utility easement
1-1-003: 212	State of Hawaii	Kahauiki Village Future AM Radio Tower	Utility easement
1-1-003: 239	CCH, Department of Parks and Recreation HART	Keehi Lagoon Beach Park Rail Transit Easement	Construction staging Utility easement
1-1-003 Right-of-Way	Hawaii Department of Transportation	Nimitz Highway Right-of-Way	Construction staging
1-2-021: 015	Weinberg Foundation	Light industrial	Construction staging Utility easement
1-2-021: 035	State of Hawaii	Light Industrial	Construction staging Utility easement

TABLE 2-1
Properties Affected

TMK	Landowner	Land Use	Project Requirement
1-2-021: 036	State of Hawaii Lessee: JSR Equipment	Light Industrial	Construction staging Utility easement
1-2-021: 037	State of Hawaii Lessee: Weinberg Foundation	Light Industrial	Construction staging Utility easement

Affected property owners and lessees have been notified about the project and consulted to identify potential short- and long-term impacts. In the case of the proposed launch site (TMK 1-2-021:036), CCH is prepared to assist DLNR and lessee JSR Equipment in identifying a temporary location to accommodate uses that would be displaced during the construction period. Coordination with all affected property owners is ongoing.

2.3 Preliminary Cost and Schedule

The current construction cost estimate is $14 million. It is anticipated that construction would start in the fourth quarter of 2018 and last approximately 1 year. The contractor procurement process would begin after final design is completed and necessary entitlements are obtained.

2.4 Alternatives Considered and Dismissed

2.4.1 No Action Alternative

The No Action Alternative would maintain sewage flow through the existing active force main with no capital improvement. Under the No Action Alternative, environmental impacts resulting from construction activities would be averted and improvement costs would not be incurred by CCH. This alternative would violate the mandate of the Consent Decree to provide a backup facility for flow diversion. The No Action Alternative was eliminated from further consideration because it does not meet the purpose of and need for the project.

2.4.2 Rehabilitation

An alternative considered by CCH was to rehabilitate the abandoned 36-inch sewer force main that runs parallel with the active 42-inch sewer force main and crosses Moanalua and Kalihi Streams on respective utility bridges. Field investigations were conducted to evaluate the current condition of the force main. An internal condition assessment was conducted using a closed circuit television (CCTV) camera. The limited portions of the force main above-grade that are encased in concrete bridges were also visually inspected.

This alternative was referred to as the Segmented Rehabilitation alternative because it was comprised of multiple rehabilitation approaches for various segments along the length of the force main.

- **Cured-In-Place Pipe (CIPP) in Buried Segment.** CIPP was the approach proposed for the western portion of the force main where it is direct buried and supported on piles. This portion of the force main extends from near the Kamehameha Pump Station to the western end of the Moanalua Pipe Bridge, and was intended to mitigate the effects of potential external corrosion of the existing force main, a condition exacerbated by highly corrosive soils.
- **CIPP in Bridges Segment.** CIPP was the approach recommended by an earlier engineering report, and would involve lining the two bridge segments because of their internal deterioration. In addition to the CIPP rehabilitation, the bridges would also need to be structurally rehabilitated.
- **Slip-Lining of Segment between Bridges.** CCTV investigation found a 450-foot portion of the segment between the two bridges to have too much water to get a camera through, despite attempts to dewater. Because this segment could not be inspected, it was assumed that one or more holes in the

pipe had allowed water to intrude in an area known to have high groundwater conditions. CIPP needs dry conditions to be effective; therefore, slip-lining was proposed as the rehabilitation alternative for this segment.

Due to the existing condition of the 36-inch force main as previously described, and the need to also reconstruct the existing pipe bridges, rehabilitation was eliminated from further consideration.

2.5 Other Nearby State and County Projects

Several projects are planned in the vicinity of the force main project in the next several years, including projects that are currently under construction and those with construction schedules that are expected to overlap with the force main project.

2.5.1 Kamehameha Highway Wastewater Pump Station Upgrade

The ENV is managing a project to upgrade the pump station by replacing existing equipment with four new pump and motor units, making structural repairs, and implementing other modernization measures. Construction will occur within the pump station property boundary. No off-site improvements are anticipated; however, a temporary construction staging area will be needed and may be located off site. While the pumps are offline, a temporary bypass pipe and pumping equipment will be needed to maintain sewage flow.

Coordination Issues

Construction of this project is expected to begin in September 2017 and is expected to take approximately 24 months. Upgrades to the WWPS are expected to be underway when construction of the new sewer force main project begins. The overlapping wastewater projects would lengthen the period when activities in the northern section of the park may be impeded. Sequencing of the two projects would be coordinated to avoid disruption in wastewater system operation and to minimize park impacts.

2.5.2 Keehi Lagoon Beach Park 6-inch Sewer Line Replacement

This project proposes to replace a 6-inch sewer line within Keehi Lagoon Beach Park that connects to a manhole for the 42-inch gravity sewer main on the Ewa side of the WWPS. The 6-inch sewer line is affected by water intrusion and in violation of environmental regulations. Under this project approximately 250 feet of sewer line would be replaced by open trench construction. This project is being designed and managed by ENV on behalf of DPR. Design is scheduled to be completed by the end of 2017, followed by construction in 2018.

Coordination Issues

The 6-inch sewer line project area is located to the west of the force main project and would be connected to the existing 42-inch gravity main. The construction areas for the two projects are separate and do not overlap. Construction funding and management are also separate.

2.5.3 Honolulu Rail Transit Project

The Honolulu Rail Transit Project (HRTP) is constructing a 20-mile elevated guideway system from East Kapolei to Ala Moana with 21 stations. This project is being undertaken by the Honolulu Authority for Rapid Transportation, a semiautonomous CCH agency with participation by the Federal Transit Administration. The guideway structure will traverse a portion of Keehi Lagoon Beach near its *mauka* property line, and generally following the alignment of the park's access road (Figure 2-8). The guideway is a structure approximately 30 feet wide and between 20 to 30 feet high. The segment within the park will be constructed on 10 columns that are approximately 6 feet in diameter.

The contractor is currently mobilizing and conducting pre-design explorations. Construction of the Keehi Lagoon Beach Park section is projected to continue through 2021.

According to the project's Final Environmental Impact Statement, Keehi Lagoon Beach Park is identified as a 4(f) resource under the U.S. DOT Act. As a public park, use for non-recreational purposes is restricted.

Consequently, construction staging within the park can occur only to support rail construction within the park (FTA 2010).

Coordination Issues

The force main project and the rail project have overlapping construction areas in the northeast section of Keehi Lagoon Beach Park. Construction schedules are likely to coincide to some degree. The two projects have initiated coordination efforts, beginning with the exchange of information and discussion of design constraints where the force main would need to cross the rail easement. Coordination will continue as both projects advance.

2.5.4 Kahauiki Village

Kahauiki Village is a public-private partnership to develop a community of approximately 150 one- and two-bedroom modular homes on 11.3 acres of land located between Moanalua Stream and Kalihi Stream. It is planned to provide long-term permanent and affordable housing for approximately 150 Oahu families who are currently homeless. When completed, Kahauiki Village is expected to house over 600 adults and children. The State of Hawaii, which owns the property, transferred the land to CCH which in turn leased it to the nonprofit AIO Foundation which is spearheading development.

The project is supported by a Governor's emergency proclamation (first issued in Oct 16, 2015 and subsequently extended) that suspends various laws to expedite and facilitate development.

Site preparation and the installation of utilities is currently underway. The first phase will include 25 residential units that are expected to be occupied by the end of 2017. In addition to residences, the master plan includes an administration and services building, daycare/pre-school facility, community gardens, and other landscaped areas (Figure 2-9).

Coordination Issues

A 25-foot utility easement would be established for the new 36-inch force main. Although the force main would pass under the Kahauiki Village peninsula, the utility easement is a three-dimensional construct that extends from below ground into air space and, therefore, would affect land use on the ground. Utility easements typically exclude the construction of permanent structures. Based on the preliminary force main alignment, the utility easement would avoid Phase 1 which is under construction. Initial indications are that the easement would mostly affect roadways and parking lots. Modifications to the Kahauiki Village site plan may be needed to shift the location of some facilities outside the easement. Coordination with the Kahauiki Village development team is ongoing.

2.5.5 AM Radio Antenna Tower

This project would construct a radio antenna tower for Honolulu AM radio stations, KHKA (1,500 kilohertz [KHz]) and KLHT (1,040 KHz). The tower would provide a permanent replacement for an existing tower that is currently located in the Keehi Interchange and conflicts with construction of the elevated guideway for the rail project. A new tower is planned on the peninsula west of Kalihi Stream and is integrated with the master plan for Kahauiki Village (Figure 2-9). The new tower would be a 150-foot guyed, lattice tower within a fenced space that measures approximately 300 feet in diameter. The tower compound would include a small accessory building to house transmitting equipment and a network of grounding wires buried approximately 3 feet below the surface. Construction of the radio tower is scheduled to begin in September 2018 and completed by the end of the year.

Coordination Issues

The underground force main would not affect the new radio tower. The proposed utility easement runs *makai* of the new radio tower and would not affect the tower's planned location.

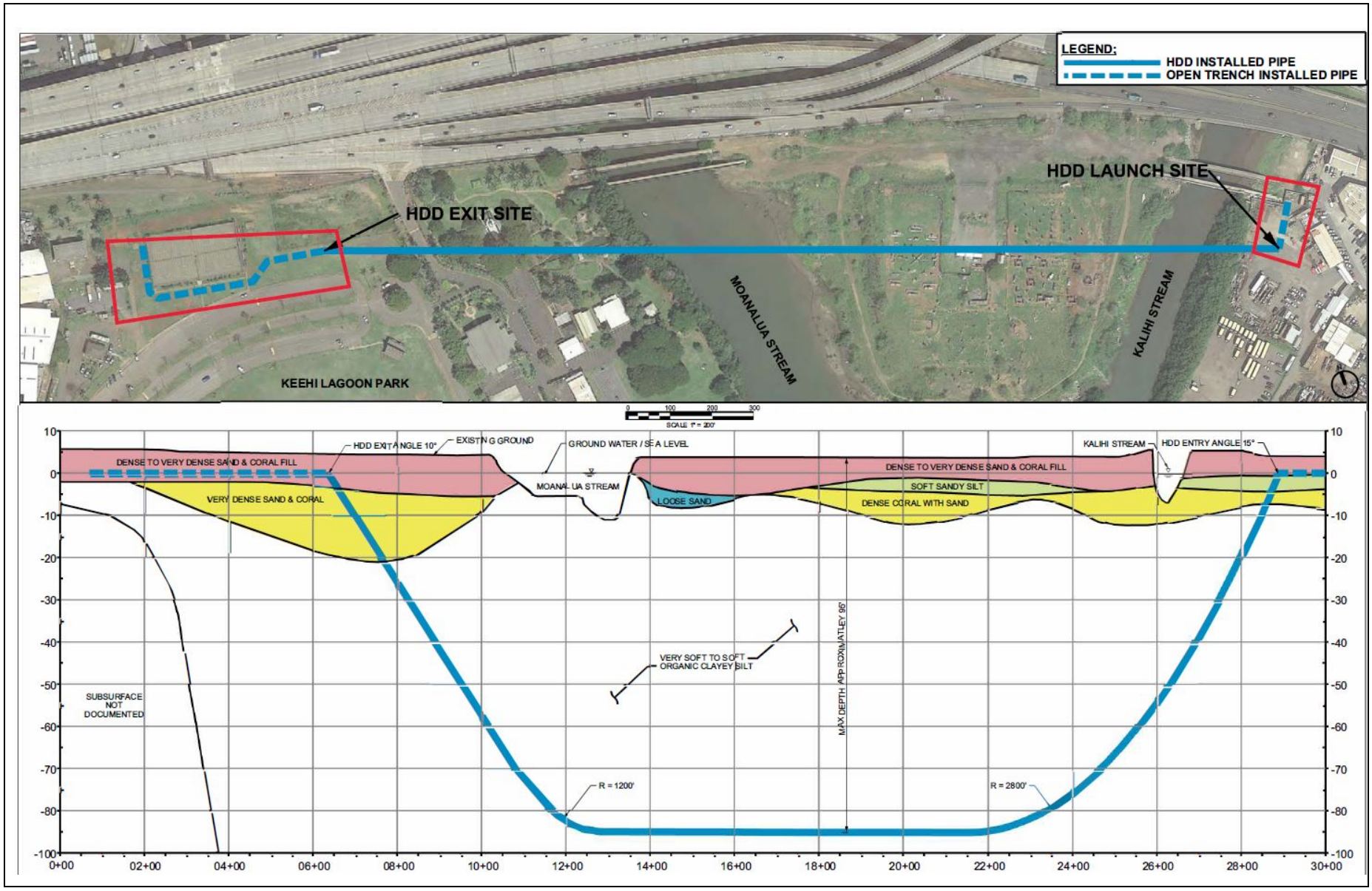
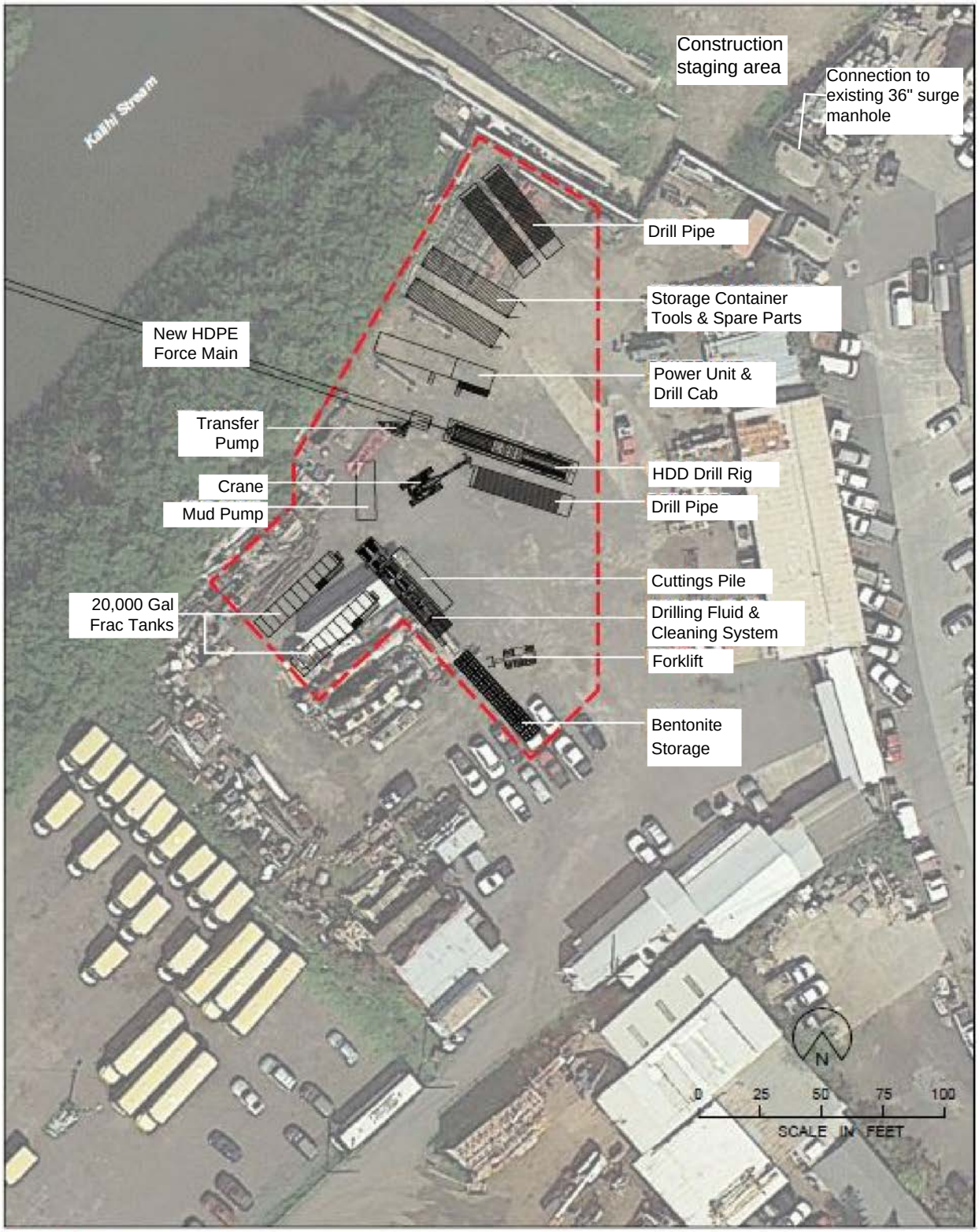


FIGURE 2-1

HDD Preliminary Plan and Profile

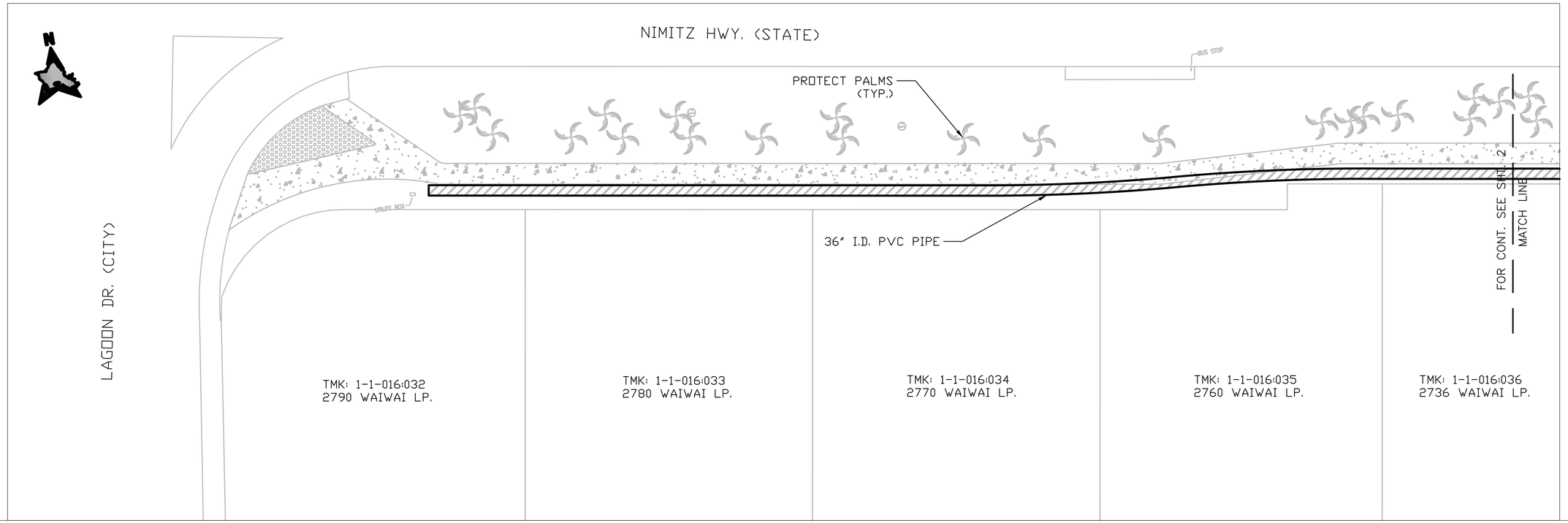
Kamehameha Highway Wastewater Pump Station Force Main System Improvements



Area Boundary

Note: Locations are approximate.

FIGURE 2-2
PRELIMINARY LAYOUT--LAUNCH AREA
Kamehameha Highway Wastewater Pump Station Force Main System Improvements
Oahu, Hawaii



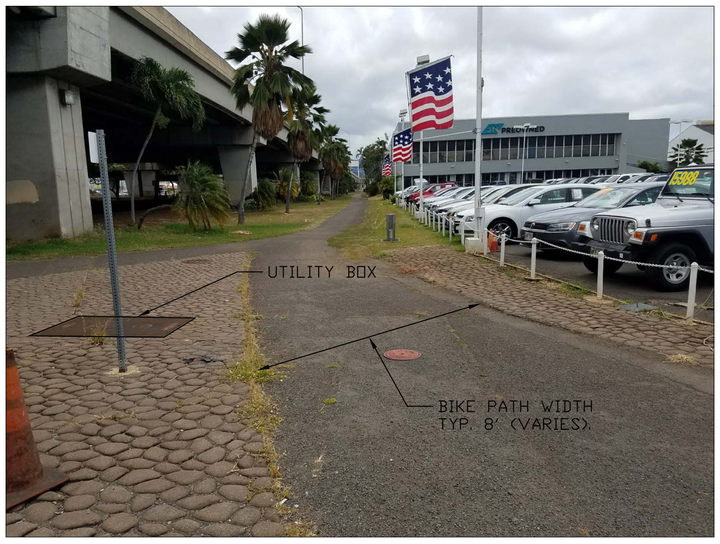


FIGURE 2-3

Temporary Pipe Laydown Plan (Sheet 1 of 4)

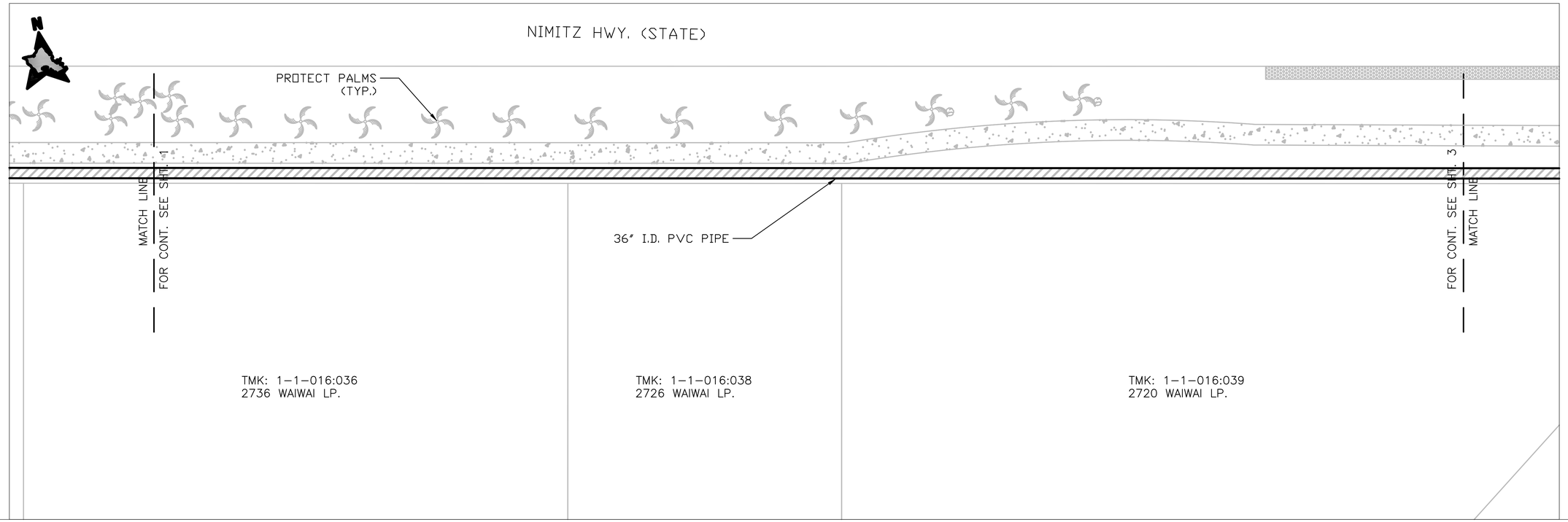
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

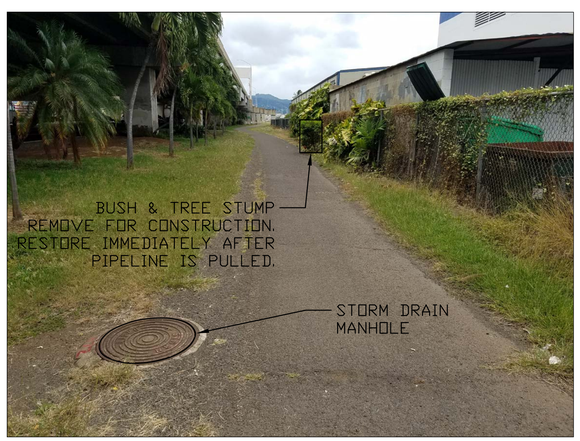
NIMITZ HWY. PIPE LAYDOWN

VIEW FACING EAST

NOTES:

1. DRAWING NOT SHOWN TO SCALE. DO NOT USE FOR CONSTRUCTION.
2. LOCATION OF UTILITIES NOT SHOWN ON PLAN. REFER TO DIGITAL IMAGING FOR LOCATIONS.





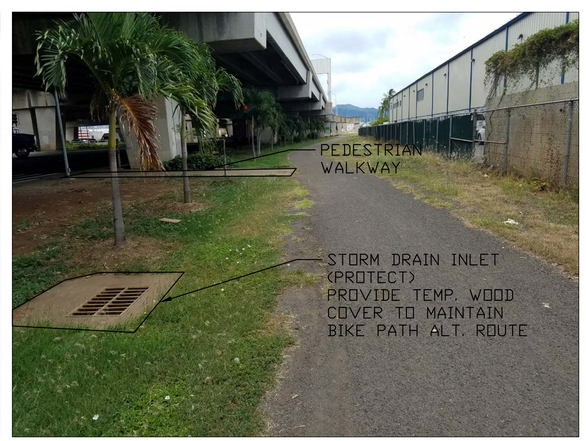
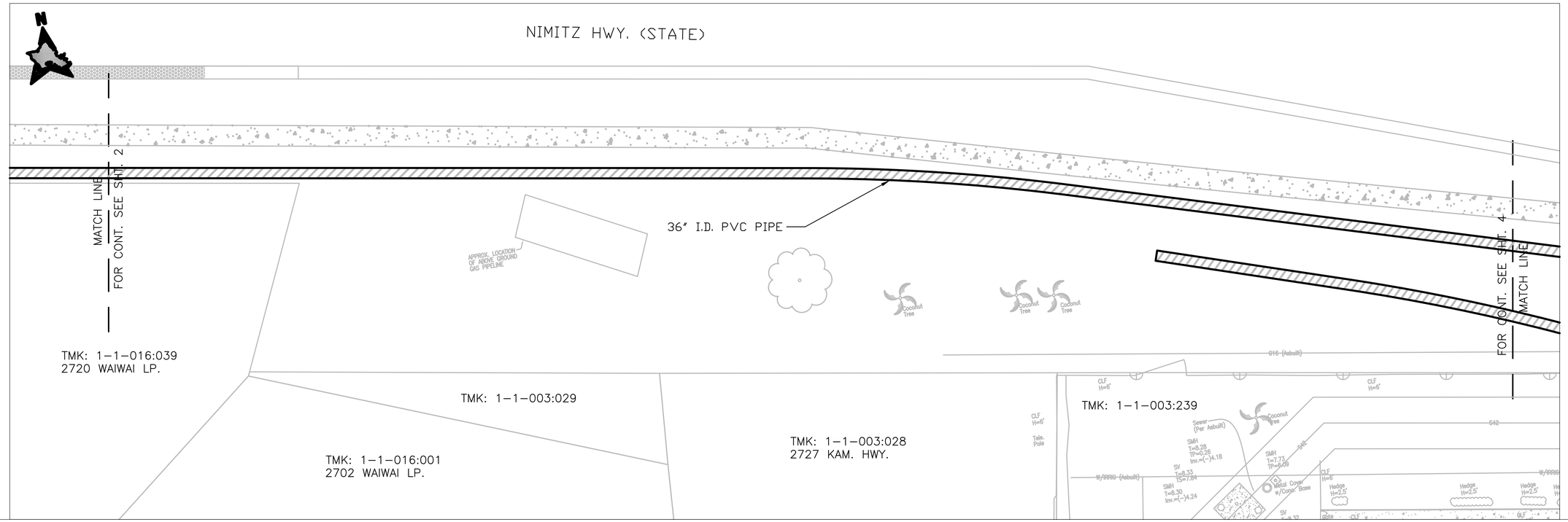


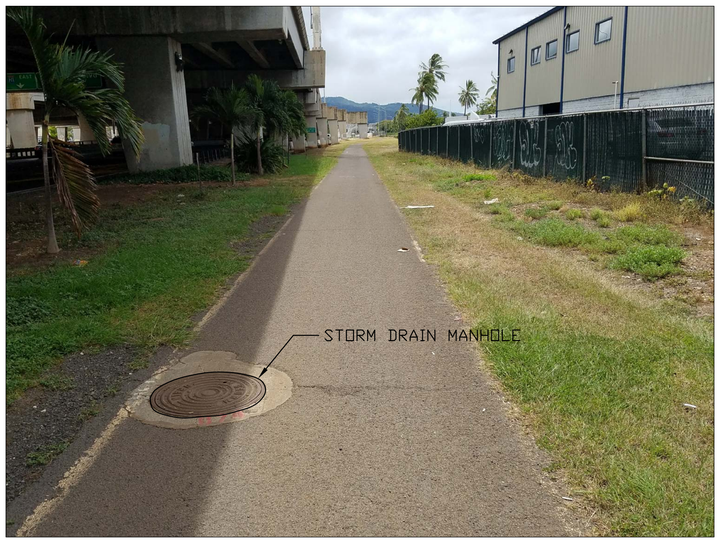
FIGURE 2-4
Temporary Pipe Laydown Plan (Sheet 2 of 4)
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

NIMITZ HWY. PIPE LAYDOWN

VIEW FACING EAST

NOTES:
1. DRAWING NOT SHOWN TO SCALE. DO NOT USE FOR CONSTRUCTION.
2. LOCATION OF UTILITIES NOT SHOWN ON PLAN. REFER TO DIGITAL IMAGING FOR LOCATIONS.





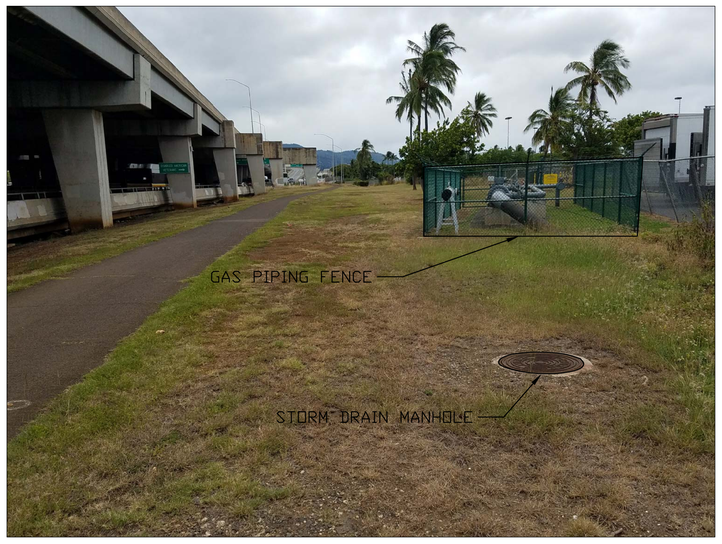


FIGURE 2-5
Temporary Pipe Laydown Plan (Sheet 3 of 4)
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

NIMITZ HWY. PIPE LAYDOWN

VIEW FACING EAST

NOTES:

1. DRAWING NOT SHOWN TO SCALE. DO NOT USE FOR CONSTRUCTION.
2. LOCATION OF UTILITIES NOT SHOWN ON PLAN. REFER TO DIGITAL IMAGING FOR LOCATIONS.

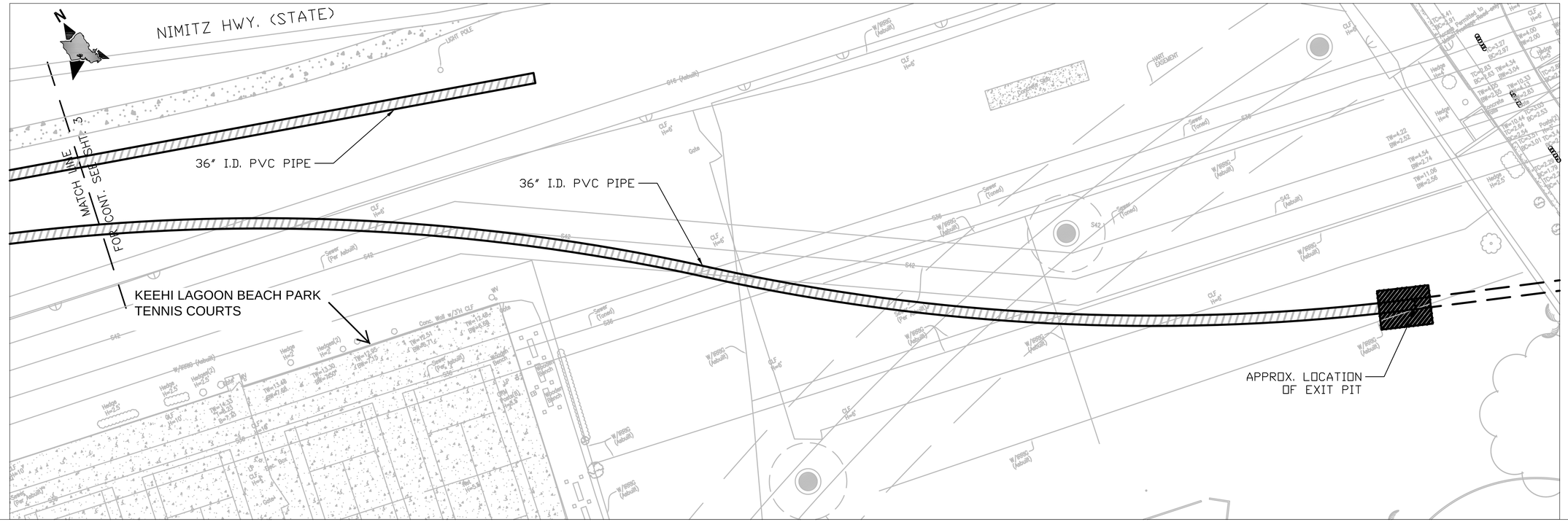


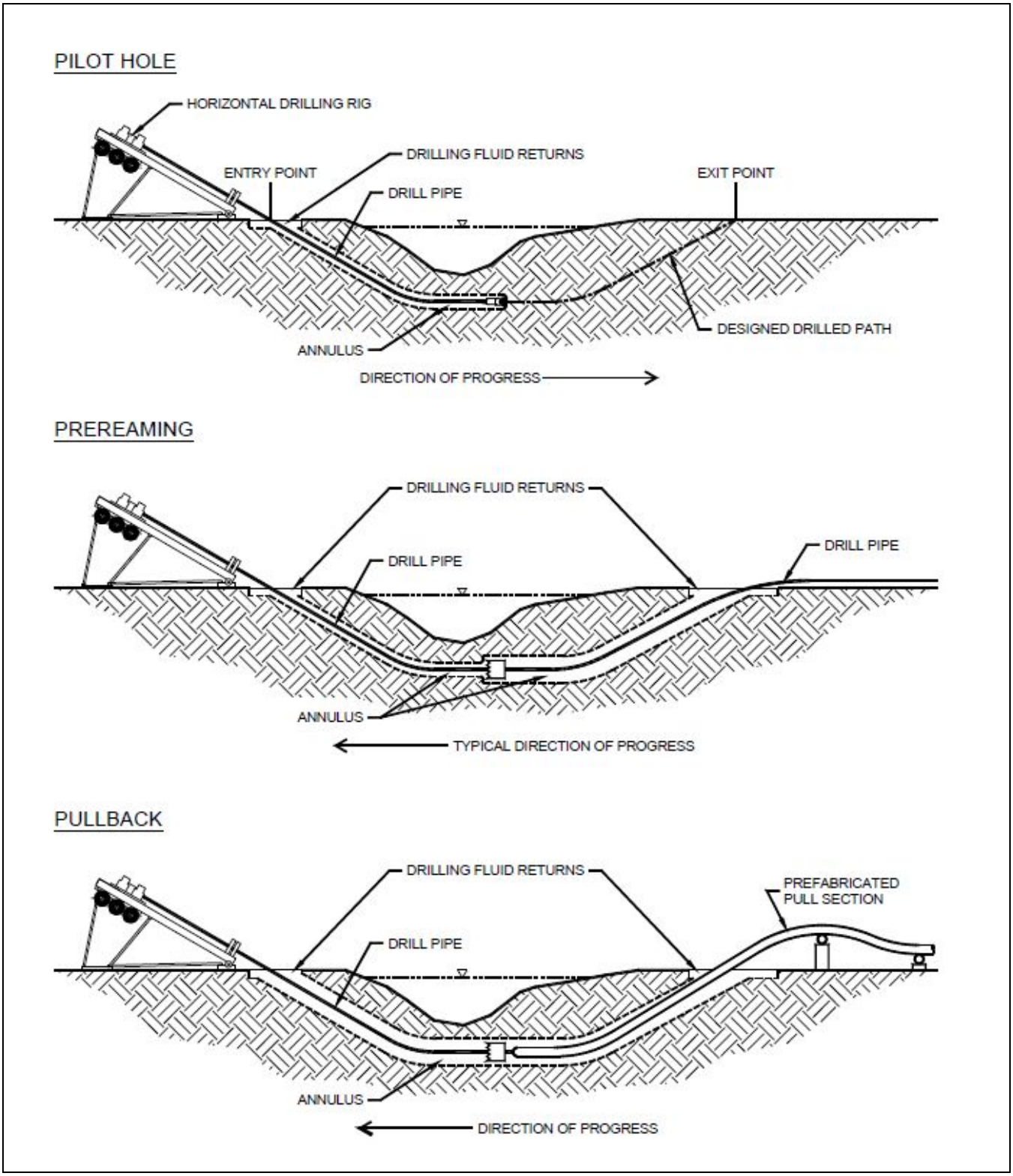
FIGURE 2-6
Temporary Pipe Laydown Plan (Sheet 4 of 4)
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

NIMITZ HWY. PIPE LAYDOWN

VIEW FACING EAST

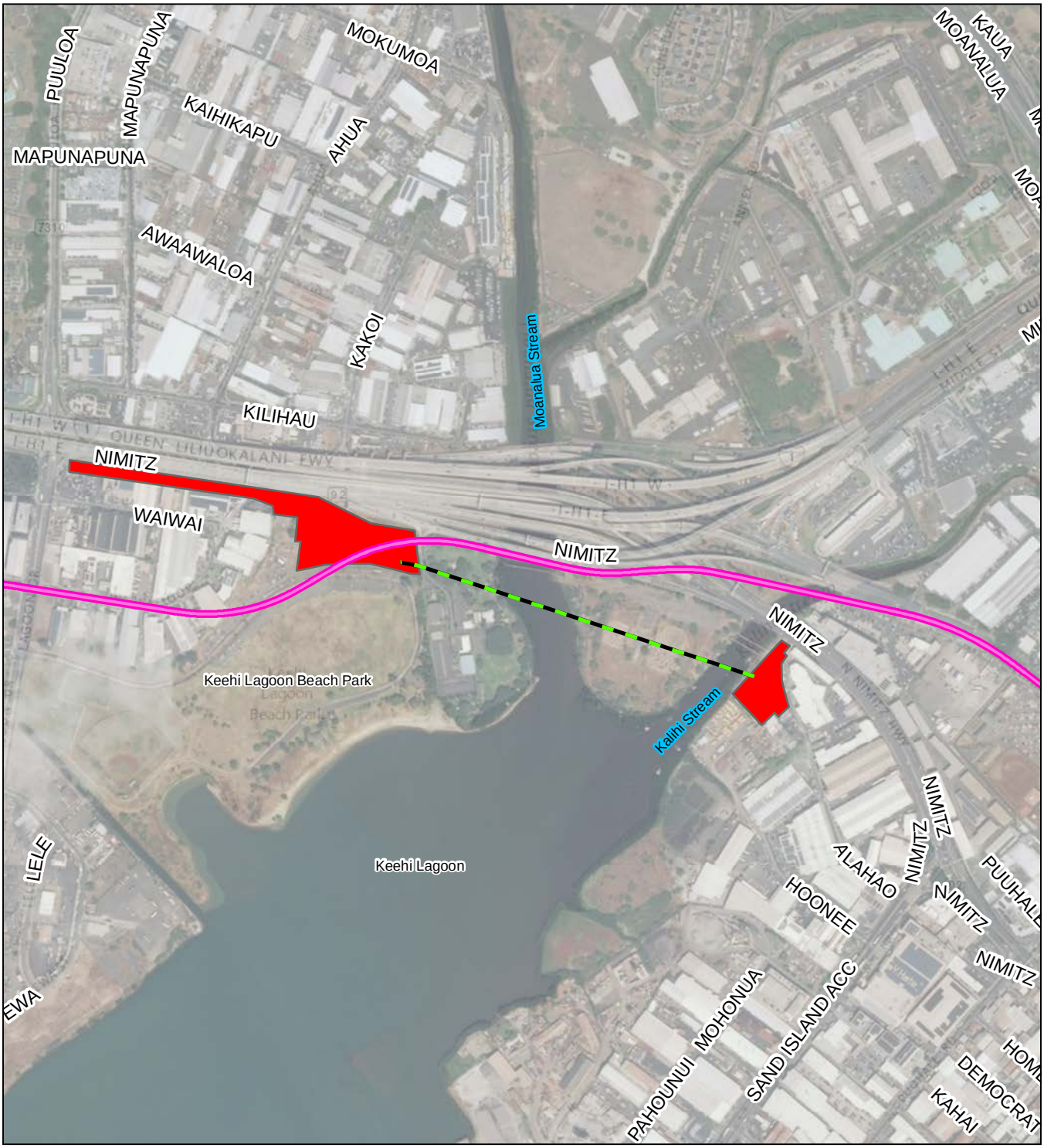
NOTES:

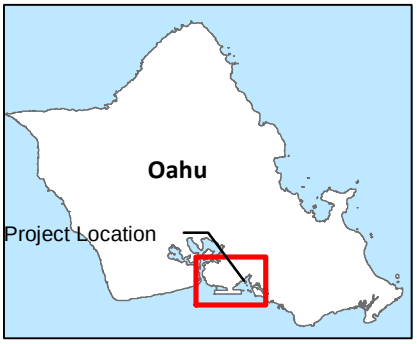
1. DRAWING NOT SHOWN TO SCALE. DO NOT USE FOR CONSTRUCTION.
2. LOCATION OF OBSTRUCTIONS NOT SHOWN ON PLAN. REFER TO DIGITAL IMAGING FOR LOCATIONS.



SOURCE: U.S. Fish and Wildlife Service, *NiSource Multi-Species Habitat Conservation Plan*, Appendix J, June 2013

FIGURE 2-7
HDD Process Diagram
Kamehameha Highway Wastewate Pump Station Force Main System Improvements





LEGEND

- Horizontal Directional Drilling
- Project Area
- HART Guideway

N

0 500 1,000

Approximate Scale in Feet

FIGURE 2-8

Honolulu Rail Transit Project

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

SOURCE: www.kahauiki.org
Accessed April 25, 2017

FIGURE 2-9
Kahauiki Village and Radio Antenna
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

CHAPTER 3

Affected Environment, Impacts, and Mitigation

This section describes the affected environment, impacts, and mitigation for relevant resources areas.

3.1 Topography, Geology, and Soils

3.1.1 Existing Conditions

The new sewer force main project is located in the coastal area surrounding Keehi Lagoon, a shallow estuary of Mamala Bay in the southern portion of Oahu. Land within and adjacent to the project alignment is characterized by level terrain.

The Natural Resources Conservation Service (NRCS) identified two soil types in the project area as shown in Figure 3-1 (U.S. Department of Agriculture, NRCS 2001):

- **Fill land, mixed (FL), 0 to 3 percent slopes.** Fill land consists of well-drained soils with slopes of 0 to 3 percent. It is characterized by mixed or similar soil types. Elevation ranges from 0 to 400 feet. The soils are considered well-drained with slow runoff and low to moderate permeability.
- **Ewa silty clay (EmA), 0 to 2 percent slopes.** The Ewa series consists of well-drained soils that formed in alluvium weathered from basaltic rock. Ewa soils are on alluvial fans and terraces and have slopes of 0 to 2 percent. Elevations range from sea level to 150 feet above mean sea level. The soils are considered well drained with slow to medium runoff and moderate permeability.

As part of the project's field exploration, 5 test borings were completed in 2017. The investigation included soil borings to depths ranging from 90 to 120 feet below ground surface (bgs) along the force main alignment. Based on the soil borings, subsurface conditions consist of materials deposited and eroded in a complex and difficult-to-predict series of layers that vary highly in engineering properties and horizontal and vertical limits. A simplified representation of the subsurface conditions consists of three general materials:

- **Shallow Granular.** A near-surface layer of fill and deltaic deposits that consists primarily of loose to medium dense sand and gravel with minor amounts of silt and clay. This layer appears to vary from about 2 to 30 feet deep over the entire pipeline route, but is only about 2 to 5 feet deep in the open-cut segments of the proposed pipeline
- **Deep Granular.** Coralline detritus, fractured and open-work limestone, and welded cinders characterized primarily as well- to poorly-graded sand and gravel with minor amounts of fines and very loose to loose, extending to depths in excess of 100 feet.
- **Cohesive.** Lagoon and slow-water alluvial deposits ranging from fat clay to silt, which are typically very soft to soft.

Section 3.3.1 presents additional discussion of groundwater.

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.

Because of the subsurface soils encountered, temporary trench support and dewatering will be required in the open-trench portions. A trenchless pipeline installation constructed by HDD is proposed for crossing the two streams. The trenchless crossing places the pipe out of the path of potential impact by water-carried objects, below the depth of potential scour, and avoids potential long-term settlement and construction impacts of a pile-supported profile.

Construction of the force main would involve short-term land disturbance that may result in waterborne and airborne soil erosion. The erosion potential is relatively low given the small area of disturbance. To minimize the potential for construction-related erosion impacts, best management practices (BMPs) will be developed and implemented in accordance with Honolulu County Code for erosion and sedimentation control (CCH, 2015a) and the CCH *Storm Water Best Management Practice Manual* (2011). Other mitigation measures will be specified as part of applicable NPDES permits obtained from HDOH. Section 3.2, Climate and Air Quality, and Section 3.3, Hydrology and Water Quality, include lists of applicable BMPs.

3.2 Climate and Air Quality

3.2.1 Existing Conditions

Oahu's climate 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. The average maximum daily temperature is approximately 80 degrees Fahrenheit (°F), with an average minimum of 66°F. Mean annual rainfall at the Honolulu International Airport for the period 1971-2000 was approximately 18 inches. According to National Weather Service data available on the National Oceanic and Atmospheric Administration (NOAA) website, rainfall is typically highest in October through February and lowest from May through September.

HDOH operates a network of air quality monitoring stations at locations around the state. Stations typically do not monitor the full complement of air quality parameters. As reported in the Annual Summary of Air Quality Data for 2015 (HDOH, 2016), the state is in attainment of all federal and State air quality standards.

There are four air monitoring stations on the Island of Oahu with the closest air monitoring station located approximately 5 miles southeast of the project site in Sand Island. the pollutants monitored at the Sand Island station were ozone (O_3) and particulate matter less than 2.5 microns ($PM_{2.5}$). The readings at this location show that criteria pollutant levels were below Federal ambient air quality standards (Table 3-1).

TABLE 3-1
Oahu Air Monitoring Station (Sand Island) Data for 2015

Pollutant	Annual Mean (All Hours)	Federal Air Quality Standard (Primary)
0_3 (8-hour)	0.028 ppm	0.075 ppm
$PM_{2.5}$ (24-hour)	5.4 µg/m^3	35 µg/m^3

Source: State of Hawaii Annual Summary 2015 Air Quality Data (HDOH, 2016)

Notes:

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

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 the following three types of pollutants: (1) fugitive dust emissions from vehicular movement and soil excavation, (2) exhaust emissions from onsite construction equipment, and (3) sewage odor. Overall, air quality impacts are expected to be insignificant because the construction period is of limited duration and impacts would be minimized with the implementation of BMPs for dust control and exhaust emissions.

Fugitive Dust. Construction activities will employ fugitive dust emission control measures in compliance with provisions of the HDOH Rules and Regulations (Chapter 43, Section 10), and HAR Chapter 11-60.1, "Air

Pollution Control," Section 11-60.1-33, on Fugitive Dust. Measures that are expected to be used to control airborne emissions include the following:

- Cover stockpiles with appropriate material and proper disposal of debris
- Water active work areas, as necessary
- Keep clean adjacent paved roads
- Cover open-bodied trucks whenever hauling material that can be blown away
- Limit the amount of disturbed areas at any given time, stabilize inactive areas that have been exposed, or both

Exhaust Emissions. Emissions from engine exhausts of onsite mobile and stationary construction equipment could also affect air quality. Emission impacts will be minimized by requiring the Contractor to use vehicles that are properly maintained. Nitrogen oxide emissions from diesel engines can be relatively high compared to emissions from gasoline-powered equipment; however, the standard for nitrogen oxide is set on an annual basis and is unlikely to be violated by emissions from short-term construction equipment. Carbon monoxide emissions from diesel engines are low and would be relatively negligible compared to vehicular emissions on nearby roadways.

Sewage Odors. Organic compounds in sewage containing sulfur or nitrogen can emit a foul odor when released to the atmosphere. Odors can be detected even at low concentrations and can vary in intensity depending on temperature, wind velocity, and wind direction. Under normal operating conditions, sewage odors are contained within the pumping and piping system, or routed through bypass pipes as needed during construction. Because the proposed project involves construction of a new sewer main, sewage odors are generally not expected. However, there may be brief and temporary periods of odor releases when the new main is connected to active components of the operating system.

3.2.2.2 Long-term Impacts on Air Quality

Over the long term, this facility would result in no changes in air quality impacts.

3.3 Hydrology and Water Quality

3.3.1 Surface Water and Groundwater

Moanalua Stream provides drainage for the 6,778-acre Moanalua watershed, which extends from the Koolau Mountain Range through major urban and light industrial areas of Mapunapuna to Keehi Lagoon. The stream is joined by Manaiki Stream upstream of the H-1 Freeway within Moanalua Gardens. The substrate of the stream is composed of sedimentary material. The U.S. Geological Survey (USGS) has two gages for Moanalua Stream. The closest gage (No. 16228200) is relatively distant from the project site at an elevation of 230 feet and only encompasses flow from about one-third of the watershed area. A maximum peak flow at the gage over the 9 years of record (1969-1978) was about 4,800 cubic feet per second (cfs), with half of the annual peak flows above 1,000 cfs. The average annual daily flow varied from 0.6 to 14.7 cfs, with a mean flow of 5.0 cfs.

Kalihi Stream is an 11.2-mile-long perennial stream that drains a 6.2-square-mile watershed and discharges into Keehi Lagoon. USGS maintains several gauges along Kalihi Stream, the lowest of which is at an elevation of 464 feet. Flow measurements taken between 1987 and 2012 show a maximum peak flow of about 4,000 cfs, with four other annual peak flow readings above 2,000 cfs. The annual mean flow from 2005 to 2012 varied from about 2.9 to 9.5 cfs.

Groundwater in the project area was encountered in the geotechnical borings at depths ranging from approximately 2 to 8 feet below the ground surface. Instruments and observations from the Honolulu Rail Transit Project borings near the proposed pipeline indicate artesian (that is, confined and under pressure head up to about 4 feet above the ground surface elevation) conditions in some locations. The depth at which the groundwater pressure becomes artesian appears to vary significantly with horizontal location, but artesian conditions are not anticipated to exist in the Shallow Granular materials or within the relatively

shallow depths of the Deep Granular materials penetrated by the open trench constructed portions of the pipeline. The depth to groundwater can be expected to vary with seasonal rainfall and tidal influence.

The State of Hawaii has established an underground injection control (UIC) program to protect the quality of the state's underground sources of drinking water from pollution by subsurface disposal of fluids. HAR 11-23 specifies conditions that govern the location, construction, and operation of injection wells that may be used, among other things, for disposal of groundwater during dewatering operations. A consideration in evaluating the acceptability of an injection well location is the UIC line which separates exempted aquifers and underground sources of drinking water. Lands that are *makai* of the UIC line are exempted aquifers and generally not used to supply drinking water. As shown in Figure 3-2, the project area is located *makai* of the UIC line.

3.3.2 Waters of the United States

The National Wetlands Inventory identifies two linear features in the project area consisting of Moanalua Stream and Kalihi Stream and the estuarine/marine wetlands lining the respective stream channels (Figure 3-3).

Biologists with AECOS, Inc. (AECOS) conducted a field survey in and adjacent to the project area at Keehi Lagoon Beach Park on May 19, 2017 (see Appendix A). A wetland area was identified in the northeastern corner of the park along a portion of the boundary with Keehi Memorial Park (Figure 3-4).

The biologists used methods for determining the presence of wetlands as prescribed by the USACE 1987 Manual and the 2012 Hawaii and Pacific Island Regional Supplement (USACE, 1987 and 2012). Based on these documents, jurisdictional wetlands are identified using the following three criteria. The wetland determination data forms prepared during the survey are included in Appendix A.

- Hydric soils—soils that are permanently or seasonally saturated by water
- Hydrophytic vegetation—plants adapted to life in water or waterlogged conditions
- Wetland hydrology—areas that are periodically inundated or have soils saturated to the surface at some time during the growing season

3.3.3 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 an anti-degradation policy; designated uses of waters, which must be maintained; water quality criteria, which must be met during construction and operation; and permitting requirements.

The federal Clean Water Act (CWA) requires states to collect and review surface water quality data and related information, and to prepare and submit to the U.S. Environmental Protection Agency (USEPA) biennial lists of waterbodies that are impaired (that is, not meeting state water quality standards). The current list is included in the *2014 State of Hawaii Water Quality Monitoring and Assessment Report* (HDOH, 2014a).

Moanalua Stream and Kalihi Stream are mapped as Inland Class 2 waters on the Water Quality Standards Map of the Island of Oahu (HDOH, 2014b). 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 supplies, shipping, and navigational use (HDOH, 2014a).

The CWA requires all states to submit lists of impaired and threatened waters every 2 years for approval by the USEPA. The states identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. According to the 2014 *State of Hawaii Water Quality Monitoring and Assessment Report* (HDOH, 2014b), Moanalua Stream and Kalihi Stream are listed as impaired waterways. Data for Moanalua Stream indicate non-attainment for total nitrogen in wet and dry seasons, and turbidity in the dry season. For the entire Kalihi Stream network, water quality assessments found non-attainment for nitrate and nitrite (NO_3+NO_2) and turbidity in the dry season, and total nitrogen and NO_3+NO_2 in the wet season. Trash in Kalihi Stream was noted as a pollutant in both seasons.

Waterbodies that do not attain State water quality standards are required to develop a water pollution reduction plan that establishes total maximum daily loads (TMDLs). Plans are not yet available for either stream. Moanalua Stream has been assigned a low priority for TMDL development; Kalihi Stream is a high priority.

3.3.4 Potential Impacts and Mitigation Measures

3.3.4.1 Short-term Construction Impacts

The project would involve grading, excavation, and construction. The proposed HDD receiving site and associated construction staging would be located on upland areas of the Keehi Lagoon Beach Park with no encroachment in the wetland.

Dewatering

The portions of the pipeline constructed in an open trench would require temporary excavation support and construction dewatering. Because of the relatively high hydraulic conductivity of the Deep Granular materials and lack of low permeability groundwater cutoff layers at depth, dewatering of roughly half of the open trench excavation would require pumping from temporary groundwater extraction wells. The discharge from well development would be treated to remove sediment prior to discharge. After well development and with proper design of the well screens and filters, the flow is anticipated to be relatively free from sediment and suspended solids, but would be routed through a Baker tank or other temporary holding facility to allow periodic sampling and testing prior to discharge.

Open trench construction through the Cohesive material would require temporary shoring and dewatering, but the dewatering flows are anticipated to be small and are likely to be collected by sumps. This water is likely to be turbid, but would be treated and tested for compliance with applicable discharge permit requirements.

HDD construction requires use of a bentonite drilling slurry to maintain an open hole until the pipe is pulled through. The slurry would be contained in pits and tanks located well back from surface waters and the work area would be surrounded by barriers dictated by BMPs to prevent release of drilling fluid and sediment-laden runoff. Drilling slurry will be disposed in an approved offsite facility.

Erosion Control

Short-term land disturbance may result in waterborne and airborne soil erosion, but the erosion potential is relatively low given the small area of disturbance. 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, 2015a) and the CCH *Storm Water Best Management Practice Manual* (2011).

If the total construction area disturbance exceeds 1 acre, an NPDES permit will be obtained for discharge of storm water during construction. The project will also obtain NPDES coverage for dewatering and hydrotesting, as required. An approved Storm Water Protection Prevention Plan will be prepared and held onsite in conjunction with any 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 spill response plan, maintain spill response equipment and supplies on site, and train construction personnel in spill response procedures

3.3.4.2 Long-term Impacts on Water Quality

No permanent fill would be placed within State waters. Materials placed under streams would not impact water quality.

In the long term, implementation of the flow diversion plan will have a beneficial impact on water quality by improving CCH's ability to accommodate incidents in the wastewater collection system that might otherwise lead to inadvertent spills and prevent untreated sewage from entering State waters.

3.4 Natural Hazards

3.4.1 Flooding

Flood hazard areas are shown in Figure 3-5 based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 15003C0353G (FEMA, 2011). The project area is located in Zone AE with known base flood elevations. Zone AE is a Special Flood Hazard Area that is subject to flooding by the 100-year flood. At the western end of the project alignment, where the HDD receiving site and WWPS are located, the base flood elevation is 9 feet. The base flood elevation is 10 feet on the eastern end of the project alignment, where the HDD launch site is located. FEMA-regulated floodways and floodplains must be kept free of encroachment and obstruction so that the 100-year flood can be carried without substantial increases in flood heights. Development in a Special Flood Hazard Area must comply with the rules and regulations of the National Flood Insurance Program (44 CFR) and local flood ordinances. CCH regulates development within flood hazard districts under Section 21-9.10, Revised Ordinances of Honolulu.

3.4.2 Seismic Activity

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

3.4.3 Tsunami Hazard

Tsunamis potentially destructive to the Hawaiian Islands may originate anywhere around the rim of the Pacific Ocean and may also be locally generated by earthquakes on or near the island. Approximately 50 tsunamis have been reported in the Hawaiian Islands since the early 1800s. The State of Hawaii Civil Defense established tsunami inundation zones and maps for all coastal areas in Hawaii. The force main project area is located within a tsunami evacuation zone (CCH, 2015b).

3.4.4 Sea Level Rise

The School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii is studying the potential threat of sea level rise on the islands. In a series of maps for coastal locations across the state, SOEST modeled the depth of inundation for a scenario in which sea level rises to an elevation that is four feet above the current mean higher high water elevation (Figure 3-6). On the western end of the project alignment, the shoreline area of Keehi Lagoon Beach Park and portions of Keehi Memorial Park would be inundated; however, the Kamehameha Highway WWPS and the valve vault for the new 36-inch force main appear to be outside, though adjacent to, the projected inundation area. On the eastern end of the project alignment, a large portion of the Kalihi Kai industrial area is projected to be under water.

3.4.5 Potential Impacts and Mitigation Measures

The new force main is located within the Zone AE FEMA floodplain. The design of the utilities is required to comply with the National Flood Insurance Program's regulations and requirements. As an underground facility, 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 CCH.

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.

The project area is located within the tsunami evacuation zone. In the event of a tsunami warning, all construction will stop and personnel will evacuate to a safe zone on higher *mauka* ground. By observing the tsunami warning and moving into a safe zone, the risk to workers in the project area would be minimized. The proposed project would not impact the geology of the region and therefore would not increase the tsunami risk to the surrounding area.

As an underground facility, the sewer force main is less vulnerable to the effects of sea level rise. Because the force main is a sealed system operating under pressure, it is neither subject to infiltration by groundwater, nor significantly impacted by projected increase in groundwater elevations because of sea level rise. Even under current conditions, the new pipe and the associated valves and connections are being designed for an environment characterized by a high groundwater table that is influenced by tidal fluctuations. An issue for additional consideration is the planning and design of electrical components that would be adversely affected in the future by perennial water intrusion.

3.5 Noise and Vibration

3.5.1 Existing Conditions

The adjacent road network is the primary generator of ambient noise at the project location. Existing noise sources include vehicles traveling along Nimitz Highway at ground level and on the overhead viaduct section of the H-1 Freeway. Keehi Lagoon Beach Park and Keehi Memorial Park are the closest noise-sensitive areas, although these land uses are non-residential. The closest residential receptors would be the units in Phase 1 of Kahauiki Village to be constructed before the force main project commences. The residential units would be outside a radius of 500 feet extending from the launch site; however, the Village's day care/preschool facility would be located within 500 feet of the launch site.

3.5.2 Potential Impacts and Mitigation Measures

3.5.2.1 Construction-related Noise

Construction noise impacts are unavoidable, but would be temporary. Noise levels produced during construction would be a function of the methods employed during each stage of construction. Equipment likely to be used include the following: drill rig, rig hydraulic power unit, mud rig, mud rig engine and generator, tractors, mud pump and cleaner, crane, excavator, pile driver, backhoe, front-end loader, grader, forklift, semi-trucks, dump trucks, concrete trucks, compactors, paving equipment, and compressors. The loudest equipment generally emits noise in the range of 80 to 90 decibel(s) (A-weighted scale) (dBA) at a distance of 50 feet, which exceeds permissible levels under State law.

Per HAR 11-46-3, the project area is located in the Class A Zoning District (open space), where maximum permissible sound levels are 55 A-weighted decibels (dBA) during the daytime (7 AM to 10 PM) and 45 dBA during the nighttime (10 PM to 7 AM). Construction noise is expected to exceed the State's "maximum permissible" property line noise levels, and a Community Noise Permit will be obtained from HDOH under HAR Chapter 11-46, Community Noise Control. For HDOH to issue a noise permit, the application will need to describe construction activities for the project. Specific permit restrictions required for construction projects include the following:

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

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

variance will be requested from HDOH for continuous pullback phase of construction, bypass and dewatering pumps and generators, and specific activities that require work hours to be extended into the evenings and/or on weekends to execute critical operations and implement the overall construction schedule.

Before issuing the permit, HDOH may require the Contractor to conduct noise monitoring and incorporate noise mitigations into construction plans, which may include the following:

- Deploy movable noise enclosures that are placed as close as possible to noise sources
- Use equipment that is well maintained and fitted with engine mufflers
- Minimize idling of equipment
- Operate equipment at lower throttle settings where possible
- Provide advance notice to sensitive receptors

The overall drilling period is expected to be approximately one month in duration. To the extent practicable, construction would occur during daytime. However, the pullback operation would need to occur around the clock to minimize risk of tunnel collapse or pipe being stuck. The pullback is estimated to take 7 days to complete. Once the HDD and pullback are complete, noise emissions from the project would be more typical of construction noises associated with backhoes, graders, and pickup trucks. Because of soft soils in the project area, pile driving is anticipated to support foundations for structures such as the valve vaults.

3.5.2.2 Long-term Noise Impacts

No noise impact is expected from operations of the underground force main.

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 that identified sites within a search radius of 0.125 mile. The database indicated seven sites within the 0.125-mile radius that could potentially affect the environmental condition of the project site (see Table 2 in Appendix B). None of the listed sites are within the project area.

The following observations were made during a May 8, 2017 site reconnaissance at three project areas that may indicate a potential environmental impact.

- **North Nimitz Highway Area (Pipe Laydown).** No significant observations were made that may impact the environmental condition of the site. A storm drain was observed in the central portion of the area.
- **Keehi Lagoon Park Area (HDD Exit Site).** Stressed vegetation was observed within the easternmost portion of the Keehi Lagoon Park Area. Because this area is not a major thoroughfare, it is unlikely that the stressed vegetation is a result of vehicular traffic. In addition, because surrounding vegetation was observed to be in good condition, it is unlikely that the stressed vegetation is a result of a lack of irrigation. There is a sign identifying a fenced-off portion as a construction area. No other observations were made that may impact the environmental condition of the site.
- **Sand Island Industrial Area (HDD Launch Site).** This area is currently being used as a heavy equipment, machinery, and construction material storage yard. Heavy petroleum-like staining was observed on the ground surface, and petroleum odors were noted. Potentially hazardous materials may be present within unlabeled storage containers, as well as labeled and unlabeled 55-gallon steel drums and other various container types.

3.6.2 Potential Impacts and Mitigation Measures

Based on the results of the CER, no hazardous materials are anticipated to be encountered within the project site.

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

Construction-related activities would also require use of hazardous materials, including lubricants, hydraulic fluid for transit and construction equipment, and cleaning products. A hazardous materials spill plan will be developed that describes spill prevention measures regarding the location of refueling and storage facilities, the handling of hazardous materials, and actions to be taken in case of a spill. The contents and requirements of the hazardous materials spill plan include the following measures:

- Equipment fluid leaks will be repaired immediately.
- Absorbent material manufactured for containment and cleanup of small hazardous materials spills will be kept at the project site.
- In the event of a large hazardous materials spill or if unanticipated hazardous materials are encountered within the project site, the HDOH Hazard Evaluation and Emergency Response Office will be contacted immediately.

3.7 Flora[2]

3.7.1 Existing Conditions

This section on flora summarizes the findings of a natural resources survey (see Appendix A) conducted by AECOS. Biologists with AECOS conducted a field reconnaissance of the project area on May 5, 2017 using a wandering transect (pedestrian survey) that covered the HDD launch site and the HDD exit site, as well as the area along the Nimitz Highway bike path designated for layout of the pipe to be pulled back through the bore hole.

The vegetation at Keehi Lagoon Beach Park is landscaped and maintained lawn, shrubs, and trees. The pipe laydown area is a bike path with sparse plantings between the path and Nimitz Highway. Ruderal plants growing in disturbed areas characterize a portion of the northeast corner of the beach park, the area surveyed directly east of Kalihi Stream, and scattered parts of the entire survey area outside the maintained park. A list of plant species may be found in the biological survey report (Appendix A).

3.7.2 Potential Impacts and Mitigation Measures

The vegetation types and species identified during the botanical survey are not unique. The species observed are found in Hawaii and elsewhere and are common throughout the Hawaiian Islands. No threatened or endangered plants were observed. Therefore, no mitigation measures are required based upon the specific observed flora.

Use of the open field *mauka* of the WWPS for construction staging may impact existing trees, including three coconut palms (*Cocos nucifera L..*) and one *kamani* tree (*Calophyllum inoplyllum L.*). If removal of any tree is required, the Contractor will consult with the Division of Urban Forestry (DUF) and park staff about such removal. Trees that need to be removed will be relocated to another park location or replaced with the same number of trees whose species and location are to be determined.

The bike path corridor adjacent to Nimitz Highway that is proposed for temporary pipe laydown contains a row of palm trees, including Manila palm [*Veitchia merrillii (Beccari) H.E. Moore*] and Fiji fan palm [*Pritchardia pacifica (Kuntze) Beccari*], within a landscaped strip between the bike path and the highway. Assembly and laydown of the pipe prior to pullback is expected to take approximately 4 weeks. The pipe

[2] The plant names used in this assessment follow Wagner et al. (1990 and 1999).

would rest on a series of cradles or rollers that lift the pipe above ground. Based on preliminary planning, the pipe would not impact the palms, and they would be protected while the bike path area is used. However, to provide adequate space for the pipe and to maintain use of the bike path, two mock orange bushes (*Murraya paniculata (L.) W. Jack*) on the *makai* side of the path may need to be removed. The Contractor will coordinate with HDOT regarding tree protection and removal/restoration of vegetation in the highway right-of-way.

A specimen of *kiawe* (a mesquite) with the general appearance of *Prosopis juliflora* (long-spine *kiawe*) was observed in the back part of the park (in the proposed laydown area). *P. longiflora* is a pest species and, if located in an area needed for construction, will be cut down and not replaced.

To minimize impact to existing botanical resources and to minimize the introduction and/or spread of invasive species, the following BMPs related will be implemented:

- Prepare a tree protection plan for review and approval by the resource owner (DUF and/or HDOT), and implement the plan for all trees that are to remain in place.
- Retain natural vegetation, especially grass, where possible.
- Route construction traffic to avoid existing planted vegetation.
- Do not deposit removed vegetation along the banks of any watercourse.
- Dispose of all removed vegetation away from the project site.
- Conform to applicable State and local seed and noxious weed laws.
- Remove dirt, plant, and foreign material from vehicles and equipment before mobilizing to the project site to prevent introduction of noxious weeds and non-native plant species into the work site.

3.8 Fauna

3.8.1 Existing Conditions

On May 5, 2017, biologists with AECOS conducted a field reconnaissance survey of the project area to investigate the presence of known or suspected threatened, endangered, or candidate wildlife species and their habitats.

Three avian count stations were established and a single ten-minute avian point-count was made at each station. Eighty-seven individual birds of 9 alien species were identified visually during the avian survey. The most common species were the Common Myna (*Acridotheres tristis*) and House Sparrow (*Passer domesticus*). A list of specific bird species observed and their relative abundance may be found in Table 2 of the Natural Resources Survey (Appendix A).

A survey of terrestrial mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal signs. A feral cat, two Small Indian Mongoose (*Herpestes auropunctatus aropunctatus*), and a domesticated dog were observed.

AECOS did not conduct in-stream surveys in the project area because tunneling would take place below the stream channel and aquatic resources would not be impacted.

3.8.2 Potential Impacts and Mitigation Measures

The project is not expected to adversely impact avian or mammalian resources in the project vicinity.

No species listed as State or federally endangered or threatened were observed during the biological survey. The following is a more specific assessment of potential impacts to protected species.

Sea Turtles. Two listed (endangered or threatened) marine species—Hawksbill turtle (*Eretmochelys imbricata*) and green sea turtle (*Chelonia midas*)—are known to occur in Honolulu Harbor and Keehi Lagoon,

but are unlikely to be found along the proposed tunnel corridor. No other listed marine species are anticipated to utilize the waters above the tunnel.

Seabirds. Although no seabirds were detected during the avian survey, it is possible that the endemic sub-species of Newell's Shearwater (*Puffinus auricularis newelli*), also known as 'a'o, overfly the project site between April and the middle of December each year in small numbers. Newell's Shearwaters are not known to breed on the island of Oahu, though seabirds likely to be this species have been recorded on ornithological radar in low numbers flying over parts of the island. 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 man-made structures, and either killed outright, or injured to become easy prey for feral mammals. If night-time construction work is anticipated, lights would be properly shielded and aimed towards the ground. Outdoor lighting guidelines are provided by the DLNR, Division of Forestry and Wildlife.

Hawaiian Hoary Bat. The Hawaiian Hoary bat (*Lasiurus cinereus semotus*) or 'ope'ape'a is an endangered species that is unlikely to occur in the lowlands of urban Honolulu. No Hawaiian hoary bats were detected during the biological survey. Any impact that the project potentially poses to bats would be the clearance of taller trees, an activity not anticipated for this project.

Monk Seal. The Hawaiian monk seal is listed as an endangered species. A female monk seal was reported to have given birth on the reef runway breakwater in 2011, and for the next two years a juvenile monk seal was reported to be occasionally resident within Keehi Lagoon. By tunneling underwater, any potential impact to monk seals is anticipated to be discountable.

Best Management Practices (BMPs) related to HDD and Work near the Aquatic Environment

Department of Land and Natural Resources Division of Aquatic Resources (DAR) memorandum dated April 24, 2017 (Appendix C)

The DAR indicated that the proposed project is not expected to have adverse impacts on the aquatic environment as no in-water construction activity is expected and the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. Also, the open trench construction sections of approximately 800 feet are not in close proximity to aquatic environments. However, DAR recommended that the following BMPs be incorporated to minimize the potential for erosion, siltation, and pollution of the aquatic environment particularly at the HDD launch and exit sites:

- Lands denuded of vegetation should be planted or covered as quickly as possible to prevent further erosion and soil from falling or flowing into the stream environment.
- Schedule site work (particularly the open trench construction) during periods of minimal rainfall.
- Prevent construction materials, petroleum products, debris, and landscaping products from falling, blowing or leaching into the aquatic environment.

U.S. Fish and Wildlife Service (USFWS) letter dated April 28, 2017 (Appendix C)

USFWS provided the following standard BMPs for HDD that will be incorporated into the project's construction documents:

- A site-specific spill response will be developed. Prior to HDD operations, all construction personnel will be properly trained in spill containment and clean-up and will be familiar with the site-specific spill response plan.
- Plastic barriers will be placed under the drilling equipment and oil absorbent blankets will be placed around hydraulic components to add protection between the rig and the ground surface in order to contain any spill.

- Drilling will use proven environmentally "friendly" drilling fluids (that is, mud). Oil-based mud will not be used. Synthetic-based or water-based mud such as those containing bentonite, are currently recommended for drilling activities.
- Discharge of any drilling mud into marine or aquatic environments is discouraged. Techniques for mud-free drill exits will be employed.
- During HDD operation, the drill path will be constantly monitored for surface release by trained personnel and constant communication between the monitors and the control cab will be maintained at all times. The monitors will be kept constantly informed of the progress of the drill head so as to be able to concentrate their search for any indications of an inadvertent release of drilling fluid.
- In the event of a subsurface release in a marine or aquatic environment, divers equipped with water lifts (pumps) and filter bags will be used to remove drilling fluids from the bottom.
- In the event of drilling fluid release on land, the spill will be immediately contained and the fluid transferred back to the drill site for reuse or into storage tanks and removed from the site.
- Once the HDD operation is complete, the work area will be returned to its original condition or better.
- All drilling fluids will be disposed in an approved land disposal facility and not into the marine or aquatic environment.

3.8.3 Essential Fish Habitat

No assessment of essential fish habitat assessment was performed because this project would not involve in-water construction.

3.9 Archaeological and Historic Architectural Resources

3.9.1 Existing Conditions

Cultural Surveys Hawaii (CSH) conducted a literature review and pedestrian survey of the project area that is reported in Appendix D.

The majority of the project area, including the larger western project area (HDD receiving site and temporary pipe laydown area), lies within the seaward portion of *Moanalua Ahupua'a*, the westernmost of the traditional *ahupua'a* of the traditional *Kona Moku*. Substantial fill activities including the filling of coastal fishponds and construction of the John Rodgers Airport (later the Honolulu International Airport) are readily apparent when comparing early maps and photographs with later ones. Figure 3-7 shows the shoreline from a 1928 USGS topographic map. Virtually the entire project area is fill land to below the water table with the fill understood as dating to 1942/1943. All of the area of proposed open trenching is post-1940 fill land.

No historic properties have been identified previously within the project area, nor within approximately 325 feet (100 meters) of the project area. Based on a literature review, one previous archaeological study (Hammatt et al. 2013) overlapped with a portion of the western project area, but no historic properties were recorded in that study.

CSH conducted field inspections on May 17 and 19, and June 23, 2017. The most notable features within the western portion of the project area were distinctive appurtenances to the enclosed tennis courts, including the drinking fountains and a seating area comprising six concrete benches and eight moss rock pillars that are remnants of a feature labelled "Benches & Trellises" on the Keehi Lagoon Beach Park site plan from 1967.

Another potential historic property, a concrete slab on grade, was noted in the northeast corner of the western project area, measuring approximately 8-foot by 30-foot and 2 inches above ground surface. Although seemingly unremarkable, the presence of 12 U-shaped brackets along the perimeter of the slab

suggest support for posts or walls. The purpose of the slab is unclear, but may date from the 1940s or 1950s with possible military association.

The eastern portion of the project area is largely within the JSR Equipment baseyard. Research indicates that the HDD launch site and the stretch proposed for open trench excavation are graded fill land.

3.9.2 Potential Impacts and Mitigation Measures

As all of the proposed excavation area (and virtually all of the project area) is post-1940 fill land, no archaeological inventory survey or archaeological monitoring program is proposed.

The SHPD Architecture Branch will be consulted about the 8-foot by 30-foot concrete slab east of the tennis courts that may constitute a historic property. While Keehi Lagoon Beach Park is a highly utilitarian facility, distinctive amenities such as the water fountain, will also be discussed with SHPD regarding potential historic significance.

If cultural resources or human remains were inadvertently discovered during construction, the contractor will comply with State law and administrative rules for handling them.

3.10 Cultural Resources

3.10.1 Existing Conditions

Consistent with the requirements of HRS Chapter 343, CSH conducted detailed 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, *kaao* (legends), traditional *moolelo* (stories), *wahi pana* (storied places), *olelo noeau* (proverbs), *oli* (chants), and traditional cultural practices. The report is provided in Appendix D.

3.10.2 Potential Impact and Proposed Mitigation Measures

No known cultural practices are known to occur in the project area. The HDD launch site is located within a developed industrial area; the HDD receiving site is located in a section of Keehi Lagoon Park that is used for active and passive recreation activities and parking. All permitted activities would resume once the improvements have been completed. If cultural resources or human remains were inadvertently discovered during construction, the contractor will comply with State law and administrative rules for handling them.

3.11 Population and Demographic Factors

3.11.1 Existing Conditions

The project area is not located in a residential neighborhood. The new Kahauiki Village residential development will be located on the peninsula between Moanalua Stream and Kalihi Stream. The first phase (25 units) is scheduled for completion at the end of 2017. The overall site development plan shows a total of 150 units, which are expected to house over 600 adults and children.

3.11.2 Potential Impacts and Mitigation Measures

No significant impact on population or demographic composition is expected as a result of this project.

3.12 Economic and Fiscal Resources

3.12.1 Existing Conditions

Honolulu, on the island of Oahu, serves as the major business and trading center for the Hawaiian Islands. Honolulu Harbor handles cargo for several international freight 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. Honolulu also contains many commercial, industrial, and retail properties.

According to the Bureau of Labor Statistics' Honolulu Economic Summary, the largest industries in terms of jobs are government (101,000); trade, transportation, and utilities (89,400); leisure and hospitality (72,100); professional and business services (68,200); and education and health services (65,200) (U.S. Bureau of Labor Statistics, 2017b). Median household income for the period 2011 to 2015 was $74,460 (U.S. Census Bureau, 2017). The city has experienced a sustained period of unemployment with a rate of 2.4 percent in April 2017 (U.S. Bureau of Labor Statistics 2017a).

3.12.2 Potential Impacts and Mitigation Measures

3.12.2.1 Economic Impacts

The proposed project is anticipated to have several types of economic impacts, with one being construction-related employment and income. With a preliminary estimated cost of $14 million, the project is expected to support a number of construction workers for the duration of the project. Given the relatively short duration of the project, this project is more likely to help sustain existing employment and income levels than to create new jobs. Nevertheless, the combination of wages paid to workers on this project (direct income), payments to suppliers (indirect income), and their subsequent expenditures (induced income), there would be a positive cumulative impact as monies circulate through the local economy.

3.12.2.2 Fiscal Impacts

Public funds are needed for long-term operations and maintenance of the new force main. However, the modern facility is being designed to minimize maintenance costs—for example, by using materials that are corrosion resistant and by incorporating design for ease of access, maintenance, and repair. These design features would provide long-term fiscal benefits to CCH.

3.13 Land Uses

3.14 Parks and Recreational Facilities

3.14.1 Existing Conditions

Keehi Lagoon Beach Park

Keehi Lagoon Beach Park is a 70-acre public park located off Lagoon Drive that is operated and maintained by DPR. The park is open from 6:00 AM to 10:00 PM daily. It contains 12 tennis courts, a baseball diamond, walking paths, picnic areas, comfort stations, canoe halau, and access to coastal waters. A large open field on the *maka*i side of the access road is used for various team and individual sports, including soccer, cricket, softball practice, and kite flying. The beach area is primarily used for boating and outrigger canoes. Paddling clubs engage in ongoing practice sessions. Several races and regattas are held between spring (pre-season) and summer (season). The statewide canoe racing championships are held every other year, with the qualifying races held during the alternate years. The park also hosts several major cultural events, including celebrations by the Samoan and Micronesian communities. These events are typically held during the summer months.

Photo 9. Mauka tennis court area near the wastewater pump station.

Photo 10. Remnants of a shaded seating area on the east side of the tennis courts.

Keehi Memorial Park

Keehi Memorial Park is an area of approximately 11 acres located between Keehi Lagoon Beach Park and Moanalua Stream. Pursuant to Governor's Executive Order 3967 dated February 19, 2003, the property was "set aside for the following purpose: for Pacific War Memorial property purposes[.]" Keehi Memorial Park is managed by the Keehi Memorial Organization (KMO) which, in turn, is overseen by DLNR, Division of State Parks. Facilities on the property include a rental office, memorial obelisk, several community centers and meeting rooms, Disabled American Veterans Headquarters, and two chapels. Outdoor facilities include a basketball/volleyball court, grass field with a baseball backstop, small pavilions and picnic area.

3.14.2 Potential Impacts and Mitigation Measures

The new sewer force main would be constructed by HDD under Keehi Memorial Park, and no construction impacts are expected on this property. Consequently, the discussion below is limited to project impacts on Keehi Lagoon Beach Park.

Construction of the new sewer force main would temporarily impact the northeast portion of Keehi Lagoon Beach Park around the WWPS, including the four *mauka* tennis courts. As seen in Photo 9, the courts were refurbished with a new surface as part of a park-wide project that improved all twelve courts. The *mauka* courts are the only lighted facilities, but electrical service is currently unavailable and the lights are not operational at this time. Based on preliminary design, construction activities would occur on land surrounding the courts, but would not require use of the court surface itself (Figure 2-6). If use of the courts is needed for successful execution of the HDD operation, they would be covered with protective material to minimize damage while being used for construction, and restored if any damage should result.

Even if the tennis courts are not needed for temporary pipe laydown or staging, they would not be available for public use for approximately one year. During this time, the new pipe would be installed by HDD and open trenching. Both the methods require excavation to depths of 15 feet below ground surface with ongoing operation of dewatering equipment. The HDD receiving pit would be located on the Diamond Head (or east) side of the courts and the open trench would extend along the *makai* side of the courts to a new valve vault on the Ewa side. Because the construction zone wraps around the courts, public access would need to be restricted for safety reasons.

The project is being designed to avoid underground utility and irrigation lines in this area to the extent practicable, but some lines may need to be temporarily relocated and/or replaced as part of the site restoration process.

Construction vehicles, including vehicles transporting equipment, materials, and workers, would need to use the park's internal roadway to access the project site. The rail project has temporarily closed portions of the roadway and parking area. Based on preliminary plans, the sewer force main project is not expected to require additional or expanded closures.

The ENV and Contractor will continue to coordinate with park staff to mitigate project impacts on major park events, including schedule coordination to enable the project to meet construction deadlines.

Upon project completion, the courts, fencing, utilities, and other accessory features will be repaired and/or restored to pre-construction conditions or better.

The described project work would not have a long-term adverse effect on any existing or planned recreational features, attributes, or activities of Keehi Lagoon Beach Park.

3.15 Visual and Aesthetic Resources

3.15.1 Existing Conditions

The two ends of the project alignment offer a distinct contrast in visual resources. The western end is located in a park setting that is characterized by open grassy fields and sports facilities. The eastern end, in comparison, is in an urban setting characterized by paved surfaces and industrial buildings and warehouses.

3.15.2 Potential Impacts and Mitigation Measures

Visual changes would be minimal because the facility is largely underground. Concrete covers would be constructed for the underground valve vaults near the WWPS, but this ground-level feature would have minimal visibility except in the immediate area. Because the project location is adjacent to the *mauka* boundary of Keehi Lagoon Beach Park, construction activities are not expected to obstruct coastal views for park users. The project site would be visible from the adjacent Nimitz Highway; however, the highway does not provide motorists with coastal views and proposed construction activities would not diminish scenic resources.

3.16 Roads and Traffic

3.16.1 Existing Conditions

Nimitz Highway (State Route 92) is part of the transportation corridor connecting Honolulu International Airport and the surrounding industrial/business area with downtown Honolulu. In the project vicinity, the highway is classified as a Principal Arterial with a posted speed limit of 35 mph. The highway had an average daily traffic volume of 45,500 in 2015 (including traffic flows in both direction). Eastbound traffic volume during the AM peak hour (7:30 AM to 8:30 AM) was approximately 1,140 and was approximately 2,340 during the PM peak hour (3:45 PM to 4:45 PM). The viaduct portion of the H-1 Freeway is located over Nimitz Highway such that the pylons supporting the elevated structure are present within the right-of-way.

An asphalt-paved bike and pedestrian path, approximately 8 feet in width, is located on the *makai* side of Nimitz Highway (see Photo 7 in Section 2.1, above). In the project area, the bike path extends from the Lagoon Drive intersection to the Moanalua Stream Bridge. A bus stop for eastbound routes is located on the Diamond Head side of the Lagoon Drive intersection. Pedestrian access to this bus stop is via the bike path.

3.16.2 Potential Impacts and Mitigation Measures

The primary project locations—the horizontal directional drilling launch and exit sites and open trench areas—are outside the public right-of-way; therefore, travel lane closures are not expected. Impacts to State and local roads would mostly consist of transporting materials and equipment and construction personnel. Construction activity would not adversely affect travel or access by emergency service vehicles on State or local roadways.

In general, construction access to the western project area would use the beach park driveway. However, it is possible that the delivery of piping material may require short-term access from Nimitz Highway through a break in the guardrail in the vicinity of the WWPS. In those limited situations, a traffic management plan would be developed by the Contractor and submitted to HDOT for review and approval.

The temporary pipe laydown area would affect a strip of land within the Nimitz Highway right-of-way that extends for approximately 0.50 mile between Lagoon Drive and Keehi Lagoon Beach Park. The pipe would be placed on roller cradles that hold the pipe in place and create a defined laydown space, approximately 4 feet wide. The laydown period is expected to last for 30 days, during which the pipe segments would be fused, laid out, and eventually pulled back into the bore hole. The bike path would be open for public use to the extent practicable. However, the section between Lagoon Drive and Ahua Street is particularly narrow and temporary restrictions may be needed for public safety and security. If temporary closure of the bike path is needed, proper detour signage would be posted directing pedestrians and bicyclists to use the bike path on the *mauka* side of Nimitz Highway for the block between Lagoon Drive and Ahua Street. Both the Lagoon Drive and Ahua Street intersections are outfitted with pedestrian signals and crosswalks.

Pedestrian accommodation would be provided for access to the bus stop on the Diamond Head side of Lagoon Drive throughout the construction period. It is not anticipated that the bus stop would need to be temporarily relocated; however, if the situation arises, the project team will consult and work with the Oahu Transit Service.

Preliminary plans indicate that the laydown area would not adversely affect the row of palm trees on the *mauka* side of the bike path. Measures will be taken to protect the palms.

Although no significant adverse impacts on traffic would be associated with construction or operation of the project, the following mitigation measures would be implemented during project construction:

- Permits to access State and/or City roads will be obtained, as needed, for overweight and oversize loads.
- Construction materials and equipment will be transferred to and from the project site during off-peak hours (8:30 AM to 3:30 PM) to the extent practicable to minimize disruption to traffic on highways and local streets.
- Flaggers will be employed as necessary to direct traffic when large equipment is exiting or entering public roads to minimize the risk of accidents.
- Notices to adjacent landowners will be distributed when construction takes place to help minimize access disruptions.

3.17 Public Utilities and Services

3.17.1 Existing Conditions

3.17.1.1 Water System

The BWS provides municipal water service throughout the island. There are no BWS-maintained water lines in the project area.

Keehi Lagoon Beach Park, on the western end of the project alignment, contains water lines for irrigation, water fountains, and comfort stations that are operated and maintained by DPR. The lawn area and shrubbery on the *makai* side of the tennis courts are irrigated. There are two water fountains in front of the courts and a backflow preventer to the east of the courts.

Water service on the eastern end of the project alignment extends to Alahao Place.

3.17.1.2 Wastewater System

The CCH wastewater management system is managed by ENV. Wastewater generated on Oahu is processed by one of nine wastewater treatment plants, including the Sand Island Wastewater Treatment Plant where sewage flows through the Kamehameha Highway WWPS force main system are processed and released through an ocean outfall.

In addition to pump station and force main, the west side of the project area contains a 6-inch sewer line that serves the comfort stations within the Keehi Lagoon Beach Park and a lateral line from Keehi Memorial Park. The 6-inch line connects to a 42-inch gravity main on the Ewa side of the WWPS.

The east side of the project alignment is a collection point for sewage flows from several pipes. Although the existing 36-inch force main is no longer active, it is connected to a surge manhole just east of Kalihi Stream that continues to receive sewage flow from a 36-inch gravity line serving areas *mauka* of Nimitz Highway. The Kauhauiki Village project recently installed a low pressure 3-inch sewer force main that crosses Kalihi Stream attached to the *makai* utility bridge and is hooked up to the existing wastewater collection system.

3.17.1.3 Solid Waste Management

The County's solid waste management system is managed by ENV. There is one municipal landfill on Oahu, Waimanalo Gulch Landfill, located in Kapolei. CCH owns the landfill, but contracts with a private company for the management and operation of the site. The County is currently evaluating options for expansion of the landfill. One additional landfill is privately owned by PVT Land Company, Ltd., and is designated specifically for construction and demolition waste.

3.17.1.4 Gas, Electrical and Telecommunications Systems

A 16-inch gas line is located within an easement that generally runs *makai* of and parallel to Nimitz Highway. The gas line is owned by Hawaii Gas and services residential and commercial customers. An aboveground

section of the gas line is located within a fenced enclosure *mauka* of the WWPS. A sign attached to the WWPS perimeter fence states that the underground lies is offset 8 feet to the north.

Manholes that belong to Hawaiian Electric Company (HECO) and Hawaiian Telcom are located within the temporary pipe laydown area. A Hawaiian Telcom pay phone is located *makai* of the tennis courts, but is not currently operational.

3.17.2 Potential Impacts and Mitigation Measures

The proposed project is expected to temporarily impact park water and/or irrigation lines within the construction area. All components of the water system that are disturbed by construction will be restored upon completion of the project.

As discussed in Section 2.5.2, there is a project to replace a segment of the 6-inch sewer line within Keehi Lagoon Beach Park. The replacement project is located outside the project area for the new 36-inch force main. Although the construction schedules for the two projects may overlap, they are separate improvement efforts.

A low-pressure sewer system has been constructed for Kahauiki Village. Flows will be discharging through a 3-inch force main into the same manhole as the new 36-inch force main. To avoid disruption of wastewater service for the Village, a temporary bypass may be needed while the necessary hookups are made. No adverse impact to wastewater service for the Village is anticipated.

Solid-waste impacts are expected to be short-term and related to construction activities. The Contractor will be required to dispose of or recycle all construction materials at approved sites and with proper handling during transport. 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 County's solid waste facilities.

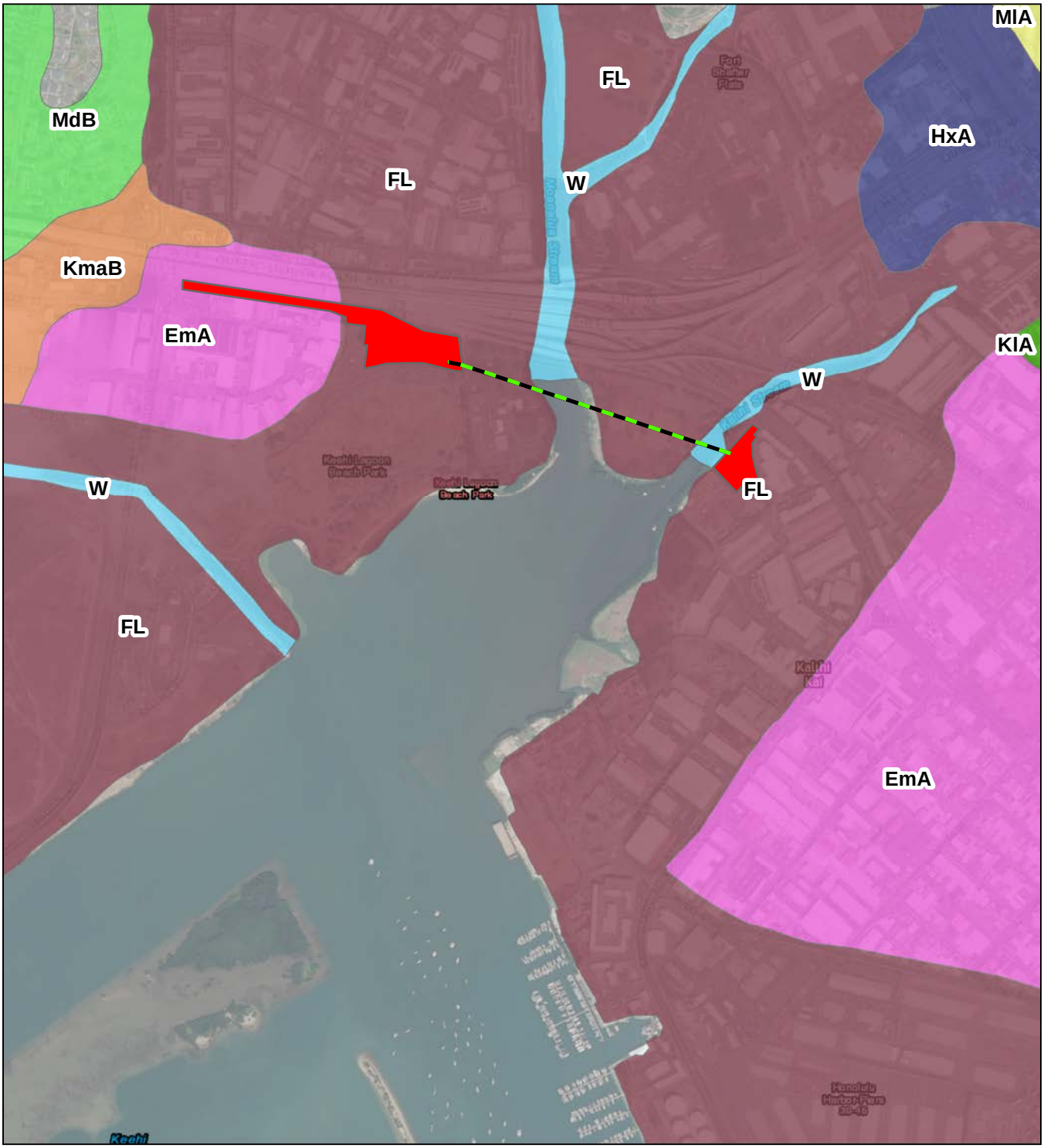
Underground gas, electrical, and telecommunications lines are located in the Nimitz Highway bike path area and in the open field *mauka* of the WWPS. Project activities in these areas would take place aboveground; therefore, no impact to underground utilities would occur. Additional coordination with Hawaii Gas and other utility companies will occur as project design advances.

3.18 Secondary and Cumulative Impacts

The new 36-inch sewer force main project is a self-contained project. The new main will serve as a backup facility to the active 42-inch force main. Because the primary purpose of the new force main is to enable flow diversion when needed, it would not change the capacity of the existing wastewater collection system, and is not expected to have secondary impacts such as population change, land development, or effects on other public facilities and services.

The HRTP project and other utilities projects in Keehi Lagoon Park will have overlapping construction schedules that are expected to cumulatively increase temporary impacts on, for example, the amount of park space needed for construction and staging, limitations on public use of park facilities, visibility of construction equipment, and construction noise. These impacts would be minimized through implementation of respective BMPs throughout construction and through coordination with DPR and between contractors.

Following construction, operation of the new force main would not represent any additional permanent impacts to natural or human resources; and, therefore, would not represent a cumulative impact when combined with other projects.



LEGEND

Note: Locations are approximate.

- Horizontal Directional Drilling
- Project Area

Soil Designation

- EmA: Ewa silty clay loam
- FL: Fill land, mixed
- HxA: Honouliuli clay
- KlA: Kawaihapai clay loam
- KmaB: Keaau stony clay
- MdB: Makalapa clay
- MlA: Makiki stony clay loam
- W: Water

FIGURE 3-1
Soils Map
Kamehameha Highway Wastewater Pump Station Force Main System Improvements
Oahu, Hawaii

N

0 500 1,000

Approximate Scale in Feet

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LEGEND

State of Hawaii Department of Health Underground Injection Control Line

Horizontal Directional Drilling

Project Area

Note: Locations are approximate.

N

0 500 1,000

Approximate Scale in Feet

FIGURE 3-2

Underground Injection Control Line

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

May 24, 2017

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

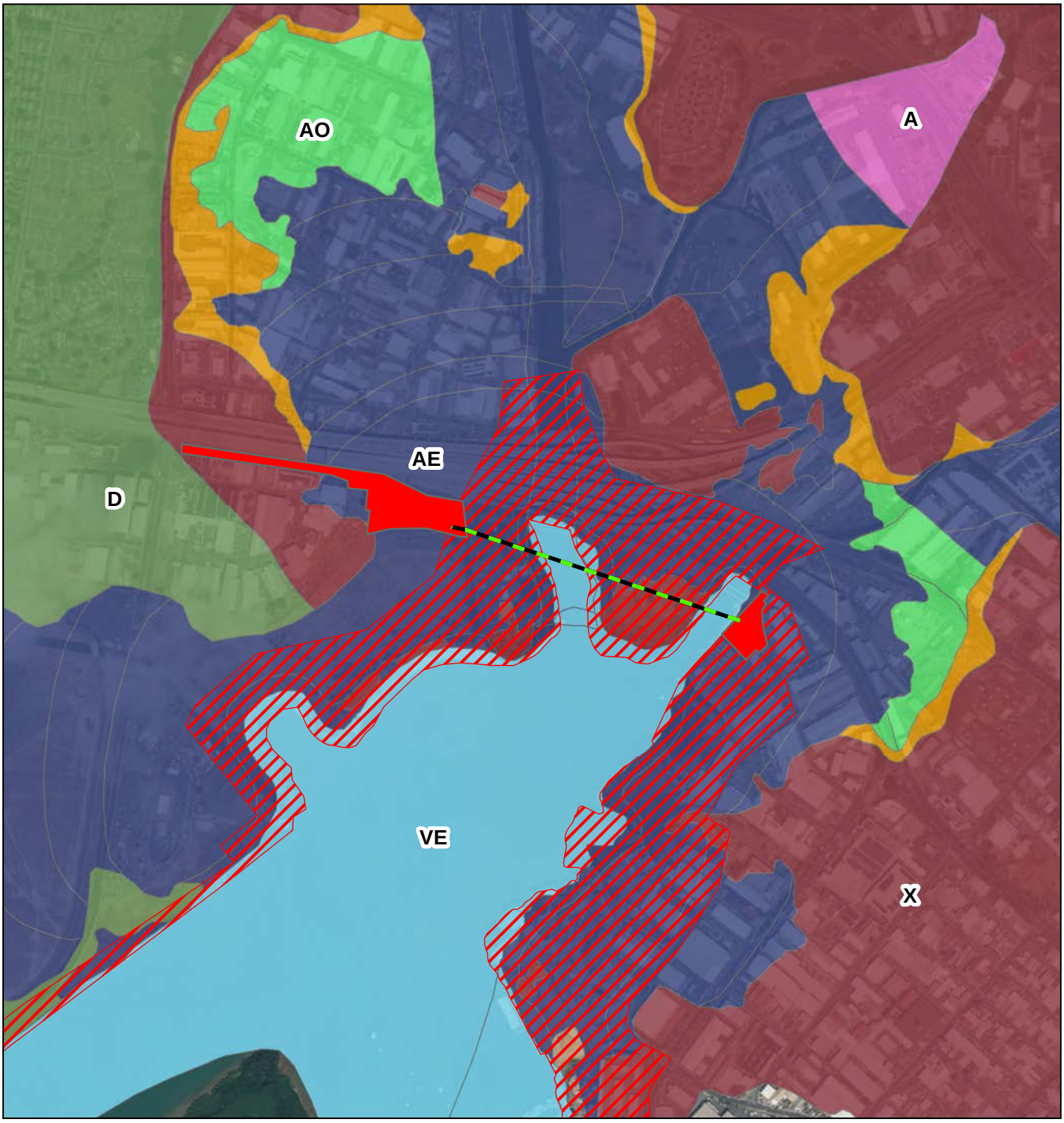
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

SOURCE: U.S. Fish and Wildlife Service
National Wetlands Inventory (NWI) Mapper
www.fws.gov/wetlands/data/mapper.html

FIGURE 3-3
National Wetlands Inventory Map
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

ch2m

FIGURE 3-4
Wetland Boundary—Keehi Lagoon Beach Park
Kamehameha Highway Wastewater Pump Station Force Main System Improvements



Note: Locations are approximate.

Horizontal Directional Drilling

Project Area

Tsunami Evacuation

Flood Zone Classifications

0.2 PCT ANNUAL CHANCE FLOOD HAZARD

A

AE

D

VE

X

FIGURE 3-5

Flood and Tsunami Hazards

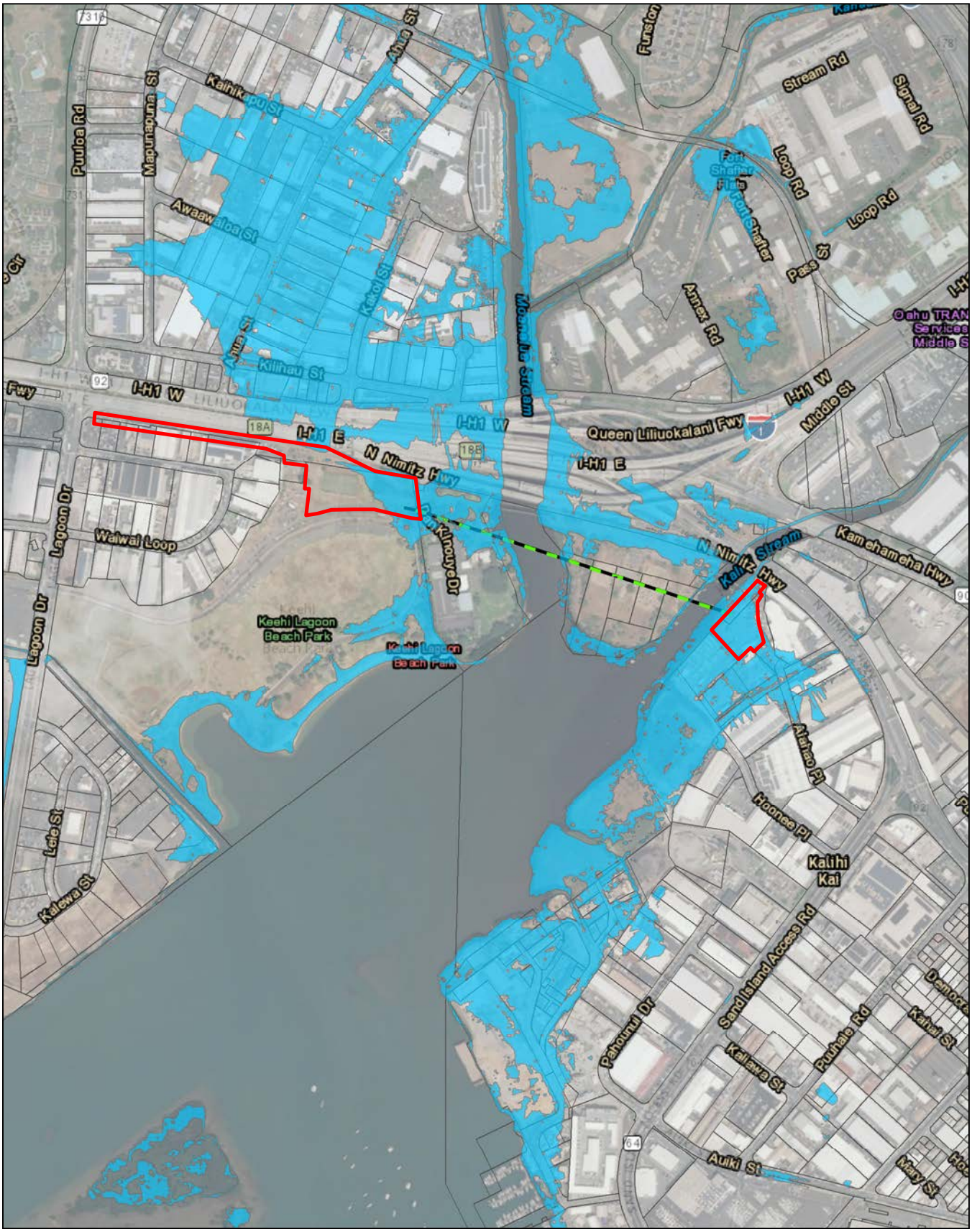
Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

N

0 500 1,000

Approximate Scale in Feet



LEGEND

- SOEST: 4 feet above mean sea level projected rise
- Horizontal Directional Drilling
- Project Area

Note: Locations are approximate.

0 500 1,000

Approximate Scale in Feet

FIGURE 3-6

Sea Level Rise

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

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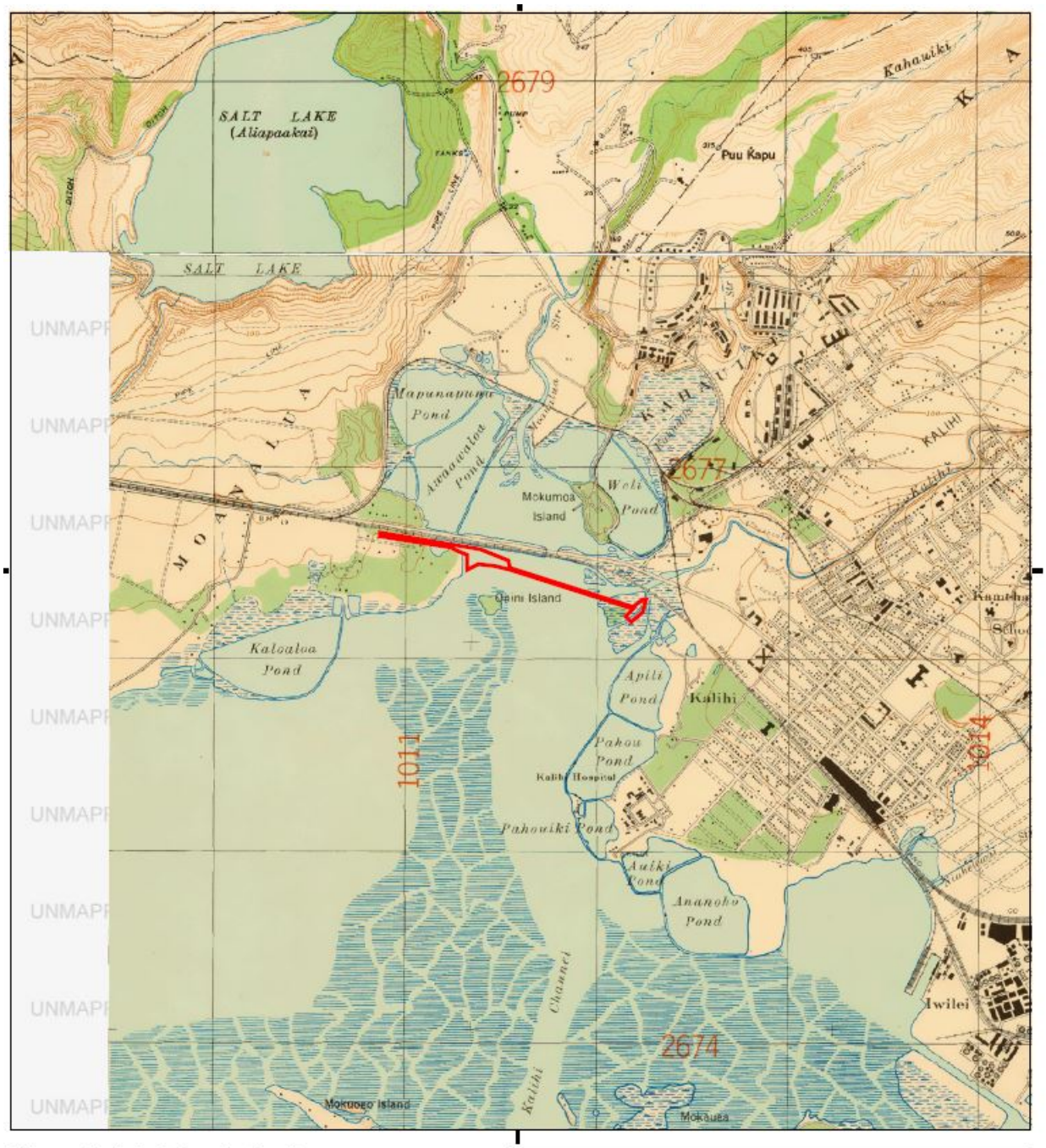

This report includes information from the following map sheet(s).

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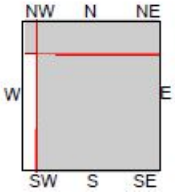


TP, HONOLULU, 1928, 7.5-minute
NE, KANEOHE, 1928, 7.5-minute
NW, WAIPAHU, 1928, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

FIGURE 3-7
Historic Shoreline (1928 Topo)
Kamehameha Highway Wastewate
Pump Station Force Main System
Improvements

CHAPTER 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, as discussed herein.

4.1 Federal

The proposed project would not involve the use of federal funds, but will require a federal permit pursuant to Section 10 of the Rivers and Harbors Act. This permit triggers the need for compliance with various Federal laws and regulations that are discussed in this section.

4.1.1 Rivers and Harbors Act of 1899

The proposed action would occur under navigable waters and, therefore, would fall under the jurisdiction of Sections 9 and 10 of the Rivers and Harbors Act of 1899. USACE and the U.S. Coast Guard (USCG) entered into a Memorandum of Agreement in 1973 that described the responsibilities of each agency relative to permitting bridge work within water influenced by the ebb and flow of tides. The Memorandum of Agreement stipulated that the USCG is responsible for issuing bridge permits approving the location and plans of all new bridges, modification of existing bridges, international bridges, and causeways in or over navigable waterways of the United States influenced by tidal action that may affect the movement of shipping. USACE maintains authority to regulate construction under Section 10.

In a pre-application meeting held on May 9, 2017, USACE confirmed the need for a federal permit under Section 10, and that the project would qualify for Nationwide Permit 12, which covers utility lines.

4.1.2 Section 106 of the National Historic Preservation Act of 1966

The National Historic Preservation Act of 1966, as amended (PL 89-665, codified as 16 United States Code [U.S.C.] 470), 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 National Historic Preservation Act of 1966 (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 to evaluate the potential for effects on existing historic sites, if any, resulting from the project. Because the proposed project is not federally funded, the Section 106 consultation process was not implemented. However, the project is complying with the State counterpart for historic preservation review pursuant to HRS 6E-8. Findings relating to potential effects of the proposed project on historic properties are discussed in Sections 3.9 and 3.10 of this document.

4.1.3 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.

Requests for technical assistance to identify listed threatened and endangered species and critical habitat were sent to the USFWS and NMFS. USFWS responded by letter dated April 28, 2017, identifying the Hawaiian hoary bat and threatened Newell's shearwater as species that occur or transit through the project area. The letter included BMP recommendations for horizontal directional drilling. Potential impacts on the listed species and BMPs are discussed in Section 3.8 of this document.

4.1.4 Migratory Bird Treaty Act

The MBTA of 1918, as amended (16 U.S.C. 760), protects migratory wild birds found in the United States. The MBTA makes it unlawful to pursue, hunt, take, capture, possess, sell, purchase, barter, import, export, or transport any migratory bird or any part, next, or egg of any such bird, unless authorized under a permit issued by the Secretary of the U.S. Department of the Interior.

USFWS's letter dated April 28, 2017, identified the wedge-tailed shearwater, a species protected under the MBTA, as occurring or transiting through the project area. A discussion of potential project impacts is included in Section 3.8 of this document. Construction may temporarily displace MBTA-protected birds (likely limited to a few individuals) that are expected to find suitable foraging habitat in nearby areas. The possibility of adversely affecting migratory birds as a result of the proposed project is likely small and would be avoided with implementation of mitigation described in Section 3.8.5.

4.1.5 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), 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 that are 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 proposed use of HDD to install the new sewer main would eliminate the need for in-water construction; as such, potential impacts to EFH will be avoided.

4.1.6 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 *(1) "the discharge of pollution into the navigable waters be eliminated by 1985," (2) "the discharge of toxic pollutants in toxic amounts be prohibited," and (3) an "interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and... recreation in and on the water... by July 1, 1983*" (CWA §101a, 33 U.S.C. §1251a).

Section 404 of the CWA regulates discharge of dredge and fill material in Waters of the U.S., including wetlands, and requires a Department of the Army permit from USACE. Section 401 of the CWA directs states to establish water quality certification (WQC) programs; in Hawaii, the Section 401 WQC is administered by HDOH, Clean Water Branch. The project would not result in any discharges of fill material to Waters of the U.S.

Section 402 of the CWA requires a NPDES permit for point source discharges, including stormwater discharges associated with construction activities, dewatering, and hydrotesting. The permit is required for construction activities that disturb 1 acre or more and discharge stormwater from the project site to Waters of the U.S.

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 Hawaii State Plan objectives and policies, as detailed in Table 4-1. No priority guidelines are applicable to the proposed project.

TABLE 4-1
Compliance with the Hawaii State Plan

Objective	Compliance with Specific Objectives and Policies
Population	This theme is not applicable to the project.
Economy—in general	The project would be in compliance with this theme, particularly the following objectives and policies: (a)(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited. As described in Section 3.12, the proposed project is anticipated to provide economic benefits by supporting a number of construction workers for the duration of the project (approximately 1 year).
Economy—agriculture	This theme is not applicable to the project.
Economy—visitor industry	This theme is not applicable to the project.
Economy—federal expenditures	This project will not use federal funds.
Economy—potential growth and innovative activities	This theme is not applicable to the project.
Economy—information industry	This theme is not applicable to the project.
Physical environment—land-based, shoreline, and marine resources	The project would be in compliance with this theme, particularly the following objectives and policies: (b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities. By constructing the new facility by horizontal directional drilling, the project would substantially reduce adverse effect on important surface level natural resources. Biological surveys of the project area found no threatened or endangered plant or animal species; BMPs would be implemented to avoid and minimize contact with special-status species that could occur in the project area.
Physical environment—scenic, natural beauty, and historic resources	The project would be in compliance with this theme, particularly the following objectives and policies: (a)(1) Promote the preservation and restoration of significant natural and historic resources. (a)(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features. (a)(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage. All project components will be underground and, as such, would not result in any change to the existing landscape or quality of views.
Physical environment—land, air, and water quality	The project would be in compliance with this theme, particularly the following objectives and policies: (a)(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.

TABLE 4-1
Compliance with the Hawaii State Plan

Objective	Compliance with Specific Objectives and Policies
	(b)(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters. (b)(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters. The project would result in short-term, construction-related impacts (noise, dust, and erosion), but implementation of BMPs would minimize the effects to the environment.
Facility systems—in general	The project would be in compliance with this theme, particularly the following objectives and policies: (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. The ENV recognizes the need to provide a backup sewer force main for the Kamehameha Highway WWPS. To develop an efficient and effective wastewater system, the new facility is being designed to current CCH and industry guidelines.
Facility systems—solid and liquid wastes	This project would implement the objectives and policies of this theme, in particular: (a)(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes. The purpose of this project is to safeguard against force main failures that, in the past, have resulted in the release of raw sewage into waterbodies and contamination of coastal waters from high levels of bacteria. By constructing the proposed 36-inch sewer force main in accordance with the CCH Flow Diversion Plan, the risk of harm to human health and/or the environment would be reduced substantially.
Facility systems—water	This theme is not applicable to the project.
Facility systems—transportation	This theme is not applicable to the project.
Facility systems—energy	This theme is not applicable to the project.
Facility systems—telecommunications	This theme is not applicable to the project.
Socio-cultural advancement (housing, health, education, social services, leisure, individual rights and personal well-being, culture, public safety, and government)	These themes are not applicable to the project.

4.2.2 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. The lands within and surrounding the project area are classified in the Urban District (Figure 4-1). However, the project will cross under portions of two streams that are classified in the Conservation District, Resource Subzone. The new force main is an allowed public use within the land use classification but requires a Conservation District Use Permit. Approval is by the Board of Land and Natural Resources.

4.2.3 Coastal Zone Management Program and Federal Consistency Determination

In 1977, Hawaii enacted HRS Chapter 205A, Hawaii CZM Program, to carry out the State's CZM policies and regulations under the federal Coastal Zone Management Act (CZMA). Hawaii's coastal zone includes the waters from the shoreline to the seaward 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 CZM program objectives and policies. The Hawaii CZM Program focuses on ten policy objectives:

- 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 western portion of the new force main alignment is located within Keehi Lagoon Beach Park. Four of the park's 12 tennis courts would be temporarily closed during construction for public safety. No other recreational areas of the park would be impacted. An alternate alignment away from the tennis courts is not feasible because the force main would be connected to the existing wastewater pump station which is located adjacent to the courts. Upon project completion, disturbed park land and facilities would be restored and use of the tennis courts would resume.

- 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**:** This project is located on post-1940s fill land and is not expected to affect prehistoric resources. There are no historically significant architectural resources in the project area.

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

  Discussion**:** As an underground facility, the project would not obscure scenic coastal views or encroach on open space resources.

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

  Discussion**:** The project would employ tunneling technology to avoid impacts to surface ecological resources. BMPs recommended by the U.S. Fish and Wildlife Service and the Hawaii Division of Aquatic Resources would be implemented during construction to minimize the potential for adverse impact on water quality and aquatic wildlife.

- 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.

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

  Discussion**:** Potential hazards, including stream flooding, sea level rise, and seismic risk, are being addressed through engineering and design. Erosion control BMPs will be implemented to minimize off-site dispersion of water- and air-borne soil and pollutants.

- 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.

- 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.

- 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.

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

  Discussion**:** The proposed project would not impact marine resources.

Other key areas of the CZM program include (1) a permit system to control development within a SMA managed by each County and the Office of Planning (see Section 4.3.5, below), (2) a Shoreline Setback Area which 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 located within the County of Honolulu SMA. The proposed project does not involve the placement, construction, or removal of materials near the coastline. The proposed project 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.

4.2.4 HRS, Chapter 6E, Historic Preservation Review

HRS Chapter 6E and HAR 13-275 through 284 lay out the State's historic preservation review process. §6E-8 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. Consultation with the SHPD, pursuant to HRS 6E, is ongoing.

4.2.5 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 CIA. A CIA is being conducted for the project in compliance with this requirement (see Section 3.10).

4.3 City and County of Honolulu

4.3.1 City and County of Honolulu General Plan

The CCH 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. The project and the assessment process undertaken for the project are consistent with the overall objective for utilities in the General Plan, which states the following:

> "Population growth results in increased demands for water, sewerage, and solid waste disposal services provided by government, as well as the communication, electricity, and gas systems provided by the private sector. Not only must such needs be met, but the social,

economic, and environmental consequences of meeting these needs must be carefully considered."

In addition, the project is consistent with the following specific objectives and policies in the Transportation and Utilities section of the General Plan:

Objective B

To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 3

Encourage the development of new technology which will reduce the cost of providing water and the cost of waste disposal.

Policy 5

Provide safe, efficient, and environmentally sensitive waste-collection and waste-disposal services.

Discussion: A primary purpose of this project is to improve the wastewater collection system. The decision to pursue the project described in this document was based on a series of studies to systematically evaluate and analyze the existing sewerage assets and alternatives to implement needed improvements.

Objective C

To maintain a high level of service for all utilities.

Policy 1

Maintain existing utility systems in order to avoid major breakdowns.

Policy 2

Provide improvements to utilities in existing neighborhoods to reduce substandard conditions.

Discussion: This project is part of a comprehensive CCH program to correct and reinforce deficiencies in the wastewater system and promote the safe and efficient functioning of existing infrastructure assets. If a breakdown should occur, the system would have the resilience to minimize harm to neighborhoods in the service area.

Objective D

To maintain transportation and utility systems which will help Oahu continue to be a desirable place to live and visit.

Policy 1

Give primary emphasis in the capital-improvement program to the maintenance and improvement of existing roads and utilities.

Policy 4

Evaluate the social, economic, and environmental impact of additions to the transportation and utility systems before they are constructed.

Policy 5

Require the installation of underground utility lines wherever feasible.

Discussion: This project underwent a comprehensive process of inspections, alternatives analysis, and technical evaluations to determine the course of action that would integrate appropriately with the existing wastewater system and provide community benefits, while minimizing adverse impacts. Sewerage is almost

always constructed underground, but several options were explored to identify the preferred type of underground facility, construction approach, and alignment.

4.3.2 Primary Urban Center Development Plan

The CCH General Plan requires that community development plans be adopted by the County Council for each judicial district in CCH. It is intended to provide detail to the elements presented in the General Plan and emphasize those elements most relevant to the issues and conditions of the specific area plan.

The ordinance approving the Primary Urban Center (PUC) Development Plan was signed in June 2004. The proposed project is consistent with the following wastewater system policies identified in the plan:

- Implement wastewater collection system improvements to provide adequate service and sound facilities to existing neighborhoods and timely increases in system capacity to areas planned to undergo improvement or change in use.
- Implement adequate and timely upgrades/expansion of wastewater treatment facilities to meet the growth demands of the PUC.

Discussion: The new 36-inch standby force main would provide improved service for the geographic area that is currently handled by the existing 42-inch force main alone. The service area is a portion of the PUC that has a relatively stable residential and workforce population, and is not planned for substantial growth. Therefore, data on historic flows and peak events provided a sound basis for establishing required capacity, and the new facility was sized and designed accordingly.

4.3.3 Public Infrastructure Map

Public infrastructure maps (PIM) show the location of major public infrastructure projects through symbols. Revisions to the PIM by adding symbols is generally required before funds are expended for land acquisition or project construction. As stated in Section 4-8.4, Revised Ordinances of Honolulu, the revision process applies to “major public infrastructure” that meets one or more of the following criteria:

1. It has significant impact on surround land uses or the natural environment;
2. It establishes a new facility;
3. It substantially changes the function of an existing facility; or
4. It involves modification (replacement or renovation) of an existing facility which would permit significant new development or redevelopment.

By memorandum dated June 20, 2017, DPP determined that this project is exempt from PIM requirements.

4.3.4 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. At both bridge locations, the adjacent land is zoned as AG-1 (Restricted Agricultural District) and AG-2 (General Agricultural District) on the *mauka* side and as P-2 (General Preservation) on the *makai* side (Figure 4-2). The proposed project would not require a change in the existing zoning designations.

4.3.5 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 that is administered by CCH. The permitting process provides a heightened level of public scrutiny to ensure consistency with SMA objectives.

The new sewer force main alignment is located within the SMA (Figure 4-3) and a SMA Use permit will be required for the proposed project.

This section discusses project impacts relative to SMA review guidelines in Section 25-3.2, Revised Ordinances of Honolulu.

(a) All development in the special management area shall be subject to reasonable terms and conditions set by the council to ensure that:

(1) Adequate public access, by dedication or other means, to and along the publicly owned or used beaches, recreation areas and natural reserves is provided to the extent consistent with sound conservation principles:

Discussion: This project would not impede public access to any beach or coastal recreation area.

(2) Adequate and properly located public recreation areas and wildlife preserves are reserved;

Discussion: Construction would temporarily restrict use of four tennis courts (eight other tennis courts would be unaffected). Full use of the courts would be restored after the project is completed in approximately one year.

(3) Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon special management area resources; and

Discussion: During construction, temporary bypass and pumping equipment would be provided to support replacement, repair, and connection of and to existing infrastructure, while continuing operation of the wastewater collection system. In the long run, the new force main would provide system backup in the event there is disruption in the active main which requires diversion of flows; thereby, substantially reducing the risk of environmental contamination.

(4) Alterations to existing land forms and vegetation; except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, wind damage, wave damage, storm surge, landslides, erosion, sea level rise, siltation or failure in the event of earthquake.

Discussion: Installation of the new force main by HDD would minimize disturbance to surface resources and location of the pipe underground substantially reduces exposure to environmental hazards and stressors.

(b) No development shall be approved unless the council has first found that:

(1) The development will not have any significant adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest. Such adverse effect shall include but not be limited to the potential cumulative impact of individual developments, each one of which taken in itself might not have a significant adverse effect and the elimination of planning options;

Discussion: This project implements a Consent Decree to reinforce the City's wastewater collection system to safeguard public health. The particular segment addressed by this project was identified as a priority because of its location near waterbodies and the environmental and public health risk posed by accidental sewage release.

(2) The development is consistent with the objectives and policies set forth in Section 25-3.1 and area guidelines contained in HRS §205A-26;

Discussion: See Section 4.3.5, above.

(3) The development is consistent with the county general plan, development plans and zoning. Such a finding of consistency does not preclude concurrent processing where a development plan amendment or zone change may also be required.

Discussion: See Sections 4.3.1 (General Plan), 4.3.2 (PUC Development Plan), and 4.3.4 (Zoning), above.

(4) The development has been adequately planned to minimize the risk from coastal hazards such as tsunamis, hurricanes, wind, storm waves, flooding, erosion, and sea level rise.

Discussion: The project has been planned and designed in accordance with professional and industry standards to function under known environmental conditions and anticipated hazards.

(5) That the development does not impeded public access to the shoreline or beach area.

Discussion: The proposed development would not affect beach or shoreline access.

(c) The council shall see to minimize, where reasonable:

(1) Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough, or lagoon;

Discussion: By tunneling under Moanalua and Kalihi streams, the project would not require any dredging, filling, or alteration of the aquatic environment.

(2) Any development which would reduce the size of any beach or other area usable for public recreation

Discussion: This project would not reduce any beach or area used for public recreation.

(3) Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management area and the mean high tide line where there is no beach;

Discussion: This project would not restrict public access to tidal and submerged lands, beaches, or rivers and streams within the SMA.

(4) Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast; and

Discussion: With the exception of concrete vault covers at ground level, this project is located underground.

(5) Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

Discussion: As an underground facility, the project would not affect surface resources, including fisheries and wildlife habitat. BMPs to be implemented and monitored throughout HDD operations will minimize the potential for adverse impacts through inadvertent releases that could temporarily degrade water quality.

Note: Locations are approximate.

LEGEND

- Horizontal Directional Drilling
- Conservation District Resource Subzone
- Project Area

State Land Use District

- Urban

0 500 1,000

Approximate Scale in Feet

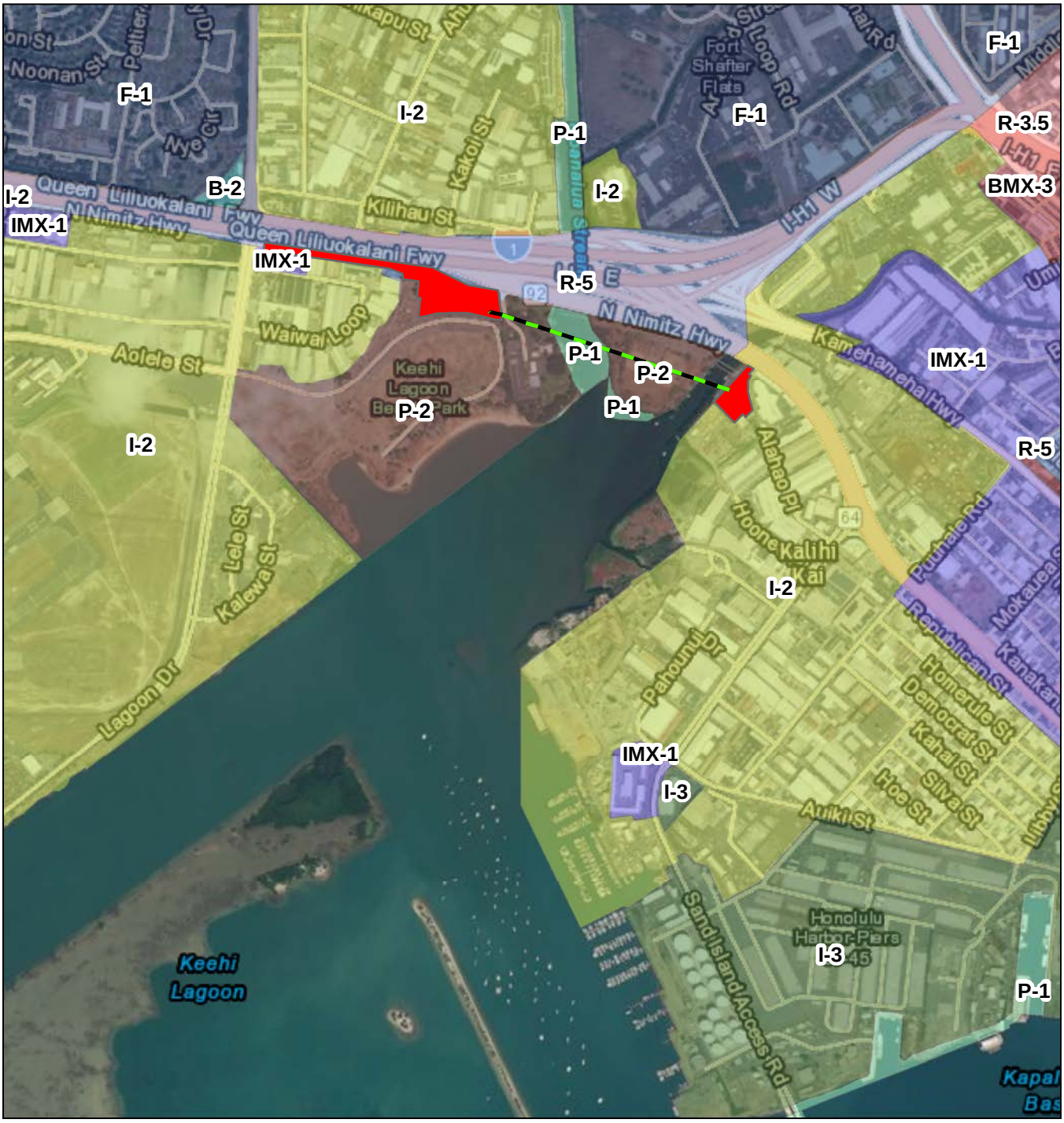
FIGURE 4-1

State Land Use Districts

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

UNK \\NALA\PROJ\GIS_LIBRARY\CCH_PUBLIC_WORKS\MAPS\REPORT\FINAL_REPORT\V2\FIG4-1_SLUD.MXD RMANGAN 7/20/2017 12:57:07 PM



LEGEND

- Project Area
- Horizontal Directional Drilling

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
- I-3 Waterfront Industrial District
- IMX-1 Industrial Mixed Use District
- P-1 Restricted Preservation District
- P-2 General Preservation District
- R-3.5 Residential District
- R-5 Residential District

Note: Locations are approximate.

0 500 1,000

Approximate Scale in Feet

FIGURE 4-2

Zoning Classification

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

UNK \\NALA\PROJ\GIS_LIBRARY\CCH_PUBLIC_WORKS\MAPS\REPORT\FINAL_REPORT\V2\FIG4-2_ZONING.MXD RMANGAN 7/20/2017 1:03:51 PM

LEGEND

Special Managment Area

Project Area

Note: Locations are approximate.

0 500 1,000

Approximate Scale in Feet

FIGURE 4-3

Special Management Area Map

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

UNK \\NALA\PROJ\GIS_LIBRARY\CCH_PUBLIC_WORKS\MAPS\REPORT\FINAL_REPORT\V2\FIG4-3_SMA.MXD RMANGAN 7/20/2017 1:05:46 PM

CHAPTER 5

Findings and Reasons Supporting the Anticipated Determination

This EA has found that the potential for impacts associated with the proposed project would not be significant, or would be mitigated to less than significant levels. Potential environmental impacts are generally temporary, occurring during construction, and are not expected to adversely impact the long-term environmental quality of the project area.

The potential effects of the proposed project were evaluated based on the Significance Criteria specified in HAR 11-200-12 (revised in 1996). The following is a summary of potential effects of the action.

5.1 Significance Criteria

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 resources. The project has a minimal construction footprint, limited to the HDD launch and exit sites and the trenches needed to connect the new force main to the existing system. The construction area on the east side of the force main alignment would occur within a developed industrial and business area where the ground surface is paved. The construction area on the west side of the alignment is a landscaped field within Keehi Lagoon Beach Park. Both locations are urbanized and do not provide unique habitat in the area. Therefore, no candidate, proposed, or listed threatened or endangered species would be adversely impacted. Areas disturbed by construction would be restored to existing conditions or better when construction is completed.

As described in Section 3.9, the coastline of Keehi Lagoon was filled in the mid-twentieth century to create the land mass where construction would take place. Because this area was under coastal waters until modern historic times, the project-related excavation is not expected to encounter significant cultural artifacts or buried iwi.

Curtails the range of beneficial uses of the environment

The new pipeline would benefit the environment by accommodating the diversion of wastewater flow if the active sewer force main fails and needs repair, or while it undergoes preventive maintenance. The entirety of the new facility would be underground, so that the surface environment would be available for other uses.

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 aligns with the following guideline in the area of Community Life and Housing:

> *C. Encourage the reduction of environmental pollution which may degrade a community.*

The new force main is critical in developing a more robust wastewater collection system. Because the force main crosses two streams and is located within a recreational area, failure could be catastrophic. Construction of the backup main would enable the system to respond more resiliently by diverting flows in the event malfunction occurs.

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.

Substantially affects public health

Short-term, construction-related impacts to ambient air and noise levels would be mitigated by BMPs implemented during the construction period that would minimize temporary impacts to surrounding uses. Over the long term, flow diversion capability in the Kamehameha Highway WWPS force main system would benefit public health, as intended by the 2010 Consent Decree.

Involves substantial secondary impacts, such as population changes or effects on public facilities

The proposed project does not include improvements that would change the capacity of the wastewater system in the service area. Therefore, no adverse secondary impacts on the environment, such as population growth or the need to expand other public facilities, would be anticipated with the implementation of the proposed project.

Involves substantial degradation of environmental quality

The proposed project would not cause any impacts that would substantially degrade environmental quality. By design and function, the proposed sewer force main would improve the system's robustness while minimizing harm to the surrounding environment. Construction activities associated with the proposed project are anticipated to result in relatively insignificant short-term impacts to noise, air quality and construction space requirements. The incorporation of recommended mitigation measures during the construction period would prevent adverse impacts to the environmental quality.

Is individually limited, but cumulatively has considerable effect upon the environment or involves a commitment for larger actions

The proposed force main project is a self-contained action and is not part of additional and/or related actions.

Separate construction projects in the vicinity of the proposed force main include the rail transit project and 6-inch sewer line replacement project in Keehi Lagoon Beach Park, and Kahauiki Village and AM radio antenna projects on the peninsula between Moanalua and Kalihi streams. The construction period for these projects would overlap, thus requiring interface among different contractors. Because the affected area is largely isolated from residential and commercial uses, and generally outside the public ROW, potential impacts to residents and the traveling public are minimized. Temporary impacts to recreational facilities and services at Keehi Lagoon Beach Park would be unavoidable, but a concerted effort is being made to reduce cumulative impacts through active coordination with park management and staff.

Substantially affects a rare, threatened, or endangered species, or its habitat

Three federally protected species have the potential to occur in the action area: Hawaiian hoary bat, Newell's shearwater, and wedge-tailed shearwater. Potential impacts from the proposed project to these species are expected to be discountable and temporary. The BMPs described in Section 3.8 would ensure that there are no significant or long-term effects to these federally listed species.

Detrimentally affects air or water quality or ambient noise levels

There would be minimal short-term impacts on air quality and noise levels during the construction period. Mitigation measures would be implemented to minimize construction-related noise and dust impacts. In the long term, there would be no adverse impacts on air and water quality.

Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters

The project location is exposed to flooding and tsunami. Consequently, the new facility 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 new sewer force main and connections would be entirely underground and have no effect on the visual quality of the environment.

Requires substantial energy consumption

Fuel would be consumed by construction vehicles and equipment, but this use would be comparable to other construction projects and no adverse effects are expected.

5.2 Conclusion

Through design, impact avoidance and minimization actions, and proposed BMPs and mitigation measures, the analysis contained in this EA has determined that the project would have no significant adverse impacts or would have impacts that can be mitigated to less than significant levels.

CHAPTER 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.

CHAPTER 7

Consultation and Coordination

7.1 Agencies, Organizations and Individuals Consulted During Preparation of the Draft Environmental Assessment

The following agencies, organizations, and individuals were contacted during preparation of the Draft EA. They received preliminary project information and were asked to provide comments relative to specific environmental compliance or for general assistance in preparing the Draft EA and/or were engaged through project-related meetings. A template of the general consultation letter is included at the end of this section.

7.1.1 Federal

- USACE
- USCG
- USFWS
- NMFS

7.1.2 State of Hawaii

- Department of Accounting and General Services
- HDOH, Clean Water Branch
- HDOH, Environmental Planning Office
- DLNR
- DLNR, Land Division
- DLNR, Division of State Parks
- HDOT
- Office of Hawaiian Affairs
- Office of Planning
- State Representative Romy Cachola
- State Senator Glenn Wakai

7.1.3 City and County of Honolulu

- Department of Emergency Management
- Department of Emergency Services
- Department of Facility Maintenance
- Honolulu Fire Department
- Department of Land Management
- Department of Parks and Recreation
- DPP
- Honolulu Police Department
- Honolulu Authority for Rapid Transportation
- Department of Transportation Services
- Councilmember Joey Manahan
- Kalihi-Palama Neighborhood Board

7.1.4 Utilities

- Honolulu BWS
- HECO
- Hawaii Gas
- Hawaiian Telcom
- Oceanic Time Warner Cable

7.1.5 Other Stakeholders

- AIO Foundation/Kahauiki Village
- AIO/Centerline Solutions
- Keehi Memorial Organization
- TMK 12021036, JSR Equipment
- TMK 12012038, O'Bryan Incorporated c/o Weinberg Foundation
- TMK 12021015, 12021037, Weinberg Foundation
- TMK 12021040, Pestana Corporation c/o Bob's Equipment
- TMK 12021041, Robert's Central Laupahoehoe Inc.
- TMK 12021042 Ed Yamashiro

7.2 Early Consultation Comment Letters Received

A total of 20 agencies responded to requests for comments during the Draft EA preparation period. Of these, 15 responding agencies provided the substantive comments summarized below. Comments are also addressed in the relevant sections of the Draft EA. Unless noted, comment and response letters are reproduced in full at the end of this section.

- **U.S. Fish and Wildlife Service** (letter dated April 28, 2017)[3]

  1. Based on the Service's database and records, known or endangered species that occur or transit through the vicinity of the proposed project area are the federally endangered Hawaiian hoary bat and threatened Newell's shearwater. Also within the project vicinity is the wedge-tailed shearwater, a species protected under the MBTA. There are no designated critical habitat present.
  2. Service BMPs for HDD enclosed with recommendation to incorporate relevant practices into project design.

- Hawaii Department of Accounting and General Services (letter from Roderick K. Becker, Comptroller, dated April 6, 2017)

  No comments at this time. Project does not impact any DAGS [Department of Accounting and General Services] project or existing facilities.

- **HDOH, Clean Water Branch** (letter from Alec Wong, Chief, dated April 7, 2017)

  1. A project that potentially impacts State waters must meet (1) antidegradation policy, (2) designated uses, and (3) water quality criteria.
  2. NPDES permit coverage may be required.
  3. Permit from USACE may be required.
  4. Compliance with State water quality standards is required.

[3] The USFWS letter was received in response to a request for a list of threatened and endangered species. This letter is reproduced in Appendix C. No follow-up response was provided.

5. All projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters; consider BMPs, consider green building practices; identify opportunities for bioengineering).

- **HDOH, Environmental Planning Office** (letter from Laura Leialoha Phillips McIntyre, Program Manager, dated April 17, 2017)

  1. Review State and Federal environmental health land use guidance.
  2. Updated GIS website provides maps and viewers for environmental health programs.
  3. Use of the Hawaii Environmental Health Portal is encouraged.
  4. Review requirements for NPDES permits.
  5. Wastewater plans must conform to HAR 11-62, Wastewater Systems. The Planning and Design Section of the Wastewater Branch has the right to review detailed wastewater plans for conformance to applicable rules.
  6. Injection walls used for subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to regulation per HAR 11-23, Underground Injection Control (UIC). A UIC permit must be issued before injection well operation occurs.
  7. Construction waste must be disposed of at a solid w[a]ste disposal facility that complies with HAR 11-58, Solid Waste Management Control.
  8. Review HEPA documents on the OEQC viewer.
  9. EPA's environmental justice mapping and screening tool combines environmental and demographic indicators.
  10. Information related to sea level rise changes in Hawaii are available online.

- **DLNR DAR** (memo from Bruce Anderson, Administrator, dated April 25, 2017)

  1. Project is not expected to have adverse impacts on the aquatic environment as there is no in-water construction activity.
  2. BMPs should be incorporated to minimize the potential for erosion, siltation, and pollution of the environment, particularly at the HDD launch and exit sites:
     (a) Lands denuded of vegetation should be planted or covered as quickly as possible.
     (b) Schedule site work, particularly open channel construction, during periods of minimal rainfall.
     (c) Prevent construction materials, petroleum products, debris, and landscaping products from falling, blowing, or leaching into the aquatic environment.
  3. Notify DAR of changes in project plans and provide an opportunity to review and comment on the changes.

- **DLNR Division of Boating and Ocean Recreation** (memo from Edward Underwood, Administrator, dated April 5, 2017)

  No comments

- **DLNR Office of Conservation and Coastal Lands** (letter from Samuel J. Lemmo, Administrator dated April 13, 2017)[4]

  A portion of the project area is in the Conservation District Resource Subzone (map attached)

  1. The p[ro]posed sewer force main may be considered an identified land use (Public Purpose Use) in the Conservation District. To apply for this use, a CDUA [Conservation District Use Application] must be completed and submitted for processing. A decision will be made by the Board.
  2. Project requires filing an EA.
  3. A public hearing will not be required.
  4. Project must comply with CZMA law regarding SMA requirements. The SMA use permit must be provided at least 30 days prior to Board action.

- **DLNR Engineering Division** (memo from Carty S. Chang, Chief Engineer, dated May 7, 2017)

  1. Project is required to comply with the rules and regulations of the National Flood Insurance Program (NFIP) when development falls within a designated Flood Hazard. The project property is responsible for researching the Flood Hazard zone designation. Local community flood ordinances may be more restrictive and take precedence over NFIP standards.

- **DLNR Land Division-Oahu District** (memo from Darlene Bryant-Takamatsu dated April 4, 2017)

  1. Any improvements on State land needs the approval of a land disposition from the Board of Land and Natural Resources.

- **HDOT** (letter from Ford N. Fuchigami, Director, dated May 23, 2017)

  1. A permit is required for work in the state highway ROW.

- Office of Hawaiian Affairs (letter from Kamana'opono M. Crabbe, Chief Executive Officer, dated May 1, 2017)

  1. No substantive comments at this time.
  2. Would like to review the Draft EA.
  3. Requests assurance that all work will case if cultural deposits are identified during ground altering activities and appropriate agencies contacted according to applicable law.

- **Office of Planning** (letter from Leo R. Asuncion, Director, dated April 10, 2017)

  1. The Draft EA should assess project conformance with the Hawaii State Plan.
  2. The Draft EA should assess project conformance with CZM objectives.
  3. Project is located within the SMA. Consult with DPP on procedures for SMA use.
  4. The Draft EA should examine potential negative results on coastal and marine resources during construction and operations. Consider OP's Stormwater Impact Assessment when evaluating project-related stormwater impacts.

- **Honolulu Department of Facility Maintenance** (letter from Ross S. Sasamura, Director, dated March 30, 2017)

  1. Peninsula off Nimitz Highway is leased to a private developer to build homes as a public-private venture under the Governor's Emergency Proclamation on homelessness.

[4] The OCCL letter was received in response to a request for determination of permitting requirement in the Conservation District. No follow-up response was provided.

2. Recommend contacting the developer (aio) and the Honolulu Department of Land Management.

- **Honolulu Fire Department** (letter from Socrates D. Bratakos, Assistant Chief, dated April 11, 2017)

  No significant impact to fire department services

- **Honolulu DPP** (letter from Kathy Sokugawa, Acting Director, dated April 28, 2017)

  1. New force main will be located in the SMA. Based on the project description, the work is considered "development" and a SMA perm[it] is required.
  2. The Draft EA should discuss consistency with the Oahu General Plan and Primary Urban Center Development Plan.
  3. The Planning Division should be contacted to determine whether a Public Infrastructure Map amendment is needed.
  4. The Draft EA should address potential impacts of area flooding and sea level rise.
  5. The Draft EA should discuss flooding, drainage, and mitigation measures to prevent runoff during construction.

- **Honolulu Police Department** (letter from Cary Okimoto, Acting Police Chief, dated April 4, 2017)

  No significant impact on the services or operations of the police department

- **Honolulu Authority for Rapid Transportation** (letter from Gregory T. Rapp, Project Manager, dated May 18, 2017)

  1. Force main considerations:
     (a) Casing is not required to cross the HART rail easement.
     (b) HART will provide the latest plans showing the layout of piles/columns.
     (c) There should be a minimum 10-foot clearance to the shafts.
     (d) There is no requirement for the force main crossing to be at 90 degrees to the HART easement.
     (e) System design will limit the potential for development of stray electrical currents.
  2. Coordination and protocol issues to be addressed at working meetings.

- **Honolulu Department of Transportation Services** (letter from Wes Frysztacki, Director, dated April 27, 2017)

  1. The Draft EA should include a Traffic Management Plan that discusses traffic impacts on surrounding City roadways and mitigation measures.
  2. HDOT should be informed of the temporary layout of pipeline adjacent to Nimitz Highway
  3. HART should be consulted because of proximity to the guideway.
  4. Existing roadway and sidewalk areas should be restored to original condition or better in the event of damage.
  5. Neighborhood Board, area residents, businesses, emergency personnel, OTS, etc. should be kept apprised of project details and impacts form project activities on adjoining local streets.
  6. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 AM to 3:30 PM) to minimize disruptions to traffic on local streets.

- **Honolulu BWS** (letter from Ernest Y.W. Lau, Manager and Chief Engineer, dated April 10, 2017)

  No comments

- **Hawaii Gas** (letter from Keith Yamamoto, Engineering Manager, dated April 3, 2017)
  1. Advisement that Hawaii Gas maintains an underground 16-inch utility gas line in the project vicinity serving commercial and residential customers
  2. Consider the presence of the gas line in project planning and design to minimize potential conflicts
  3. Map of gas line enclosed for information.

7.3 Distribution List for the Draft Environmental Assessment

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

7.3.1 Federal

- USACE
- USCG
- USFWS
- NMFS

7.3.2 State of Hawaii

- HDOH
- DLNR
- HDOT
- Office of Hawaiian Affairs
- Office of Planning
- State Historic Preservation Division
- State Representative Romy Cachola
- State Senator Glenn Wakai

7.3.3 City and County of Honolulu

- Department of Emergency Management
- Department of Emergency Services
- Department of Facility Maintenance
- Honolulu Fire Department
- Department of Land Management
- Department of Parks and Recreation
- DPP
- Honolulu Police Department
- Honolulu Authority for Rapid Transportation
- Department of Transportation Services
- Councilmember Joey Manahan
- Kalihi-Palama Neighborhood Board

7.3.4 Utilities

- Honolulu BWS
- HECO
- Hawaii Gas
- Hawaiian Telcom
- Oceanic Time Warner Cable

7.3.5 Other Stakeholders

- AIO Foundation/Kahauiki Village
- AIO/Centerline Solutions
- Keehi Memorial Organization
- TMK 12021036, JSR Equipment
- TMK 12012038, O'Bryan Incorporated c/o Weinberg Foundation
- TMK 12021015, 12021037, Weinberg Foundation
- TMK 12021040, Pestana Corporation c/o Bob's Equipment
- TMK 12021041, Robert's Central Laupahoehoe Inc.
- TMK 12021042 Ed Yamashiro

7.3.6 Public Library

- Kalihi-Palama Public Library

PRE-ASSESSMENT COMMENT AND RESPONSE LETTERS[5]

- Hawaii Department of Accounting and General Services
- Hawaii Department of Health, Clean Water Branch*
- Hawaii Department of Health, Environmental Planning Office*
- Hawaii Department of Land and Natural Resources, Division of Aquatic Resources*
- Hawaii Department of Land and Natural Resources, Division of Boating and Ocean Recreation
- Hawaii Department of Land and Natural Resources, Office of Conservation and Coastal Lands*
- Hawaii Department of Land and Natural Resources, Engineering Division*
- Hawaii Department of Land and Natural Resources, Land Division-Oahu District*
- Hawaii Department of Transportation*
- Office of Hawaiian Affairs*
- Office of Planning*
- Honolulu Department of Facility Maintenance*
- Honolulu Fire Department
- Honolulu Department of Planning and Permitting*
- Honolulu Police Department
- Honolulu Authority for Rapid Transportation*
- Honolulu Department of Transportation Services*
- Honolulu Board of Water Supply
- Hawaii Gas*

[5] Response letters were sent only to agencies that offered substantive comments (indicated by asterisk).

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.943.1133
Fax 808.954.4400

Name
Title
Organization
Address
City, State, Zip

April 21, 2017

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036
Pre-Assessment Consultation

Dear Name,

CH2M Hill is preparing environmental documentation and scoping permit requirements on behalf of the City and County of Honolulu, Department of Design and Construction (DDC) for proposed construction of a new sewer force main that would connect the Kamehameha Highway Wastewater Pump Station (WWPS) located at the corner of Keehi Lagoon Park to the Kapalama Interceptor Relief Sewer located at the Sand Island industrial area.

We are requesting comments and input regarding environmental concerns in all resource areas, and information that might assist in evaluating the project.

Project Location

The proposed project would involve constructing a new force main primarily by horizontal directional drilling (HDD) with a continuous tunnel passing under Moanalua Stream and Kalihi Stream, Keehi Lagoon Memorial Park, and the peninsula off Nimitz Highway that has been occupied by a paintball facility. The proposed force main alignment is shown in the attached *Figures 1 and 2, Proposed Alignment*.

Project Background and Purpose

The Kamehameha Highway WWPS was constructed and began operations in 1959. Originally, a 36-inch concrete cylinder pipe force main conveyed raw sewage from the WWPS. In 1997, the City constructed a 42-inch force main to replace the aging pipe with a history of breaks. The 1997 force main now serves as the active primary force main and the original 36-inch force main was abandoned in place. A Force Main Flow Diversion Plan, required for the Kamehameha Highway Force Main under the First Amended 2010 Wastewater Consent Decree, calls for the City to identify a means of diverting flows if the active force main fails.

The City undertook a comprehensive evaluation of alternatives for improving wastewater conveyance to meet the Consent Decree requirements. The preferred alternative forms the basis for the project description.

Project Description

Based on conceptual engineering, the new force main is estimated to extend for a total of 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by HDD and 800 linear feet would be installed using open trench construction. The portions of open trench construction are estimated to include approximately 200 feet on the east end and 600 feet on the west end and would connect the force main to the existing sewer system. No in-water construction activity is expected since the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. The proposed alignment and profile are shown in the attached *Figure 3, Preliminary Plan and Profile.*

The new pipe that is proposed to be installed using HDD would be high density polyethylene (HDPE) with an inner diameter of 36 inches to match the diameter of the existing, abandoned force main. The sections of pipe to be installed using open trench construction would be 36 inch HDPE or PVC pipe.

In addition to the pipeline alignment, major components of the project would include the following:

- Launch Site. The launch site is where the drill rig and ancillary equipment would be set up and drilling for the new pipeline would begin. The proposed launch site would be located in the industrial yard directly east of Kalihi Stream and is expected to occupy an area of approximately 25,000 square feet. The drill head would advance from this location westward to the receiving site. When the tunnel has been bored, the new HDPE pipe (laid out at the receiving end) would be pulled back through the tunnel.

- Receiving Site. The receiving site would be located in the northeast corner of Keehi Lagoon Beach Park (east of the tennis courts) and is expected to occupy an area of approximately 20,000 square feet.

- Temporary Layout of Pipeline. To construct the HDD portion of the pipeline, the 2,300 foot long HDPE pipe would need to be laid out in preparation for pull back through the bored hole. It is preferable to avoid stopping the pull back to accommodate an "intermediate" weld because there is a risk that the in-ground portion of pipe could become trapped in place, thereby complicating further advance. The current plan is to lay down the new pipe in two sections side by side, adjacent to Nimitz Highway. The pipe segments would not encroach into the Lagoon Drive intersection, but there are risks in execution due to the need for an "intermediate" weld to connect the two pipe segments together. The proposed layout is shown in the attached *Figure 4, HDD Pipe Layout Alignment*.

- Staging Areas and Construction Access. With the exception of temporary layout of the pipeline, all equipment staging and material storage would occur within the construction area at the launch and receiving sites. Access to the launch site would be through the industrial business area off Sand Island Access Road. Access to the receiving site would be through the Keehi Lagoon Beach Park driveway and parking lot.

Project Schedule

Construction of this project is expected to begin in the fourth quarter of 2018 and take approximately 12 months to complete.

Pre-Assessment Consultation

The DEA for this project is being prepared in accordance with Chapter 343, Hawai'i Revised Statutes. A copy of the draft document will be available for public review, and you will also have an opportunity to provide comments at that time.

We would appreciate preliminary comments sent to CH2M HILL by May 19, 2017. If you have questions, please contact me by phone at (808) 440-0208 or by email at tony.ali@ch2m.com, or Nancy Nishikawa, environmental planner, by phone at (808) 440-0272 or by email at nancy.nishikawa@ch2m.com
Mahalo.

Sincerely,

Tony Ali

Tony Ali
Project Manager

Enclosures

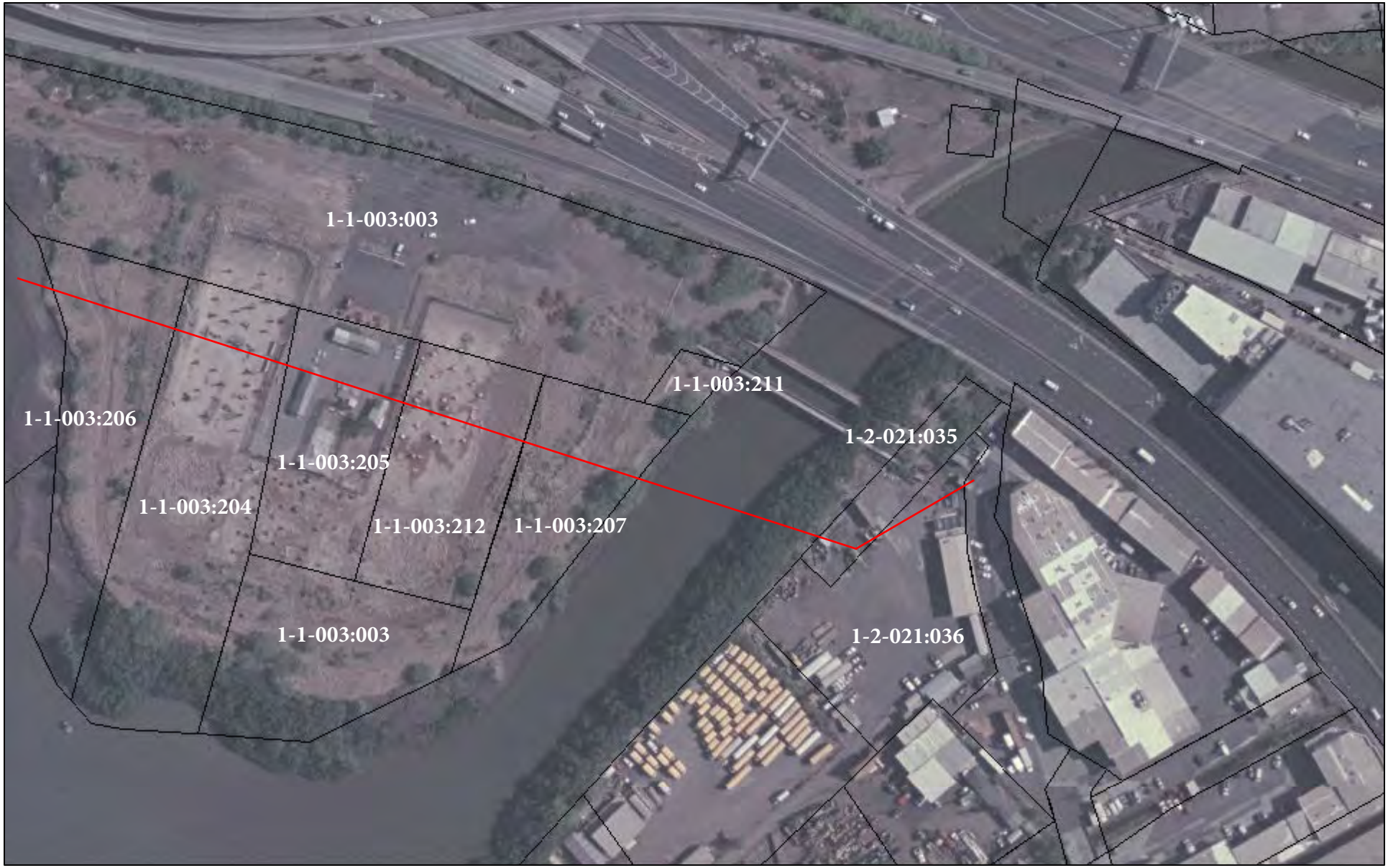
C: Kim Suzuki, DDC

August 31, 2016

Figure 1

New Kamehameha Highway Force Main - *Proposed* Alignment

———	Proposed New Force Main
SMH	Existing Sewer Discharge Manhole
KHPS	Kamehameha Highway Wastwater Pump Station



August 31, 2016

Figure 2

Proposed New Force Main

New Kamehameha Highway Force Main - *Proposed* Alignment

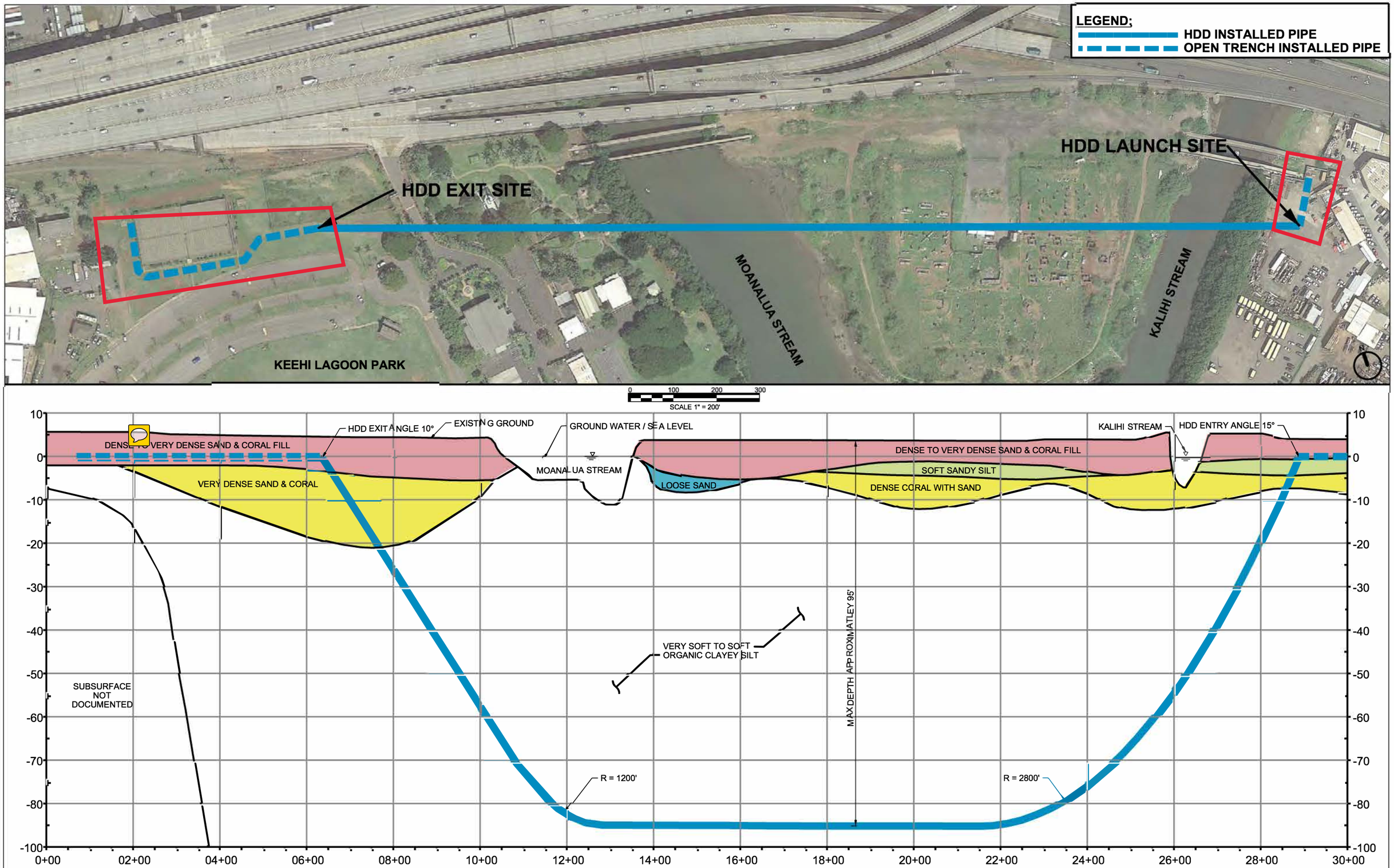
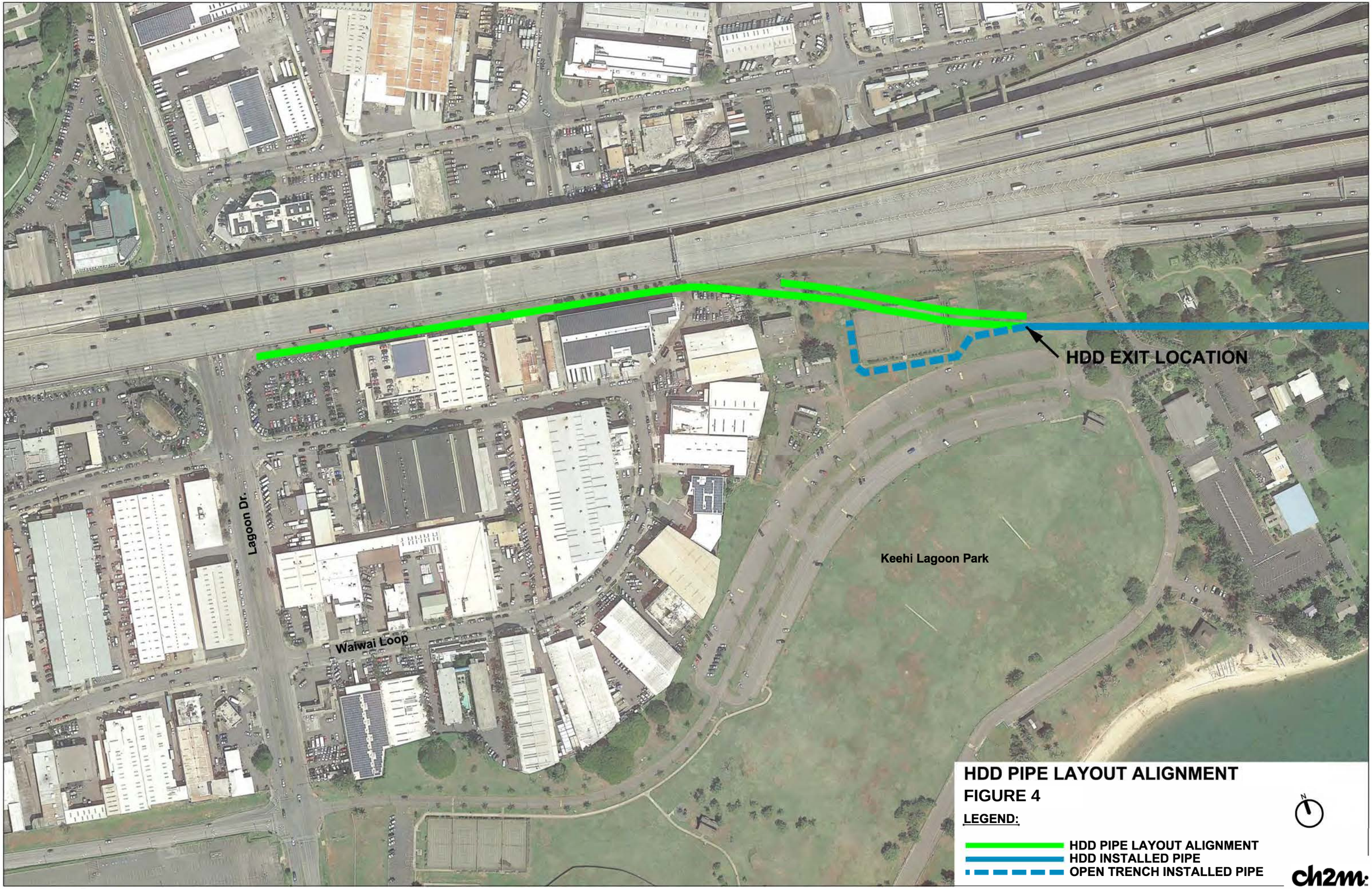


FIGURE 3. PRELIMINARY PLAN AND PROFILE

ch2m


HDD EXIT LOCATION
Keehi Lagoon Park
Lagoon Dr.
Waiwai Loop
HDD PIPE LAYOUT ALIGNMENT
FIGURE 4
LEGEND:
HDD PIPE LAYOUT ALIGNMENT
HDD INSTALLED PIPE
OPEN TRENCH INSTALLED PIPE
N
ch2m

DAVID Y. IGE
GOVERNOR

RODERICK K. BECKER
Comptroller

AUDREY HIDANO
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

APR 06 2017

RECEIVED

APR 10 2017

(P)1164.7

Mr. Tony Ali, Project Manager
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813-4307

Dear Mr. Ali:

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Pre Assessment Consultation
TMK: (1) 1-1-003:004, 138, 204-207, 212, 239 and 1-2-021:035 and 036

Thank you for the opportunity to comment on the subject project. Based on the information provided, we have no comments to offer at this time as the proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities.

If you have any questions, your staff may contact Mr. Kimo Marion of the Public Works Division at 586-0491.

Sincerely,

RODERICK K. BECKER
Comptroller

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD/CWB

04013PNN.17

April 7, 2017

Mr. Tony Ali
Project Manager
CH2M Hill
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

SUBJECT: Comments on the Pre-Assessment Consultation for the Proposed Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main Project
Honolulu, Island of Oahu, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated March 24, 2017, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water

cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

NN:ak

c: DOH-EPO [via e-mail Noella.Narimatsu@doh.hawaii.gov only]
Ms. Nancy Nishikawa, CH2M Hill [via e-mail nancy.nishikawa@ch2m.com only]

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Alec Wong
Chief
Clean Water Branch
Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Wong,

Thank you for sending early consultation comments by letter dated April 7, 2017.

We appreciate the information provided on permitting and water quality certification under State law and the federal Clean Water Act.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

EPO 17-073

April 17, 2017

Mr. Tony Ali, Project Manager
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813
Email: tony.ali@ch2m.com

Dear Mr. Ali:

SUBJECT: Pre-Assessment Consultation (PAC) for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main, Honolulu, Oahu
TMK: Portions of (1)1-1-003:004, 138, 204, 205, 206, 207, 212, 239; 1-2-021:035, 036

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your PAC to our office on March 28, 2017.

We understand from the PAC that *"The proposed project would involve constructing a new force main primarily by horizontal directional drilling (HDD) with a continuous tunnel passing under Moanalua Stream and Kalihi Stream, Keehi Lagoon Memorial Park, and the peninsula off Nimitz Highway that has been occupied by a paintball facility."*

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

Please note that all wastewater plans must conform to applicable provisions (HAR, Chapter 11-62, "Wastewater Systems"). We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: http://health.hawaii.gov/wastewater and contact the Planning and Design Section of the Wastewater Branch (WWB) at (808) 586-4294.

Injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting (HAR, Chapter 11-23, "Underground Injection Control {UIC}"). DOH approval must be obtained before any injection well construction commences. A UIC permit must be issued before any injection well operation occurs. For specific questions please email sdwb@doh.hawaii.gov or call (808) 586-4258.

Any construction waste generated by the project needs to be disposed of at a solid waste disposal facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. Additional information is accessible at: http://health.hawaii.gov/shwb. For specific questions call (808) 586-4226.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

Hawaii's climate is changing. Sea level rise and the associated coastal impacts have the potential to harm an array of natural and built environments in Hawaii. For additional information on projected sea level rise in Hawaii, EPO recommends that you visit the following informative links:

- State of Hawaii Climate Adaptation Portal: http://climateadaptation.hawaii.gov
- University of Hawaii, Manoa, School of Ocean and Earth Sciences and Technology, Coastal Geology Group: http://www.soest.hawaii.edu/coasts/index.html
- US Environmental Protection Agency – Climate Impacts on Coastal Areas: https://www.epa.gov/climate-impacts/climate-impacts-coastal-areas

We request that you utilize all this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

Mahalo nui loa,

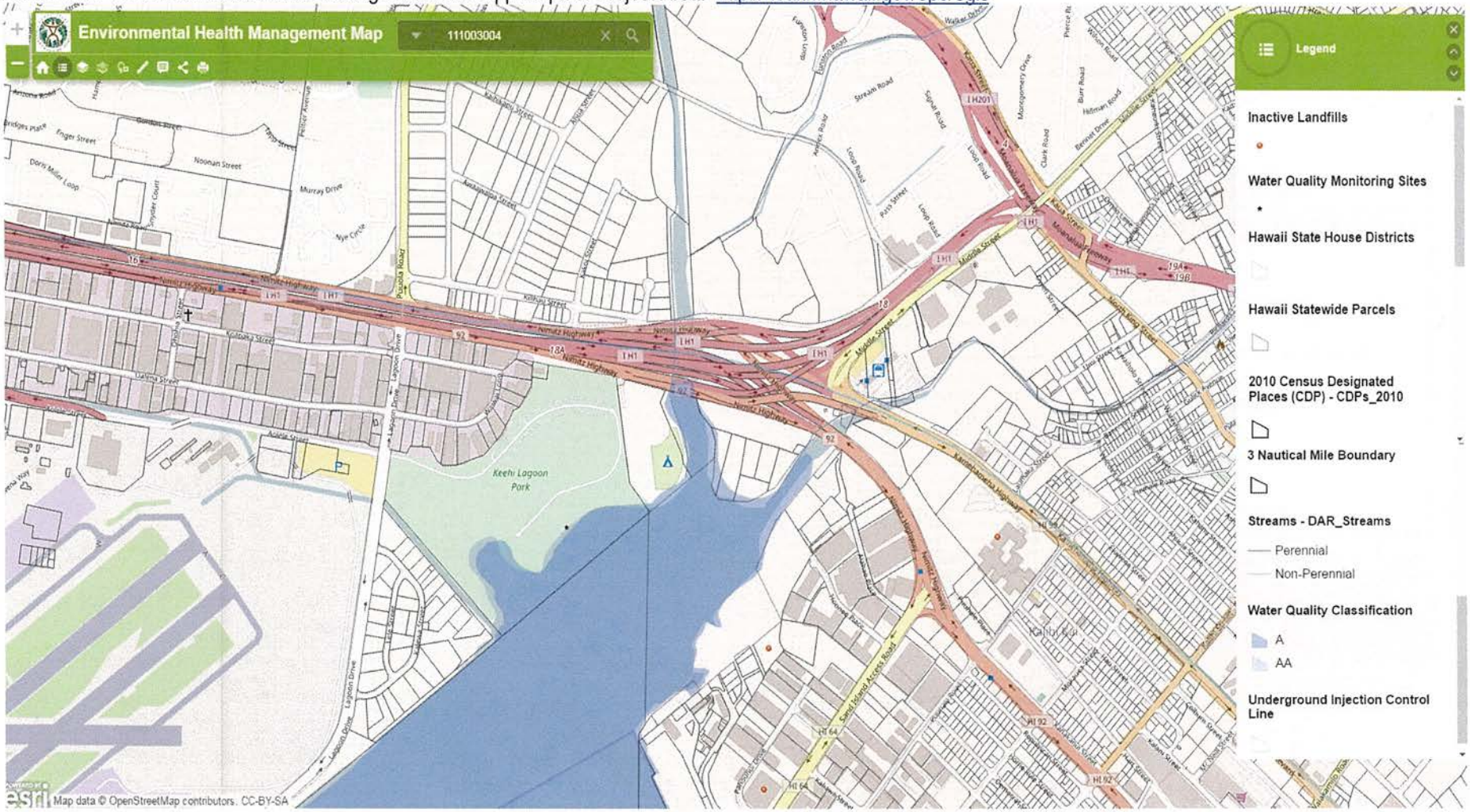
Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

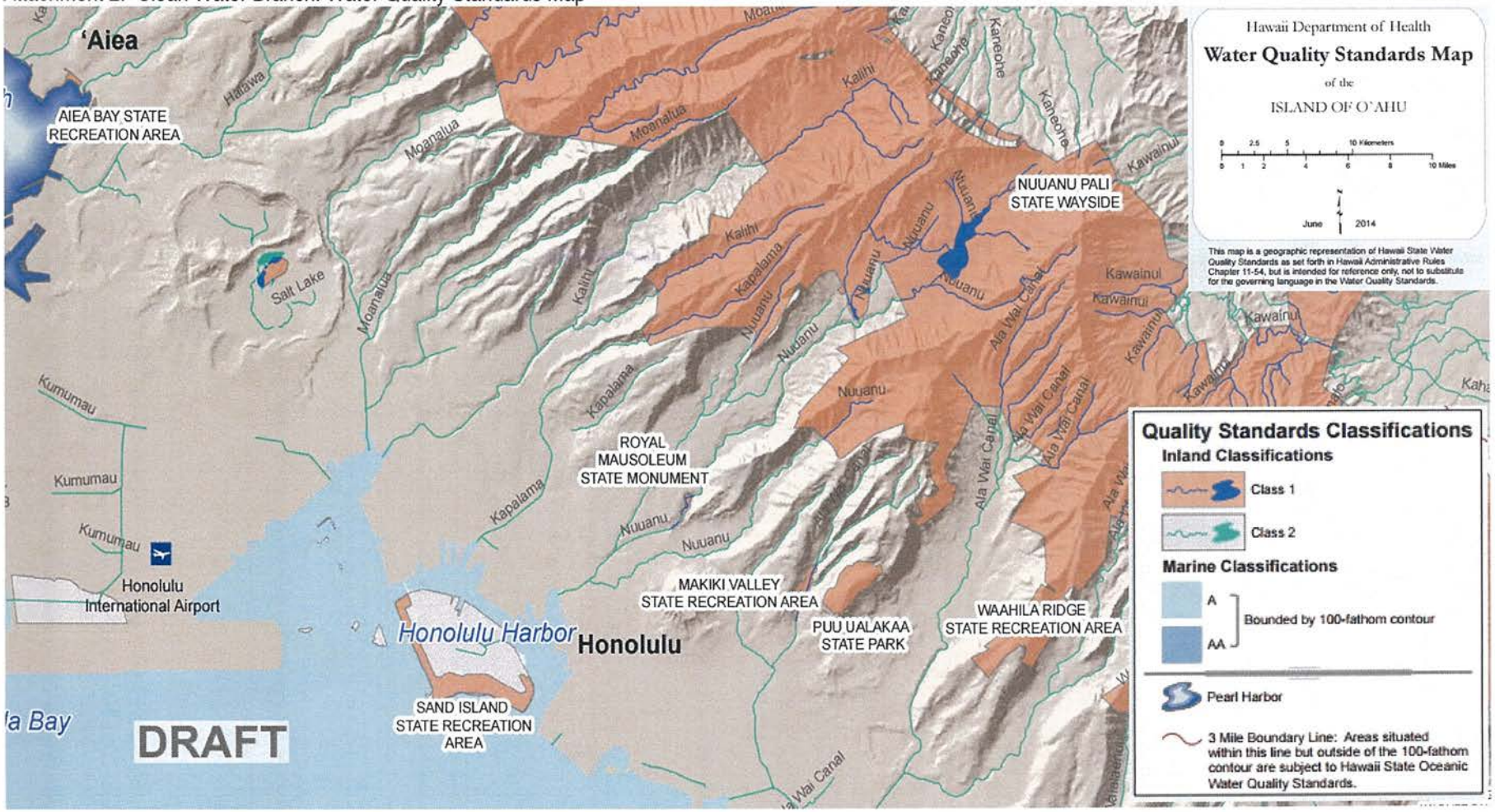
Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis
Attachment 2: Clean Water Branch: Water Quality Standards Map
Attachment 3: OEQC viewer (of past EA's, EIS's in area)
Attachment 4: U.S. EPA EJSCREEN Report for Project Area
Attachment 5: DOH CWB three (3) page letter dated April 7, 2017

c: DOH: WWB, CWB {via email only}

Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis



Attachment 2: Clean Water Branch: Water Quality Standards Map



Attachment 3: OEQC viewer (of past EA's, EIS's in area)

Attachment 4: U.S. EPA EJSCREEN Report for Project Area

EJSCREEN Report (Version 2016)

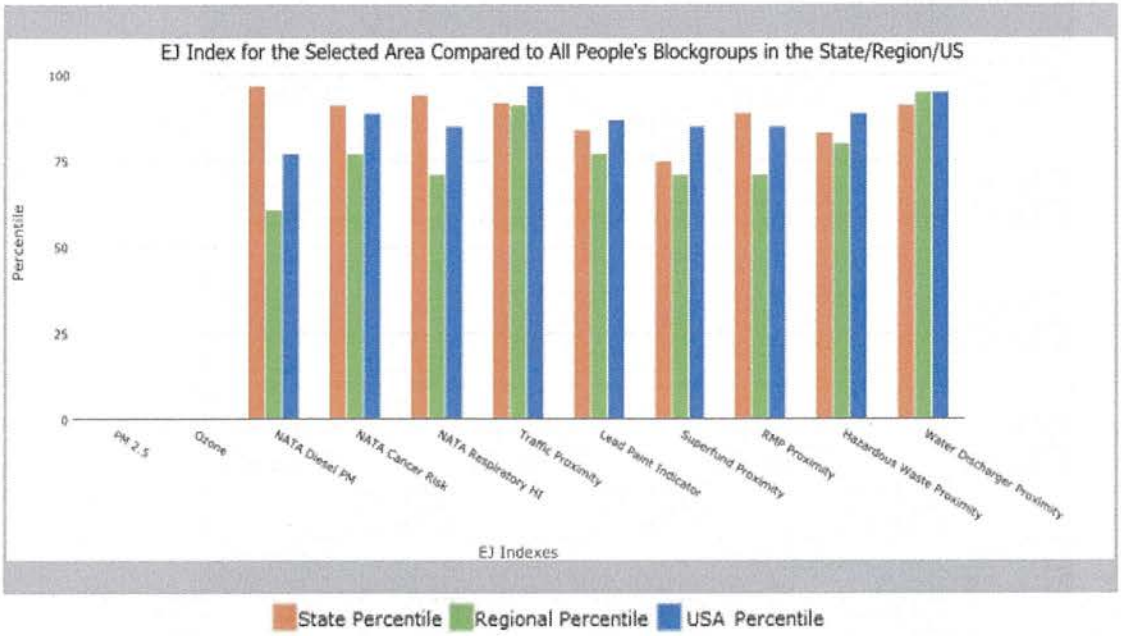
1 mile Ring Centered at 21.332401,-157.891652, HAWAII, EPA Region 9

Approximate Population: 15,613

Input Area (sq. miles): 3.14

(The study area contains 2 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	97	61	77
EJ Index for NATA* Air Toxics Cancer Risk	91	77	89
EJ Index for NATA* Respiratory Hazard Index	94	71	85
EJ Index for Traffic Proximity and Volume	92	91	97
EJ Index for Lead Paint Indicator	84	77	87
EJ Index for Superfund Proximity	75	71	85
EJ Index for RMP Proximity	89	71	85
EJ Index for Hazardous Waste Proximity†	83	80	89
EJ Index for Water Discharger Proximity	91	95	95



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.332401,-157.891652, HAWAII, EPA Region 9

Approximate Population: 15,613

Input Area (sq. miles): 3.14

(The study area contains 2 blockgroup(s) with zero population.)

March 29, 2017

Digitized Point

1:4,514

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0
National Pollutant Discharge Elimination System (NPDES)	0

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.332401,-157.891652, HAWAII, EPA Region 9

Approximate Population: 15,613

Input Area (sq. miles): 3.14

(The study area contains 2 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	N/A	N/A	N/A	9.37	N/A	9.32	N/A
Ozone (ppb)	N/A	N/A	N/A	51	N/A	47.4	N/A
NATA* Diesel PM (µg/m³)	0.502	0.149	95	0.978	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	52	34	94	43	80-90th	40	80-90th
NATA* Respiratory Hazard Index	1.9	1	92	2	50-60th	1.8	60-70th
Traffic Proximity and Volume (daily traffic count/distance to road)	2700	990	89	1100	88	590	95
Lead Paint Indicator (% Pre-1960 Housing)	0.27	0.16	74	0.24	62	0.3	57
Superfund Proximity (site count/km distance)	0.083	0.098	67	0.15	57	0.13	60
RMP Proximity (facility count/km distance)	0.37	0.19	88	0.57	64	0.43	70
Hazardous Waste Proximity+ (facility count/km distance)	0.16	0.14	83	0.14	77	0.11	82
Water Discharger Proximity (facility count/km distance)	0.64	0.34	84	0.2	94	0.31	88
Demographic Indicators							
Demographic Index	60%	52%	74	47%	68	36%	81
Minority Population	91%	77%	74	58%	84	37%	91
Low Income Population	28%	26%	59	36%	42	35%	43
Linguistically Isolated Population	23%	6%	93	9%	87	5%	94
Population With Less Than High School Education	22%	9%	92	17%	66	14%	79
Population Under 5 years of age	8%	6%	68	7%	62	6%	66
Population over 64 years of age	10%	15%	27	13%	50	14%	39

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

+ The hazardous waste environmental indicator and the corresponding EJ index will appear as N/A if there are no hazardous waste facilities within 50 km of a selected location.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Ms. Laura Phillips McIntyre
Program Manager
Environmental Planning
Office Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Ms. McIntyre,

Thank you for sending early consultation comments by letter dated April 17, 2017.

We acknowledge the information provided on the availability of updated maps and viewers for environmental health programs, the Hawaii Environmental Health Portal, access to HEPA documents through the OEQC viewer, EPA environmental justice mapping and screening tool, and information on sea level rise. We also appreciate references to administrative rules that are applicable or potentially applicable to the project, including HAR 11-62, Wastewater Systems; HAR 11-23, Underground Injection Control; and HAR 11-58, Solid Waste Management Control.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 28, 2017

CH2M Hill
Attention: Mr. Tony Ali, Project Manager
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

via email: tony.ali@ch2m.com

Dear Mr. Ali:

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent you on April 27, 2017, enclosed are comments from the Division of Aquatic Resources on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
APR 03 2017
Division of Aquatic Resources
DAR 5598

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 30, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

JKV
ZOV
GHV

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main
LOCATION: Honolulu, Island of Oahu; TMK: (1) 1-1-003:004, 138, 204-207, 212 and 239; 1-2-021:035 and 036
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **April 26, 2017.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: Bruce S. Anderson
Bruce S. Anderson, Ph.D., DAR Administrator
Print Name:
Date: 4-25-17

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

April 24, 2017

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
2017 APR 24 AM 10:52
RECEIVED LAND DIVISION

DAR # 5508

MEMORANDUM

TO: Bruce Anderson, Administrator
DATE: 4-25-17
FROM: Glenn Higashi, Aquatic Biologist GKH

SUBJECT: Request for Comments: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main, Honolulu, Oahu

Comment	Date Request	Receipt	Referral	Due Date
	03/30/17	04/03/17	04/05/17	04/26/17

Requested by: Russell Y. Tsuji, Land Administrator
Land Division

Summary of Proposed Project

Title: Request for Comments: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main, Honolulu, Oahu

Project by: City and County of Honolulu, Department of Design and Construction

Location: Tax Map Key: (1) 1-1-003:004, 138, 204-207, 212 and 239; 1-2-021:035 and 036

Brief Description:

The applicant, City and County of Honolulu, Department of Design and Construction is proposing to construct a new force main primarily by horizontal directional drilling (HDD) with a continuous tunnel passing under Moanalua Stream and Kalihi Stream, Keehi Lagoon Memorial Park, and the peninsula off Nimitz Highway that has been occupied by a paintball facility. The proposed force main alignment is on the makai side of Nimitiz Highway and is estimated to extend for a total of 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by HDD and 800 linear feet would be installed using open trench construction. The portions of open trench construction are estimated to include approximately 200 feet on the east end and 600 feet on the west end and would connect the force main to the existing sewer system. No in-water construction activity is expected since the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams.

The new pipe that is proposed to be installed using HDD would be high density polyethylene {HDPE) with an inner diameter of 36 inches to match the diameter of the existing, abandoned force main. The sections of pipe to be installed using open trench construction would be 36 inch HDPE or PVC pipe.

In addition to the pipeline alignment, major components of the project would include the following:

- Launch Site. The launch site is where the drill rig and ancillary equipment would be set up and drilling for the new pipeline would begin. The proposed launch site would be located in the industrial yard directly east of Kalihi Stream and is expected to occupy an area of approximately 25,000 square feet. The drill head would advance from this location westward to the receiving site. When the tunnel has been bored, the new HDPE pipe {laid out at the receiving end) would be pulled back through the tunnel.
- Receiving Site. The receiving site would be located in the northeast corner of Keehi Lagoon Beach Park (east of the tennis courts) and is expected to occupy an area of approximately 20,000 square feet.
- Temporary Layout of Pipeline. To construct the HDD portion of the pipeline, the 2,300 foot long HDPE pipe would need to be laid out in preparation for pull back through the bored hole. It is preferable to avoid stopping the pull back to accommodate an "intermediate" weld because there is a risk that the in-ground portion of pipe could become trapped in place, thereby complicating further advance. The current plan is to lay down the new pipe in two sections side by side, adjacent to Nimitz Highway. The pipe segments would not encroach into the Lagoon Drive intersection, but there are risks in execution due to the need for an "intermediate" weld to connect the two pipe segments together.
- Staging Areas and Construction Access. With the exception of temporary layout of the pipeline, all equipment staging and material storage would occur within the construction area at the launch and receiving sites. Access to the launch site would be through the industrial business area off Sand Island Access Road. Access to the receiving site would be through the Keehi Lagoon Beach Park driveway and parking lot.

Comments:

The proposed project is not expected to have adverse impacts on the aquatic environment as there is no in-water construction activity expected since the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. Also, the open trench construction of approximately 800 feet are not in close proximity to the aquatic environments. However, the following Best Management Practices (BMPs) should still be incorporated to minimize the potential for erosion, siltation and pollution of the aquatic environment particularly at the HDD Launch and Exit Sites:

1) Lands denuded of vegetation should be planted or covered as quickly as possible to prevent further erosion and soil from falling or flowing into the stream environment;
2) Scheduling site work (particularly the open channel construction) during periods of minimal rainfall; and
3) Prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment.

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

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Dr. Bruce Anderson, Administrator
Division of Aquatic Resources
Department of Land and Natural Resources
1151 Punchbowl Street, Room 330
Honolulu, HI 96813

Attention: Mr. Glenn Higashi, Aquatic Biologist

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Dr. Anderson,

Thank you for sending early consultation comments by memorandum dated April 24, 2017.

We offer the following in response to your comments:

1. We acknowledge your comment that the project is not expected to have adverse impacts on the aquatic environment because horizontal directional drilling will not involve in-water construction.
2. BMPs regarding revegetation of exposed soils and measures to prevent pollutants from entering the aquatic environment will be included in the project specifications and construction documents. Because the project has a tight deadline imposed by the Consent Decree, scheduling open trenching during the drier season may not be fully achievable. However, to reduce the potential for soil erosion, the length of trenching underway at any time will be limited to the extent practicable.
3. Your office will be consulted in the event of significant design change.

We will notify your office when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
2017 APR -7 AM 11:36
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 30, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main
LOCATION: Honolulu, Island of Oahu; TMK: (1) 1-1-003:004, 138, 204-207, 212 and 239; 1-2-021:035 and 036
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **April 26, 2017.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: Edward R Underwood

Print Name: Edward R Underwood
Date: 4/5/17

cc: Central Files

MAR31'17PM 1:31BOR ADM

RECEIVED

APR 20 2017

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

COR: OA-17-175

APR 13 2017

Nancy Nishikawa
c/o CH2M Hill
1132 Bishop St., Ste. 1100
Honolulu, HI 96813

SUBJECT: **REQUEST FOR INFORMATION REGARDING PERMITTING AND APPROVAL REQUIREMENTS FOR A PROPOSED SEWER FORCE MAIN**
Honolulu District, Island of Oahu
TMK: (1) 11003:004, 138, 204-207, 212, & 239; and 112021:035 & 036

Dear Ms. Nishikawa,

The Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter requesting information on permitting and/or approval requirements for a proposed new Sewer Force Main. For reference, a portion of the proposed project area is located within the State Land Use (SLU) Conservation District *Resource* Subzone (**Exhibit 1**).

According to our files, Conservation District Use Permit (CDUP) OA-2550 was approved by the Board of Land and Natural Resources (BLNR) in September, 1992 for a Sewer Force Main in this area. Based on the information provided, the existing Sewer Force Main is the active primary force main; this current proposed project is being pursued in order to satisfy the *First Amended 2010 Wastewater Consent Decree*, which calls for the City and County of Honolulu to identify a means of diverting flows if the active force main fails.

1. Based on the preceding request, the OCCL believes that the proposed sewer force main may be considered an identified land use in the Conservation District pursuant to Hawaii Administrative Rules (HAR) §13-5-22, P-6 **PUBLIC PURPOSE USES** (D-1) *Not for profit land uses undertaken in support of a public service by an agency of the county, state, or federal government, or by an independent non-governmental entity, except that an independent non-governmental regulated public utility may be considered to be engaged in a public purpose use. Examples of public purpose uses may include, but are not limited to public roads, marinas, harbors, airports, trails, water systems and other utilities, energy generation from renewable resources, communication systems, flood or erosion control projects, recreational facilities, community centers, and other public purpose uses, intended to benefit the public in accordance with public policy and the purpose of the conservation district*. In order to apply for this use, you will be required to submit a

completed Conservation District Use Application (CDUA) and all associated documents for review and processing. Please note that the final decision to approve or deny your application will rest with the BLNR;

2. In conformance with §343, Hawaii Revised Statutes (HRS), as amended, and HAR, §11-200-8, this proposed project will require the filing of an Environmental Assessment (EA).

3. Pursuant to HAR §13-5-40 Hearings, a public hearing will not be required; and

4. Please be informed that, the applicant's responsibility includes complying with the provisions of Hawaii's Coastal Zone Management law (Chapter 205A, Hawaii Revised Statures) that pertain to the Special Management Area (SMA) requirements administered by the various counties. Negative action by the Chair of the BLNR on this application can be expected should you fail to obtain and provide us, at least thirty (30) days prior to Chairpersons action, one of the following from the appropriate county:

   - An official determination that the proposal is exempt from the provisions of the county rules relating to the SMA;
   - An official determination that the proposed development is outside the SMA; or
   - An SMA Use Permit for the proposed development.

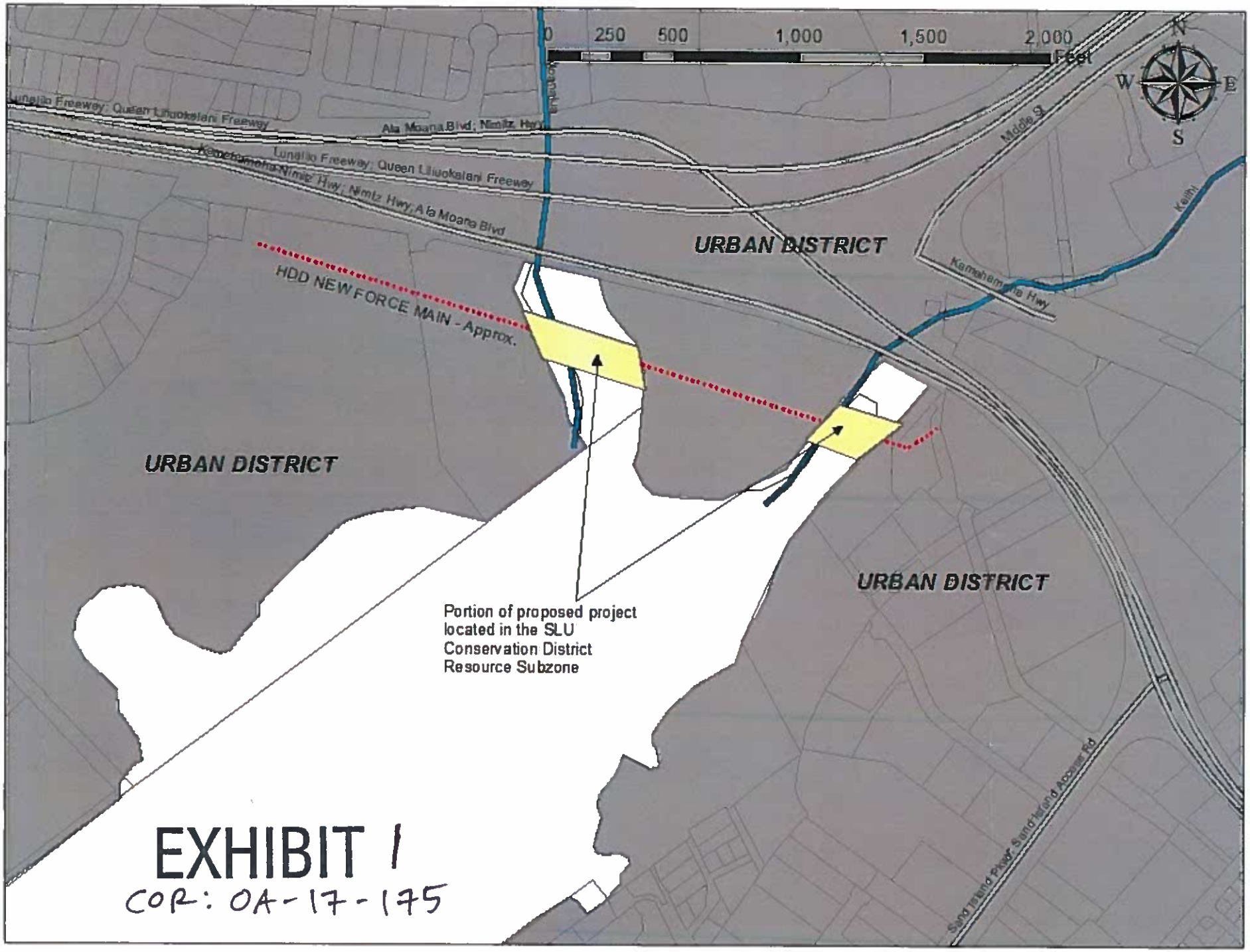
If you have any questions regarding this letter, please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at 808-587-0316.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

Attachments: Exhibit 1 – GIS Map of approx. project site

CC: *ODLO*
CWRM
DOH
DAR
DOBOR
City and County of Honolulu – ENV
City and County of Honolulu – DPP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Lunalilo Freeway; Queen Liliuokalani Freeway
Ala Moana Blvd; Nimitz Hwy
Lunalilo Freeway; Queen Liliuokalani Freeway
Kamehameha Hwy; Nimitz Hwy; Ala Moana Blvd
Middle St
Kalihi
Kamehameha Hwy
URBAN DISTRICT
HDD NEW FORCE MAIN - Approx.
URBAN DISTRICT
URBAN DISTRICT
Portion of proposed project
located in the SLU
Conservation District
Resource Subzone
Sand Island Pkwy; Sand Island Access Rd
EXHIBIT 1
COR: OA-17-175

DAVID Y. IGE
GOVERNOR OF HAWAII

'17 APR 10 A10:29 ENGINEERING

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2017 APR 10 AM 11:02
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

March 30, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
From: X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: To: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main
LOCATION: Honolulu, Island of Oahu; TMK: (1) 1-1-003:004, 138, 204-207, 212 and 239; 1-2-021:035 and 036
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **April 26, 2017**.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: _____

Print Name: Carty S. Chang, Chief Engineer
Date: 4/7/17

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Pre-assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a designated Flood Hazard.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zone designations can be found using the Flood Insurance Rate Map (FIRM), which can be accessed through the Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may take precedence over the NFIP standards as local designations prove to be more restrictive. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 4/7/17

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Carty S. Chang
Chief Engineer
Engineering Division
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Chang,

Thank you for sending early consultation comments by memorandum dated May 7, 2017.

We acknowledge the information provided. The Draft Environmental Assessment will address potential impacts related to flood designations in the project area. Additionally, the project will comply with all applicable federal and local flood hazard requirements.

Your office will be notified when the document is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 30, 2017

RECEIVED
LAND DIVISION
2017 APR -4 PM 2:52
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main
LOCATION: Honolulu, Island of Oahu; TMK: (1) 1-1-003:004, 138, 204-207, 212 and 239; 1-2-021:035 and 036
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **April 26, 2017.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

Any improvements on State Land needs the approval of a Land disposition from the Board of Land and Natural Resources.

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: Darlene Bryant-Takamatsu

Print Name: Darlene Bryant-Takamatsu
Date: 4/4/17

cc: Central Files

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Ms. Darlene Bryant-Takamatsu
Land Division, Oahu District
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Ms. Bryant-Takamatsu,

Thank you for sending early consultation comments by memorandum dated April 4, 2017.

We acknowledge that land disposition approval from the Board of Land and Natural Resources is needed for improvements on State land. The project will submit a request for right-of-entry to construct the project on State land and obtain an easement for access and maintenance.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

DAVID Y. IGE
GOVERNOR

RECEIVED

MAY 26 2017

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO
DIR 0477
HWY-CM 2.4805

May 23, 2017

Mr. Tony Ali
CH2M HILL
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main Pre-Assessment Consultation

Thank you for the opportunity to provide preliminary comments for the subject project.

A permit from the Department of Transportation, Highways Division, will be required for working in the State highway right-of-way. Please submit construction plans for review when available.

Should you have any questions, please call Mr. John Williams, Acting Engineering Program Manager, Construction and Maintenance Branch, Highways Division, at (808) 587-2183 or email at John.Williams@hawaii.gov.

Sincerely,

FORD N. FUCHIGAMI
Director of Transportation

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Ford N. Fuchigami
Director
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Fuchigami,

Thank you for sending early consultation comments by letter dated May 23, 2017.

We acknowledge that any work in the State highway right-of-way will need to be permitted. Our project team will coordinate further with the Highways Division-Oahu District and provide construction plans for review when available.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

RECEIVED

MAY 24 2017

PHONE (808) 594-1888

FAX (808) 594-1938

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

HRD17-8151

May 1, 2017

Tony Ali
Project Manager
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813

Re: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Moanalua Ahupua'a, Kona District, O'ahu Island
Tax Map Key: (1) 8-6-001:044

Aloha e Tony Ali:

The Office of Hawaiian Affairs (OHA) is in receipt of your letter dated March 24, 2017, seeking pre-assessment consultation. According to your letter, the City and County of Honolulu proposes to construct a new sewer force main that will connect the Kamehameha Highway Wastewater Pump Station (WWPS) located at the corner of Ke'ehi Lagoon Park to the Kapālama Interceptor Relief Sewer located at Sand Island industrial area. The project improvements include:

- New force main is estimated to extend for a total of 3,100 linear feet;
- 2,300 linear feet of this length would be installed by horizontal directional drilling and 800 linear feet would be installed using open trench construction;
- Portions of open trench construction are estimated at 200 feet on the east end and 600 feet on the west end and would connect the force main to the existing sewer system;
- Rehabilitation of the grit removal system and pre-aeration tanks and channels, upgrade dewatering system, and
- Replacement of the digester covers, digester mixing system, and waste gas handling

The new pipe being proposed will be installed using horizontal directional drilling using high density polyethylene with an inner diameter of 36 inches to match the diameter of the existing, abandoned force main.

OHA recognizes the importance of this project and has no substantive comments at this time. We look forward to reviewing the draft environmental assessment as it becomes available. OHA does request assurances that should iwi kūpuna or Native Hawaiian cultural deposits be identified during ground altering activities, all work will immediately cease and he appropriate agencies, including OHA, will be contacted pursuant to applicable law.

We would like to emphasize that the proposed project runs along the coastline which is an area with traditionally high concentrations of pre-contact habitation as well as areas in which sub-surface cultural resources exist, including ancestral Native Hawaiian burials. This should be taken into account during project planning, and in the development of archaeological investigation and monitoring plans.

Thank you for the opportunity to comment. Should you have any questions, please contact Kathryn Keala at (808) 594-0272 or kathyk@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:kk

Please address replies and similar, future correspondence to our agency:

Dr. Kamana'opono Crabbe
Attn: OHA Compliance Enforcement
560 N. Nimitz Hwy, Ste. 200
Honolulu, HI 96817

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Dr. Kamana'opono M. Crabbe
Ka Pouhana, Chief Executive Officer
Office of Hawaiian Affairs
560 N. Nimitz Highway, Suite 200
Honolulu, HI 96817

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Dr. Crabbe,

Thank you for sending early consultation comments by letter dated May 1, 2017.

We acknowledge that you have no substantive comments on the project at this time.

Please note, however, that that the fourth and fifth bullets in your letter (regarding rehabilitation and replacement of various processing equipment) are not actions included in the subject project.

The project specifications and contract documents will require compliance with all laws regarding the discovery of cultural deposits.

We will notify your office when the Draft Environmental Assessment is available at the outset of the public review and comment period. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

Ref. No. P-15565

April 10, 2017

Mr. Tony Ali
Project Manager
CH2M HILL
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

Subject: Pre-Assessment Consultation - Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main, Honolulu, Hawaii
TMK: Portions of (1) 1-1-003:004, 138, 204, 205, 206, 207, 212, 239; and (1) 1-2-021: 035 and 036

Thank you for the opportunity to provide comments on this pre-assessment consultation request for the Kamehameha Highway Wastewater Pump Station's force main project. The early consultation review material was transmitted to our office via letter dated March 24, 2017.

It is our understanding the City and County of Honolulu, Department of Design and Construction proposes the installation and alignment of a new sewer force main that would connect the Kamehameha Highway Wastewater Pump Station to the Kapalama Interceptor Relief Sewer located within the Sand Island industrial area. The construction of the force main will involve horizontal directional drilling and open trench construction to enable a sewage force main to pass under Moanalua Stream, Kalihi Stream, Keehi Lagoon Memorial Park, and the Nimitz Highway Peninsula.

No construction activity is expected within the waters of the two streams or Keehi Lagoon. The pipeline would be pulled through the constructed tunnel without impacting water and marine resources. In addition to the pipeline alignment, the project will require the construction of a launch site and receiving site, a temporary layout of pipeline area, a staging area, and construction access.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Pursuant to Hawaii Administrative Rules (HAR) § 11-200-10(4) – general description of the action's technical, economic, social, and environmental characteristics; this project must demonstrate that it is consistent with a number of state environmental,

social, economic goals, and policies for land use. Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Planning Act, provides goals, objectives, policies, and priority guidelines for growth, development, and the allocation of resources throughout the state in areas of state interest.

The analysis on the Hawaii State Planning Act should include a discussion on the project's ability to meet all of the goals, objectives, policies, and priority guidelines or clarify where it is in conflict with them. If any of these themes are not applicable to the project, the Draft Environmental Assessment (Draft EA) should affirmatively state such determination followed by discussion paragraphs.

2. The coastal zone management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (see HRS § 205A-1).

   HRS Chapter 205A-5(b) requires all state and county agencies to enforce the CZM objectives and policies. The Draft EA should include an assessment as to how the proposed action conforms to the goals and objectives of the Hawaii CZM program as listed in HRS § 205A-2. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. The project site is located within the Special Management Area (SMA) of the City and County of Honolulu. Please consult with the Department of Planning and Permitting, City and County of Honolulu on the procedures for SMA use.

4. Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; in order to ensure that the water and marine resources of the south shore of Oahu remain protected, the negative effects of stormwater inundation to the project area and its surroundings should be evaluated in the Draft EA.

   The Draft EA should examine potential negative impacts resulting from this project on coastal and marine resources during construction and operational phase. Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, streams and wetlands, and soil absorption characteristics. These items, as well as the marine water quality classification, should be considered when developing mitigation measures for the protection of surface water resources and coastal ecosystem, pursuant to HAR § 11-200-10(7) – propose mitigation.

This project may benefit from the use of OP's Stormwater Impact Assessment. This document can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff. This guidance may also assist in formulating mitigation goals, and strategies, as well as integrating stormwater impact mitigation within the planning and environmental review process. This document can be viewed at http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf.

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

Sincerely,

Leo R. Asuncion
Director

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Leo R. Asuncion
Director
Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, HI 96813

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Asuncion,

Thank you for sending early consultation comments by letter dated April 10, 2017.

We offer the following in response to your comments:

1. The Draft Environmental Assessment (EA) will discuss consistency with the Hawaii State Plan.
2. The Draft EA will also discuss consistency with Coastal Zone Management objectives.
3. The Honolulu Department of Planning and Permitting has determined that a Special Management Area use permit (major) will be needed and, as such, will be identified as a required permit in the Draft EA.
4. The Draft EA will address potential impacts on resources and conditions in the coastal environment.
5. We appreciate the Office of Planning's Stormwater Impact Assessment as an environmental planning resource.

Your office will be notified when the Draft EA is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

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

RECEIVED
APR 03 2017

IN REPLY REFER TO:
17-085

March 30, 2017

Mr. Tony Ali, Project Manager
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii

Dear Mr. Ali:

Thank you for allowing us the opportunity to review subject project pre-assessment consultation. We provide the following comments:

Project Location – The peninsula off Nimitz Highway that has been occupied by a paintball facility is now leased to a private developer (aio) to build 200 "Komatsu Modular" homes as a Public Private Venture under the Governor's Emergency Proclamation on homelessness. The point of contact for aio is Mr. Duane Kurisu at 523-5644, while the point of contact for the City's Department of Land Management (DLM) is Ms. Sandy Pfund at 768-4291. Figures 1 and 2 show the proposed new sewer force main alignment is traversing the proposed housing development site. We strongly recommend CH2M to make contact with the developer and City's DLM.

Thank you again for allowing us to review and provide our preliminary comments. We look forward for continued dialogue and exchange of information to allow our planned projects proceed smoothly and mitigate future conflicts.

Sincerely,

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

cc: Ms. Kim Suzuki – Department of Design and Construction
Ms. Sandy Pfund – Department of Land Management

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Ross Sasamura
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Ulu'ohia Street, Suite 215
Kapolei, HI 96707

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Sasamura,

Thank you for sending early consultation comments by letter dated March 30, 2017.

As recommended in your letter, we have reached out to the developers of the Kahauiki Village Project and to Ms. Sandy Pfund of the Department of Land Management. Our project team met with the partners developing Kahauiki Village on two occasions and there is ongoing coordination and information exchange between the projects. I especially wish to extend my appreciation to Mr. Tim Houghton for his assistance in facilitating one of the meetings.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

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

April 11, 2017

Mr. Tony Ali
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

Subject: Preassessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Tax Map Keys: 1-1-003: 004, 138, 204, 205, 206, 207, 212, and 239
1-2-021: 035 and 036

In response to your letter dated March 24, 2017, regarding the above-mentioned subject, the Honolulu Fire Department determined that there will be no significant impact to fire department services.

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

Sincerely,

SOCRATES D. BRATAKOS
Assistant Chief

SDB/SY:bh

RECEIVED

MAY 01 2017

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

KIRK CALDWELL
MAYOR

2017/ELOG-701(JD)

April 28, 2017

Mr. Tony Ali
CH2M
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

SUBJECT: Request for Comments
Pre-Assessment for Draft Environmental Assessment (EA)
Kamehameha Highway Wastewater Pump Station (WWPS)
New 36-inch Force Main – Honolulu
Tax Map Keys: Portions of 1-1-003: 004, 138, 204, 205, 206, 207, 212, 239; and 1-2-021: 035 and 036

This responds to your request for comments, received March 28, 2017, on the forthcoming Draft EA. The Project is to install a new 36-inch-diameter, 3,100-linear foot-long sewer force main south of Nimitz Highway, across the subject parcels. We have reviewed the Project summary and have the following comments:

1. The new sewer force main will be located within the Special Management Area (SMA). Additionally, the launch and receiving sites are located within the SMA and will be used as staging areas for equipment and material storage and construction access areas. Based on the description, the work is considered "development" for purposes of the SMA. Therefore, an SMA Permit is required. Pursuant to Chapter 25 of the Revised Ordinances of Honolulu, if the cumulative cost of the improvements exceeds $500,000, a Major SMA Use Permit will be required.

2. The Draft EA should discuss the consistency of the Project with the Oahu General Plan and the Primary Urban Center Development Plan.

3. We recommend that you consult with our Planning Division to determine whether a Public Infrastructure Map Amendment is required.

4. The Draft EA should address any potential impacts that area flooding and sea level rise will have on the proposed improvements.

5. The Draft EA should discuss flooding, drainage, and mitigative measures to prevent runoff from the Project site during construction.

Should you have any questions, please contact Jordan Dildy of our Zoning Regulations and Permits Branch at 768-8027 or by email at jdildy@honolulu.gov.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Ms. Kathy Sokugawa
Acting Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Ms. Sokugawa,

Thank you for sending early consultation comments by letter dated April 28, 2017.

We offer the following in response to your comments:

1. The Special Management Area use permit (major) will be obtained for this project.
2. The Draft Environmental Assessment (EA) will discuss consistency with the General Plan and Primary Urban Center Development Plan.
3. The project team is in contact with Mr. Eugene Takahashi, Planning Division, regarding a potential requirement to amend the Public Infrastructure Map.
4. Potential flooding and sea level rise impacts will be addressed in the Draft EA.
5. Flooding, drainage, and storm water management impacts and mitigation measures will also be addressed.

Your office will be notified when the Draft EA is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

~~LOUIS M. KEALOHA~~
CHIEF

CARY OKIMOTO
JERRY INOUYE
DEPUTY CHIEFS

OUR REFERENCE MT-DK

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APR 10 2017

April 4, 2017

Mr. Tony Ali
Project Manager
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

This is in response to your letter dated March 24, 2017, requesting comments on a Pre-Assessment Consultation for the proposed Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main project.

This project should have no significant impact on the services or operations of the Honolulu Police Department.

If there are any questions, please call Major Crizalmer Caraang of District 5 (Kalihi) at 723-8202.

Thank you for the opportunity to review this project.

Sincerely,

CARY OKIMOTO
Acting Chief of Police

By
MARK TSUYEMURA
Management Analyst VI
Office of the Chief

HONOLULU AUTHORITY for RAPID TRANSPORTATION

IN REPLY REFER TO:
CMS-FGDB450-00154

RECEIVED
MAY 30 2017

May 18, 2017

Mr. Tony Ali
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813

Dear Mr. Ali:

Contract: Honolulu Rail Transit Project
Contract No. CT-HRT-1600385
Airport Section Guideway and Sta. DB

Subject: Response to CH2M Honolulu Letter received in CMS on April 5, 2017
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main

HART acknowledges receipt of CH2M Honolulu Letter regarding the Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main received in CMS on April 5, 2017.

HART is currently in communication with you via email to aid and assist you in any coordination efforts. Early communication has indicated that work has not yet started with design and construction forecasted to begin at a later date.

Please see below for responses to your questions that you expressed in your letter:

1. Force Main Design Considerations

   - Is a casing required across easement? *Casing will not be required.*
   - Can our design team have latest plans for the layout of the piles/columns? *Yes, we will be able to provide you with the latest plans.*
   - How close can force main get to the HART piles? *There should be a minimum 10' clearance to the shafts.*
   - Does crossing have to be oriented 90 degrees to HART easement? *There is no requirement for the crossing to be 90 degrees to the HART easement.*
   - Will HART design their system to limit the potential for development stray currents (corrosion potential)? *Yes.*

2. Coordination Protocol and Issues:

   We will address protocol procedures and issues at the working meetings.

If you have further questions regarding this matter, please contact me at (808) 768-6243.

Sincerely,

Gregory T. Rapp, AIA, LEED AP
Project Manager, HART

Attachment: CH2M's Letter – Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main

cc: Mr. John Moore, HART
Mr. Eric Leung, HART
Mr. Dean Matro, HART
Mr. Taka Kimura, HART/GEC
Mr. Mike Barbour, HART/CEI
Mr. Jeff Werner, HART/CEI

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Gregory T. Rapp
Project Manager
Honolulu Authority for Rapid Transportation
1099 Alakea Street, Suite 1700
Honolulu, HI 96813

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Rapp,

Thank you for sending early consultation comments by letter dated May 18, 2017.

We appreciate the information provided to assist with design of the new 36-inch sewer force main.

We look forward to future working meetings with the HART construction management team to enable fruitful coordination between the two projects.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

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MAY 01 2017

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP4/17-686411R

April 27, 2017

Mr. Tony Ali
Project Manager
CH2M Hill
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

SUBJECT: Pre-Assessment Consultation Draft Environmental Assessment (DEA) for Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main, Honolulu, Oahu, Hawaii

In response to your letter dated March 24, 2017, we have the following comments:

1. The DEA should include a Traffic Management Plan, which discusses traffic impacts the project may have on any surrounding City roadways, including short-term impacts during construction with corresponding measures to mitigate these impacts.

2. The Hawaii Department of Transportation should be informed of the temporary layout of pipeline adjacent to Nimitz Highway, which is under their jurisdiction.

3. The Honolulu Authority for Rapid Transportation should be consulted as they may have some concerns. The pipeline appears to run under or adjacent to the guideway at different locations.

4. Any damage to the existing roadway and sidewalk area caused by the project should be restored to its original or better condition.

5. The area Neighborhood Board, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the

details of the proposed project and the impacts that the project may have on the adjoining local street area network.

6. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

We reserve further comment pending review of the DEA.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

Wes Frysztacki
Director

cc: Kim Suzuki, Department of Design and Construction

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

Junly 7, 2017

Mr. Wes Frysztacki
Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Frysztacki,

Thank you for sending early consultation comments by letter dated April 27, 2017.

We offer the following in response to your comments:

1. The primary project locations—the horizontal directional drilling launch and exit sites—are outside the public right-of-way; therefore, travel lane closures are not expected. Impacts to local roads would mostly be the movement of materials and equipment and construction personnel. Although no significant adverse impacts on traffic would be associated with construction or operation of the project, the following mitigation measures are included in the Draft EA for implementation during project construction:
    - Permits to access State and/or City roads will be obtained, as needed, for overweight and oversize loads.
    - Construction materials and equipment will be transferred to and from the project site during off-peak hours (8:30 AM to 3:30 PM) to the extent practicable to minimize disruption to traffic on local streets.
    - Flaggers will be employed as necessary to direct traffic when large equipment is exiting or entering public roads to minimize the risk of accidents.
    - Notices to adjacent landowners will be distributed when construction takes place to help minimize access disruptions.
2. The Hawaii Department of Transportation has been notified about the project through a pre-assessment consultation letter. We are aware of HDOT's permit requirement and anticipate further discussions to address project impacts, such as potential temporary encroachment on the asphalt bike and pedestrian path.
3. Coordination with HART is also ongoing.

4. Project specifications will require site restoration, including repairs to roads and sidewalks if damaged by construction activity.
5. We have reached out to property owners and tenants along the new force main alignment. Community outreach will continue and project information will be disseminated through the construction period.
6. To mitigate potential traffic impacts, construction equipment and materials would be transported to the project area during off-peak hours.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

April 10, 2017

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
ADAM C. WONG, Vice Chair
DAVID C. HULIHEE
KAPUA SPROAT
KAY C. MATSUI

ROSS S. SASAMURA, Ex-Officio
FORD N. FUCHIGAMI, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

Mr. Tony Ali
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Ali:

Subject: Your Letter Dated March 24, 2017 Requesting Comments on the Pre-Assessment Consultation for the New Wastewater Pump Station 36" Force Main off Kamehameha Highway - Tax Map Key: 1-1-003: 004, 138, 204-207, 212, & 239 and 1-2-021: 035 & 36

Thank you for the opportunity to comment on the proposed wastewater station project.

We do not have comments on the proposed Wastewater Pump Station 36" force main.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

HAWAI'I GAS
THE CLEAN ENERGY COMPANY

RECEIVED

APR 06 2017

April 3, 2017

Mr. Tony Ali
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Dear Mr. Tony:

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main Pre-Assessment Consultation

Please be advised that Hawaii Gas maintains an underground 16" utility gas line in the project vicinity, which serves commercial and residential customers in the area and is interconnected with the utility network in Honolulu. We would appreciate your consideration during the project planning and design process to minimize any potential conflicts with the existing gas facilities in the project area.

Enclosed are the gas maps as requested for your use and information.

Thank you for the opportunity to comment on the pre-assessment. Should there be any questions, or if additional information is desired, please call Jeremy Santiago at 594-5552.

Sincerely,

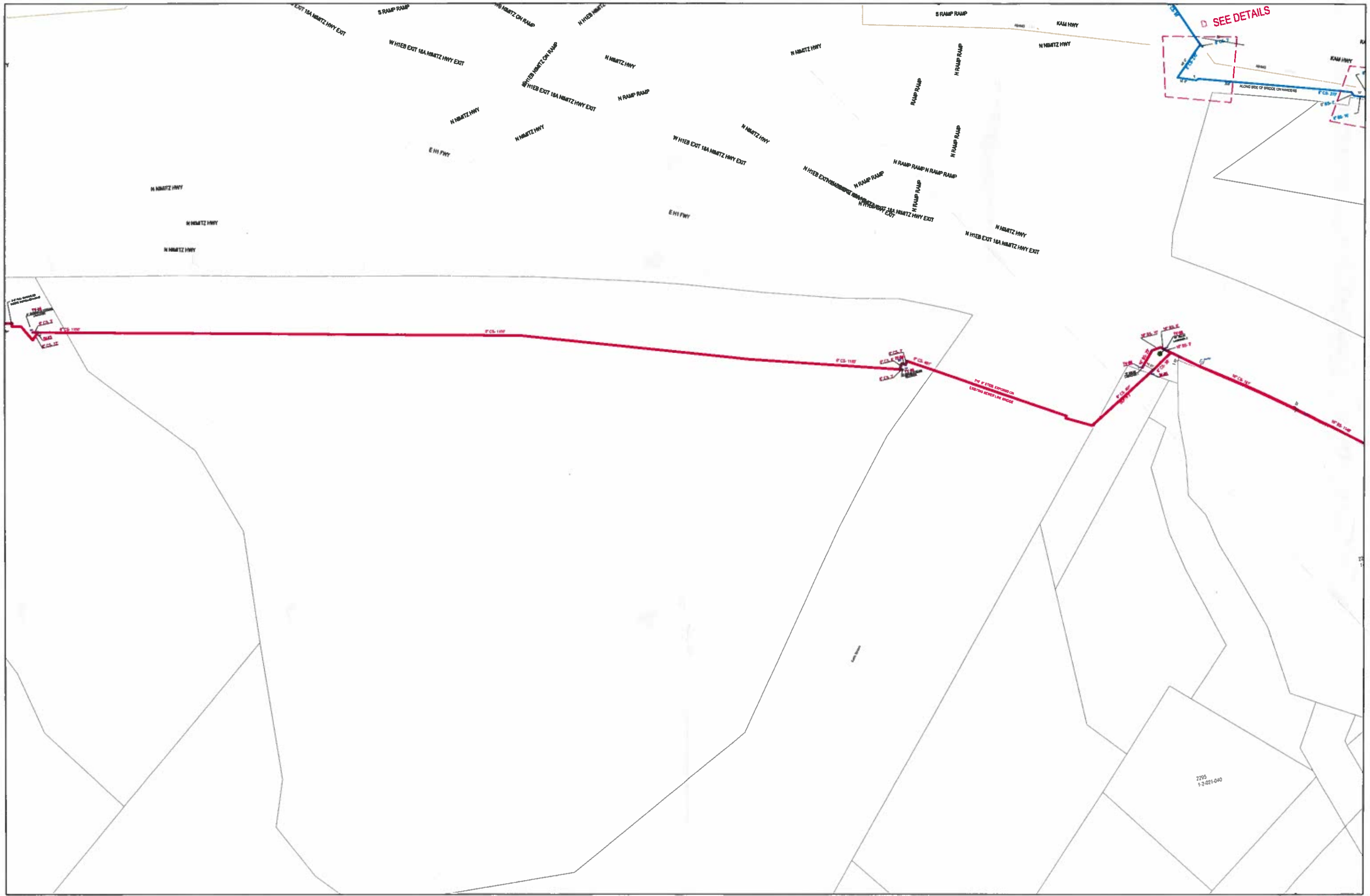
Hawaii Gas

Keith K. Yamamoto
Manager, Engineering

KKY:krs

Attached: Gas Maps

Santiago, Jeremy 3/29/2017 4:36:23 PM



Santiago, Jeremy 3/29/2017 4:36:21 PM

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.440.0208
Fax 808.954.4400
Tony.Ali@ch2m.com

July 7, 2017

Mr. Keith Yamamoto
Manager, Engineering
Hawaii Gas
P.O. Box 3000
Honolulu, HI 96802

Subject: Pre-Assessment Consultation
Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
TMKs: Portions of [1] 1-1-003:004, 138, 204, 205, 206, 207, 212, and 239; and 1-2-021:035 and 036

Dear Mr. Yamamoto,

Thank you for sending early consultation comments by letter dated April 6, 2017.

In particular, we appreciate the map showing the alignment of the 16-inch utility gas line. This information will be used in project planning and design.

Your office will be notified when the Draft Environmental Assessment is available for public review and comment. In the meantime, if you have any questions, please contact me at (808) 440-0208, or by email at Tony.Ali@ch2m.com

Sincerely,

Tony Ali

Tony Ali
Project Manager

C: Kim Suzuki, DDC

References

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Wagmer, W. L., D. R. Herbst, and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawaii: Volume I and II*. Bishop Museum Special Publication 83. Honolulu, HI: University of Hawaii Press.

Appendix A
Natural Resources Survey and Wetlands Delineation

Natural resources survey and wetlands delineation for a wastewater force main from Kalihi Kai to Keʻehi Lagoon Beach Park, Honolulu, Oʻahu[1]

July 7, 2017 *AECOS* No. 1505

Eric Guinther, Susan Burr, and Stacey Kilarski
AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

AECOS biologists conducted a natural resources survey and wetlands delineation for a proposed sewerage force main project (the "Project") on the south coast of Oʻahu (see Figure 1) to be installed by both open trench construction and horizontal directional drilling (HDD) from a parcel (TMK: 1-2-021:035) in Kalihi Kai off Alahao Street to Keʻehi Lagoon Beach Park (TMK: 1-1-003:239). The force main would pass under the estuarine reaches of both Kalihi and Moanalua Streams, as well as the triangular land feature between Nimitz Highway and the mouths of these streams at a depth approaching of 95 ft (29 m) below the ground surface (see Figure 2). The proposed route would pass beneath the Keʻehi Lagoon Memorial site before daylighting at the north end of Keʻehi Lagoon Beach Park in an area fenced separate from the park at the time of our survey. The force main is routed from the exit point along the south and east side of the existing tennis courts and connects to the existing Kamehameha Wastewater Pump Station. On the east side, the force main is connected to an existing surge manhole to the north of the HDD launch site.

[1] Survey and report undertaken for CH2M, under City and County of Honolulu Contract No. SC-DDC-1300108 (June, 2013) to be used in Project documents and become part of the public record.

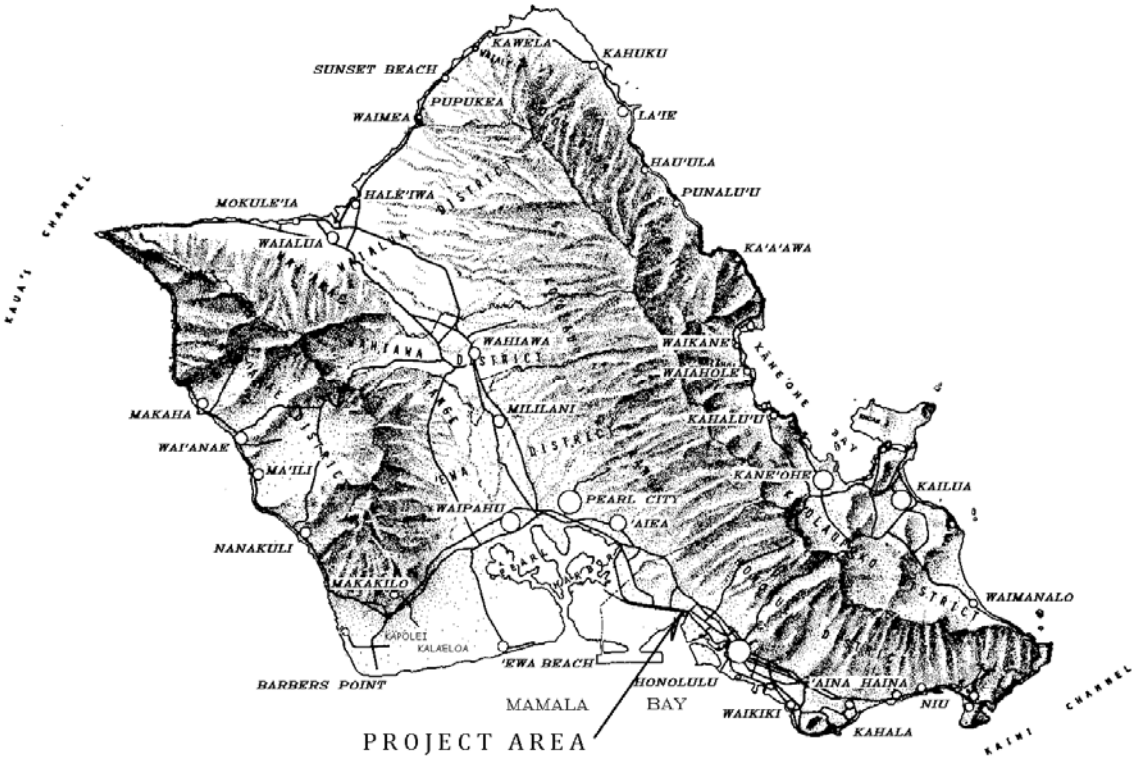

Figure 1. Project area location on the south coast of O'ahu.

Methods

Botanical Survey

A botanical survey was conducted by E. B. Guinther on May 5, 2017 using a wandering transect (pedestrian survey) method that covered the HDD launch site and the HDD exit site, as well as an area along Nimitz highway bike path designated for layout of the pipe to be pulled back through the bore hole.

Although not anticipated to be directly involved in the Project, the land under the HDD route that lies between Kalihi and Moanalua streams was recently survey by the authors (*AECOS*, 2017a,b). Included in the 2016 survey as the "Alahao site" (*AECOS*, 2017b) was part of the parcel (TMK: 1-2-021:035) along the left bank of Kalihi Stream that is in the present Project area, a location where the force main would be connected by surface excavation to an existing force main under Nimitz Highway.

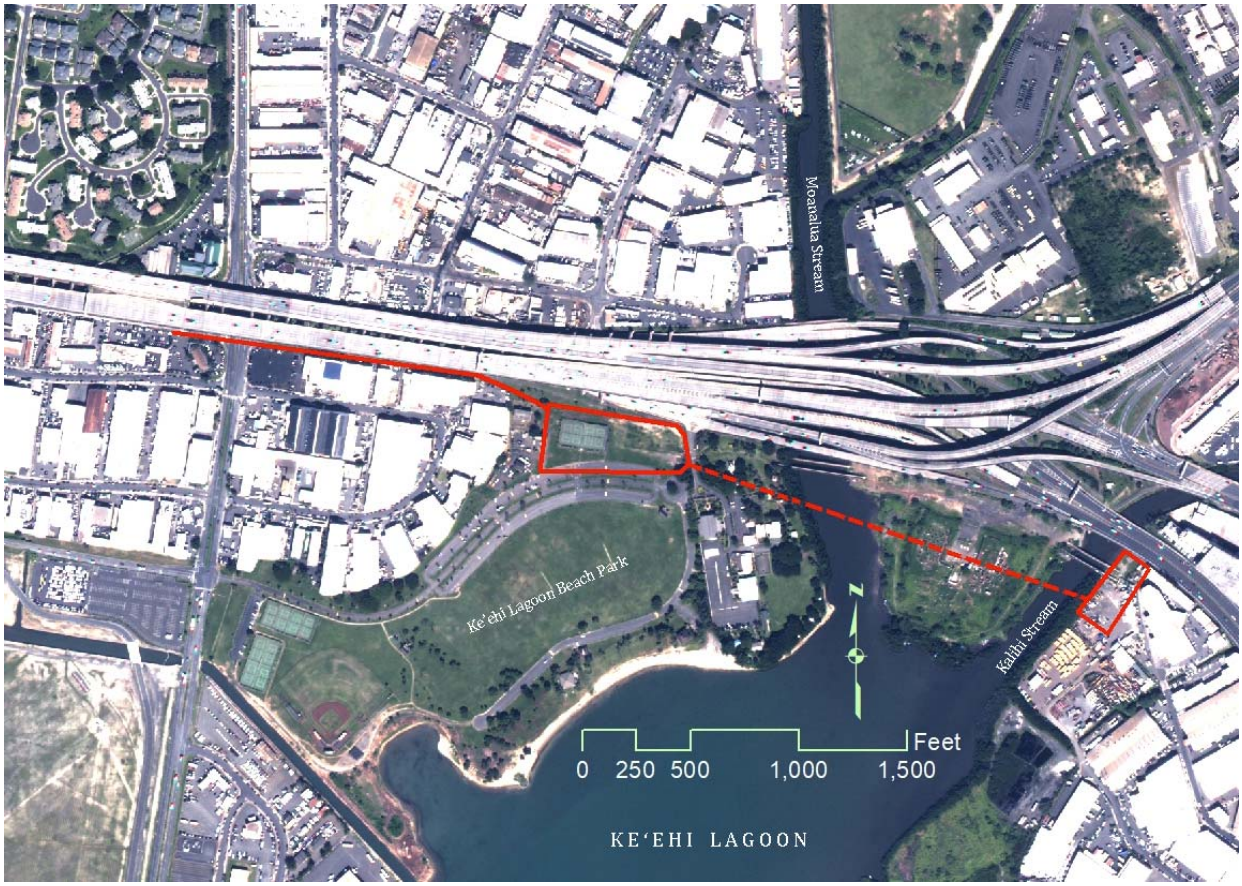

Figure 2. Survey areas indicated in red, except where dashed (the subsurface HDD portion); photo-image is dated 2011.

Plant names 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

Three avian count stations were established by *AECOS* biologist, Susan Burr, within the Project areas on May 5, 2017 and a single ten-minute avian point-count made at each station. Field observations were made with the aid of Leica 10 x 42 binoculars and by listening for vocalizations. Avian counts were conducted between 0830 and 1050 in the morning. Time not spent at point-

count stations was used to search the area for species and habitats not detected during the point-counts and any additional species observed are listed as "incidental sightings". Weather conditions were ideal, with no rain, unlimited visibility, and light winds from the east northeast. The proximity of the Project area to the highway made audial detection difficult. The avian phylogenetic order and nomenclature used in this report follows the *Checklist* of *North and Middle America Birds* by American Ornithological Society (AOS, 2017).

Terrestrial Mammals Survey

The survey of mammals on May 5, 2017 was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally of all terrestrial vertebrate mammalian species detected within the project area was kept along with notes of general abundances.

Wetlands Delineation

On May 19, 2017, Susan Burr and two *AECOS* technicians conducted a survey to determine if wetlands are present within the Project area at Ke'ehi Lagoon Beach Park and, if present, delineate[2] the boundary. On May 5, 2017, the biologists encountered standing water and obligate wetland plants (*Batis maritima* and *Bolboschoenus maritimus paludosus*) in the northeast corner end of Ke'ehi Lagoon Beach Park, just to the east of HDD exit site. Indian fleabane (*Pluchea indica*), a facultative wetland species (occurs in wetlands and non-wetlands), extends west of the standing water into the Project area.

AECOS scientists followed the methods of wetland delineation described in *Corps of Engineers Wetland Delineation Manual* ("Manual"; USACE, 1987) and *Regional Supplement for Hawai'i and Pacific Islands* (USACE, 2012a). The wetland status of plant species derives from the 2012 National Wetland Plant List (USACE, 2012b) and a 2016 update (Lichvar, et al., 2016). Under ordinary circumstances, establishment of a jurisdictional wetland requires three positive wetland indicators, one each for hydrology, soils, and vegetation. The boundary between wetland and upland is established as a line outside of which at least one of the three indicators is not present. In practical terms, this boundary is a judgment call, based on establishing clear differences for both sides (upland and wetland) and then selecting a boundary that represents the sharpest line that can be drawn through what is typically a gradient in nature.

[2] The process of determining a line on the ground (and shown on maps) separating jurisdictional waters from upland is termed "delineation". Although *AECOS* can "delineate" wetlands, jurisdictional determination is the purview of USACE, and that agency must concur with our delineation for it to become official.

We established a wetland determination sampling point (SP) within the standing water and three additional SPs along a transect line perpendicular to the wetted area (Attachment A). *AECOS* scientists marked the SP locations and wetland boundary with a handheld, global navigation satellite system (GNSS) instrument (Trimble 6000 Series, Geo XT), providing submeter accuracy of the recorded positions.

Results

Botanical Survey

The vegetation at Ke'ehi Lagoon Beach Park is landscaped and maintained lawn, shrubs, and trees. The pipe laydown area is a bike path with sparse plantings between the path and Nimitz Highway. Ruderal plants growing in disturbed areas characterize a portion of the northeast corner of the Park ("fenced area"), the area surveyed directly east of Kalihi Stream ("east side area"), and scattered parts of all of the survey area outside the maintained park.

A listing of plant species (a flora) encountered in the survey is given as Table 1. This flora listing includes estimates of each species abundance in the area. One species of fern, one gymnosperm ally, and 88 taxa of flowering plants are listed. Of these, only 5 (6%) are considered native (all indigenous, no endemics) and two (2%) are thought to be early Polynesian introductions (so-called "canoe-plants"). Twelve (12) of the taxa are ornamentals (that is landscape plants not known to establish in the wild) and several others (most of the trees) are naturalized species that have been planted in the park as ornamentals.

Table 1. Listing of plants (flora) for the proposed wastewater force main at Ke'ehi Lagoon Beach Park.

Species listed by family	Common name	Status	Abundance	Notes
	FERNS AND FERN ALLIES			
PTERIDACEAE				
Pteris vittata L.	ladder brake	Nat	R	<1>
	GYMNOSPERMS AND ALLIES			
CYCADACEAE				
Cycas sp.	sago palm	Orn	U	<1>

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
	FLOWERING PLANTS			
	DICOTYLEDONES			
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	O	
Ruellia prostrata Poir.	---	Nat	R	<1>
AIZOACEAE				
Sesuvium portulacastrum (L.) L.	*'ākulikuli*	**Ind**	R	<3>
AMARANTHACEAE				
Amaranthus viridis L.	slender amaranth	Nat	R	<1>
Amaranthus spinosus L.	spiny amaranth	Nat	R	
ANACARDIACEAE				
Schinus terebinthifolius Raddi	Christmas berry	Nat	R	<1>
APOCYNACEAE				
Allamanda cathartica L.	allamanda	Orn	R	<1>
Nerium oleander L.	oleander	Orn	U	
ASTERACEAE (COMPOSITAE)				
Bidens alba (L.) DC.	---	Nat	Oc	
Calyptocarpus vialis Less.	---	Nat	C	
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat	R	<1,4>
Emilia fosbergii Nicolson	*pualele*	Nat	R	<1>
Flaveria trinerva (Spreng.) C. Mohr	---	Nat	Oc	<3>
Lactuca serriola L.	prickly lettuce	Nat	R	<3>
Pluchea carolinensis (Jacq.) G. Don		Nat	U	<2>
Pluchea indica (L.) Less.	Indian fleabane	Nat	Aa	<2>
Sonchus oleraceus L.	sow thistle	Nat	U	<1>
Tridax procumbens L.	coat buttons	Nat	C	
BATACEAE				
Batis maritima L.	pickleweed	Nat	R	<2>
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip tree	Nat	R	<1>
BORAGINACEAE				
Heliotropium currasavicum L.	*kīpūkai*	**Ind**	R	<3>
Heliotropum procumbens Mill.	---	Nat	R	<2>
BRASSICACEAE				
Lepidium virginicum L.	common peppergrass	Nat	O	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
BUDDLEIACEAE				
Buddleia asiatica Lour.	dog tail, *huelo 'ilio*	Nat	U	<1>
CARICACEAE				
Carica papaya L.	*mīkana,* papaya	Nat	R	<1>
CARYOPHYLLACEAE				
Petrorhagia velutina (Guss.) P. Ball & Heyw.	childing pink	Nat	R	<3>
Spergularia marina (L.) Griseb.	saltmarsh sand spurry	Nat	R	<2>
CLUSIACEAE				
Calophyllum inophyllum L.	*kamani*	**Pol**	R	<1>
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl	---	Nat	O	<2>
Ipomoea triloba L.	little bell	Nat	U	
Jacquemontia ovalifolia (Choisy) H. Hallier	*pā'uohi'iaka*	**Ind**	R	<2>
CUCURBITACEAE				
Momordica charantia L.	wild bitter melon	Nat	R	<3>
EUPHORBIACEAE				
Euphorbia albomarginata Torr. & A. Gray	rattlesnake weed	Nat	Ru	<3>
Euphorbia cyathophora J.A. Murray	Mexican fire plant	Nat	R	<1>
Euphorbia hypericifolia L.	graceful spurge	Nat	O	
Euphorbia hirta L.	garden spurge	Nat	Uc	
Euphorbia prostrata Aiton	prostrate spurge	Nat	Ru	<1>
Phyllanthus debilis Klein ex Willd.	niruri	Nat	Uc	<1>
FABACEAE				
Albizia saman F. Muell.	monkeypod (seedlings)	Nat	U	<1>
Crotalaria incana L.	fuzzy rattlepod	Nat	U	<1>
Desmanthus pernambucanus (L.) Thellung	virgate mimosa	Nat	Oa	<2>
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	Nat	R	<1>
Indigofera hendicaphyla Jacq.	creeping indigo	Nat		
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	O	<2>
Macroptilium lathyroides (L.) Urb.	cow pea	Nat	R	<2>
Pithecelobium dulce (Roxb.) Benth.	*'opiuma*	Nat	U	<2>
Prosopis juliflora (Sw.) DC.	*long-spine kiawe*	Nat	R	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
LAMIACEAE				
Hyptis pectinata (L.) Poit.	comb hyptis	Nat	R	<3>
MALVACEAE				
Hibiscus rosa-sinensis L.	Chinese hibiscus	Orn	U	
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat	Ou	
MALVACEAE (continued).				
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat	Ou	
Sida ciliaris L.	---	Nat	AA	
Sida rhombifolia L.	Cuba jute	Nat	R	<3>
Sida spinosa L.	prickly sida	Nat	U	<3>
NYCTAGINACEAE				
Bougainvillea spectabilis Wild.	bougainvillea	Orn	U	
Boerhavia coccinea Mill.	false *alena*	Nat	O	
OXALIDACEAE				
Oxalis corniculata L.	*'ihi'ai*	**Pol**	U	<1>
PASSIFLORACEAE				
Passiflora foetida L.	love-in-a-mist	Nat	U	<2>
PLANTAGINACEAE				
Plantago lanceolata L.	narrow-lvd plantain	Nat	Rc	
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat	U	
Portulaca pilosa L.	---	Nat	U	
RHIZOPHORACEAE				
Rhizophora mangle L.	red mangrove	Nat	p	<3>
RUBIACEAE				
Hedyotis corymbosa (L.) Lam.	---	Nat	U	
Ixora sp.	ixora	Orn	R	<1>
RUTACEAE				
Murraya paniculata (L.) W. Jack	mock orange	Orn	U	<1>
SOLANACEAE				
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner	cherry tomato	Nat	U	<3>
	FLOWERING PLANTS			
	MONOCOTYLEDONES			
ARACEAE				
Epipremnum pinnatum (L.) Engler	pothos	Nat	O	<1>

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
ARECACEAE				
Cocos nucifera L.	coconut palm. seedling	Nat	R	<1>
Dypsis lutescens (H. Wendl.) Beentje & J. Dransfield	areca palm	Orn	R	<1>
Pritchardia pacifica (Kuntze) Beccari	Fiji fan palm	Orn	U	<1>
ARECACEAE (continued).				
Veitchia merrillii (Beccari) H.E. Moore	Manila palm	Orn	O	<1>
CYPERACEAE				
Cyperus gracilis R. Br.	McCoy grass	Nat	Uc	<1>
Cyperus rotundus L.	nut grass	Nat	A	
LILIACEAE				
Crinum asiaticum L.	giant lily	Orn	O	<1>
POACEAE				
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	Nat	AA	
Cenchrus ciliaris L.	buffelgrass	Nat	Oc	
Cenchrus echinatus L.	sand bur	Nat	U	
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	AA	<2>
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	AA	
Cynodon x magennisii Hurcomb	Bermuda 'Tifdwarf'	Orn	Ra	<1>
Dactyloctenium aegyptium (L.) Willd.	beach wiregrass	Nat	O	
Digiteria insularis (L.) Mez ex Ekman	sourgrass	Nat	U	
Eleusine indica (L.) Gaertn.	wiregrass	Nat	C	
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	U	
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	O	
Melinus repens (Willd.) Zizka	Natal redtop	Nat	U	<3>
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat	Ua	<3>
Sporobolus diandrus (Retz.) P. Beauv.	Indian dropseed	Nat	AA	<2>
Urochloa mutica (Forssk.) Nguyen	California grass	Nat	R	<2>
Zoysia matrella var. *matrella* Merr.	Manila grass	Nat	Ra	<1>

Table 1 (continued).

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:

Ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

Orn = A cultivated plant; a species not thought to be naturalized (spreading on its own) in Hawai'i.

Pol = An early Polynesian introduction. Introduced before 1778.

ABUNDANCE = occurrence ratings for plant species:

-- - Species not present in area.

R – Rare	seen in only one or perhaps two locations.
U - Uncommon	seen at most in several locations
O - Occasional	seen with some regularity
C - Common	observed numerous times during the survey
A - Abundant	found in large numbers; may be locally dominant.
AA - Very abundant	abundant and dominant; defining vegetation type.

Lower case letters (u, c, a) following qualitative rating of abundance indicate localized abundance is greater than occurrence rating. For example, Ra would be a plant encountered only once or twice, but very numerous where encountered.

NOTES:
<1> – Observed only in the pipe laydown area.
<2> - Found, although not necessarily exclusively, in fenced area.
<3> - Found, although not necessarily exclusively, on east side.
<4> - Plant lacking key diagnostic characteristics (flower, fruit); identification, therefore, uncertain.

The only plant of concern encountered during the survey is a specimen of "*kiawe*" (a mesquite) with the general appearance of *Prosopis juliflora* (long-spine *kiawe*). This tree is located in a back part of the park (in the laydown area). *P. longiflora* is a pest species of some concern (PIER, 2008, 2013; HISC, 2015) and this plant should be cut down.

Avian Survey

During the 10-minute visual surveys, we identified 87 individual birds of 9 alien species representing 8 families (Table 2). Common Myna (*Acridotheres tristis*) was the most common species observed at the project site. The only other bird species observed all three count stations was House Sparrow (*Passer domesticus*). Cattle Egret (*Bubulcus ibis*), Spotted Dove (*Streptopelia chinensis*), Zebra Dove (*Geopelia striata*), and Common Waxbill (*Estrilda astrild*) were observed at two stations each. Red-vented Bulbul (*Pycnonotus cafer*), Japanese White-eye (*Zosterops japonicus*), and Red-crested Cardinal (*Paroaria coronata*) were each observed at a single station. A single domestic chicken (*Gallus* sp.) was recorded as an incidental observation.

Table 2. List of bird species observed and their relative abundance at the project site during the May 5, 2017 survey.

Scientific name	Common name	Status	10-min Counts Sta. 1	Sta. 2	Sta. 3	***RA*** (total/Stas.)
	PELECANIFORMES					
	ARDEIDAE – Herons, Bitterns, & Allies					
Bubulcus ibis L.	Cattle Egret	A	7	4	--	**3.7**
	COLOMBIFORMES					
	COLUMBIDAE – Pigeons & Doves					
Streptopelia chinensis Scopoli	Spotted Dove	A	2	--	2	**1.3**
Geopelia striata L.	Zebra Dove	A	8	--	1	**3.0**
	PASSERIFORMES					
	ESTRILDIDAE – Estrildid Finches					
Estrilda astrild L.	Common Waxbill	A	4	--	8	**4.0**
	PASSERIDAE – Sparrows					
Passer domesticus L.	House Sparrow	A	7	3	11	**7.0**
	PYCNONOTIDAE – Bulbuls					
Pycnonotus cafer L.	Red-vented Bulbul	A	--	--	1	**0.3**
	STURNIDAE – Starlings					
Acridotheres tristis L.	Common Myna	A	17	6	3	**8.7**
	THRAUPIDAE – Tanagers					
Paroaria coronata J.F. Miller	Red-crested Cardinal	A	1	--	--	**0.3**
	ZOSTEROPIDAE – White-eyes					
Zosterops japonicas Temminck & Schlegel	Japanese White-eye	A	--	--	2	**0.7**

Legend to Table 2

Status = distributional status for the Hawaiian Islands:
A Alien – Introduced to the Hawaiian Islands by humans.

RA Relative abundance – number of birds detected divided by number of count stations.

Terrestrial Mammals Survey

We observed a single feral cat (*Felis catus*), two Small Indian Mongoose (*Herpestes auropunctatus auropunctatus*), and a domesticated dog (*Canus lupus familiaris*).

Wetlands Delineation

SP 1 is the only location that meets all three of the required indicators to be considered a wetland: the site meets the dominance test for hydrophytic vegetation, the soil is considered to by hydric because it has a depleted matrix, and one primary and two secondary wetland hydrology indicators are present. The upper 4 in of the soil profile was saturated at SP 2; however, this saturation was due to a reported water main break the previous day, not to the presence of wetland hydrology. Hydric vegetation and hydric soils were not present at SP 2. Although vegetation was cleared at SP 3 on the day prior to our survey, our May 5, 2017 site visit and aerial photographs indicate Indian fleabane was the dominant species at this location and, therefore, could meet the indicator for hydrophytic vegetation. Hydric soil and wetland hydrology were not present at SP 3. To better define the wetland boundary between SP 1 and SP 2, we established SP 4. SP 4 meets the dominance test for hydrophytic vegetation and has one primary and three secondary indicators of wetland hydrology; however, the soil is not hydric at SP 4.

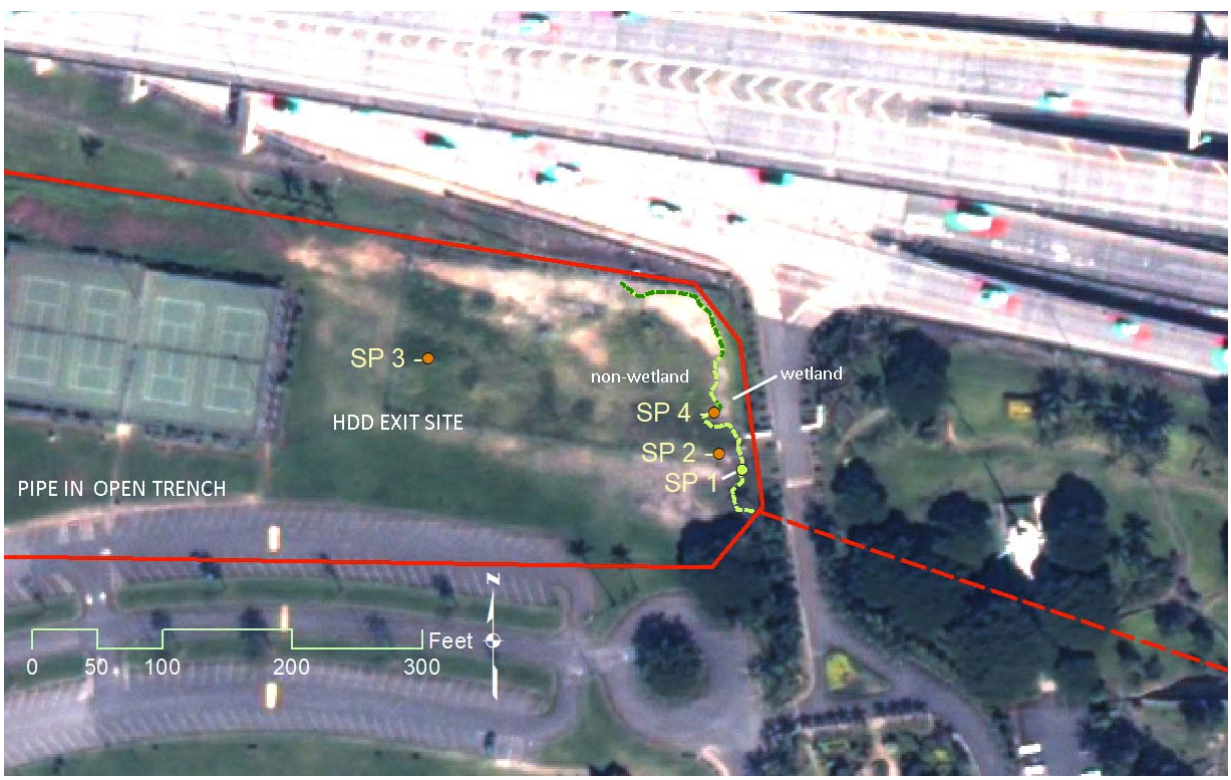

Figure 3. Wetland boundary (dashed green line) at Ke'ehi Lagoon Beach Park.

We used the edge of the pickleweed (*Batis maritima*) growth and a slight change in elevation to define the wetland boundary, which is outside (east of) the Project site (Figure 3). It appears this small wetland floods from under the Nimitz Highway viaduct (from the north) as a function of either high tide or high stream flow in Moanalua Stream.

The HDD Launch site is a mostly paved, construction baseyard. The force main connecting pipe will be set into a trench extending northeast across a much disturbed area between foot bridges and Nimitz Highway (Figure 4). On May 19, 2017, the U.S. Army Corps of Engineers (USACE) concurred with the wetland boundary on Kalihi Stream delineated by *AECOS* adjacent to parcel TMK: 1-2-021:035 in Kalihi Kai (USACE-HD, 2017).

Figure 4. Wetland boundary (dashed green line) at Kalihi Kai Project area as delineated by *AECOS* on November 2, 2016 (*AECOS*, 2017b) and accepted by USACE on May 19, 2017.

Assessment

Botanical Resources

No species listed by the state or federal governments endangered species statutes or considered a candidate species, or is rare, or is of any special concern relative to conservation was observed at the site (HDLNR, 1998; USFWS, 2017). Therefore, no mitigations measures are required based upon specifics of the observed flora.

Avian Resources

The findings of the avian survey are consistent with what would be expected in a highly disturbed area at this elevation on O'ahu. The only birds observed in the project area are naturalized, urban-dwelling birds. Of the 9 species observed, 6 (Cattle Egret, Spotted Dove, Zebra Dove, Red-vented Bulbul, Common Myna, and Japanese White-eye) are listed as injurious species—animals known to be harmful to agriculture, aquaculture, indigenous wildlife or plants, or constitute a nuisance or health hazard (HDLNR, 2015).

No species listed as state or federally endangered or threatened (HDLNR, 2015; USFWS, 2017) are present. The project is not expected to adversely impact avian resources extant in the project vicinity.

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and the habitats present on or adjacent to the site. Although no rodents were recorded in our survey, some, if not all, of the four established alien Muridae found in Hawai'i—roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), black rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus musculus domesticus*)—could use various resources within the Project area. All of these introduced rodents are deleterious to native ecosystems and native species. No mammalian species currently protected or proposed for protection under either the federal or State of Hawai'i endangered species programs were detected during the course of this survey (DLNR, 2015; USFWS, 2015).

Potential Impacts to Protected Species

Installation of a pipeline by HDD is generally accomplished in three stages. The first stage consists of directionally drilling a small diameter pilot hole along the

designed directional path. The second stage involves reaming or enlarging the pilot hole to a diameter suitable for installation of the pipeline. The third stage consists of pulling the pipe back into the enlarged hole. No in-water construction activity is expected because the new force main would be pulled through a tunnel at an elevation (-50 to -90 ft) below the bottom of the existing streams. Noises generated from directional drilling during the first stage are not expected to substantial enough to disturb protected species in nearshore waters of Honolulu Harbor and Ke'ehi Lagoon.

The HDD process has the potential for movement of drilling fluid upwards into the material through which the drill passes. In some cases, the drilling fluid may be forced to the surface, called "frac-out". Reasons for such seepage may include, for examples, voids and fractures or very soft deposits—Signs of seepage are surface indicators (plumes if occurring under water) or loss of circulation of the drilling fluid. Greatest potential for frac-out is at the entry and exit locations of the crossing due to shallow depth and loose near-surface soils. The likelihood of frac-out decreases as the depth below the surface of the drill hole increases. A required contingency plan will include measures for prevention and containment, response, and clean-up and correction. For this Project, launch and exit locations are on dry land where drilling fluid seepage can be easily detected and contained. As such, the risk of impacts to protected resources as a result of frac-outs is unlikely.

<u>Sea turtles</u> - Two listed (endangered or threatened; HDLNR, 2015; NOAA-NMFS, 2011a, 2015; USFWS, 2015) marine species—hawksbill turtle (*Eretmochelys imbricata*) and green sea turtle (*Chelonia midas*)—are known to occur in Honolulu Harbor and Ke'ehi Lagoon, but are unlikely to be found along the proposed tunnel corridor. No other listed marine species are anticipated to utilize the waters above the tunnel corridor, but are known to occur in the general vicinity.

<u>Seabirds</u> - Although no seabirds were detected during our survey, it is possible that the endemic sub-species of Newell's Shearwater (*Puffinus auricularis newelli*), also known as *'a'o*, over-fly the Project site between April and the middle of December each year in small numbers (USFWS, 1983). Newell's Shearwaters are not known to breed on the Island of O'ahu, though seabirds likely to be this species have been recorded on ornithological radar in low numbers flying over parts of the island. 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 man-made structures, and either killed outright, or injured to become easy prey for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed, et al., 1985; Telfer, et al., 1987; Cooper and Day, 1994; Podolsky, et al., 1998). If night-time

construction work is anticipated, lights should be directional and point down and away from the ocean shore; all lights need to be properly shielded and aimed towards the ground. Outdoor lighting guidelines are provided by HDLNR-DOFAW (2016).

Hawaiian hoary bat - The Hawaiian hoary bat (*Lasiurus cinereus semotus*) or *'ōpe'ape'a,* is an endangered species that is unlikely to occur in the lowlands of urban Honolulu. No Hawaiian hoary bats were detected during the course of our survey. Any impact that the Project potentially poses to bats would be by clearing of taller trees, an activity not anticipated for this Project.

Monk Seal — The Hawaiian monk seal was listed as an endangered species pursuant to the ESA on November 23, 1976 (41 FR 51612) and remains listed as endangered. In that same year, the Hawaiian monk seal was designated as "depleted" under the Marine Mammal Protection Act (MMPA). A female monk seal was reported to have given birth on the Reef Runway breakwater in 2011, and for the next two years a juvenile monk seal was reported to be occasionally resident within the Ke'ehi Lagoon (Schofield, 2015).

Wetlands

Wetlands occur in the vicinity of both the HDD launch site, located to the east of Kalihi Stream, and the HDD exit site, located to the west of Moanalua Stream. A Department of Army (DA) permit would be required if work is to occur within the delineated wetlands. However, Project plans show no work in these jurisdictional waters.

Critical Habitat

No federal Critical Habitat exists for any species at the Project site. Thus, modification of habitats on all or any part of the site will not result in an impact to federally designated Critical Habitat. There is no equivalent statute under state law.

Critical habitat for Hawaiian monk seals has been designated to include the seafloor and marine environment to 10 m above the seafloor from the 200 m depth contour. In places identified by boundary points, Hawaiian monk seal critical habitat extends 5 m inland from the shoreline. The waters offshore of the Project area are designated monk seal marine critical habitat. However, the shoreline fronting Ke'ehi Lagoon Beach Park does not fall within boundary points defining preferred pupping areas or significant haul-out areas and is therefore excluded from monk seal terrestrial critical habitat (NOAA-NMFS, 2015).

Recommendations

- Best management practices (BMPs) must be employed during construction to eliminate or reduce the discharge of pollutants from the Project area to adjacent wetlands and Moanalua and Kalihi Streams. Effective BMPs will minimize the potential to degrade water quality, which can negatively affect marine resources.

- If construction activity is to be undertaken after sunset, all associated lights should be well-shielded, and where large flood/work lights are used, these should be placed on poles that are high enough to allow the lights to be pointed directly downward. Avoiding night-time work during the peak of seabird fallout between September 15 and December 15 can minimize adverse impacts to listed seabird species. Minimizing lighting directed towards the ocean is also an important consideration.

References

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Attachment A

Wetland determination data forms

Reset Form

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Kamehameha Hwy Force Main City: Honolulu Sampling Date: 05/19/2017 Time: 7:40 am

Applicant/Owner: City and County of Honolulu State/Terr./Comm.: Hawaii Island: Oahu Sampling Point: SP 1

Investigator 1: Susan Burr Investigator 2: Jessica Withrow TMK/Parcel: 1-1-003:239

Landform: coastal plain Local relief: convex

Lat: 21°19'59.93761" N Long: 157°53'43.52540"W Datum: WGS 1984 Slope (%): 1

Soil Map Unit Name: Fill land, mixed NWI classification: Irregularly flooded, intertidal estuarine wetland with emergent vegetation

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☑	No ☐	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ☑	No ☐	**within a Wetland? Yes ☑ No ☐**

Remarks: 24.32 in. rainfall Jan 1 - April 30, 80% of average (www.prh.noaa.gov)

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 6 x 1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0 =Total Cover (sum)		

Sapling/Shrub Stratum (Plot size: 6 x 1 m)			
1. Pluchea indica	10	Yes	FAC
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	10 =Total Cover (sum)		

Herb Stratum (Plot size: 6 x 1 m)			
1. Bolboschoenus maritimus paludosos	40	Yes	OBL
2. Paspalum vaginatum	15	Yes	FACW
3.		No	Select
4.		No	Select
5.		No	Select
6.		No	Select
7.		No	Select
8.		No	Select
	55 =Total Cover		

Woody Vine Stratum (Plot size: 6 x 1 m)			
1. None		No	Select
2.		No	Select
	0 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:		
OBL species	x 1	=	0
FACW species	x 2	=	0
FAC species	x 3	=	0
FACU species	x 4	=	0
UPL species	x 5	=	0
Column Totals: 0 (A)			0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks

SOIL

Sampling Point: SP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
0-5	10 YR 2/2	100		0	Select	Select	Loamy Sand	High in organics
5-18	2.5Y 4/1	60	2.5 Y 4/3	40	D	M	Loamy Sand	High in organics, with gravel
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- select
- Histisols (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Muck Presence (A8)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Gleyed Matrix (S4)

- select
- Sandy Redox (S5)
- Dark-Surface (S7)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- select
- Stratified Layers (A5)
- Sandy Mucky Mineral (S1)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present: Yes ☑ No ☐

Remarks:
Depth of pit = 18 inch depth
At 10 inches depth 30% gravel fill

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

- select
- Surface Water (A1
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water Stained Leaves (B9)

- select
- Aquatic Fauna (B13)
- Tilapia Nests (B17)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tiled Soils (C6)
- Thin Muck Surface (C7)
- Fiddler Crab Burrows (C10) (Guam, CNMI, a
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- select
- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Salt Deposits (C5)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 1
Water Table Present?	Yes ☑	No ☐	Depth (inches): 13
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Faint positive alpha, alpha dipyridyl test
Standing water present 1m away (1inch deep)

Reported to receive runoff from driveway.
Reported to flood during high tide/rain events
Standing water present on 5/5/17

Reset Form

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Kamehameha Hwy Force Main City: Honolulu Sampling Date: 05/19/2017 Time: 8:25 am

Applicant/Owner: City and County of Honolulu State/Terr./Comm.: Hawaii Island: Oahu Sampling Point: SP 2

Investigator 1: Susan Burr Investigator 2: Jessica Withrow TMK/Parcel: 1-1-003:239

Landform: coastal plain Local relief: none

Lat: 21°20'00.06165"N Long: 157°53'43.71315"W Datum: WGS 1984 Slope (%): 0

Soil Map Unit Name: Fill land, mixed NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☑, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	
Hydric Soil Present?	Yes ☐	No ☑	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ☑	No ☐	**within a Wetland? Yes ☐ No ☑**

24.32 in. rainfall Jan 1 - April 30, 80% of average (www.prh.noaa.gov)

Remarks:

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0 =Total Cover (sum)		

Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. Plucea indica	20	Yes	FAC
2. Desmodium tortuosum	5	Yes	FACU
3.		No	Select
4.		No	Select
5.		No	Select
	25 =Total Cover (sum)		

Herb Stratum (Plot size: 1-m radius)			
1.		No	Select
2. Chloris barbata	20	Yes	FACU
3. Leptochloa fusca	20	Yes	FACW
4.		No	Select
5.		No	Select
6.		No	Select
7.		No	Select
8.		No	Select
	40 =Total Cover		

Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No	Select
2.		No	Select
	0 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	0	x 1	=	0
FACW species	20	x 2	=	40
FAC species	20	x 3	=	60
FACU species	25	x 4	=	100
UPL species	0	x 5	=	0
Column Totals:	65 (A)			200 (B)

Prevalence Index = B/A= 3.08

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks

SOIL

Sampling Point: SP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
1-3	10YR 3/3	100	None	0	Select	Select	Loamy Sand	Gravel fill
3-11	10YR 3/3	100	None		Select	Select	Sandy Loam	70% limestone gravel fill
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

select
Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select
Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

select
Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hard fill material

Depth (inches): 11

Hydric Soil Present: Yes ☐ No ☑

Remarks:
Depth of pit = 11 inches

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select
Surface Water (A1
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select
Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select
Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): None
Water Table Present?	Yes ☐	No ☑	Depth (inches): >11
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 4

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Top 4 inches saturated due to water line break yesterday

Reset Form

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Kamehameha Hwy Force Main City: Honolulu Sampling Date: 05/19/2017 Time: 8:37 am

Applicant/Owner: City and County of Honolulu State/Terr./Comm.: Hawaii Island: Oahu Sampling Point: SP3

Investigator 1: Susan Burr Investigator 2: Jessica Withrow TMK/Parcel: 1-1-003:239

Landform: coastal plain Local relief: none

Lat: 21°20'00.79844"N Long: 157°53'46.07416"W Datum: WGS 1984 Slope (%): 0

Soil Map Unit Name: Fill land, mixed NWI classification: Upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☑, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☐	No ☑	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ☐	No ☑	**within a Wetland? Yes ☐ No ☑**

Remarks:

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0 =Total Cover (sum)		

Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. Pluchea indica	100	Yes	FAC
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	100 =Total Cover (sum)		

Herb Stratum (Plot size: 1-m radius)			
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
6.		No	Select
7.		No	Select
8.		No	Select
	0 =Total Cover		

Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No	Select
2.		No	Select
	0 =Total Cover		

Remarks Vegetation cleared with backhoe on Wednesday, plant information from visit on 5/5/17 and from aerial photo.

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:		
OBL species	x 1	=	0
FACW species	x 2	=	0
FAC species	x 3	=	0
FACU species	x 4	=	0
UPL species	x 5	=	0
Column Totals: 0 (A)			0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
0-6"	7.5YR 4/3	100	None	0	Select	Select	Sandy Loam	With gravel fill
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

select
Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select
Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

select
Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hard pack limestone fill material at 6"

Depth (inches): 6

Hydric Soil Present: Yes ☐ No ☑

Remarks:
Depth of pit = 6"

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select
Surface Water (A1
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select
Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select
Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): None
Water Table Present?	Yes ☐	No ☑	Depth (inches): >6"
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches): >6"

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
negative alpha, alpha dipyridyl test

Water flow nearby from a broken irrigation pipe caused by construction crew.

Reset Form

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Kamehameha Hwy Force Main City: Honolulu Sampling Date: 05/19/2017 Time: 8:55 am

Applicant/Owner: City and County of Honolulu State/Terr./Comm.: Hawaii Island: Oahu Sampling Point: SP 4

Investigator 1: Susan Burr Investigator 2: Jessica Withrow TMK/Parcel: 1-1-003:239

Landform: coastal plain Local relief: concave

Lat: 21°20'00.37179"N Long: 157°53'43.74830"W Datum: WGS 1984 Slope (%): 1

Soil Map Unit Name: Fill land, mixed NWI classification: Upland (near boundary)

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☐	No ☑	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ☑	No ☐	**within a Wetland? Yes ☐ No ☑**

Remarks:

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0 =Total Cover (sum)		

Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. Pluchea indica	1	Yes	FAC
2. Batis maritima	1	Yes	OBL
3. Leptochloa fusca	1	Yes	FACW
4.		No	Select
5.		No	Select
	3 =Total Cover (sum)		

Herb Stratum (Plot size: 1-m radius)			
1. Moved to sapling shrub		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
6.		No	Select
7.		No	Select
8.		No	Select
	0 =Total Cover		

Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No	Select
2.		No	Select
	0 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:		
OBL species	x 1	=	0
FACW species	x 2	=	0
FAC species	x 3	=	0
FACU species	x 4	=	0
UPL species	x 5	=	0
Column Totals: 0 (A)			0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks

SOIL

Sampling Point: SP 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
0-1	7.5YR 2.5/2	100	None		Select	Select	Muck	
1-6	7.5YR 2.5/2	100	None		Select	Select	Loamy Sand	90%limestone gravel fill
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

select
Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select
Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

select
Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hard pack limestone

Depth (inches): 6

Hydric Soil Present: Yes ☐ No ☑

Remarks:
Depth of pit = 6"
Muck does not meet color requirement for A8

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select
Surface Water (A1
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select
Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select
Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): > 6
Water Table Present?	Yes ☐	No ☑	Depth (inches): > 6
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 1

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
negative alpha, alpha dipyridyl test
Saturation from ponded water.

Appendix B
Environmental Conditions Review

TECHNICAL MEMORANDUM

Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Prepared for

City and County of Honolulu

June 2017

1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

TECHNICAL MEMORANDUM

Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

PREPARED FOR:	City and County of Honolulu, Department of Design and Construction
PREPARED BY:	CH2M
DATE:	June XX, 2017
REVISION NO.:	Draft

Introduction and Purpose

The City and County of Honolulu (City), Department of Design and Construction (DDC) proposes the installation of a secondary force main that connects the Kamehameha Highway Wastewater Pump Station (WWPS) located at the corner of Keehi Lagoon Park to the Kapalama Interceptor Relief Sewer, Section IV, at the Sand Island Industrial Area. In accordance with Hawaii Revised Statutes (HRS) Chapter 343, Section 5, this project requires the preparation of an Environmental Assessment (EA) by reason of involving the proposed use of State or County lands or the use of State or County funds. In addition, the project is located entirely within the Special Management Area (SMA), and is therefore subject to the preparation of an EA as required by Chapter 205A of the HRS and Chapter 25 of the Revised Ordinances of Honolulu (ROH). One component of the EA, and the purpose of this environmental conditions review technical memorandum (herein referred to as the tech memo), is to provide information regarding the current environmental conditions related to the presence of any hazardous substances or petroleum products in, on, or at the above-mentioned locations (herein referred to as the project site), as shown in Figure 1.

This tech memo is not intended to meet the methodology prescribed by ASTM International (ASTM) Standard E1527-13, *Standard Practice for Environmental Site Assessments: Phase l Environmental Site Assessment Process* (herein referred to as the Practice) but utilizes components of the Practice to complete the scope of service described below. Therefore, this tech memo is not considered to be a Phase I Environmental Site Assessment (ESA) for the project site nor does it satisfy the requirements for the Landowner Liability Protections (innocent landowner defense, contiguous property owner liability protection, and bona fide prospective purchaser liability protection) provided by the Comprehensive Environmental Response, Compensation, and Liability Act All Appropriate Inquiry Rule (40 *Code of Federal Regulations* Part 312).

Scope of Service

The scope of service performed for this tech memo is as follows:

- **Records Review**. A regulatory database computerized environmental report (CER) was commissioned using Environmental Data Resources, Inc. (EDR) databases to evaluate reasonably ascertainable federal, state, and local regulatory environmental contamination information to determine properties which may have a potential impact on the environmental conditions of the project site. Environmental records from the State of Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response (HEER) and Solid and Hazard Waste Branch (SHWB) Leaking

Underground Storage Tank (LUST) databases were reviewed to identify any additional environmental contamination information that was not identified in the CER. A review of historical topographic maps and aerial photographs was also performed as part of this tech memo.

- **Site Reconnaissance.** Access to the project site was provided to CH2M on May 8, 2017 to perform a pedestrian survey on and around the accessible project site. Items observed during the pedestrian survey were (1) visible evidence of potential hazardous materials or petroleum handling, storage, or disposal, and (2) other potential contaminants or practices that may have affected the environmental condition of the project site. Representative photos taken during the site reconnaissance are provided in Attachment A. A pedestrian survey of adjoining properties was not performed. The site reconnaissance involved a combination of walking over areas where rights of entry were provided and safely accessible by foot. Available sightlines were used to note the current conditions of the project site. Because of construction material storage and heavy equipment parking, dense ground vegetative cover, or aggregate coverage within the project area, sightlines to these ground surface areas were also limited. Access to the interior of storage sheds or commercial businesses was not provided.

Site Description

The project site is comprised of approximately 7.9 acres within the following tax map keys (TMKs) (Figure 2):

Table 1. Project Site TMKs
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Owner	TMK
State of Hawaii, Department of Land and Natural Resources, State Parks Division	1-1-003-239
State of Hawaii, Department of Transportation, Airports Division	1-1-003-004
State of Hawaii	1-1-003-138
State of Hawaii	1-1-003-206
State of Hawaii	1-1-003-204
State of Hawaii	1-1-003-205
State of Hawaii	1-1-003-212
State of Hawaii	1-1-003-207
State of Hawaii	1-2-021-035
State of Hawaii	1-2-021-036

For purposes of this tech memo, the project site is divided into three areas. Current uses of the three areas include the following:

- **North Nimitz Highway Area**. Located in the western portion of the project site, the North Nimitz Highway Area is comprised of a pedestrian footpath and landscaping. This area is mauka (north) of various commercial and light industrial businesses including CarQuest Auto Parts and Servco Auto Dealership. A 16-inch gas pipeline operated by Hawaii Gas is located within the North Nimitz Highway Area of the project site.

- **Keehi Lagoon Park Area**. Located in the central portion of the project site, the Keehi Lagoon Park Area is comprised of open, green space for recreational use, tennis courts, and a fenced off area of unknown use.
- **Sand Island Industrial Area**. Comprising the eastern portion of the project site, the Sand Island Industrial Area includes an equipment and heavy machinery storage yard.

Adjacent land uses include various businesses along North Nimitz Highway and Keehi Lagoon Beach Park to the west. Keehi Lagoon Memorial, Disabled American Veterans non-profit organization, and the future Kahauiki Village (former Hawaii All-Star Paintball Games) are to the north of the project site. North Nimitz Highway and Queen Liliuokalani Freeway parallel the proposed force main to the north of the project site and several industrial businesses are present to the east. The proposed force main also crosses streams at two locations, once at the Moanalua Stream and the other at the Kalihi Stream.

Records Review Findings

A regulatory database CER was commissioned in the form of an EDR Radius Map Report (EDR, 2017a) in order to preliminarily identify certain sites that may have a direct and immediate impact on the project site. For purposes of this tech memo, if sites identified in the CER met all of the following criteria, then they were preliminarily identified as having the potential to affect to the environmental condition of the project site:

- Within the project site or within a 0.125-mile radius
- Existing hazard controls include engineering controls or institutional controls; or a violation or release was reported for which further investigation or closure is in progress; or both
- Current status indicates ongoing investigation or remediation and a No Further Action (NFA) with Unrestricted Land Use determination was not obtained

Table 2 includes those sites that met all of the above criteria and provides additional information regarding their location relative to the project site and current regulatory status (as provided in the EDR Radius Map Report). Additional review regarding the status of these sites may be warranted to definitively determine their impact on the environmental condition of the project site. A complete listing of all sites identified in accordance with the CER search radii is available in the executive summary of the EDR Radius Map Report presented in Attachment A.

Table 2. CER Review: Sites Identified to Potentially Affect the Environmental Condition of the Project Site
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Property Name/Address	Distance (Miles)/ Direction	Database	Regulatory Status
Al Phillips Facility 515 Lagoon Drive	0.106/W	SHWS	SHWS • Lead Agency: HEER • Hazard Undetermined • Priority: Medium • Middle distillates, PCE, and TCE in soil gas • Assessment Ongoing
Jack Endo Electric, Inc. 2814 Kilihau Street	0.0096/WNW	LUST, UST	LUST • Facility ID: 9-101395 • Status: LUST Cleanup Initiated • Status date: 1/19/2011 • Release ID: 930007
Alsco (American Linen) Tank 2771 Waiwai Loop	0.049/W	SHWS, SPILLS, INST CONTROL, ENG CONTROLS	SHWS • Lead Agency: HEER • Hazard Managed with Controls • Priority: No Further Action • Diesel in soil and groundwater • NFA Letter – Restricted Residential Use (6/14/2005)
Keehi Lagoon Canoe Facility, Increment II Hoonee Place	0.093/S	SHWS, SPILLS, INST CONTROL, ENG CONTROLS	SHWS • Lead Agency: HEER • Hazard Managed with Controls • Priority: No Further Action • Lead, PAHs, petroleum in soil and/or groundwater • NFA Letter – Restricted Use (10/20/2005)
Pearl Harbor Naval Complex – US Naval Command Pearl Harbor Honolulu, Hawaii	0.057/NW	NPL, CERCLIS, US ENG CONTROLS, US INST CONTROL, ROD, PRP	NPL Status: Currently on the Final NPL
Peacock Roofing and Termite Co. 2726 Waiwai Loop	0.024/ project site within this property	LUST, UST, RCRA NonGen/NLR	LUST • Facility ID: 9-103351 • Status: Site Cleanup Completed – No Further Action • Status date: 10/15/2001 Release ID: 990158
Ogden Allied Services 2720 Waiwai Loop	0.027/ project site within this property	LUST, UST	LUST • Facility ID: 9-100888 • Status: Site Cleanup Completed – No Further Action • Status date: 10/01/2001 Release ID: 970061

Notes

CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
ENG CONTROLS	Engineering Control
INST CONTROL	Institutional Control
NPL	National Priority List Site
PCE	tetrachloroethylene
PRP	Potentially Responsible Parties
RCRA NonGen/NLR	Resource Conservation and Recovery Act Non-Generator/No Longer Regulated
ROD	Record of Decision
SHWS	Solid and Hazardous Waste Site
SPILLS	Spills Information
TCE	trichloroethylene
UST	Underground Storage Tank

Additionally, a review of environmental records from the HDOH HEER and SHWB LUST databases did not identify any additional environmental contamination information that was not identified in the CER.

An environmental lien and activity use limitation (AUL) search was commissioned for the two primary TMKs in which the project site is located: 1-1-003-239 and 1-2-021-036 (EDR, 2017b). No environmental liens or AULs were found for either TMK. The following is a summary of ownership and lessee information from the environmental lien and AUL search:

- TMK: 1-1-003-239
  - Current Owner: State of Hawaii Department of Land and Natural Resources Parks Division
- TMK: 1-2-021-036
  - Current Owner: State of Hawaii
  - Lessee: JSR Equipment Inc.

Topography Map Review

CH2M reviewed historical 7.5-minute topographic maps of the project site that were provided by EDR (EDR, 2017c), which are presented in Attachment B. Table 3 summarizes their findings.

Table 3. Historical Topographic Map Findings for Project Site
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Year Revised	Project Site
1928 (7.5-minute series)	The eastern portion of the project site is identified as undeveloped marsh or swamp land. The western-most portion is identified as partial woodland vegetation with several buildings and harbor water while the remaining area is located in the water.
1953 (7.5-minute series)	The project site is no longer marked with the marsh/swamp symbol. The western portion of the project site is identified as built-up area and has been developed into a residential neighborhood.
1954 (7.5-minute series)	There were no changes within the project site from the 1953 map.
1959 (7.5-minute series)	The western portion of the project site is no longer identified as built-up area. A road and parking lot associated with the Keehi Lagoon Beach Park is visible in the western portion of the project site.
1968/1969 (7.5-minute series)	The eastern portion of the project site is identified as shrubland. The westernmost portion of the project site is identified as built-up area.
1970 (7.5-minutes series)	There were no changes within the project site from the 1968/1969 map.
1998/1999 (7.5-minutes series)	The eastern portion of the project site is identified as built-up. In the western portion of the project site, several buildings and a road are visible in the Keehi Lagoon Beach Park.
2013 (7.5-minutes series)	There were no changes within the project site from the 1998/1999 map.

No landfills or other significant features are identified on the topographic maps.

Historic Aerial Photograph Review

Aerial photographs provide visual documentation of site conditions at the time of the photographs, and can indicate activities such as dumping or industrial use of a site. CH2M reviewed historical aerial photographs provided by EDR (EDR, 2017d). The photographs are included in Attachment C, and a summary of the reviewed photographs is presented in Table 4.

Table 4. Aerial Photograph Findings for Project Site
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Year	Project Site
1968	The eastern portion of the project site is heavily wooded while the western portion is occupied by commercial buildings and the central portion is cleared, likely for recreational use.
1975	The eastern portion of the project site appears to be used for equipment storage or vehicle parking. New commercial buildings are present in the western portion while a tennis court is present in the central portion.
1978	No significant changes from the 1975 aerial photograph.
1985	The majority of vegetation has been removed from the eastern portion of the project site and appears to be used for equipment storage and heavy machinery parking. The western portion appears unchanged from the 1978 aerial photograph.
1992	No significant changes from the 1985 aerial photograph.
2000	Only the western portion is visible. No significant changes from the 1992 aerial photograph.
2004	Only the eastern portion is visible. No significant changes from the 2000 aerial photograph.
2008	Only the eastern portion is visible. No significant changes from the 2004 aerial photograph.

Site Reconnaissance

A walking site reconnaissance was conducted on May 8, 2017 within accessible portions of the project site to document current site conditions. The walking site reconnaissance was not performed for the entirety of the project site because entry into certain portions (i.e. the connex storage containers within the Sand Island Industrial Area or the commercial businesses within the North Nimitz Highway Area) was not provided. Instead, to the extent practical, visual surveys were performed from the accessible portions of the project site.

Accessible access roads and walkways were walked and visually surveyed looking north, south, east, and west, to document surrounding properties and current conditions. As a result of heavy machinery and large storage containers in the Sand Island Industrial Area and inaccessible commercial businesses in the North Nimitz Highway Area, sightlines onto all portions of the project site and all ground surfaces were limited. The northeastern fenced off portion of the Keehi Lagoon Park Area was visually surveyed from the outside, and was not entered due to safety concerns.

Table 5 summarizes the observations made during the May 8, 2017 site reconnaissance of surface conditions. Representative photographs are provided in Attachment D.

Table 5. Summary of Site Reconnaissance Exterior Observations
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Category	North Nimitz Highway Area	Keehi Lagoon Park Area	Sand Island Industrial Area
Petroleum Products	Petroleum products were not observed, but may be present south of the Area due to commercial businesses (i.e. CarQuest Auto Parts, Auto Dealership).	Petroleum products were not observed.	The Area is currently used as a laydown yard for equipment and machinery. Presence of hydraulic oils, brake fluids, lubricants, diesel fuel, and other petroleum distillates are likely as it was observed that the heavy equipment and machinery are still in use or have been recently used. Maintenance of equipment was not observed. Staining was present on the ground surface. Drums and tanks of unknown contents were observed. A northwestern portion of the Area appeared to be used as an equipment wash or rinse area. The interior of connex containers were not accessible. Two diesel fuel dispensing tanks present in the adjoining property to the east.
Hazardous Materials and Hazardous Waste	Hazardous materials and hazardous waste were not observed.	Hazardous materials and hazardous waste were not observed.	Potentially hazardous materials observed included: o Numerous 55-gallon steel drums (some weathered or rusting) and other various container types containing unknown material o Numerous connex boxes containing unknown material o A potential equipment wash or rinse area was observed in the northwestern portion of the Area. The ground appeared to have fine sediments that have dried and cracked over time, presumably from vehicles or equipment being washed and the water accumulating onto the unpaved ground.
Polychlorinated Biphenyls (PCBs)	PCBs or PCB-containing equipment were not observed.	One electrical transformer was observed in the adjoining property to the west, however it is unknown if PCBs are used.	PCBs or PCB-containing equipment were not observed.

Table 5. Summary of Site Reconnaissance Exterior Observations
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Category	North Nimitz Highway Area	Keehi Lagoon Park Area	Sand Island Industrial Area
Aboveground Storage Tanks (ASTs)	ASTs were not observed.	ASTs were not observed.	Two diesel fuel ASTs were observed in the adjoining property to the east. Two fuel tanks associated with trucks, vehicles, heavy equipment, and machinery were visibly observed. It could not be determined whether they were still in use.
Underground Storage Tanks (USTs)	USTs were not observed.	USTs were not observed.	USTs were not observed.
Solid Waste	Solid waste was not observed.	Solid waste was not observed.	Solid waste in the form of debris was observed in the Area. It is uncertain as to whether construction material was being store or was solid waste. Debris included abandoned equipment, boxes with rusting metal cords, drill augers, aggregate piles, new construction materials, and various containers containing unknown material.
Water	The primary water source to the Area is from the potable municipal source.	The primary water source to the Area is from the potable municipal source. A water valve was observed to be installed within the Area.	The primary water source to the Area is from the potable municipal source.
Wastewater	No sanitary-sewer systems were observed within the Area.	A sanitary-sewer system was observed within the Area.	No sanitary-sewer systems were observed within the Area.
Stormwater	A storm drain was observed in the central portion of the Area. A portion of the Area is unpaved with stormwater likely being reinfiltrated or running off to adjoining properties.	Storm drains were not observed in the Area. The Area is predominantly unpaved with stormwater likely being reinfiltrated or running off to the adjoining portions of the Area.	Storm drains were not observed in the Area. The Area is unpaved with stormwater likely being reinfiltrated or running off to adjoining portions of the Area.
Heating and Cooling	No heating or cooling systems were observed in the Area.	No heating or cooling systems were observed in the Area.	No heating or cooling systems were observed in the Area.

Table 5. Summary of Site Reconnaissance Exterior Observations
Environmental Conditions Review for the Kamehameha Highway Wastewater Pump Station 36-inch Force Main

Category	North Nimitz Highway Area	Keehi Lagoon Park Area	Sand Island Industrial Area
			Air-conditioning window units were observed on trailers in adjoining property to the southeast
Stressed vegetation	Stressed vegetation was not observed throughout the Area.	Stressed vegetation was observed throughout the western-most portion of the Area. Some stressed vegetation may be attributed to the operation of vehicular traffic (i.e., unpaved driveway) but there were portions in the east where consistent heavy operation of vehicles is unlikely.	Stressed vegetation was not observed throughout the Area. However, there is no irrigation or landscaping being performed. Furthermore, the Area has been cleared of any vegetation for equipment and materials storage and traversed by operational vehicles.
Stains or stained soil	No stains or stained soil was observed.	No stains or stained soil was observed.	Petroleum-like staining of the bare ground surface observed in the central portion of the Area and underneath some heavy machinery and equipment.
Odors	No unusual odors, such as petroleum or solvent odors were observed.	No unusual odors, such as petroleum or solvent odors were observed.	Petroleum odors were observed in some portions of the Area.
Pits, ponds or lagoons	Pits, ponds or lagoons were not observed within the Area during the May 2017 site reconnaissance.	Pits, ponds or lagoons were not observed within the Area during the February 2017 site reconnaissance. The Keehi Lagoon is located approximately 275 meters south of the Area. The Moanalua Stream is located approximately 150 meters east of the Area.	Pits, ponds or lagoons were not observed within the Area during the May 2017 site reconnaissance. The Kalihi Stream is located adjoining the Area to the east.
Unusual geologic conditions	Unusual geologic conditions, such as sink holes, were not visually observed within the Area.	Unusual geologic conditions, such as sink holes, were not visually observed within the Area.	Unusual geologic conditions, such as sink holes, were not visually observed within the Area. A concrete pad of unknown origin was observed in the central portion of the Area.

Summary and Conclusion

A review of the regulatory database CER indicated seven sites within a 0.125-mile radius of the project site that potentially affect the environmental condition of the project site. These sites and their regulatory status, as provided in the EDR Radius Map Report (EDR, 2017a) are detailed in Table 2.

The following observations were made at each of the project site's three Areas that may indicate a potential environmental impact:

- **North Nimitz Highway Area:** During the May 8, 2017 site reconnaissance, no significant observations were made that may impact the environmental condition of the site. However, the interior of the commercial businesses (automotive parts and dealership) could not be assessed. A storm drain was observed in the central portion of the Area. A subsurface natural gas pipeline exists within the North Nimitz Highway Area.
- **Keehi Lagoon Park Area:** Stressed vegetation was observed within the eastern-most portion of the Keehi Lagoon Park Area. Because this portion of the Area is not a major thoroughfare, it is unlikely that the stressed vegetation is a result of vehicular traffic. Additionally, because surrounding vegetation was observed to be in good condition, it is unlikely that the stressed vegetation is due to a lack of irrigation. A fenced off portion of the Area in the northeast with a sign identifying it as a construction area is present. No other observations that may impact the environmental condition of the site were made.
- **Sand Island Industrial Area:** The Area is currently being used as a heavy equipment, machinery, and construction material storage yard. Heavy petroleum-like staining was observed on the ground surface, and petroleum odors were noted. Potentially hazardous materials may be present within unlabeled storage containers, as well as labeled and unlabeled 55-gallon steel drums and other various container types (i.e. buckets, crates, boxes).

Significant Assumptions and Limitations

In preparing this tech memo, CH2M has relied on certain information provided by the client, by federal, state, and local officials, and by other parties referenced herein, and on information contained in the files of governmental agencies that was reasonably ascertainable at the time of this assessment. Although there may have been some degree of overlap in the information provided by these various sources, CH2M did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site assessment, except where a reasonable person with similar experience or background would or should have known of the inaccuracy of the information provided. CH2M has based its conclusions set forth in this tech memo based upon this readily available data, information, or statements supplied by HART or third parties as cited herein. Conclusions in this tech memo are subject to change if additional or more reliable information becomes available.

Any opinions or recommendations presented apply to site conditions existing when services were performed. CH2M cannot report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces. CH2M assumes no responsibility for conditions it was not authorized to investigate, or which was not in its specific scope of work.

This tech memo was prepared for the exclusive use of the City DDC for specific application to the project site. No warranty, expressed or implied, is made. There are no beneficiaries of this tech memo other than the City DDC, and no other person or entity is to rely on this tech memo without the written consent of CH2M and a written agreement limiting CH2M's liability.

References

Environmental Data Resources, Inc. (EDR). 2017a. *The EDR Radius Map Report with GeoCheck. KHFM Environmental Assessment, Kamehameha Highway, Honolulu, HI, Inquiry Number 4928184.2s.* May 4.

Environmental Data Resources, Inc. (EDR). 2017b. *EDR Environmental Lien and AUL Search. KHFM Environmental Assessment, Kamehameha Highway, Honolulu, HI, Inquiry Number 4928184.7S.* May 12.

Environmental Data Resources, Inc. (EDR). 2017c. *EDR Historical Topo Map Report*. *KHFM Environmental Assessment, Kamehameha Highway, Honolulu, HI, Inquiry Number 4928184.4.* May 4.

Environmental Data Resources, Inc. (EDR). 2017d. *The EDR Aerial Photo Decade Package*. *KHFM Environmental Assessment, Kamehameha Highway, Honolulu, HI, Inquiry Number 4928184.12.* May 5.

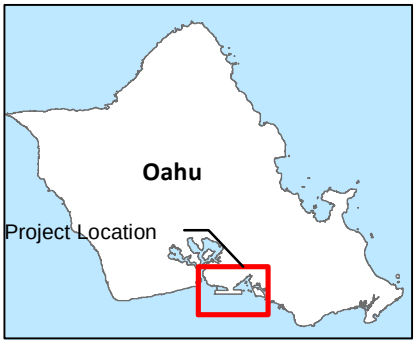
Figures

1 Project Location Map
2 Project Location Areas

Attachments

A EDR Radius Map with GeoCheck, Executive Summary
B EDR Historical Topo Map Report
C EDR Aerial Photo Decade Package
D Representative Site Reconnaissance Photographs

Figures



LEGEND

Horizontal Directional Drilling

Project Area

Note: Locations are approximate.

N

0 1,000 2,000

Approximate Scale in Feet

FIGURE 1

Project Location Map

Kamehameha Highway Wastewater Pump Station Force Main System Improvements

Oahu, Hawaii

FIGURE 2
Project Location Areas
Kamehameha Highway Wastewater Pump Station Force Main System Improvements
Oahu, Hawaii

Attachment A

EDR Radius Map Report with GeoCheck

KHFM Environmental Assessment
Kamehameha Highway
Honolulu, HI 96819

Inquiry Number: 4928184.2s
May 04, 2017

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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GEOCHECK ADDENDUM

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Physical Setting Source Map	A-7
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Physical Setting Source Records Searched	PSGR-1

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

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EXECUTIVE SUMMARY

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

TARGET PROPERTY INFORMATION

ADDRESS

KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

COORDINATES

Latitude (North):	21.3326890 - 21˚ 19' 57.68''
Longitude (West):	157.8932940 - 157˚ 53' 35.85''
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	614768.9
UTM Y (Meters):	2359232.2
Elevation:	0 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5941635 HONOLULU, HI
Version Date:	2013
West Map:	5941087 PEARL HARBOR, HI
Version Date:	2013

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
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	HICKAM AIR FORCE BAS		DOD	Same	3136, 0.594, WSW
Reg	FORT SHAFTER		DOD	Same	1578, 0.299, NE
Reg	PEARL HARBOR NAVAL S		DOD	Same	2641, 0.500, North
Reg	PEARL HARBOR NAVAL C	US NAVAL COMMAND	NPL, SEMS, US ENG CONTROLS, US INST CONTROL, ROD,..	Same	302, 0.057, NW
1	KAMEHAMEHA HWY WWPS	2691 N. NIMITZ HWY	HI UST, HI Financial Assurance	Higher	18, 0.003, WNW
A2	AUTOMOTIVE WAREHOUSE	2760 WAIWAI LP	HI UST	Higher	127, 0.024, WNW
A3		2760 WAIWAI LOO	EDR Hist Auto	Higher	127, 0.024, WNW
A4		2760 WAIWAI LOOP	EDR Hist Auto	Higher	127, 0.024, WNW
A5	AUTOMOTIVE WAREHOUSE	2760 WAIWAI LP	RCRA NonGen / NLR, FINDS, ECHO	Higher	127, 0.024, WNW
A6	PEACOCK ROOFING AND	2726 WAIWAI LP	HI LUST, HI UST	Higher	128, 0.024, WNW
A7	PEACOCK ROOFING AND	2726 WAI WAI LOOP	RCRA NonGen / NLR, FINDS, ECHO	Higher	128, 0.024, WNW
B8	OGDEN ALLIED SERVICE	2720 WAIWAI LP	HI LUST, HI UST	Higher	143, 0.027, WNW
C9		2702 WAIWAI LOOP	EDR Hist Auto	Higher	144, 0.027, WNW
C10		2702 WAIWAI LOO	EDR Hist Auto	Higher	144, 0.027, WNW
D11	SOUTH SEAS MOTORS	2841 N NIMITZ HWY	RCRA NonGen / NLR, FINDS, ECHO	Higher	210, 0.040, WNW
B12	CASTLE & COOKE COMME	2702 WAIWAI LOOP	RCRA-CESQG, FINDS, ECHO	Higher	227, 0.043, WNW
A13	GEO. OKANO ELECTR. C	2781 WAIWAI LP	HI UST	Higher	241, 0.046, West
A14	ALSCO (AMERICAN LINE	2771 WAIWAI LP	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	259, 0.049, West
A15	YOUNG LAUNDRY & DRY	2771 WAIWAI LOOP	SEMS-ARCHIVE, HI UST, RCRA NonGen / NLR, FINDS,...	Higher	259, 0.049, West
D16	OAHU TIRE SERVICE &	2808 KAMEHAMEHA HWY	HI LUST, HI UST	Higher	271, 0.051, WNW
D17	HARBOR GRAPHICS	2222 KAM HIGHWAY	RCRA-CESQG, FINDS, ECHO	Higher	311, 0.059, WNW
E18	RITE WAY AUTO DETAIL	609 AHUA ST	HI UST	Higher	321, 0.061, WNW
F19		2769 KILIHAU ST	EDR Hist Auto	Higher	336, 0.064, WNW
F20	ISLAND DEMO (FOR REG	2769 KILIHAU ST	RCRA NonGen / NLR, ICIS, US AIRS, FINDS, ECHO, CA...	Higher	336, 0.064, WNW
G21	FORMER NEW AND USED	545 LAGOON DR	HI LUST	Higher	337, 0.064, West
G22	RYDER TRANSPORTATION	545 N LAGOON DR	RCRA-CESQG, FINDS, ECHO	Higher	337, 0.064, West
D23	MALOLO BEVERAGES & S	2815 KOAPAKA ST	HI UST	Higher	338, 0.064, West
H24	HAWAII COMMUNITY DEV	2 ALAHAO PL	RCRA NonGen / NLR, FINDS, ECHO	Higher	356, 0.067, ESE
E25	INTERNATIONAL ORCHID	2815-A KILIHAU ST	HI UST	Higher	375, 0.071, WNW
E26		2815 KILIHAU ST	EDR Hist Auto	Higher	375, 0.071, WNW
I27		2833 KILIHAU ST	EDR Hist Auto	Higher	375, 0.071, WNW
I28	WALMART WAREHOUSE NO	2833 KILIHAU ST	RCRA NonGen / NLR	Higher	375, 0.071, WNW
I29	WHIMPORTS TOY COMPAN	2829 KILIHAU ST	HI UST	Higher	375, 0.071, WNW
B30	R AND D TECHNOLOGIES	2688 WAIWAI LOOP	RCRA NonGen / NLR, FINDS, ECHO	Higher	381, 0.072, West
H31	IMPS INC	2298 ALAHAO PL BLDG	RCRA NonGen / NLR, FINDS, ECHO	Higher	397, 0.075, ESE
J32	INFINITI MOTOR SALES	2885 KILIHAU ST	HI UST	Higher	418, 0.079, WNW
B33	ALA WAI BOULEVARD &	2655 WAIWAI LOOP	RCRA-CESQG, FINDS, ECHO, CA HAZNET	Higher	448, 0.085, West
B34	EARLE M. JORGENSEN C	2655 WAIWAI LP	HI UST	Higher	448, 0.085, West
K35	DOUGLAS TAKATA EQUIP	2706 KILIHAU ST	HI LUST, HI UST	Higher	451, 0.085, NW

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
36	TRANE PACIFIC SERVIC	2298 D ALAHAO PLACE	RCRA NonGen / NLR, FINDS, ECHO	Higher	458, 0.087, ESE
J37	NISSAN MOTOR CORP. I	2880 KILIHAU ST	HI LUST, HI UST	Higher	459, 0.087, WNW
I38	MARTIN WAREHOUSE AND	2838 KILIHAU ST	HI LUST, HI UST	Higher	461, 0.087, WNW
I39	MAGNUM TRANSPORTATIO	2838 KILIHAU ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	461, 0.087, WNW
40	SCHUMAN CARRIAGE CO.	2424 KAMEHAMEHA HWY	HI UST	Higher	464, 0.088, East
E41		2804 KILIHAU ST	EDR Hist Auto	Higher	506, 0.096, WNW
E42	UNITED TRUCK RENTAL	2804 KILIHAU ST	HI LUST, HI UST	Higher	506, 0.096, WNW
E43	JACK ENDO ELECTRIC,	2814 KILIHAU ST	HI LUST, HI UST, HI Financial Assurance	Higher	507, 0.096, WNW
E44		2814 KILIHAU ST	EDR Hist Auto	Higher	507, 0.096, WNW
F45	U-HAUL OF HAWAII, IN	2722 KILIHAU ST	HI LUST, HI UST, RCRA NonGen / NLR, FINDS, ECHO	Higher	513, 0.097, NW
E46	REFUSE INC	633 AHUA ST	HI LUST, HI UST	Higher	541, 0.102, NW
H47		2291 ALAHAO PL	EDR Hist Cleaner	Higher	550, 0.104, SE
K48	M. H. ELECTRIC COMPA	2688 KILIHAU ST	RCRA-CESQG, ECHO	Higher	555, 0.105, NW
G49	AL PHILLIPS FACILITY	515 LAGOON DR	HI SHWS	Higher	561, 0.106, West
G50		515 LAGOON DR	EDR Hist Cleaner	Higher	561, 0.106, West
L51	CHRISTIAN BROADCASTI	2844 KOAPAKA ST	RCRA-CESQG, FINDS, ECHO	Higher	566, 0.107, WNW
K52	ROVENS TANAKA CONTRA	2678 KILIHAU ST	HI LUST, HI UST	Higher	572, 0.108, NW
M53	ALII STOR-MOR	2670 KILIHAU ST	HI LUST, HI UST	Higher	589, 0.112, NW
N54	FIRST HAWAIIAN BANK	2339 KAMEHAMEHA HWY	HI UST, HI SPILLS, HI Financial Assurance	Higher	620, 0.117, East
M55	PACIFIC DIVING INDUS	2646 KILIHAU ST	HI LUST, HI UST, HI Financial Assurance	Higher	624, 0.118, NNW
O56	PAN-PACIFIC CONSTRUC	2621 WAIWAI LP	HI LUST, HI UST	Higher	633, 0.120, West
O57	RAY WILSON CO DBA RW	2621 WAIWAI LOOP	RCRA-CESQG, FINDS, ECHO	Higher	633, 0.120, West
O58	PEERLESS ROOFING CO.	2629 WAIWAI LOOP	HI LUST, HI UST	Higher	634, 0.120, West
O59	FLICK PEST CONTROL	2629 WAI WAI LOOP	RCRA NonGen / NLR, FINDS, ECHO	Higher	634, 0.120, West
J60	INTEGRATED MEDIA INC	630 PUULOA RD	RCRA NonGen / NLR, FINDS, ECHO	Higher	635, 0.120, WNW
O61	AMERICAN PACIFIC TRA	2635 WAIWAI LP	HI SHWS, HI LUST, HI UST	Higher	636, 0.120, West
M62	OCEANIC CABLEVISION	2669 KILIHAU ST	HI SHWS, HI SPILLS	Higher	658, 0.125, NNW
P63	AERONAUTICAL RADIO,	2668 WAIWAI LP	HI LUST, HI UST	Higher	660, 0.125, West
L64	SATURN OF HONOLULU	2901 NIMITZ HWY	RCRA-CESQG, FINDS, ECHO	Higher	691, 0.131, WNW
L65	SATURN OF HONOLULU	2901 N NIMITZ HWY	HI LUST, HI UST	Higher	691, 0.131, WNW
L66	ATTCO, INC.	2855 KOAPAKA ST	HI UST, HI Financial Assurance	Higher	707, 0.134, West
P67	DARREN T KIMURA	2660 WAIWAI LOOP ST	SEMS-ARCHIVE, RCRA-SQG, FINDS, ECHO	Higher	715, 0.135, West
P68	OCCIDENTAL CHEM CO	2660 WAIWAI LP	HI SHWS	Higher	715, 0.135, West
P69	JERRY CHING REALTY	2660 WAIWAI LP	HI UST	Higher	715, 0.135, West
Q70	94-344 HOKUALA STREE	619 MAPUNAPUNA ST ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	724, 0.137, WNW
R71	MERCANTILE TRUCKING	2280 ALAHAO PL	HI LUST, HI UST	Higher	731, 0.138, SE
R72	MERCANTILE TRUCKING	2280 ALAHAO PL	RCRA NonGen / NLR	Higher	731, 0.138, SE
R73	WHITE ENVIRONMENTAL	2290 ALAHAO PL UNIT	RCRA-CESQG, FINDS, ECHO, CA HAZNET	Higher	731, 0.138, SE
R74	V P AND F F JR	2290 ALAHAO PL	RCRA NonGen / NLR	Higher	731, 0.138, SE

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
P75	PALAMA MEAT CO., INC	2656 WAIWAI LP	HI UST	Higher	742, 0.141, West
N76	F.T. OPPERMAN & COMP	2340-B KAMEHAMEHA HW	HI LUST, HI UST	Higher	744, 0.141, East
O77	LAGOON CHEVRON 95570	2604 WAIWAI LP	HI LUST, HI Financial Assurance	Higher	745, 0.141, West
O78	CHEVRON 95570	2604 WAIWAI LOOP	RCRA-LQG	Higher	745, 0.141, West
S79	AIRPORT SHELL	2805 UALENA ST	RCRA-CESQG	Higher	755, 0.143, West
S80	EQUILON ENTERPRISES	2805 UALENA ST	RCRA NonGen / NLR, FINDS	Higher	755, 0.143, West
S81	AIRPORT SHELL (PMID0	2805 UALENA ST	HI LUST, HI UST, HI Financial Assurance	Higher	755, 0.143, West
T82	G. W. MURPHY CONSTRU	650 KAKOI ST	HI LUST, HI UST, HI Financial Assurance	Higher	778, 0.147, NW
T83	F K S RENTALS AND SA	653 KAKOI ST	HI LUST, HI UST, RCRA NonGen / NLR, FINDS, ECHO	Higher	788, 0.149, NW
M84	VECTOR CONTROL BRANC	2611 KILIHAU ST	SEMS-ARCHIVE, HI SHWS, HI LUST, HI UST, RCRA...	Higher	802, 0.152, NNW
U85	ABF FREIGHT SYSTEM,	2282 HOONEE PL	RCRA-CESQG	Higher	808, 0.153, SE
U86	HAGADONE PRINTING CO	2278 HOONEE PL	HI SHWS, HI INST CONTROL	Higher	841, 0.159, SE
U87	OAHU BINDERY, INC.	2278 HOONEE PL	HI UST	Higher	841, 0.159, SE
N88	GASPRO (KALIHI FACIL	2305 KAMEHAMEHA HWY	HI LUST, HI UST	Higher	842, 0.159, East
N89	GASPRO INC	2305 KAMEHAMEHA HWY	SEMS-ARCHIVE, RCRA-CESQG, FINDS, ECHO, CA HAZNET	Higher	842, 0.159, East
N90	LENAKONA DEVELOPMENT	2305 KAMEHAMEHA HWY	HI SHWS, HI LUST, HI UST	Higher	842, 0.159, East
V91	NATIONAL CONCRETE SA	650 AHUA ST	HI UST	Higher	855, 0.162, NW
V92	REIT MANAGEMENT & RE	669 AHUA ST	RCRA NonGen / NLR	Higher	855, 0.162, NW
V93	I. DOI TRUCKING	669 AHUA ST	HI LUST, HI UST	Higher	855, 0.162, NW
L94	WINTHROP PRODUCTS IN	2869 KOAPAKA STREET	RCRA NonGen / NLR, FINDS, ECHO	Higher	876, 0.166, West
W95	GRANGER PACIFIC, INC	611 MIDDLE ST	HI LUST, HI UST	Higher	889, 0.168, ENE
W96	611 MIDDLE STREET WA	611 MIDDLE ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	889, 0.168, ENE
T97	PACIFIC TRANSFER & W	664 KAKOI ST	HI LUST, HI UST, HI Financial Assurance	Higher	912, 0.173, NW
X98	TRADEWINDS U-DRIVE I	2875-A KOAPAKA ST	HI UST, HI Financial Assurance	Higher	914, 0.173, West
S99	COMMERCIAL SHELVING	P.O. BOX 29480 2835	HI UST	Higher	920, 0.174, West
Y100	SYLVA BRAIDWOOD	2856 UALENA ST	HI UST	Higher	923, 0.175, West
101	HAWAII DAIRY HOLDING	2277 KAMEHAMEHA HWY	HI SHWS, HI LUST, HI UST, HI VCP, HI Financial...	Higher	930, 0.176, ESE
X102	MIKE SALTA PONTIAC	2882 KOAPAKA ST	HI UST	Higher	932, 0.177, West
Q103	D C ELECTRIC INC.	649-A MAPUNAPUNA ST	HI UST	Higher	972, 0.184, NW
Z104	SUN INDUSTRIES	660 MAPUNAPUNA ST	HI LUST, HI UST	Higher	985, 0.187, NW
X105	AMERICAN RESTAURANT	2887 KOAPAKA ST	HI UST	Higher	988, 0.187, West
V106	ROYAL CONTRACTING CO	677 AHUA ST	HI LUST, HI UST	Higher	988, 0.187, NW
Q107	PRECISION ELECTRIC	653 MAPUNAPUNA ST	HI LUST, HI UST	Higher	1005, 0.190, NW
108	KEEHI TRANSFER STATI	606 MIDDLE STREET	RCRA-SQG, HI LUST, HI UST, HI SPILLS, FINDS, ECHO,...	Higher	1006, 0.191, NE
U109	LONGS DRUG STORES WA	2270 HOONEE PL	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	1013, 0.192, SE
U110	LONGS DRUG STORE 809	2270 HOONEE PL	RCRA-CESQG, FINDS, ECHO	Higher	1013, 0.192, SE
AA111	TRANE PACIFIC SERVIC	330 SAND ISLAND ACCE	RCRA NonGen / NLR, FINDS, ECHO, CA HAZNET	Higher	1028, 0.195, ESE
AA112	VP & FFJR	330 SAND ISLAND ACCE	HI UST	Higher	1028, 0.195, ESE
V113	NORDIC CONSTRUCTION,	685 AHUA ST	HI UST	Higher	1048, 0.198, NW

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
V114	TRANS QUALITY	685 AHUA ST	RCRA-SQG	Higher	1048, 0.198, NW
Y115	INTERNATIONAL MARINE	2870 UALENA STREET	RCRA-SQG, ECHO	Higher	1050, 0.199, West
S116	AVIS RENT-A-CAR SYST	2912 AOLELE ST	HI UST, HI Financial Assurance	Higher	1067, 0.202, West
Y117	EDGARDO PUGLIA (PMID	2845 UALENA STREET	HI LUST, HI UST	Higher	1069, 0.202, West
Y118	THOS. FUJIKAWA PAINT	2865 UALENA ST	HI UST	Higher	1078, 0.204, West
W119	YEE HOP PROPERTY	621 MIDDLE ST	HI SHWS, HI SPILLS	Higher	1086, 0.206, ENE
W120	C.Q. YEE HOP	621 MIDDLE ST	HI LUST, HI UST	Higher	1086, 0.206, ENE
Z121	BURKE CO THE 17	681 MAPUNAPUNA ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	1100, 0.208, NW
Z122	SUN INDUSTRIES	689 PUULOA RD	HI UST	Higher	1104, 0.209, NW
AB123	THE ESTATE OF SAMUEL	697 AHUA ST	RCRA NonGen / NLR	Higher	1109, 0.210, NW
Y124	AMERICAN INT. R.A.C.	2880 UALENA ST	HI LUST, HI UST	Higher	1129, 0.214, West
V125	ALOHA STATE SALES CO	2829 AWAAWALOA ST	HI UST	Higher	1144, 0.217, NW
Z126	MOOS MACHINE WORKS I	685 MAPUNAPUNA ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	1151, 0.218, NW
Z127	MOOS MACHINE SHOP	685 MAPUNAPUNA ST	HI UST	Higher	1151, 0.218, NW
Z128	S. MCCABE PAVING	673 MAPUNAPUNA ST	HI UST	Higher	1153, 0.218, NW
AC129	MIKE SALTA PONTIAC	2945 N NIMITZ HWY	RCRA-CESQG, HI UST, FINDS, ECHO	Higher	1154, 0.219, WNW
Y130	SPRINGS INC (PMID 00	2875 UALENA ST	HI UST	Higher	1158, 0.219, West
AD131	B C P CONSTRUCTION O	2831 AWAAWALOA ST UN	RCRA NonGen / NLR	Higher	1184, 0.224, NW
AD132	RALPH S. INOUYE CO.,	2831 AWAAWALOA ST	HI LUST, HI UST	Higher	1184, 0.224, NW
AE133	DEPT OF TRANSPORTATI	2919 AOLELE ST	HI LUST, HI UST, HI Financial Assurance	Higher	1189, 0.225, West
AE134	AIRPORTS DIV MAINTEN	2919 AOLELE STREET	RCRA-CESQG, FINDS	Higher	1189, 0.225, West
Z135	ABC DSPL	2760 KAMEHAMEHA HWY	SEMS-ARCHIVE	Higher	1192, 0.226, NW
AD136	SWIFT ADHESIVES & CO	2847 AWAAWALOA ST	HI SHWS	Higher	1211, 0.229, NW
AD137	PUGLIA ENGINEERING I	2847 AWAAWALOA ST	RCRA-CESQG, FINDS, ECHO	Higher	1211, 0.229, NW
AD138	SWIFT ADHESIVES & CO	2847 AWAAWALOA ST	SEMS-ARCHIVE	Higher	1211, 0.229, NW
AF139	HAWAIIAN MARINES SAL	2223 HOONEE PL	RCRA NonGen / NLR, FINDS, ECHO	Higher	1212, 0.230, SE
AF140	UNITEK INSULATION IN	2234 HOONEE PL	RCRA NonGen / NLR, FINDS, ECHO, CA HAZNET	Higher	1214, 0.230, SE
AF141	KEMS INC.	2234 HOONEE PL	HI UST	Higher	1214, 0.230, SE
AC142	CYCLE CITY	2965 N NIMITZ HWY	HI UST	Higher	1226, 0.232, WNW
AD143	MUTUAL PLUMBING SUPP	2812 AWAAWALOA ST	HI LUST, HI UST	Higher	1232, 0.233, NW
144	HICKS CONSTRUCTION C	2885 UALENA ST	HI UST	Higher	1240, 0.235, West
AB145	SHELLY MAZDA AUTO PR	709 AHUA ST	HI LUST, HI UST	Higher	1242, 0.235, NW
AG146	PPG ARCHITECTURAL FI	2312 KAMEHAMEHA HWY	RCRA-SQG	Higher	1251, 0.237, East
AG147	ACOUSTICAL MATERIAL	2312 KAMEHAMEHA HWY	RCRA NonGen / NLR	Higher	1251, 0.237, East
AG148	HARDERS CO.	2312 KAMEHAMEHA HWY,	HI LUST	Higher	1251, 0.237, East
Z149	WILLIAM J. KIMI, JR.	692 MAPUNAPUNA ST OR	HI LUST, HI UST	Higher	1252, 0.237, NW
AC150	JN CHEVROLET/MAZDA D	2971 N NIMITZ HWY	HI UST	Higher	1301, 0.246, WNW
AA151	HONOLULU CORP YARD	1348 SAND ISLAND ACC	RCRA NonGen / NLR, FINDS, ECHO	Higher	1305, 0.247, ESE
152	NAV. & MARINE CORPS	530 PELTIER AVE / BL	HI LUST, HI UST	Higher	1323, 0.251, WNW

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
AG153	TESORO 2GO 61020	2260 KAMEHAMEHA HWY	HI LUST, HI UST, HI Financial Assurance	Higher	1334, 0.253, East
154	HAWAII MEAT COMPANY	711 MIDDLE ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	1356, 0.257, ENE
AH155	GARLOW PETROLEUM INC	707 KAKOI ST	HI LUST, HI UST, HI Financial Assurance	Higher	1361, 0.258, NNW
AH156	DEPARTMENT OF TRANSP	727 KAKOI ST	HI LUST, HI UST, HI Financial Assurance	Higher	1399, 0.265, NNW
AH157	WAREHOUSE AND MAINTE	727 KAKOI ST	HI SHWS, HI SPILLS	Higher	1399, 0.265, NNW
AH158	DEPARTMENT OF TRANSP	727 KAKOI ST	SEMS-ARCHIVE, ECHO	Higher	1399, 0.265, NNW
AI159	MUTUAL WELDING CO.	729 AHUA ST	HI LUST, HI UST	Higher	1433, 0.271, NW
AJ160	SAVAGE WHOLESALE	2918 UALENA ST	HI LUST, HI UST	Higher	1448, 0.274, West
AI161	ISLAND ERECTORS	720 AHUA ST	HI LUST, HI UST	Higher	1449, 0.274, NW
162	AMFAC DIST.- INDUSTR	2846 AWAAWALOA ST	HI LUST, HI UST	Higher	1503, 0.285, NW
AI163	MUTUAL WELDING	739 AHUA ST	HI LUST, HI UST	Higher	1530, 0.290, NNW
AJ164	S & M WELDING CO., L	2928 UALENA ST	HI LUST, HI UST	Higher	1546, 0.293, West
AK165	K. YAMADA DISTRIBUTO	2939-2949 KOAPAKA ST	HI LUST, HI UST	Higher	1560, 0.295, West
AJ166	FORMER ZIEGLER STEEL	2919 UALENA ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	1569, 0.297, West
AL167	C P M & F INC	285 SAND ISLAND RD	HI LUST, HI UST, RCRA NonGen / NLR	Higher	1578, 0.299, SE
AM168	CARL'S JR. NIMITZ 76	2140 N NIMITZ HWY	HI LUST, HI UST, HI Financial Assurance	Higher	1603, 0.304, ESE
AL169	HAWAIIAN BITUMULS &	248 SAND ISLAND ACCE	HI SHWS, HI LUST, HI UST, HI INST CONTROL, HI AIRS	Higher	1618, 0.306, SE
AL170	HAWAII BITUMULS	248 SAND ISLAND ACCE	SEMS-ARCHIVE, RCRA NonGen / NLR, FINDS	Higher	1618, 0.306, SE
171	218 MOHONUA PLACE	218 MOHONUA PL	HI SHWS	Higher	1638, 0.310, SSE
172	MONARCH BUILDING SUP	749 MAPUNAPUNA ST	HI SHWS, HI LUST, HI UST, HI Financial Assurance	Higher	1661, 0.315, NW
AI173	HAWAIIAN REINFORCING	761 AHUA ST	HI LUST, HI UST	Higher	1685, 0.319, NNW
AK174	OVERSEAS FREIGHT FOR	2959 KOAPAKA ST	HI LUST, HI UST	Higher	1764, 0.334, West
AN175	WORLDWIDE MOVING & S	2809 KAIHIKAPU ST	HI LUST, HI UST	Higher	1839, 0.348, NNW
AM176	HAWAII PRESS NEWSPAP	2100 N NIMITZ HWY	HI LUST, HI UST	Higher	1866, 0.353, SE
AN177	DIAMOND HEAD PETROLE	2827 KAIHIKAPU ST	HI LUST, HI UST, HI Financial Assurance	Higher	1892, 0.358, NNW
AN178	HAWAIIAN FLUID POWER	803 AHUA ST	HI SHWS, HI SPILLS	Higher	1901, 0.360, NNW
179	TOUCHSTONE	231 SAND ISLAND ACCE	HI LUST, HI UST	Higher	1902, 0.360, SSE
180	SHERMAN ENTERPRISES	2959 UALENA ST	HI LUST, HI UST	Higher	1904, 0.361, West
AO181	MIDDLE STREET INTERM	MIDDLE STREET AND KA	HI LUST, HI UST	Higher	1912, 0.362, ENE
182	AIRPORT USED CAR REN	3033 N NIMITZ HWY	HI LUST, HI UST	Higher	1915, 0.363, WNW
AP183	2250 PAHOUNUI DRIVE	2250 PAHOUNUI DR	HI SHWS	Higher	1917, 0.363, SSE
AN184	PACIFIC CONSTRUCTION	2831 KAIHIKAPU ST	HI LUST, HI UST	Higher	1918, 0.363, NNW
AQ185	A-1 A-LECTRICIAN, IN	2849 KAIHIKAPU ST	HI LUST, HI UST	Higher	1945, 0.368, NNW
AR186	2135 AUIKI ST	2135 AUIKI ST	HI SHWS	Higher	1959, 0.371, SSE
AQ187	DI MAURO PROPERTIES	2855 KAIHIKAPU ST	HI LUST, HI UST	Higher	1970, 0.373, NW
AS188	PACIFIC FENCE, INC.	770 MAPUNAPUNA ST	HI LUST, HI UST	Higher	1992, 0.377, NW
AN189	HAWAII FLUID SUPPLY	809 AHUA ST	HI LUST, HI UST	Higher	1994, 0.378, NNW
AO190	OTS BUS UNIT REPAIR	811 MIDDLE ST	HI SHWS, HI LUST, HI UST, HI Financial Assurance	Higher	2020, 0.383, ENE
AQ191	HAWAIIAN GROCERY STO	2915 KAIHIKAPU ST	HI LUST, HI UST	Higher	2023, 0.383, NW

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
AN192	OCEANIC CABLEVISION	2826 KAIHIKAPU ST	HI LUST, HI UST, HI Financial Assurance	Higher	2032, 0.385, NNW
193	SKEET RANGE	APZV-FEP-V	UXO	Higher	2064, 0.391, North
AQ194	BILS FAMILY PARTNERS	2850 KAIHIKAPU ST	HI LUST, HI UST	Higher	2066, 0.391, NNW
AR195	180 SAND ISLAND ACCE	180 SAND ISLAND ACCE	HI SHWS	Higher	2093, 0.396, SSE
AP196	KILLEBREW & WHITE CO	2264 PAHOUNUI DR	HI LUST, HI UST, HI Financial Assurance	Higher	2107, 0.399, SSE
AT197	GRAYLINE HAWAII LTD	435 KALEWA ST	HI LUST, HI UST, RCRA NonGen / NLR	Higher	2133, 0.404, SW
198	FORT SHAFTER	BLDG 1527, 1528 TANK	HI LUST, HI UST	Higher	2165, 0.410, NNE
AS199	KAM'S EXPRESS, INC.	802 MAPUNAPUNA ST	HI LUST, HI UST, HI Financial Assurance	Higher	2186, 0.414, NW
AP200	KILLBREW/WHITE COMPA	2276 PAHOUNUI DR	HI LUST, HI UST	Higher	2198, 0.416, SSE
201	ROSCOE MOSS COMPANY	830 AHUA ST	HI LUST, HI UST	Higher	2235, 0.423, NNW
202	FORT SHAFTER BOLLARD	1557 PASS ST	HI SHWS, HI SPILLS	Higher	2239, 0.424, NE
203	SAFETY KLEEN CORP 7	723 UMI ST	RCRA-TSDF, RCRA NonGen / NLR	Higher	2314, 0.438, East
AU204	AIR ENGINEERING	2308 PAHOUNUI DR	HI SHWS, HI LUST, HI UST, HI ENG CONTROLS, HI INST...	Higher	2338, 0.443, South
AV205	B & C TRUCKING CO.,	812 MAPUNAPUNA ST	HI LUST, HI UST	Higher	2351, 0.445, NW
AU206	158 SAND ISLAND ACCE	158 SAND ISLAND ACCE	HI SHWS	Higher	2368, 0.448, SSE
AT207	DOLLAR RENT-A-CAR (P	452 KALEWA ST	HI LUST, HI UST	Higher	2370, 0.449, SW
208	DILLINGHAM SHELL	2066 DILLINGHAM BLVD	HI LUST, HI UST, HI Financial Assurance	Higher	2372, 0.449, ESE
AW209	SAND ISLAND 76 (#104	165 SAND ISLAND ACCE	HI LUST, HI UST, HI Financial Assurance	Higher	2374, 0.450, SSE
AX210	YUE-FUNG KWAN CONSTR	2004-2008 REPUBLICAN	HI SHWS, HI SPILLS	Higher	2376, 0.450, SE
211	HALSEY TERRACE FAMIL	2958/2960 GORDON ST	HI LUST, HI UST	Higher	2381, 0.451, WNW
AV212	THE WOW COMPANY, INC	822 MAPUNAPUNA ST	HI LUST, HI UST	Higher	2437, 0.462, NW
AY213	BUDGET MAINTENANCE Y	448 KALEWA ST	HI LUST, HI UST, HI Financial Assurance, HI UIC	Higher	2439, 0.462, SW
214	U.S. ARMY RESERVE CE	FORT SHAFTER FLATS /	HI LUST, HI UST	Higher	2475, 0.469, NE
AW215	SECURITY ARMORED CAR	2140 KALIAWA ST	HI LUST, HI UST, HI Financial Assurance	Higher	2476, 0.469, SSE
AX216	1950 HOMERULE STREET	1950 HOMERULE ST	HI SHWS, HI SPILLS	Higher	2499, 0.473, SE
AZ217	LOVE'S BAKERY, LLC	911 MIDDLE ST	HI LUST, HI UST, HI AIRS, HI Financial Assurance	Higher	2509, 0.475, ENE
AY218	TERMINAL TRANSPORTAT	443 KALEWA ST	HI LUST, HI UST	Higher	2528, 0.479, SW
AW219	STATE POULTRY PROCES	2132 KALIAWA ST	HI SHWS, HI SPILLS	Higher	2537, 0.480, SSE
220	BROWNING-FERRIS INDU	207 PUUHALE RD	HI LUST, HI UST	Higher	2556, 0.484, SSE
BA221	HONEYWELL	2809 MOKUMOA STREET	RCRA-CESQG, HI LUST, HI UST, FINDS, ECHO	Higher	2594, 0.491, NNW
AY222	SIDA OF HAWAII (PMID	439 KALEWA ST	HI LUST, HI UST, HI Financial Assurance	Higher	2612, 0.495, SW
AV223	MR. SANDMAN	842 MAPUNAPUNA ST	HI LUST, HI UST	Higher	2617, 0.496, NNW
AV224	VERMICULITE OF HAWAI	842-A MAPUNAPUNA STR	SEMS, ICIS	Higher	2617, 0.496, NNW
AV225	HAWAII STAGING AND L	842 MAPUNAPUNA ST	HI SHWS, HI SPILLS	Higher	2617, 0.496, NNW
AV226	HAWAII STAGING AND L	842A MAPUNAPUNA STRE	SEMS, PRP	Higher	2617, 0.496, NNW
AZ227	2343 NORTH KING STRE	2343 N KING ST	HI SHWS, HI INST CONTROL	Higher	2620, 0.496, ENE
228	THRIFTY RENT- A-CAR	3039 UALENA ST	HI LUST, HI UST	Higher	2624, 0.497, West
BA229	HAWAIIAN ISLES ENTER	2839 MOKUMOA ST	HI LUST, HI UST	Higher	2626, 0.497, NNW
230	TRANS HAWAIIAN - OAH	124 PUUHALE RD	HI SHWS, HI LUST, HI UST	Higher	2679, 0.507, SSE

MAPPED SITES SUMMARY

Target Property Address:
KAMEHAMEHA HIGHWAY
HONOLULU, HI 96819

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
231	HECO PAD-MOUNTED TRA	2344 PAHOUNUI DR	HI SHWS, HI SPILLS, HI AIRS	Higher	2680, 0.508, South
232	FORMER FLYNN LEARNER	120 SAND ISLAND ACCE	HI SHWS, HI LUST, HI UST, HI ENG CONTROLS, HI INST...	Higher	2712, 0.514, SSE
233	ENVIROSERVICES & TRA	2889 MOKUMOA ST	CORRACTS, RCRA-TSDF, RCRA NonGen / NLR, RAATS	Higher	2754, 0.522, NNW
234	HERTZ RENT- A-CAR (P	414 LELE ST	HI SHWS, HI LUST, HI UST, HI ENG CONTROLS, HI INST...	Higher	2758, 0.522, SW
235	DILLINGHAM BOULEVARD	DILLINGHAM BLVD & MO	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	2995, 0.567, ESE
236	AIRPORT GROUP INTERN	3071 AOLELE ST	HI SHWS, HI LUST, HI UST, HI Financial Assurance	Higher	3064, 0.580, West
BB237	MCKESSON WINE & SPIR	80 SAND ISLAND ACCES	HI SHWS, HI LUST, HI UST, HI SPILLS, HI Financial...	Higher	3075, 0.582, South
BB238	USPS VEHICLE MAINTEN	89 SAND ISLAND ACCES	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	3142, 0.595, South
239	PACIFIC POULTRY	1804 KANAKANUI ST	HI SHWS, HI SPILLS	Higher	3168, 0.600, SE
240	NAVY MFH HALSEY TERR		HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	3173, 0.601, WNW
241	COCA-COLA BOTTLING C	949 MAPUNAPUNA ST	HI SHWS, HI LUST, HI UST, HI SPILLS	Higher	3234, 0.613, NNW
242	SERVCO - VEHICLE PRO	2101 AUIKI ST	HI SHWS, HI UST, HI Financial Assurance	Higher	3344, 0.633, SSE
243	PUKOLOA WOOD TREATIN	2819 PUKOLOA ST	HI SHWS	Higher	3403, 0.645, NNW
244	KAPALAMA CONTAINER Y	1845 AUIKI ST	HI SHWS, HI SPILLS	Higher	3481, 0.659, SSE
245	FACTORY STREET LEAD	2003 N KING ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	3524, 0.667, East
246	HAWAIIAN MISO AND SO	1714 MARY ST	HI SHWS, HI SPILLS	Higher	3617, 0.685, SSE
247	NATIONAL CAR RENTAL	3223 N NIMITZ HWY	HI SHWS, HI UST, HI Financial Assurance	Higher	3732, 0.707, West
248	KAPALAMA MILITARY RE	5 SAND ISLAND ACCESS	HI SHWS, HI SPILLS	Higher	3940, 0.746, SSE
249	HAWAII FUELING FACIL	3201 AOLELE STREET	HI SHWS, HI INST CONTROL, HI SPILLS, HI UIC	Higher	3953, 0.749, West
250	HECO PAD-MOUNT TRANS	2875 PAA ST (MAPUNAP	HI SHWS, HI SPILLS	Higher	4094, 0.775, NNW
251	KAPALAMA MILITARY RE	SAND ISLAND ACCESS R	HI SHWS, HI UST, HI Financial Assurance	Higher	4302, 0.815, SSE
252	KALIHI AND KALAEPAA	KALAEPAA DR AND KALI	HI SHWS, HI SPILLS	Higher	4412, 0.836, SSE
253	GTE BASE YARD SUMP	3239 UALENA ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	4413, 0.836, West
254	ATLAS ELECTRIC CO.	1151 MAPUNAPUNA ST	HI SHWS, HI SPILLS	Higher	4460, 0.845, NNW
255	HAWAII FUELING FACIL	8 SAND ISLAND ACCESS	HI SHWS, HI INST CONTROL, HI SPILLS	Higher	4563, 0.864, South
256	KUHIO PARK TERRACE C	1475 LINAPUNI ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL	Higher	4626, 0.876, ENE
257	KUHIO PARK TERRACE T	LINAPUNI ST	HI SHWS, HI ENG CONTROLS, HI INST CONTROL, HI...	Higher	4983, 0.944, ENE
BC258	ASIG SAND ISLAND	6 SAND ISLAND ACCESS	HI SHWS, HI SPILLS	Higher	5049, 0.956, SSE
BC259	HAWAII FUELING FACIL	6 SAND ISLAND ACCESS	HI SHWS, HI SPILLS	Higher	5049, 0.956, SSE
BC260	HAWAII FUELING FACIL	6 & 8 SAND ISLAND AC	HI SHWS, HI SPILLS	Higher	5149, 0.975, 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

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 institutional controls / engineering controls registries

LUCIS..... Land Use Control Information System

Federal ERNS list

ERNS..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

HI 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

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

EXECUTIVE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

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
HI 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
HI SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS ..... Formerly Used Defense Sites
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
RMP ..... Risk Management Plans
PADS ..... PCB Activity Database 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

EXECUTIVE SUMMARY

LEAD SMELTERS..... Lead Smelter Sites
US MINES..... Mines Master Index File
ABANDONED MINES..... Abandoned Mines
DOCKET HWC..... Hazardous Waste Compliance Docket Listing
FUELS PROGRAM..... EPA Fuels Program Registered Listing
HI DRYCLEANERS..... Permitted Drycleaner Facility Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP..... EDR Proprietary Manufactured Gas Plants

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

HI RGA HWS..... Recovered Government Archive State Hazardous Waste Facilities List
HI RGA LF..... Recovered Government Archive Solid Waste Facilities List
HI 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.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.

A review of the NPL list, as provided by EDR, and dated 12/05/2016 has revealed that there is 1 NPL site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PEARL HARBOR NAVAL C	***US NAVAL COMMAND***	***NW 0 - 1/8 (0.057 mi.)***	***0***	***9***

EXECUTIVE SUMMARY

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 10/10/2016 has revealed that there are 3 SEMS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PEARL HARBOR NAVAL C	***US NAVAL COMMAND***	***NW 0 - 1/8 (0.057 mi.)***	***0***	***9***
VERMICULITE OF HAWAI	***842-A MAPUNAPUNA STR***	***NNW 1/4 - 1/2 (0.496 mi.)***	***AV224***	***359***
HAWAII STAGING AND L	***842A MAPUNAPUNA STRE***	***NNW 1/4 - 1/2 (0.496 mi.)***	***AV226***	***364***

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 10/10/2016 has revealed that there are 8 SEMS-ARCHIVE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
YOUNG LAUNDRY & DRY	***2771 WAIWAI LOOP***	***W 0 - 1/8 (0.049 mi.)***	***A15***	***88***
DARREN T KIMURA	***2660 WAIWAI LOOP ST***	***W 1/8 - 1/4 (0.135 mi.)***	***P67***	***161***
VECTOR CONTROL BRANC	***2611 KILIHAU ST***	***NNW 1/8 - 1/4 (0.152 mi.)***	***M84***	***185***
GASPRO INC	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N89***	***192***
ABC DSPL	2760 KAMEHAMEHA HWY	NW 1/8 - 1/4 (0.226 mi.)	Z135	250
SWIFT ADHESIVES & CO	2847 AWAAWALOA ST	NW 1/8 - 1/4 (0.229 mi.)	AD138	253
DEPARTMENT OF TRANSP	***727 KAKOI ST***	***NNW 1/4 - 1/2 (0.265 mi.)***	***AH158***	***279***
HAWAII BITUMULS	***248 SAND ISLAND ACCE***	***SE 1/4 - 1/2 (0.306 mi.)***	***AL170***	***292***

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 12/12/2016 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ENVIROSERVICES & TRA	***2889 MOKUMOA ST***	***NNW 1/2 - 1 (0.522 mi.)***	***233***	***373***

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 12/12/2016 has revealed that there is 1 RCRA-TSDF site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SAFETY KLEEN CORP 7	***723 UMI ST***	***E 1/4 - 1/2 (0.438 mi.)***	***203***	***330***

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 12/12/2016 has revealed that there is 1 RCRA-LQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON 95570	2604 WAIWAI LOOP	W 1/8 - 1/4 (0.141 mi.)	O78	173

RCRA-SQG: 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.

A review of the RCRA-SQG list, as provided by EDR, and dated 12/12/2016 has revealed that there are 5

RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DARREN T KIMURA	***2660 WAIWAI LOOP ST***	***W 1/8 - 1/4 (0.135 mi.)***	***P67***	***161***
KEEHI TRANSFER STATI	***606 MIDDLE STREET***	***NE 1/8 - 1/4 (0.191 mi.)***	***108***	***214***
TRANS QUALITY	685 AHUA ST	NW 1/8 - 1/4 (0.198 mi.)	V114	225
INTERNATIONAL MARINE	***2870 UALENA STREET***	***W 1/8 - 1/4 (0.199 mi.)***	***Y115***	***227***
PPG ARCHITECTURAL FI	2312 KAMEHAMEHA HWY	E 1/8 - 1/4 (0.237 mi.)	AG146	262

RCRA-CESQG: 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). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 12/12/2016 has revealed that there are 16 RCRA-CESQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CASTLE & COOKE COMME	***2702 WAIWAI LOOP***	***WNW 0 - 1/8 (0.043 mi.)***	***B12***	***83***
HARBOR GRAPHICS	***2222 KAM HIGHWAY***	***WNW 0 - 1/8 (0.059 mi.)***	***D17***	***94***
RYDER TRANSPORTATION	***545 N LAGOON DR***	***W 0 - 1/8 (0.064 mi.)***	***G22***	***103***
ALA WAI BOULEVARD &	***2655 WAIWAI LOOP***	***W 0 - 1/8 (0.085 mi.)***	***B33***	***123***
M. H. ELECTRIC COMPA	***2688 KILIHAU ST***	***NW 0 - 1/8 (0.105 mi.)***	***K48***	***139***
CHRISTIAN BROADCASTI	***2844 KOAPAKA ST***	***WNW 0 - 1/8 (0.107 mi.)***	***L51***	***141***
RAY WILSON CO DBA RW	***2621 WAIWAI LOOP***	***W 0 - 1/8 (0.120 mi.)***	***O57***	***147***
SATURN OF HONOLULU	***2901 NIMITZ HWY***	***WNW 1/8 - 1/4 (0.131 mi.)***	***L64***	***157***
WHITE ENVIRONMENTAL	***2290 ALAHAO PL UNIT***	***SE 1/8 - 1/4 (0.138 mi.)***	***R73***	***167***
AIRPORT SHELL	2805 UALENA ST	W 1/8 - 1/4 (0.143 mi.)	S79	175
ABF FREIGHT SYSTEM,	2282 HOONEE PL	SE 1/8 - 1/4 (0.153 mi.)	U85	188
GASPRO INC	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N89***	***192***
LONGS DRUG STORE 809	***2270 HOONEE PL***	***SE 1/8 - 1/4 (0.192 mi.)***	***U110***	***219***
MIKE SALTA PONTIAC	***2945 N NIMITZ HWY***	***WNW 1/8 - 1/4 (0.219 mi.)***	***AC129***	***239***
AIRPORTS DIV MAINTEN	***2919 AOLELE STREET***	***W 1/8 - 1/4 (0.225 mi.)***	***AE134***	***246***
PUGLIA ENGINEERING I	***2847 AWAAWALOA ST***	***NW 1/8 - 1/4 (0.229 mi.)***	***AD137***	***251***

Federal institutional controls / engineering controls registries

US ENG CONTROLS: A listing of sites with engineering controls in place.

A review of the US ENG CONTROLS list, as provided by EDR, and dated 11/15/2016 has revealed that there is 1 US ENG CONTROLS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PEARL HARBOR NAVAL C	***US NAVAL COMMAND***	***NW 0 - 1/8 (0.057 mi.)***	***0***	***9***

EXECUTIVE SUMMARY

US INST CONTROL: 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.

A review of the US INST CONTROL list, as provided by EDR, and dated 11/15/2016 has revealed that there is 1 US INST CONTROL site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PEARL HARBOR NAVAL C	***US NAVAL COMMAND***	***NW 0 - 1/8 (0.057 mi.)***	***0***	***9***

State- and tribal - equivalent CERCLIS

HI 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 HI SHWS list, as provided by EDR, and dated 09/23/2016 has revealed that there are 62 HI SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ALSCO (AMERICAN LINE	***2771 WAIWAI LP***	***W 0 - 1/8 (0.049 mi.)***	***A14***	***86***
AL PHILLIPS FACILITY	515 LAGOON DR	W 0 - 1/8 (0.106 mi.)	G49	140
AMERICAN PACIFIC TRA	***2635 WAIWAI LP***	***W 0 - 1/8 (0.120 mi.)***	***O61***	***153***
OCEANIC CABLEVISION	***2669 KILIHAU ST***	***NNW 0 - 1/8 (0.125 mi.)***	***M62***	***154***
OCCIDENTAL CHEM CO	2660 WAIWAI LP	W 1/8 - 1/4 (0.135 mi.)	P68	163
VECTOR CONTROL BRANC	***2611 KILIHAU ST***	***NNW 1/8 - 1/4 (0.152 mi.)***	***M84***	***185***
HAGADONE PRINTING CO	***2278 HOONEE PL***	***SE 1/8 - 1/4 (0.159 mi.)***	***U86***	***190***
LENAKONA DEVELOPMENT	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N90***	***195***
611 MIDDLE STREET WA	***611 MIDDLE ST***	***ENE 1/8 - 1/4 (0.168 mi.)***	***W96***	***203***
HAWAII DAIRY HOLDING	***2277 KAMEHAMEHA HWY***	***ESE 1/8 - 1/4 (0.176 mi.)***	***101***	***208***
LONGS DRUG STORES WA	***2270 HOONEE PL***	***SE 1/8 - 1/4 (0.192 mi.)***	***U109***	***217***
YEE HOP PROPERTY	***621 MIDDLE ST***	***ENE 1/8 - 1/4 (0.206 mi.)***	***W119***	***231***
SWIFT ADHESIVES & CO	2847 AWAAWALOA ST	NW 1/8 - 1/4 (0.229 mi.)	AD136	250
HAWAII MEAT COMPANY	***711 MIDDLE ST***	***ENE 1/4 - 1/2 (0.257 mi.)***	***154***	***271***
WAREHOUSE AND MAINTE	***727 KAKOI ST***	***NNW 1/4 - 1/2 (0.265 mi.)***	***AH157***	***278***
FORMER ZIEGLER STEEL	***2919 UALENA ST***	***W 1/4 - 1/2 (0.297 mi.)***	***AJ166***	***284***
HAWAIIAN BITUMULS &	***248 SAND ISLAND ACCE***	***SE 1/4 - 1/2 (0.306 mi.)***	***AL169***	***290***
218 MOHONUA PLACE	218 MOHONUA PL	SSE 1/4 - 1/2 (0.310 mi.)	171	295
MONARCH BUILDING SUP	***749 MAPUNAPUNA ST***	***NW 1/4 - 1/2 (0.315 mi.)***	***172***	***296***
HAWAIIAN FLUID POWER	***803 AHUA ST***	***NNW 1/4 - 1/2 (0.360 mi.)***	***AN178***	***302***
2250 PAHOUNUI DRIVE	2250 PAHOUNUI DR	SSE 1/4 - 1/2 (0.363 mi.)	AP183	306
2135 AUIKI ST	2135 AUIKI ST	SSE 1/4 - 1/2 (0.371 mi.)	AR186	308
OTS BUS UNIT REPAIR	***811 MIDDLE ST***	***ENE 1/4 - 1/2 (0.383 mi.)***	***AO190***	***311***
180 SAND ISLAND ACCE	180 SAND ISLAND ACCE	SSE 1/4 - 1/2 (0.396 mi.)	AR195	320
FORT SHAFTER BOLLARD	***1557 PASS ST***	***NE 1/4 - 1/2 (0.424 mi.)***	***202***	***329***
AIR ENGINEERING	***2308 PAHOUNUI DR***	***S 1/4 - 1/2 (0.443 mi.)***	***AU204***	***332***
158 SAND ISLAND ACCE	158 SAND ISLAND ACCE	SSE 1/4 - 1/2 (0.448 mi.)	AU206	334
YUE-FUNG KWAN CONSTR	***2004-2008 REPUBLICAN***	***SE 1/4 - 1/2 (0.450 mi.)***	***AX210***	***340***
1950 HOMERULE STREET	***1950 HOMERULE ST***	***SE 1/4 - 1/2 (0.473 mi.)***	***AX216***	***346***
STATE POULTRY PROCES	***2132 KALIAWA ST***	***SSE 1/4 - 1/2 (0.480 mi.)***	***AW219***	***350***
HAWAII STAGING AND L	***842 MAPUNAPUNA ST***	***NNW 1/4 - 1/2 (0.496 mi.)***	***AV225***	***362***
2343 NORTH KING STRE	***2343 N KING ST***	***ENE 1/4 - 1/2 (0.496 mi.)***	***AZ227***	***366***
TRANS HAWAIIAN - OAH	***124 PUUHALE RD***	***SSE 1/2 - 1 (0.507 mi.)***	***230***	***368***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HECO PAD-MOUNTED TRA	*2344 PAHOUNUI DR*	*S 1/2 - 1 (0.508 mi.)*	*231*	*370*
FORMER FLYNN LEARNER	*120 SAND ISLAND ACCE*	*SSE 1/2 - 1 (0.514 mi.)*	*232*	*372*
HERTZ RENT- A-CAR (P	*414 LELE ST*	*SW 1/2 - 1 (0.522 mi.)*	*234*	*379*
DILLINGHAM BOULEVARD	*DILLINGHAM BLVD & MO*	*ESE 1/2 - 1 (0.567 mi.)*	*235*	*380*
AIRPORT GROUP INTERN	*3071 AOLELE ST*	*W 1/2 - 1 (0.580 mi.)*	*236*	*381*
MCKESSON WINE & SPIR	*80 SAND ISLAND ACCES*	*S 1/2 - 1 (0.582 mi.)*	*BB237*	*384*
USPS VEHICLE MAINTEN	*89 SAND ISLAND ACCES*	*S 1/2 - 1 (0.595 mi.)*	*BB238*	*386*
PACIFIC POULTRY	*1804 KANAKANUI ST*	*SE 1/2 - 1 (0.600 mi.)*	*239*	*388*
NAVY MFH HALSEY TERR		*WNW 1/2 - 1 (0.601 mi.)*	*240*	*389*
COCA-COLA BOTTLING C	*949 MAPUNAPUNA ST*	*NNW 1/2 - 1 (0.613 mi.)*	*241*	*390*
SERVCO - VEHICLE PRO	*2101 AUIKI ST*	*SSE 1/2 - 1 (0.633 mi.)*	*242*	*394*
PUKOLOA WOOD TREATIN	2819 PUKOLOA ST	NNW 1/2 - 1 (0.645 mi.)	243	396
KAPALAMA CONTAINER Y	*1845 AUIKI ST*	*SSE 1/2 - 1 (0.659 mi.)*	*244*	*396*
FACTORY STREET LEAD	*2003 N KING ST*	*E 1/2 - 1 (0.667 mi.)*	*245*	*398*
HAWAIIAN MISO AND SO	*1714 MARY ST*	*SSE 1/2 - 1 (0.685 mi.)*	*246*	*400*
NATIONAL CAR RENTAL	*3223 N NIMITZ HWY*	*W 1/2 - 1 (0.707 mi.)*	*247*	*401*
KAPALAMA MILITARY RE	*5 SAND ISLAND ACCESS*	*SSE 1/2 - 1 (0.746 mi.)*	*248*	*402*
HAWAII FUELING FACIL	*3201 AOLELE STREET*	*W 1/2 - 1 (0.749 mi.)*	*249*	*405*
HECO PAD-MOUNT TRANS	*2875 PAA ST (MAPUNAP*	*NNW 1/2 - 1 (0.775 mi.)*	*250*	*410*
KAPALAMA MILITARY RE	*SAND ISLAND ACCESS R*	*SSE 1/2 - 1 (0.815 mi.)*	*251*	*411*
KALIHI AND KALAEPAA	*KALAEPAA DR AND KALI*	*SSE 1/2 - 1 (0.836 mi.)*	*252*	*412*
GTE BASE YARD SUMP	*3239 UALENA ST*	*W 1/2 - 1 (0.836 mi.)*	*253*	*414*
ATLAS ELECTRIC CO.	*1151 MAPUNAPUNA ST*	*NNW 1/2 - 1 (0.845 mi.)*	*254*	*415*
HAWAII FUELING FACIL	*8 SAND ISLAND ACCESS*	*S 1/2 - 1 (0.864 mi.)*	*255*	*416*
KUHIO PARK TERRACE C	*1475 LINAPUNI ST*	*ENE 1/2 - 1 (0.876 mi.)*	*256*	*418*
KUHIO PARK TERRACE T	*LINAPUNI ST*	*ENE 1/2 - 1 (0.944 mi.)*	*257*	*419*
ASIG SAND ISLAND	*6 SAND ISLAND ACCESS*	*SSE 1/2 - 1 (0.956 mi.)*	*BC258*	*421*
HAWAII FUELING FACIL	*6 SAND ISLAND ACCESS*	*SSE 1/2 - 1 (0.956 mi.)*	*BC259*	*422*
HAWAII FUELING FACIL	*6 & 8 SAND ISLAND AC*	*S 1/2 - 1 (0.975 mi.)*	*BC260*	*423*

State and tribal leaking storage tank lists

HI 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 HI LUST list, as provided by EDR, and dated 11/18/2016 has revealed that there are 102 HI LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PEACOCK ROOFING AND Release ID: 990158 Facility Id: 9-103351 Facility Status: Site Cleanup Completed (NFA)	*2726 WAIWAI LP*	*WNW 0 - 1/8 (0.024 mi.)*	*A6*	*78*
OGDEN ALLIED SERVICE Release ID: 970061 Facility Id: 9-100888 Facility Status: Site Cleanup Completed (NFA)	*2720 WAIWAI LP*	*WNW 0 - 1/8 (0.027 mi.)*	*B8*	*80*
OAHU TIRE SERVICE & Release ID: 920049	*2808 KAMEHAMEHA HWY*	*WNW 0 - 1/8 (0.051 mi.)*	*D16*	*94*

Facility Id: 9-100795 Facility Status: Site Cleanup Completed (NFA)				
FORMER NEW AND USED Release ID: 940159 Facility Id: 9-102949 Facility Status: Site Cleanup Completed (NFA)	545 LAGOON DR	W 0 - 1/8 (0.064 mi.)	G21	103
DOUGLAS TAKATA EQUIP Release ID: 990235 Facility Id: 9-103492 Facility Status: Site Cleanup Completed (NFA)	***2706 KILIHAU ST***	***NW 0 - 1/8 (0.085 mi.)***	***K35***	***126***
NISSAN MOTOR CORP. I Release ID: 930040 Facility Id: 9-101334 Facility Status: Site Cleanup Completed (NFA)	***2880 KILIHAU ST***	***WNW 0 - 1/8 (0.087 mi.)***	***J37***	***128***
MARTIN WAREHOUSE AND Release ID: 980255 Facility Id: 9-101424 Facility Status: Site Cleanup Completed (NFA)	***2838 KILIHAU ST***	***WNW 0 - 1/8 (0.087 mi.)***	***I38***	***129***
UNITED TRUCK RENTAL Release ID: 940049 Facility Id: 9-102903 Facility Status: Site Cleanup Completed (NFA)	***2804 KILIHAU ST***	***WNW 0 - 1/8 (0.096 mi.)***	***E42***	***132***
JACK ENDO ELECTRIC, Release ID: 000086 Facility Id: 9-101395 Facility Status: LUST Cleanup Initiated	***2814 KILIHAU ST***	***WNW 0 - 1/8 (0.096 mi.)***	***E43***	***133***
U-HAUL OF HAWAII, IN Release ID: 930007 Facility Id: 9-100352 Facility Status: Site Cleanup Completed (NFA)	***2722 KILIHAU ST***	***NW 0 - 1/8 (0.097 mi.)***	***F45***	***135***
REFUSE INC Release ID: 060025 Release ID: 920028 Facility Id: 9-102524 Facility Status: Site Cleanup Completed (NFA)	***633 AHUA ST***	***NW 0 - 1/8 (0.102 mi.)***	***E46***	***137***
ROVENS TANAKA CONTRA Release ID: 960055 Facility Id: 9-103177 Facility Status: Site Cleanup Completed (NFA)	***2678 KILIHAU ST***	***NW 0 - 1/8 (0.108 mi.)***	***K52***	***143***
ALII STOR-MOR Release ID: 910065 Facility Id: 9-102420 Facility Status: Site Cleanup Completed (NFA)	***2670 KILIHAU ST***	***NW 0 - 1/8 (0.112 mi.)***	***M53***	***144***
PACIFIC DIVING INDUS Release ID: 990168 Facility Id: 9-102422 Facility Status: Site Cleanup Completed (NFA)	***2646 KILIHAU ST***	***NNW 0 - 1/8 (0.118 mi.)***	***M55***	***146***
PAN-PACIFIC CONSTRUC Release ID: 940180 Facility Id: 9-101481 Facility Status: Site Cleanup Completed (NFA)	***2621 WAIWAI LP***	***W 0 - 1/8 (0.120 mi.)***	***O56***	***147***
PEERLESS ROOFING CO.	***2629 WAIWAI LOOP***	***W 0 - 1/8 (0.120 mi.)***	***O58***	***150***

Release ID: 920134
Facility Id: 9-100941
Facility Status: Site Cleanup Completed (NFA)

AMERICAN PACIFIC TRA	***2635 WAIWAI LP***	***W 0 - 1/8 (0.120 mi.)***	***O61***	***153***

Release ID: 010057
Facility Id: 9-100807
Facility Status: Site Cleanup Completed (NFA)

AERONAUTICAL RADIO,	***2668 WAIWAI LP***	***W 0 - 1/8 (0.125 mi.)***	***P63***	***157***

Release ID: 990003
Facility Id: 9-102411
Facility Status: Site Cleanup Completed (NFA)

SATURN OF HONOLULU	***2901 N NIMITZ HWY***	***WNW 1/8 - 1/4 (0.131 mi.)***	***L65***	***159***

Release ID: 930136
Facility Id: 9-100286
Facility Status: Site Cleanup Completed (NFA)

MERCANTILE TRUCKING	***2280 ALAHAO PL***	***SE 1/8 - 1/4 (0.138 mi.)***	***R71***	***166***

Release ID: 990004
Facility Id: 9-100273
Facility Status: Site Cleanup Completed (NFA)

F.T. OPPERMAN & COMP	***2340-B KAMEHAMEHA HW***	***E 1/8 - 1/4 (0.141 mi.)***	***N76***	***171***

Release ID: 010031
Facility Id: 9-101524
Facility Status: Site Cleanup Completed (NFA)

LAGOON CHEVRON 95570	***2604 WAIWAI LP***	***W 1/8 - 1/4 (0.141 mi.)***	***O77***	***172***

Release ID: 980241
Release ID: 140017
Release ID: 150009
Release ID: 880016
Facility Id: 9-101221
Facility Status: Site Cleanup Completed with EHE/EHMP
Facility Status: Site Cleanup Completed (NFA)

AIRPORT SHELL (PMID0	***2805 UALENA ST***	***W 1/8 - 1/4 (0.143 mi.)***	***S81***	***178***

Release ID: 080027
Release ID: 140007
Release ID: 100016
Release ID: 870010
Facility Id: 9-101891
Facility Status: Site Cleanup Completed (NFA)

G. W. MURPHY CONSTRU	***650 KAKOI ST***	***NW 1/8 - 1/4 (0.147 mi.)***	***T82***	***181***

Release ID: 930094
Facility Id: 9-101549
Facility Status: Site Cleanup Completed (NFA)

F K S RENTALS AND SA	***653 KAKOI ST***	***NW 1/8 - 1/4 (0.149 mi.)***	***T83***	***182***

Release ID: 900033
Facility Id: 9-100206
Facility Status: Site Cleanup Completed (NFA)

VECTOR CONTROL BRANC	***2611 KILIHAU ST***	***NNW 1/8 - 1/4 (0.152 mi.)***	***M84***	***185***

Release ID: 000071
Facility Id: 9-100110
Facility Status: Site Cleanup Completed (NFA)

GASPRO (KALIHI FACIL	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N88***	***191***

Release ID: 930055
Facility Id: 9-100861
Facility Status: Site Cleanup Completed (NFA)

LENAKONA DEVELOPMENT	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N90***	***195***

Release ID: 930121
Facility Id: 9-102588
Facility Status: Site Cleanup Completed (NFA)

I. DOI TRUCKING	***669 AHUA ST***	***NW 1/8 - 1/4 (0.162 mi.)***	***V93***	***199***

Release ID: 960011
Facility Id: 9-101392
Facility Status: Site Cleanup Completed (NFA)

GRANGER PACIFIC, INC	***611 MIDDLE ST***	***ENE 1/8 - 1/4 (0.168 mi.)***	***W95***	***202***

Release ID: 060019
Facility Id: 9-100227
Facility Status: Site Cleanup Completed (NFA)

PACIFIC TRANSFER & W	***664 KAKOI ST***	***NW 1/8 - 1/4 (0.173 mi.)***	***T97***	***205***

Release ID: 940136
Facility Id: 9-100289
Facility Status: Site Cleanup Completed (NFA)

HAWAII DAIRY HOLDING	***2277 KAMEHAMEHA HWY***	***ESE 1/8 - 1/4 (0.176 mi.)***	***101***	***208***

Release ID: 910053
Release ID: 050043
Facility Id: 9-100210
Facility Status: Site Cleanup Completed (NFA)

SUN INDUSTRIES	***660 MAPUNAPUNA ST***	***NW 1/8 - 1/4 (0.187 mi.)***	***Z104***	***211***

Release ID: 940048
Facility Id: 9-101883
Facility Status: Site Cleanup Completed (NFA)

ROYAL CONTRACTING CO	***677 AHUA ST***	***NW 1/8 - 1/4 (0.187 mi.)***	***V106***	***213***

Release ID: 960083
Facility Id: 9-101533
Facility Status: Site Cleanup Completed (NFA)

PRECISION ELECTRIC	***653 MAPUNAPUNA ST***	***NW 1/8 - 1/4 (0.190 mi.)***	***Q107***	***213***

Release ID: 040003
Facility Id: 9-103317
Facility Status: Site Cleanup Completed with EHMP

KEEHI TRANSFER STATI	***606 MIDDLE STREET***	***NE 1/8 - 1/4 (0.191 mi.)***	***108***	***214***

Release ID: 940058
Facility Id: 9-100128
Facility Status: Site Cleanup Completed (NFA)

EDGARDO PUGLIA (PMID	***2845 UALENA STREET***	***W 1/8 - 1/4 (0.202 mi.)***	***Y117***	***230***

Release ID: 020008
Facility Id: 9-103704
Facility Status: Site Cleanup Completed (NFA)

C.Q. YEE HOP	***621 MIDDLE ST***	***ENE 1/8 - 1/4 (0.206 mi.)***	***W120***	***232***

Release ID: 940064
Facility Id: 9-102751
Facility Status: Site Cleanup Completed (NFA)

AMERICAN INT. R.A.C.	***2880 UALENA ST***	***W 1/8 - 1/4 (0.214 mi.)***	***Y124***	***236***

Release ID: 930016
Facility Id: 9-100789

Facility Status: Remedy Decision Pending (ongoing monitoring)

RALPH S. INOUYE CO.,	***2831 AWAAWALOA ST***	***NW 1/8 - 1/4 (0.224 mi.)***	***AD132***	***243***
Release ID: 930111 Facility Id: 9-100302 Facility Status: Exposure Prevention Management Plan				
DEPT OF TRANSPORTATI	***2919 AOLELE ST***	***W 1/8 - 1/4 (0.225 mi.)***	***AE133***	***244***
Release ID: 900079 Facility Id: 9-100056 Facility Status: Site Cleanup Completed (NFA)				
MUTUAL PLUMBING SUPP	***2812 AWAAWALOA ST***	***NW 1/8 - 1/4 (0.233 mi.)***	***AD143***	***260***
Release ID: 980021 Facility Id: 9-101445 Facility Status: Site Cleanup Completed (NFA)				
SHELLY MAZDA AUTO PR	***709 AHUA ST***	***NW 1/8 - 1/4 (0.235 mi.)***	***AB145***	***261***
Release ID: 150027 Facility Id: 9-102531 Facility Status: Site Cleanup Completed (NFA)				
HARDERS CO.	2312 KAMEHAMEHA HWY,	E 1/8 - 1/4 (0.237 mi.)	AG148	266
Release ID: 920057 Facility Id: 9-100867 Facility Status: Site Cleanup Completed with EHMP				
WILLIAM J. KIMI, JR.	***692 MAPUNAPUNA ST OR***	***NW 1/8 - 1/4 (0.237 mi.)***	***Z149***	***266***
Release ID: 980099 Facility Id: 9-103354 Facility Status: Site Cleanup Completed (NFA)				
NAV. & MARINE CORPS	***530 PELTIER AVE / BL***	***WNW 1/4 - 1/2 (0.251 mi.)***	***152***	***269***
Release ID: 950112 Facility Id: 9-100985 Facility Status: Site Cleanup Completed (NFA)				
TESORO 2GO 61020	***2260 KAMEHAMEHA HWY***	***E 1/4 - 1/2 (0.253 mi.)***	***AG153***	***269***
Release ID: suspected Facility Id: 9-102491 Facility Status: Suspected release				
GARLOW PETROLEUM INC	***707 KAKOI ST***	***NNW 1/4 - 1/2 (0.258 mi.)***	***AH155***	***273***
Release ID: 920034 Facility Id: 9-100733 Facility Status: Site Cleanup Completed (NFA)				
DEPARTMENT OF TRANSP	***727 KAKOI ST***	***NNW 1/4 - 1/2 (0.265 mi.)***	***AH156***	***275***
Release ID: 970056 Release ID: 900111 Facility Id: 9-101462 Facility Status: Site Cleanup Completed (NFA)				
MUTUAL WELDING CO.	***729 AHUA ST***	***NW 1/4 - 1/2 (0.271 mi.)***	***AI159***	***280***
Release ID: 920064 Facility Id: 9-101150 Facility Status: Site Cleanup Completed (NFA)				
SAVAGE WHOLESALE	***2918 UALENA ST***	***W 1/4 - 1/2 (0.274 mi.)***	***AJ160***	***280***
Release ID: 930132 Facility Id: 9-101987 Facility Status: Site Cleanup Completed (NFA)				
ISLAND ERECTORS	***720 AHUA ST***	***NW 1/4 - 1/2 (0.274 mi.)***	***AI161***	***281***

Release ID: 930005
Facility Id: 9-102446
Facility Status: Site Cleanup Completed (NFA)

AMFAC DIST.- INDUSTR	***2846 AWAAWALOA ST***	***NW 1/4 - 1/2 (0.285 mi.)***	***162***	***281***

Release ID: 980013
Facility Id: 9-101448
Facility Status: Site Cleanup Completed (NFA)

MUTUAL WELDING	***739 AHUA ST***	***NNW 1/4 - 1/2 (0.290 mi.)***	***AI163***	***282***

Release ID: 990139
Facility Id: 9-103514
Facility Status: Site Cleanup Completed (NFA)

S & M WELDING CO., L	***2928 UALENA ST***	***W 1/4 - 1/2 (0.293 mi.)***	***AJ164***	***283***

Release ID: 910052
Facility Id: 9-100307
Facility Status: Site Cleanup Completed (NFA)

K. YAMADA DISTRIBUTO	***2939-2949 KOAPAKA ST***	***W 1/4 - 1/2 (0.295 mi.)***	***AK165***	***284***

Release ID: 090028
Facility Id: 9-100935
Facility Status: Site Cleanup Completed with EHMP

C P M & F INC	***285 SAND ISLAND RD***	***SE 1/4 - 1/2 (0.299 mi.)***	***AL167***	***285***

Release ID: 930064
Facility Id: 9-100809
Facility Status: Site Cleanup Completed (NFA)

CARL'S JR. NIMITZ 76	***2140 N NIMITZ HWY***	***ESE 1/4 - 1/2 (0.304 mi.)***	***AM168***	***287***

Release ID: 040063
Release ID: 940199
Facility Id: 9-101143
Facility Status: Site Cleanup Completed (NFA)

HAWAIIAN BITUMULS &	***248 SAND ISLAND ACCE***	***SE 1/4 - 1/2 (0.306 mi.)***	***AL169***	***290***

Release ID: 900050
Facility Id: 9-100764
Facility Status: Site Cleanup Completed with EHMP

MONARCH BUILDING SUP	***749 MAPUNAPUNA ST***	***NW 1/4 - 1/2 (0.315 mi.)***	***172***	***296***

Release ID: 890020
Facility Id: 9-100275
Facility Status: Site Cleanup Completed (NFA)

HAWAIIAN REINFORCING	***761 AHUA ST***	***NNW 1/4 - 1/2 (0.319 mi.)***	***AI173***	***297***

Release ID: 950013
Facility Id: 9-101700
Facility Status: Site Cleanup Completed (NFA)

OVERSEAS FREIGHT FOR	***2959 KOAPAKA ST***	***W 1/4 - 1/2 (0.334 mi.)***	***AK174***	***298***

Release ID: 080011
Facility Id: 9-101472
Facility Status: Site Cleanup Completed (NFA)

WORLDWIDE MOVING & S	***2809 KAIHIKAPU ST***	***NNW 1/4 - 1/2 (0.348 mi.)***	***AN175***	***299***

Release ID: 940183
Facility Id: 9-100787
Facility Status: Site Cleanup Completed (NFA)

HAWAII PRESS NEWSPAP	***2100 N NIMITZ HWY***	***SE 1/4 - 1/2 (0.353 mi.)***	***AM176***	***300***

Release ID: 980096
Facility Id: 9-102564

Facility Status: Site Cleanup Completed (NFA)

DIAMOND HEAD PETROLE	***2827 KAIHIKAPU ST***	***NNW 1/4 - 1/2 (0.358 mi.)***	***AN177***	***300***

Release ID: 950007
Facility Id: 9-102901
Facility Status: Site Cleanup Completed (NFA)

TOUCHSTONE	***231 SAND ISLAND ACCE***	***SSE 1/4 - 1/2 (0.360 mi.)***	***179***	***303***

Release ID: 950045
Facility Id: 9-103011
Facility Status: Site Cleanup Completed (NFA)

SHERMAN ENTERPRISES	***2959 UALENA ST***	***W 1/4 - 1/2 (0.361 mi.)***	***180***	***304***

Release ID: 980206
Facility Id: 9-100180
Facility Status: Site Cleanup Completed (NFA)

MIDDLE STREET INTERM	***MIDDLE STREET AND KA***	***ENE 1/4 - 1/2 (0.362 mi.)***	***AO181***	***304***

Release ID: 100004
Facility Id: 9-103804
Facility Status: Site Cleanup Completed (NFA)

AIRPORT USED CAR REN	***3033 N NIMITZ HWY***	***WNW 1/4 - 1/2 (0.363 mi.)***	***182***	***305***

Release ID: 090025
Facility Id: 9-102021
Facility Status: Site Cleanup Completed with EHMP

PACIFIC CONSTRUCTION	***2831 KAIHIKAPU ST***	***NNW 1/4 - 1/2 (0.363 mi.)***	***AN184***	***307***

Release ID: 010018
Facility Id: 9-100287
Facility Status: Site Cleanup Completed (NFA)

A-1 A-LECTRICIAN, IN	***2849 KAIHIKAPU ST***	***NNW 1/4 - 1/2 (0.368 mi.)***	***AQ185***	***307***

Release ID: 940129
Facility Id: 9-100747
Facility Status: Site Cleanup Completed (NFA)

DI MAURO PROPERTIES	***2855 KAIHIKAPU ST***	***NW 1/4 - 1/2 (0.373 mi.)***	***AQ187***	***309***

Release ID: 990057
Facility Id: 9-103439
Facility Status: Site Cleanup Completed (NFA)

PACIFIC FENCE, INC.	***770 MAPUNAPUNA ST***	***NW 1/4 - 1/2 (0.377 mi.)***	***AS188***	***310***

Release ID: 950060
Facility Id: 9-101438
Facility Status: Site Cleanup Completed (NFA)

HAWAII FLUID SUPPLY	***809 AHUA ST***	***NNW 1/4 - 1/2 (0.378 mi.)***	***AN189***	***310***

Release ID: 930131
Facility Id: 9-100891
Facility Status: Site Cleanup Completed (NFA)

OTS BUS UNIT REPAIR	***811 MIDDLE ST***	***ENE 1/4 - 1/2 (0.383 mi.)***	***AO190***	***311***

Release ID: 900026
Release ID: 970027
Facility Id: 9-101884
Facility Id: 9-102498
Facility Status: Site Cleanup Completed (NFA)

HAWAIIAN GROCERY STO	***2915 KAIHIKAPU ST***	***NW 1/4 - 1/2 (0.383 mi.)***	***AQ191***	***317***

Release ID: 980119
Facility Id: 9-101897
Facility Status: Site Cleanup Completed (NFA)

OCEANIC CABLEVISION	***2826 KAIHIKAPU ST***	***NNW 1/4 - 1/2 (0.385 mi.)***	***AN192***	***318***

Release ID: 890013
Facility Id: 9-101496
Facility Status: Site Cleanup Completed (NFA)

BILS FAMILY PARTNERS	***2850 KAIHIKAPU ST***	***NNW 1/4 - 1/2 (0.391 mi.)***	***AQ194***	***319***

Release ID: 990185
Facility Id: 9-103513
Facility Status: Site Cleanup Completed (NFA)

KILLEBREW & WHITE CO	***2264 PAHOUNUI DR***	***SSE 1/4 - 1/2 (0.399 mi.)***	***AP196***	***321***

Release ID: 990197
Facility Id: 9-103396
Facility Status: Site Cleanup Completed (NFA)

GRAYLINE HAWAII LTD	***435 KALEWA ST***	***SW 1/4 - 1/2 (0.404 mi.)***	***AT197***	***322***

Release ID: 970058
Release ID: 890006
Facility Id: 9-100228
Facility Status: Site Cleanup Completed (NFA)

FORT SHAFTER	***BLDG 1527, 1528 TANK***	***NNE 1/4 - 1/2 (0.410 mi.)***	***198***	***325***

Release ID: 960042
Release ID: 900045
Release ID: 970073
Facility Id: 9-101514
Facility Status: Case Transferred to HEER (DERA)

KAM'S EXPRESS, INC.	***802 MAPUNAPUNA ST***	***NW 1/4 - 1/2 (0.414 mi.)***	***AS199***	***326***

Release ID: 030005
Facility Id: 9-102440
Facility Status: Site Cleanup Completed (NFA)

KILLBREW/WHITE COMPA	***2276 PAHOUNUI DR***	***SSE 1/4 - 1/2 (0.416 mi.)***	***AP200***	***328***

Release ID: 940160
Facility Id: 9-102929
Facility Status: Site Cleanup Completed (NFA)

ROSCOE MOSS COMPANY	***830 AHUA ST***	***NNW 1/4 - 1/2 (0.423 mi.)***	***201***	***329***

Release ID: 910066
Facility Id: 9-100305
Facility Status: Site Cleanup Completed (NFA)

AIR ENGINEERING	***2308 PAHOUNUI DR***	***S 1/4 - 1/2 (0.443 mi.)***	***AU204***	***332***

Release ID: 950022
Facility Id: 9-100170
Facility Status: Site Cleanup Completed (NFA)

B & C TRUCKING CO.,	***812 MAPUNAPUNA ST***	***NW 1/4 - 1/2 (0.445 mi.)***	***AV205***	***333***

Release ID: 930124
Facility Id: 9-101545
Facility Status: Site Cleanup Completed (NFA)

DOLLAR RENT-A-CAR (P	***452 KALEWA ST***	***SW 1/4 - 1/2 (0.449 mi.)***	***AT207***	***335***

Release ID: 940083
Facility Id: 9-100873
Facility Status: Site Cleanup Completed (NFA)

DILLINGHAM SHELL	***2066 DILLINGHAM BLVD***	***ESE 1/4 - 1/2 (0.449 mi.)***	***208***	***335***

Release ID: 950079
Release ID: 040030
Facility Id: 9-100313
Facility Status: Site Cleanup Completed (NFA)

SAND ISLAND 76 (#104	***165 SAND ISLAND ACCE***	***SSE 1/4 - 1/2 (0.450 mi.)***	***AW209***	***338***

Release ID: 020011
Release ID: 960081
Facility Id: 9-100023
Facility Status: Site Cleanup Completed (NFA)

HALSEY TERRACE FAMIL	***2958/2960 GORDON ST***	***WNW 1/4 - 1/2 (0.451 mi.)***	***211***	***341***

Release ID: 070025
Facility Id: 9-103842
Facility Status: Site Cleanup Completed (NFA)

THE WOW COMPANY, INC	***822 MAPUNAPUNA ST***	***NW 1/4 - 1/2 (0.462 mi.)***	***AV212***	***342***

Release ID: 910009
Facility Id: 9-102187
Facility Status: Site Cleanup Completed (NFA)

BUDGET MAINTENANCE Y	***448 KALEWA ST***	***SW 1/4 - 1/2 (0.462 mi.)***	***AY213***	***342***

Release ID: 990181
Facility Id: 9-101525
Facility Status: Site Cleanup Completed (NFA)

U.S. ARMY RESERVE CE	***FORT SHAFTER FLATS /***	***NE 1/4 - 1/2 (0.469 mi.)***	***214***	***344***

Release ID: 920015
Facility Id: 9-102510
Facility Status: Site Cleanup Completed (NFA)

SECURITY ARMORED CAR	***2140 KALIAWA ST***	***SSE 1/4 - 1/2 (0.469 mi.)***	***AW215***	***345***

Release ID: 960051
Facility Id: 9-103176
Facility Status: Site Cleanup Completed (NFA)

LOVE'S BAKERY, LLC	***911 MIDDLE ST***	***ENE 1/4 - 1/2 (0.475 mi.)***	***AZ217***	***347***

Release ID: 100002
Facility Id: 9-100948
Facility Status: Site Cleanup Completed with EHMP

TERMINAL TRANSPORTAT	***443 KALEWA ST***	***SW 1/4 - 1/2 (0.479 mi.)***	***AY218***	***349***

Release ID: 950057
Release ID: 000050
Facility Id: 9-101439
Facility Status: Site Cleanup Completed (NFA)

BROWNING-FERRIS INDU	***207 PUUHALE RD***	***SSE 1/4 - 1/2 (0.484 mi.)***	***220***	***351***

Release ID: 930017
Facility Id: 9-101719
Facility Status: Site Cleanup Completed (NFA)

HONEYWELL	***2809 MOKUMOA STREET***	***NNW 1/4 - 1/2 (0.491 mi.)***	***BA221***	***352***

Release ID: 950008
Facility Id: 9-100245
Facility Status: Site Cleanup Completed (NFA)

SIDA OF HAWAII (PMID	***439 KALEWA ST***	***SW 1/4 - 1/2 (0.495 mi.)***	***AY222***	***357***

Release ID: 990120
Facility Id: 9-101153
Facility Status: Site Cleanup Completed (NFA)

MR. SANDMAN	***842 MAPUNAPUNA ST***	***NNW 1/4 - 1/2 (0.496 mi.)***	***AV223***	***358***

Release ID: 990060
Release ID: 990061
Release ID: 990062
Facility Id: 9-103460
Facility Status: Site Cleanup Completed (NFA)

THRIFTY RENT- A-CAR	***3039 UALENA ST***	***W 1/4 - 1/2 (0.497 mi.)***	***228***	***367***

Release ID: 980207
Facility Id: 9-100346
Facility Status: Site Cleanup Completed (NFA)

HAWAIIAN ISLES ENTER	***2839 MOKUMOA ST***	***NNW 1/4 - 1/2 (0.497 mi.)***	***BA229***	***368***

Release ID: 990199
Facility Id: 9-102967
Facility Status: Site Cleanup Completed (NFA)

State and tribal registered storage tank lists

HI 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 HI UST list, as provided by EDR, and dated 11/18/2016 has revealed that there are 79 HI UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KAMEHAMEHA HWY WWPS	***2691 N. NIMITZ HWY***	***WNW 0 - 1/8 (0.003 mi.)***	***1***	***75***
Tank Status: Currently in Use Facility Id: 9-100141				
AUTOMOTIVE WAREHOUSE	2760 WAIWAI LP	WNW 0 - 1/8 (0.024 mi.)	A2	76
Tank Status: Permanently Out of Use Facility Id: 9-100806 Date Closed: 08/31/1992 Date Closed: 09/02/1992				
PEACOCK ROOFING AND	***2726 WAIWAI LP***	***WNW 0 - 1/8 (0.024 mi.)***	***A6***	***78***
Tank Status: Permanently Out of Use Facility Id: 9-103351 Date Closed: 05/15/1999 Date Closed: 03/15/1999				
OGDEN ALLIED SERVICE	***2720 WAIWAI LP***	***WNW 0 - 1/8 (0.027 mi.)***	***B8***	***80***
Tank Status: Permanently Out of Use Facility Id: 9-100888 Date Closed: 03/18/1997				
GEO. OKANO ELECTR. C	2781 WAIWAI LP	W 0 - 1/8 (0.046 mi.)	A13	85
Tank Status: Permanently Out of Use Facility Id: 9-101446 Date Closed: 01/01/1988				
YOUNG LAUNDRY & DRY	***2771 WAIWAI LOOP***	***W 0 - 1/8 (0.049 mi.)***	***A15***	***88***
OAHU TIRE SERVICE &	***2808 KAMEHAMEHA HWY***	***WNW 0 - 1/8 (0.051 mi.)***	***D16***	***94***
Tank Status: Permanently Out of Use Facility Id: 9-100795 Date Closed: 11/13/1991				
RITE WAY AUTO DETAIL	609 AHUA ST	WNW 0 - 1/8 (0.061 mi.)	E18	96
Tank Status: Permanently Out of Use Facility Id: 9-100269 Date Closed: 01/01/1989 Date Closed: 06/24/1989				
MALOLO BEVERAGES & S	2815 KOAPAKA ST	W 0 - 1/8 (0.064 mi.)	D23	105

Tank Status: Permanently Out of Use Facility Id: 9-100797				
INTERNATIONAL ORCHID Tank Status: Permanently Out of Use Facility Id: 9-101442 Date Closed: 12/01/1989	2815-A KILIHAU ST	WNW 0 - 1/8 (0.071 mi.)	E25	111
WHIMPORTS TOY COMPAN Tank Status: Permanently Out of Use Facility Id: 9-101913 Date Closed: 12/06/1989	2829 KILIHAU ST	WNW 0 - 1/8 (0.071 mi.)	I29	118
INFINITI MOTOR SALES Tank Status: Permanently Out of Use Facility Id: 9-100127 Date Closed: 11/13/1989	2885 KILIHAU ST	WNW 0 - 1/8 (0.079 mi.)	J32	123
EARLE M. JORGENSEN C Tank Status: Permanently Out of Use Facility Id: 9-100791 Date Closed: 02/28/1989	2655 WAIWAI LP	W 0 - 1/8 (0.085 mi.)	B34	125
DOUGLAS TAKATA EQUIP Tank Status: Permanently Out of Use Facility Id: 9-103492 Date Closed: 08/01/1999	***2706 KILIHAU ST***	***NW 0 - 1/8 (0.085 mi.)***	***K35***	***126***
NISSAN MOTOR CORP. I Tank Status: Permanently Out of Use Facility Id: 9-101334 Date Closed: 01/14/1993	***2880 KILIHAU ST***	***WNW 0 - 1/8 (0.087 mi.)***	***J37***	***128***
MARTIN WAREHOUSE AND Tank Status: Permanently Out of Use Facility Id: 9-101424 Date Closed: 09/19/1998	***2838 KILIHAU ST***	***WNW 0 - 1/8 (0.087 mi.)***	***I38***	***129***
SCHUMAN CARRIAGE CO. Tank Status: Permanently Out of Use Facility Id: 9-100440 Date Closed: 12/15/1991	2424 KAMEHAMEHA HWY	E 0 - 1/8 (0.088 mi.)	40	131
UNITED TRUCK RENTAL Tank Status: Permanently Out of Use Facility Id: 9-102903	***2804 KILIHAU ST***	***WNW 0 - 1/8 (0.096 mi.)***	***E42***	***132***
JACK ENDO ELECTRIC, Tank Status: Currently in Use Tank Status: Permanently Out of Use Facility Id: 9-101395 Date Closed: 09/19/1990 Date Closed: 02/04/1988	***2814 KILIHAU ST***	***WNW 0 - 1/8 (0.096 mi.)***	***E43***	***133***
U-HAUL OF HAWAII, IN Tank Status: Permanently Out of Use Facility Id: 9-100352 Date Closed: 11/27/1991	***2722 KILIHAU ST***	***NW 0 - 1/8 (0.097 mi.)***	***F45***	***135***
REFUSE INC Tank Status: Permanently Out of Use Facility Id: 9-102524 Date Closed: 11/01/1991	***633 AHUA ST***	***NW 0 - 1/8 (0.102 mi.)***	***E46***	***137***

Date Closed: 05/02/2006				
ROVENS TANAKA CONTRA Tank Status: Permanently Out of Use Facility Id: 9-103177 Date Closed: 12/01/1994	***2678 KILIHAU ST***	***NW 0 - 1/8 (0.108 mi.)***	***K52***	***143***
ALII STOR-MOR Tank Status: Permanently Out of Use Facility Id: 9-102420	***2670 KILIHAU ST***	***NW 0 - 1/8 (0.112 mi.)***	***M53***	***144***
FIRST HAWAIIAN BANK Tank Status: Currently in Use Facility Id: 9-102735	***2339 KAMEHAMEHA HWY***	***E 0 - 1/8 (0.117 mi.)***	***N54***	***144***
PACIFIC DIVING INDUS Tank Status: Permanently Out of Use Facility Id: 9-102422 Date Closed: 02/22/1999	***2646 KILIHAU ST***	***NNW 0 - 1/8 (0.118 mi.)***	***M55***	***146***
PAN-PACIFIC CONSTRUC Tank Status: Permanently Out of Use Facility Id: 9-101481 Date Closed: 01/24/1994	***2621 WAIWAI LP***	***W 0 - 1/8 (0.120 mi.)***	***O56***	***147***
PEERLESS ROOFING CO. Tank Status: Permanently Out of Use Facility Id: 9-100941 Date Closed: 03/12/1992	***2629 WAIWAI LOOP***	***W 0 - 1/8 (0.120 mi.)***	***O58***	***150***
AMERICAN PACIFIC TRA Tank Status: Permanently Out of Use Facility Id: 9-100807 Date Closed: 09/01/2001	***2635 WAIWAI LP***	***W 0 - 1/8 (0.120 mi.)***	***O61***	***153***
AERONAUTICAL RADIO, Tank Status: Permanently Out of Use Facility Id: 9-102411 Date Closed: 10/05/1998	***2668 WAIWAI LP***	***W 0 - 1/8 (0.125 mi.)***	***P63***	***157***
SATURN OF HONOLULU Tank Status: Permanently Out of Use Facility Id: 9-100286 Date Closed: 09/20/1993 Date Closed: 09/21/1993	***2901 N NIMITZ HWY***	***WNW 1/8 - 1/4 (0.131 mi.)***	***L65***	***159***
ATTCO, INC. Tank Status: Permanently Out of Use Facility Id: 9-100794 Date Closed: 06/30/1997	***2855 KOAPAKA ST***	***W 1/8 - 1/4 (0.134 mi.)***	***L66***	***160***
JERRY CHING REALTY Tank Status: Permanently Out of Use Facility Id: 9-102948 Date Closed: 12/01/1994	2660 WAIWAI LP	W 1/8 - 1/4 (0.135 mi.)	P69	164
MERCANTILE TRUCKING Tank Status: Permanently Out of Use Facility Id: 9-100273 Date Closed: 10/06/1998	***2280 ALAHAO PL***	***SE 1/8 - 1/4 (0.138 mi.)***	***R71***	***166***
PALAMA MEAT CO., INC Tank Status: Permanently Out of Use	2656 WAIWAI LP	W 1/8 - 1/4 (0.141 mi.)	P75	171

Facility Id: 9-100803 Date Closed: 01/10/1994				
F.T. OPPERMAN & COMP Tank Status: Permanently Out of Use Facility Id: 9-101524 Date Closed: 01/01/1989	***2340-B KAMEHAMEHA HW***	***E 1/8 - 1/4 (0.141 mi.)***	***N76***	***171***
AIRPORT SHELL (PMID0 Tank Status: Permanently Out of Use Tank Status: Permanently out of Use Facility Id: 9-101891 Date Closed: 03/18/1987 Date Closed: 07/17/2001 Date Closed: 12/02/2013	***2805 UALENA ST***	***W 1/8 - 1/4 (0.143 mi.)***	***S81***	***178***
G. W. MURPHY CONSTRU Tank Status: Permanently Out of Use Facility Id: 9-101549 Date Closed: 12/30/1989	***650 KAKOI ST***	***NW 1/8 - 1/4 (0.147 mi.)***	***T82***	***181***
F K S RENTALS AND SA Tank Status: Permanently Out of Use Facility Id: 9-100206 Date Closed: 12/27/1989	***653 KAKOI ST***	***NW 1/8 - 1/4 (0.149 mi.)***	***T83***	***182***
VECTOR CONTROL BRANC Tank Status: Permanently Out of Use Facility Id: 9-100110 Date Closed: 02/18/2000 Date Closed: 02/17/2000	***2611 KILIHAU ST***	***NNW 1/8 - 1/4 (0.152 mi.)***	***M84***	***185***
OAHU BINDERY, INC. Tank Status: Permanently Out of Use Facility Id: 9-100749 Date Closed: 12/17/1982	2278 HOONEE PL	SE 1/8 - 1/4 (0.159 mi.)	U87	191
GASPRO (KALIHI FACIL Tank Status: Permanently Out of Use Facility Id: 9-100861 Date Closed: 09/21/1992	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N88***	***191***
LENAKONA DEVELOPMENT Tank Status: Permanently Out of Use Facility Id: 9-102588 Date Closed: 11/20/1992	***2305 KAMEHAMEHA HWY***	***E 1/8 - 1/4 (0.159 mi.)***	***N90***	***195***
NATIONAL CONCRETE SA Tank Status: Permanently Out of Use Facility Id: 9-102811 Date Closed: 11/22/1993	650 AHUA ST	NW 1/8 - 1/4 (0.162 mi.)	V91	196
I. DOI TRUCKING Tank Status: Permanently Out of Use Facility Id: 9-101392 Facility Id: 9-101148 Date Closed: 06/01/1995 Date Closed: 04/01/1985 Date Closed: 01/01/1988	***669 AHUA ST***	***NW 1/8 - 1/4 (0.162 mi.)***	***V93***	***199***
GRANGER PACIFIC, INC Tank Status: Permanently Out of Use	***611 MIDDLE ST***	***ENE 1/8 - 1/4 (0.168 mi.)***	***W95***	***202***

Facility Id: 9-101453 Facility Id: 9-100227 Facility Id: 9-101169 Date Closed: 11/17/1998 Date Closed: 04/01/2002				
PACIFIC TRANSFER & W Tank Status: Permanently Out of Use Facility Id: 9-100289 Date Closed: 05/07/1994	***664 KAKOI ST***	***NW 1/8 - 1/4 (0.173 mi.)***	***T97***	***205***
TRADEWINDS U-DRIVE I Tank Status: Permanently Out of Use Facility Id: 9-100350 Date Closed: 08/13/1997 Date Closed: 10/01/1990	***2875-A KOAPAKA ST***	***W 1/8 - 1/4 (0.173 mi.)***	***X98***	***206***
COMMERCIAL SHELVING Tank Status: Permanently Out of Use Facility Id: 9-100762 Date Closed: 12/01/2001	P.O. BOX 29480 2835	W 1/8 - 1/4 (0.174 mi.)	S99	207
SYLVA BRAIDWOOD Tank Status: Permanently Out of Use Facility Id: 9-103089 Date Closed: 07/03/1995	2856 UALENA ST	W 1/8 - 1/4 (0.175 mi.)	Y100	207
HAWAII DAIRY HOLDING Tank Status: Permanently Out of Use Facility Id: 9-100210 Date Closed: 07/06/2005	***2277 KAMEHAMEHA HWY***	***ESE 1/8 - 1/4 (0.176 mi.)***	***101***	***208***
MIKE SALTA PONTIAC Tank Status: Permanently Out of Use Facility Id: 9-101166	2882 KOAPAKA ST	W 1/8 - 1/4 (0.177 mi.)	X102	210
D C ELECTRIC INC. Tank Status: Permanently Out of Use Facility Id: 9-101142	649-A MAPUNAPUNA ST	NW 1/8 - 1/4 (0.184 mi.)	Q103	211
SUN INDUSTRIES Tank Status: Permanently Out of Use Facility Id: 9-101883 Date Closed: 12/11/1993	***660 MAPUNAPUNA ST***	***NW 1/8 - 1/4 (0.187 mi.)***	***Z104***	***211***
AMERICAN RESTAURANT Tank Status: Permanently Out of Use Facility Id: 9-102482 Date Closed: 01/30/1980 Date Closed: 10/12/1990	2887 KOAPAKA ST	W 1/8 - 1/4 (0.187 mi.)	X105	212
ROYAL CONTRACTING CO Tank Status: Permanently Out of Use Facility Id: 9-101533 Date Closed: 02/25/1995	***677 AHUA ST***	***NW 1/8 - 1/4 (0.187 mi.)***	***V106***	***213***
PRECISION ELECTRIC Tank Status: Permanently Out of Use Facility Id: 9-103317 Date Closed: 10/04/2003	***653 MAPUNAPUNA ST***	***NW 1/8 - 1/4 (0.190 mi.)***	***Q107***	***213***
KEEHI TRANSFER STATI Tank Status: Permanently Out of Use	***606 MIDDLE STREET***	***NE 1/8 - 1/4 (0.191 mi.)***	***108***	***214***

Facility Id: 9-100128 Date Closed: 09/02/1993				
VP & FFJR Tank Status: Permanently Out of Use Facility Id: 9-103283 Date Closed: 04/14/1997	330 SAND ISLAND ACCE	ESE 1/8 - 1/4 (0.195 mi.)	AA112	224
NORDIC CONSTRUCTION, Tank Status: Permanently Out of Use Facility Id: 9-101546 Date Closed: 09/10/1997 Date Closed: 09/11/1997	685 AHUA ST	NW 1/8 - 1/4 (0.198 mi.)	V113	225
AVIS RENT-A-CAR SYST Tank Status: Permanently Out of Use Tank Status: Temporarily out of Use Facility Id: 9-101539 Facility Id: 9-102213 Date Closed: 06/01/1988	***2912 AOLELE ST***	***W 1/8 - 1/4 (0.202 mi.)***	***S116***	***228***
EDGARDO PUGLIA (PMID Tank Status: Permanently Out of Use Facility Id: 9-103704 Date Closed: 12/07/2001	***2845 UALENA STREET***	***W 1/8 - 1/4 (0.202 mi.)***	***Y117***	***230***
THOS. FUJIKAWA PAINT Tank Status: Permanently Out of Use Facility Id: 9-100347 Date Closed: 12/01/1991	2865 UALENA ST	W 1/8 - 1/4 (0.204 mi.)	Y118	230
C.Q. YEE HOP Tank Status: Permanently Out of Use Facility Id: 9-102751 Date Closed: 05/21/1993	***621 MIDDLE ST***	***ENE 1/8 - 1/4 (0.206 mi.)***	***W120***	***232***
SUN INDUSTRIES Tank Status: Permanently Out of Use Facility Id: 9-103685 Date Closed: 04/16/2002 Date Closed: 04/16/2001	689 PUULOA RD	NW 1/8 - 1/4 (0.209 mi.)	Z122	234
AMERICAN INT. R.A.C. Tank Status: Permanently Out of Use Facility Id: 9-100789 Date Closed: 07/29/1992	***2880 UALENA ST***	***W 1/8 - 1/4 (0.214 mi.)***	***Y124***	***236***
ALOHA STATE SALES CO Tank Status: Permanently Out of Use Facility Id: 9-101484 Date Closed: 04/13/1993	2829 AWAAWALOA ST	NW 1/8 - 1/4 (0.217 mi.)	V125	237
MOOS MACHINE SHOP Tank Status: Permanently Out of Use Facility Id: 9-102442	685 MAPUNAPUNA ST	NW 1/8 - 1/4 (0.218 mi.)	Z127	239
S. MCCABE PAVING Tank Status: Permanently Out of Use Facility Id: 9-101393 Date Closed: 07/15/1991	673 MAPUNAPUNA ST	NW 1/8 - 1/4 (0.218 mi.)	Z128	239
MIKE SALTA PONTIAC Tank Status: Permanently Out of Use	***2945 N NIMITZ HWY***	***WNW 1/8 - 1/4 (0.219 mi.)***	***AC129***	***239***

Facility Id: 9-100274 Date Closed: 01/30/1991				
SPRINGS INC (PMID 00 Tank Status: Permanently Out of Use Facility Id: 9-102956 Date Closed: 06/24/1994	2875 UALENA ST	W 1/8 - 1/4 (0.219 mi.)	Y130	242
RALPH S. INOUYE CO., Tank Status: Permanently Out of Use Facility Id: 9-100302 Date Closed: 07/24/1993	***2831 AWAAWALOA ST***	***NW 1/8 - 1/4 (0.224 mi.)***	***AD132***	***243***
DEPT OF TRANSPORTATI Tank Status: Permanently Out of Use Tank Status: Currently in Use Facility Id: 9-100056 Date Closed: 01/10/1990	***2919 AOLELE ST***	***W 1/8 - 1/4 (0.225 mi.)***	***AE133***	***244***
KEMS INC. Tank Status: Permanently Out of Use Facility Id: 9-100260	2234 HOONEE PL	SE 1/8 - 1/4 (0.230 mi.)	AF141	259
CYCLE CITY Tank Status: Permanently Out of Use Facility Id: 9-101924 Date Closed: 09/10/1991	2965 N NIMITZ HWY	WNW 1/8 - 1/4 (0.232 mi.)	AC142	259
MUTUAL PLUMBING SUPP Tank Status: Permanently Out of Use Facility Id: 9-101445 Date Closed: 11/24/1997	***2812 AWAAWALOA ST***	***NW 1/8 - 1/4 (0.233 mi.)***	***AD143***	***260***
HICKS CONSTRUCTION C Tank Status: Permanently Out of Use Facility Id: 9-101804 Date Closed: 09/01/1989	2885 UALENA ST	W 1/8 - 1/4 (0.235 mi.)	144	260
SHELLY MAZDA AUTO PR Tank Status: Permanently Out of Use Tank Status: Permanently out of Use Facility Id: 9-102531 Date Closed: 01/07/1992 Date Closed: 04/27/2015	***709 AHUA ST***	***NW 1/8 - 1/4 (0.235 mi.)***	***AB145***	***261***
WILLIAM J. KIMI, JR. Tank Status: Permanently Out of Use Facility Id: 9-103354 Date Closed: 02/28/1998	***692 MAPUNAPUNA ST OR***	***NW 1/8 - 1/4 (0.237 mi.)***	***Z149***	***266***
JN CHEVROLET/MAZDA D Tank Status: Permanently Out of Use Facility Id: 9-101149	2971 N NIMITZ HWY	WNW 1/8 - 1/4 (0.246 mi.)	AC150	267

State and tribal institutional control / engineering control registries

HI ENG CONTROLS: A listing of sites with engineering controls in place.

A review of the HI ENG CONTROLS list, as provided by EDR, and dated 09/23/2016 has revealed that

there are 6 HI ENG CONTROLS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ALSCO (AMERICAN LINE	*2771 WAIWAI LP*	*W 0 - 1/8 (0.049 mi.)*	*A14*	*86*
611 MIDDLE STREET WA	*611 MIDDLE ST*	*ENE 1/8 - 1/4 (0.168 mi.)*	*W96*	*203*
LONGS DRUG STORES WA	*2270 HOONEE PL*	*SE 1/8 - 1/4 (0.192 mi.)*	*U109*	*217*
HAWAII MEAT COMPANY	*711 MIDDLE ST*	*ENE 1/4 - 1/2 (0.257 mi.)*	*154*	*271*
FORMER ZIEGLER STEEL	*2919 UALENA ST*	*W 1/4 - 1/2 (0.297 mi.)*	*AJ166*	*284*
AIR ENGINEERING	*2308 PAHOUNUI DR*	*S 1/4 - 1/2 (0.443 mi.)*	*AU204*	*332*

Voluntary Remediation Program and Brownfields sites with institutional controls in place.

A review of the HI INST CONTROL list, as provided by EDR, and dated 09/23/2016 has revealed that there are 9 HI INST CONTROL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ALSCO (AMERICAN LINE	*2771 WAIWAI LP*	*W 0 - 1/8 (0.049 mi.)*	*A14*	*86*
HAGADONE PRINTING CO	*2278 HOONEE PL*	*SE 1/8 - 1/4 (0.159 mi.)*	*U86*	*190*
611 MIDDLE STREET WA	*611 MIDDLE ST*	*ENE 1/8 - 1/4 (0.168 mi.)*	*W96*	*203*
LONGS DRUG STORES WA	*2270 HOONEE PL*	*SE 1/8 - 1/4 (0.192 mi.)*	*U109*	*217*
HAWAII MEAT COMPANY	*711 MIDDLE ST*	*ENE 1/4 - 1/2 (0.257 mi.)*	*154*	*271*
FORMER ZIEGLER STEEL	*2919 UALENA ST*	*W 1/4 - 1/2 (0.297 mi.)*	*AJ166*	*284*
HAWAIIAN BITUMULS &	*248 SAND ISLAND ACCE*	*SE 1/4 - 1/2 (0.306 mi.)*	*AL169*	*290*
AIR ENGINEERING	*2308 PAHOUNUI DR*	*S 1/4 - 1/2 (0.443 mi.)*	*AU204*	*332*
2343 NORTH KING STRE	*2343 N KING ST*	*ENE 1/4 - 1/2 (0.496 mi.)*	*AZ227*	*366*

State and tribal voluntary cleanup sites

HI VCP: Voluntary Response Program Sites.

A review of the HI VCP list, as provided by EDR, and dated 09/23/2016 has revealed that there is 1 HI VCP site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HAWAII DAIRY HOLDING	*2277 KAMEHAMEHA HWY*	*ESE 1/8 - 1/4 (0.176 mi.)*	*101*	*208*

ADDITIONAL ENVIRONMENTAL RECORDS

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 12/12/2016 has revealed that

there are 31 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AUTOMOTIVE WAREHOUSE	***2760 WAIWAI LP***	***WNW 0 - 1/8 (0.024 mi.)***	***A5***	***77***
PEACOCK ROOFING AND	***2726 WAI WAI LOOP***	***WNW 0 - 1/8 (0.024 mi.)***	***A7***	***79***
SOUTH SEAS MOTORS	***2841 N NIMITZ HWY***	***WNW 0 - 1/8 (0.040 mi.)***	***D11***	***82***
YOUNG LAUNDRY & DRY	***2771 WAIWAI LOOP***	***W 0 - 1/8 (0.049 mi.)***	***A15***	***88***
ISLAND DEMO (FOR REG	***2769 KILIHAU ST***	***WNW 0 - 1/8 (0.064 mi.)***	***F20***	***97***
HAWAII COMMUNITY DEV	***2 ALAHAO PL***	***ESE 0 - 1/8 (0.067 mi.)***	***H24***	***106***
WALMART WAREHOUSE NO	2833 KILIHAU ST	WNW 0 - 1/8 (0.071 mi.)	I28	113
R AND D TECHNOLOGIES	***2688 WAIWAI LOOP***	***W 0 - 1/8 (0.072 mi.)***	***B30***	***119***
IMPS INC	***2298 ALAHAO PL BLDG***	***ESE 0 - 1/8 (0.075 mi.)***	***H31***	***121***
TRANE PACIFIC SERVIC	***2298 D ALAHAO PLACE***	***ESE 0 - 1/8 (0.087 mi.)***	***36***	***127***
MAGNUM TRANSPORTATIO	***2838 KILIHAU ST***	***WNW 0 - 1/8 (0.087 mi.)***	***I39***	***130***
U-HAUL OF HAWAII, IN	***2722 KILIHAU ST***	***NW 0 - 1/8 (0.097 mi.)***	***F45***	***135***
FLICK PEST CONTROL	***2629 WAI WAI LOOP***	***W 0 - 1/8 (0.120 mi.)***	***O59***	***150***
INTEGRATED MEDIA INC	***630 PUULOA RD***	***WNW 0 - 1/8 (0.120 mi.)***	***J60***	***152***
94-344 HOKUALA STREE	***619 MAPUNAPUNA ST ST***	***WNW 1/8 - 1/4 (0.137 mi.)***	***Q70***	***164***
MERCANTILE TRUCKING	2280 ALAHAO PL	SE 1/8 - 1/4 (0.138 mi.)	R72	166
V P AND F F JR	2290 ALAHAO PL	SE 1/8 - 1/4 (0.138 mi.)	R74	170
EQUILON ENTERPRISES	***2805 UALENA ST***	***W 1/8 - 1/4 (0.143 mi.)***	***S80***	***177***
F K S RENTALS AND SA	***653 KAKOI ST***	***NW 1/8 - 1/4 (0.149 mi.)***	***T83***	***182***
VECTOR CONTROL BRANC	***2611 KILIHAU ST***	***NNW 1/8 - 1/4 (0.152 mi.)***	***M84***	***185***
REIT MANAGEMENT & RE	669 AHUA ST	NW 1/8 - 1/4 (0.162 mi.)	V92	197
WINTHROP PRODUCTS IN	***2869 KOAPAKA STREET***	***W 1/8 - 1/4 (0.166 mi.)***	***L94***	***201***
TRANE PACIFIC SERVIC	***330 SAND ISLAND ACCE***	***ESE 1/8 - 1/4 (0.195 mi.)***	***AA111***	***220***
BURKE CO THE 17	***681 MAPUNAPUNA ST***	***NW 1/8 - 1/4 (0.208 mi.)***	***Z121***	***233***
THE ESTATE OF SAMUEL	697 AHUA ST	NW 1/8 - 1/4 (0.210 mi.)	AB123	235
MOOS MACHINE WORKS I	***685 MAPUNAPUNA ST***	***NW 1/8 - 1/4 (0.218 mi.)***	***Z126***	***237***
B C P CONSTRUCTION O	2831 AWAAWALOA ST UN	NW 1/8 - 1/4 (0.224 mi.)	AD131	242
HAWAIIAN MARINES SAL	***2223 HOONEE PL***	***SE 1/8 - 1/4 (0.230 mi.)***	***AF139***	***254***
UNITEK INSULATION IN	***2234 HOONEE PL***	***SE 1/8 - 1/4 (0.230 mi.)***	***AF140***	***256***
ACOUSTICAL MATERIAL	2312 KAMEHAMEHA HWY	E 1/8 - 1/4 (0.237 mi.)	AG147	264
HONOLULU CORP YARD	***1348 SAND ISLAND ACC***	***ESE 1/8 - 1/4 (0.247 mi.)***	***AA151***	***267***

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 are 3 DOD sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HICKAM AIR FORCE BAS		WSW 1/2 - 1 (0.594 mi.)	0	8
FORT SHAFTER		NE 1/4 - 1/2 (0.299 mi.)	0	8
PEARL HARBOR NAVAL S		N 1/2 - 1 (0.500 mi.)	0	8

ROD: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, and dated 11/25/2013 has revealed that there is 1 ROD site within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PEARL HARBOR NAVAL C	***US NAVAL COMMAND***	***NW 0 - 1/8 (0.057 mi.)***	***0***	***9***

UXO: A listing of unexploded ordnance site locations

A review of the UXO list, as provided by EDR, and dated 10/25/2015 has revealed that there is 1 UXO site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SKEET RANGE	APZV-FEP-V	N 1/4 - 1/2 (0.391 mi.)	193	319

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: 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.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 9 EDR Hist Auto sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	2760 WAIWAI LOO	WNW 0 - 1/8 (0.024 mi.)	A3	76
Not reported	2760 WAIWAI LOOP	WNW 0 - 1/8 (0.024 mi.)	A4	76
Not reported	2702 WAIWAI LOOP	WNW 0 - 1/8 (0.027 mi.)	C9	81
Not reported	2702 WAIWAI LOO	WNW 0 - 1/8 (0.027 mi.)	C10	82
Not reported	2769 KILIHAU ST	WNW 0 - 1/8 (0.064 mi.)	F19	97
Not reported	2815 KILIHAU ST	WNW 0 - 1/8 (0.071 mi.)	E26	111
Not reported	2833 KILIHAU ST	WNW 0 - 1/8 (0.071 mi.)	I27	112
Not reported	2804 KILIHAU ST	WNW 0 - 1/8 (0.096 mi.)	E41	132
Not reported	2814 KILIHAU ST	WNW 0 - 1/8 (0.096 mi.)	E44	135

EDR Hist Cleaner: 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.

A review of the EDR Hist Cleaner list, as provided by EDR, has revealed that there are 2 EDR Hist

EXECUTIVE SUMMARY

Cleaner sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	2291 ALAHAO PL	SE 0 - 1/8 (0.104 mi.)	H47	138
Not reported	515 LAGOON DR	W 0 - 1/8 (0.106 mi.)	G50	141

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 16 records.

Site Name	Database(s)
1339 SCHOOL STREET	HI SHWS, HI ENG CONTROLS, HI INST CONTROL
KEEHI LAGOON CANOE FACILITY, INCRE	HI SHWS, HI ENG CONTROLS, HI INST CONTROL
BEST BUY	HI SHWS, HI SPILLS
UNIVERSITY OF HAWAII INTERCHANGE	HI SHWS
HONOLULU AIRPORT INTERIM CAR RENTA	HI SHWS, HI INST CONTROL
HALAWA STREAM CHANNEL PETROLEUM CO	HI SHWS
KALANI, HART, MOKUAEA STREET, HONO	HI SHWS
ABC DISPOSAL COMPANY	HI SHWS
FORMER KAPALAMA MILITARY RESERVATI	HI SHWS
ALOHA TOWER DEVELOPMENT	HI SHWS
NIMITZ HIGHWAY WATER IMPROVEMENT P	HI SHWS
SAND ISLAND ACCESS ROAD AREAWIDE P	HI SHWS
SAND ISLAND HOUSING FIRST PROJECT	HI SHWS
KOKUA KALIHI VALLEY ACTIVE LIVING	HI SHWS, HI BROWNFIELDS
KEEHI LAGOON CANOE FACILITY	SEMS
FORT SHAFTER	HI LUST

OVERVIEW MAP - 4928184.2S

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Pipelines

100-year flood zone

500-year flood zone

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: KHFM Environmental Assessment	CLIENT: CH2M Hill
ADDRESS: Kamehameha Highway Honolulu HI 96819	CONTACT: Belinda Turran INQUIRY #: 4928184.2s
LAT/LONG: 21.332689 / 157.893294	DATE: May 04, 2017 9:26 pm

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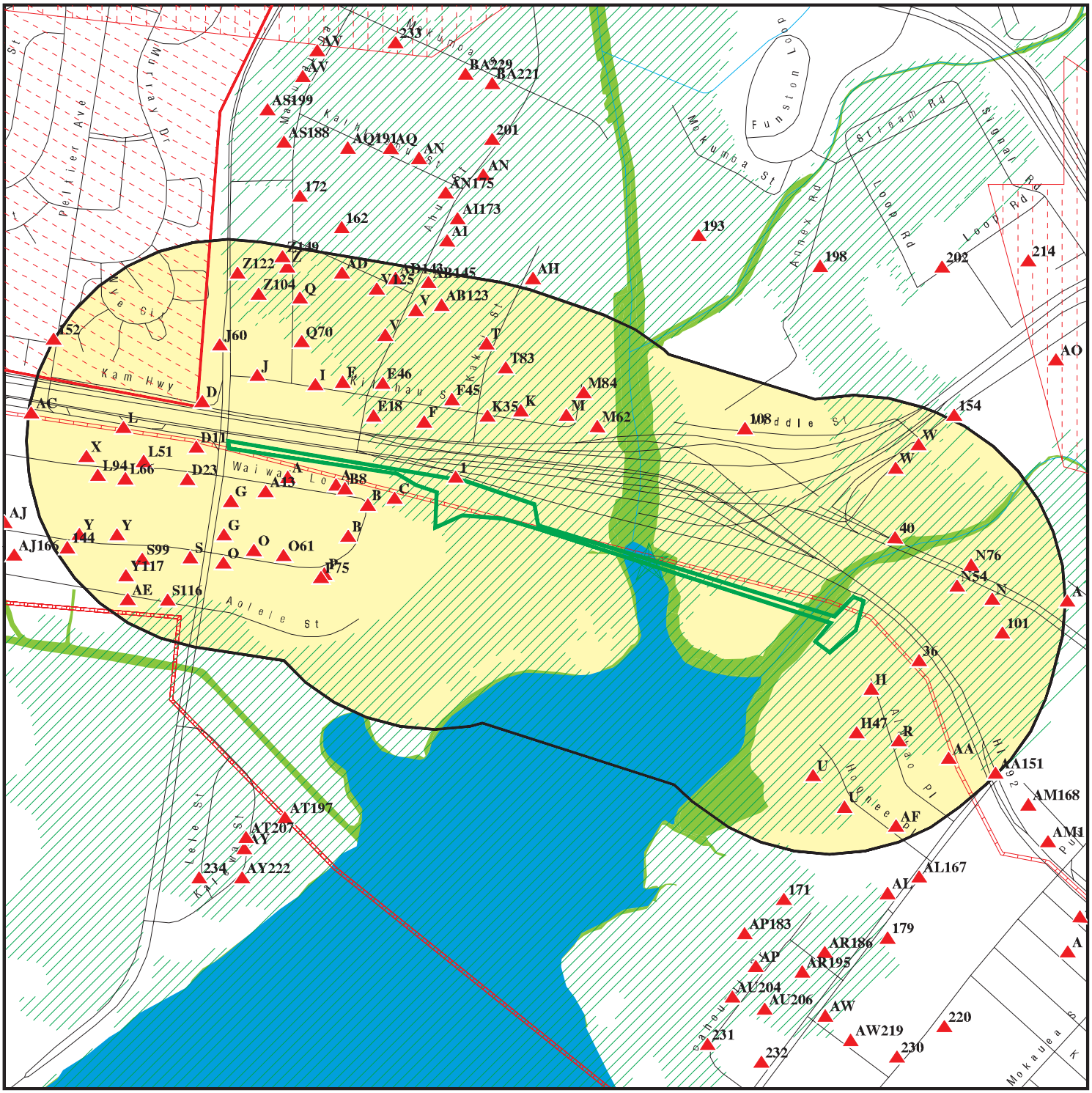
DETAIL MAP - 4928184.2S


Kamehameha Hwy
Waiwai Loop
Aolele St
Kaiwa St
Lele St
Kuhio St
Kakaio St
Kaiwa St
Mokumpa St
Funston Loop
Stream Rd
Signal Rd
Loop Rd
Annex Rd
Middle St
Mokauea St
Pelliver Ave
Mafray Dr
Kaiwa St
Kuhio St
Kaiwa St
Ahuli St
Kakaio St
Kaiwa St
Kaiwa St
Kaiwa

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		1	0	0	0	NR	1
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	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		1	0	2	NR	NR	3
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		1	5	2	NR	NR	8
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	1	NR	1
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	5	NR	NR	NR	5
RCRA-CESQG	0.250		7	9	NR	NR	NR	16
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		1	0	0	NR	NR	1
US INST CONTROL	0.500		1	0	0	NR	NR	1
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
HI SHWS	1.000		4	9	19	30	NR	62
State and tribal landfill and/or solid waste disposal site lists								
HI SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
HI LUST	0.500		18	27	57	NR	NR	102
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
HI UST	0.250		29	50	NR	NR	NR	79
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
HI ENG CONTROLS	0.500		1	2	3	NR	NR	6
HI INST CONTROL	0.500		1	3	5	NR	NR	9
State and tribal voluntary cleanup sites								
HI VCP	0.500		0	1	0	NR	NR	1
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
HI BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
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
HI 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
HI SPILLS	0.001		0	NR	NR	NR	NR	0
HI SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		14	17	NR	NR	NR	31
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	1	2	NR	3
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
TSCA	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
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		1	0	0	0	NR	1
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		1	NR	NR	NR	NR	1
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	0.001		0	NR	NR	NR	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	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	1	0	NR	1
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
HI AIRS	0.001		0	NR	NR	NR	NR	0
HI DRYCLEANERS	0.250		0	0	NR	NR	NR	0
HI Financial Assurance	0.001		0	NR	NR	NR	NR	0
CA HAZNET	TP		NR	NR	NR	NR	NR	0
HI UIC	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		9	NR	NR	NR	NR	9
EDR Hist Cleaner	0.125		2	NR	NR	NR	NR	2
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
HI RGA HWS	0.001		0	NR	NR	NR	NR	0
HI RGA LF	0.001		0	NR	NR	NR	NR	0
HI RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	92	129	91	33	0	345

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

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Attachment B
EDR Historical Topo Map Report

KHFM Environmental Assessment

Kamehameha Highway

Honolulu, HI 96819

Inquiry Number: 4928184.4

May 04, 2017

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

05/04/17

Site Name:	Client Name:
KHFM Environmental Assessm	CH2M Hill
Kamehameha Highway	1585 Kapiolani Blvd.
Honolulu, HI 96819	Honolulu, HI 96814
EDR Inquiry # 4928184.4	Contact: Belinda Turran

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by CH2M Hill were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# 477851.03.31.03

Project: 477851.03.31.03

Coordinates:

Latitude:	21.332689 21° 19' 58" North
Longitude:	-157.893294 -157° 53' 36" West
UTM Zone:	Zone 4 North
UTM X Meters:	614767.12
UTM Y Meters:	2359371.22
Elevation:	0.09' above sea level

Maps Provided:

2013
1998, 1999
1983
1970
1968, 1969
1959
1954
1953
1928

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2013 Source Sheets

Honolulu
2013
7.5-minute, 24000

Pearl Harbor
2013
7.5-minute, 24000

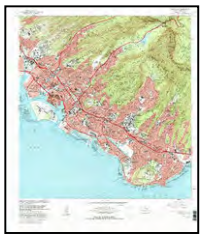
1998, 1999 Source Sheets

Honolulu
1998
7.5-minute, 24000
Aerial Photo Revised 1998

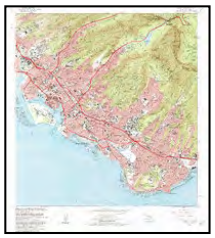
Pearl Harbor
1999
7.5-minute, 24000
Aerial Photo Revised 1999

1983 Source Sheets

Pearl Harbor
1983
7.5-minute, 24000
Aerial Photo Revised 1978



Honolulu
1983
7.5-minute, 24000
Aerial Photo Revised 1978



Honolua
1983
7.5-minute, 24000
Aerial Photo Revised 1978

1970 Source Sheets

OAHU
1970
15-minute, 62500

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1968, 1969 Source Sheets

Puuloa
1968
7.5-minute, 24000
Aerial Photo Revised 1968

Honolulu
1969
7.5-minute, 24000
Aerial Photo Revised 1968

1959 Source Sheets

Puuloa
1959
7.5-minute, 24000
Aerial Photo Revised 1959

Honolulu
1959
7.5-minute, 24000
Aerial Photo Revised 1959

1954 Source Sheets

HONOLULUVICINITYNORTH
1954
7.5-minute, 24000

HONOLULUVICINITYSOUTH
1954
7.5-minute, 24000

1953 Source Sheets

Honolulu
1953
7.5-minute, 24000
Aerial Photo Revised 1952

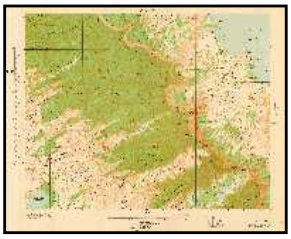
Puuloa
1953
7.5-minute, 24000
Aerial Photo Revised 1952

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1928 Source Sheets

WAIPAHU
1928
7.5-minute, 20000

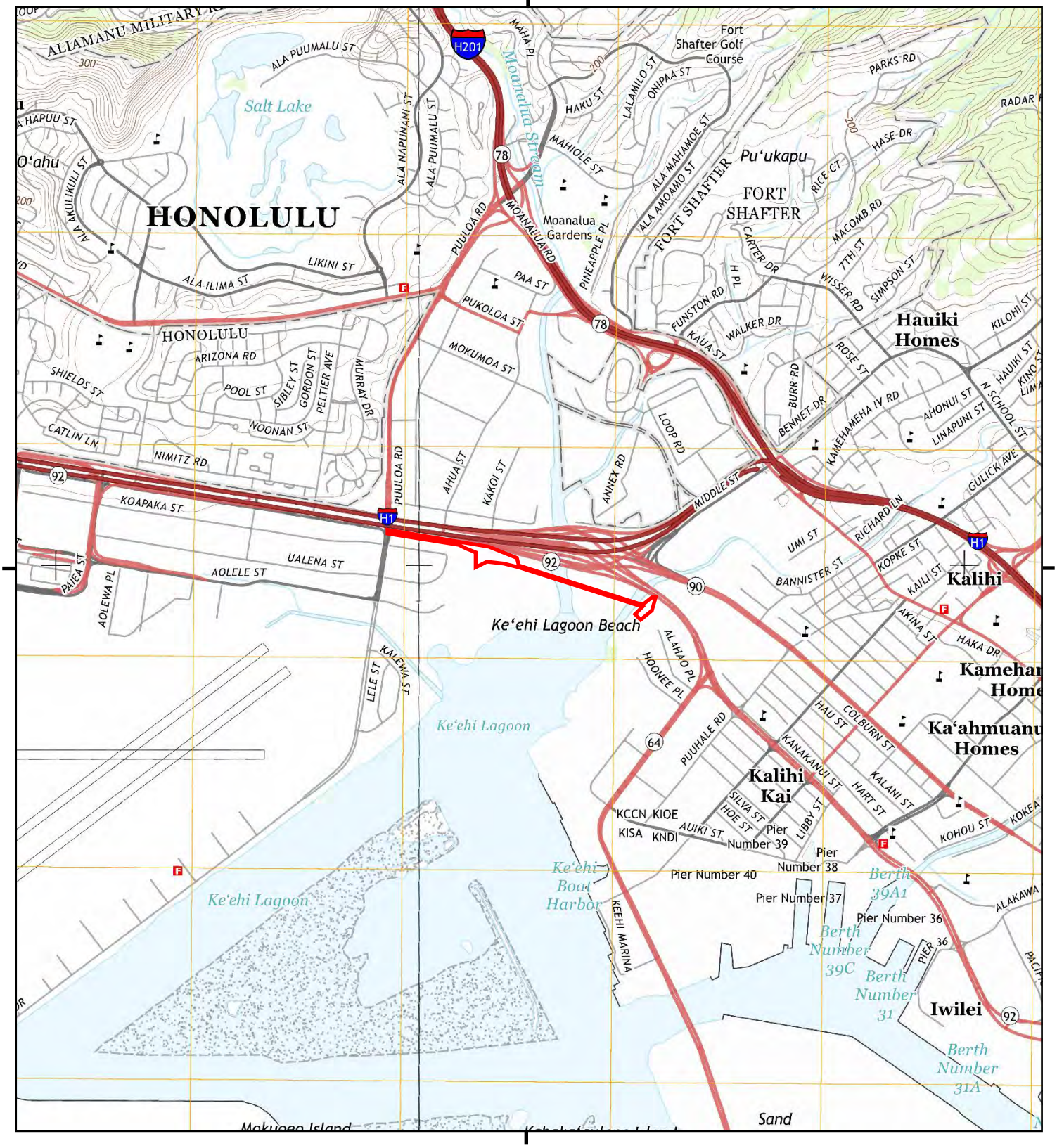


KANEOHE
1928
7.5-minute, 20000

HONOLULU
1928
7.5-minute, 20000

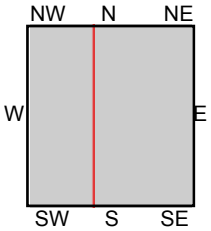
Historical Topo Map

2013



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



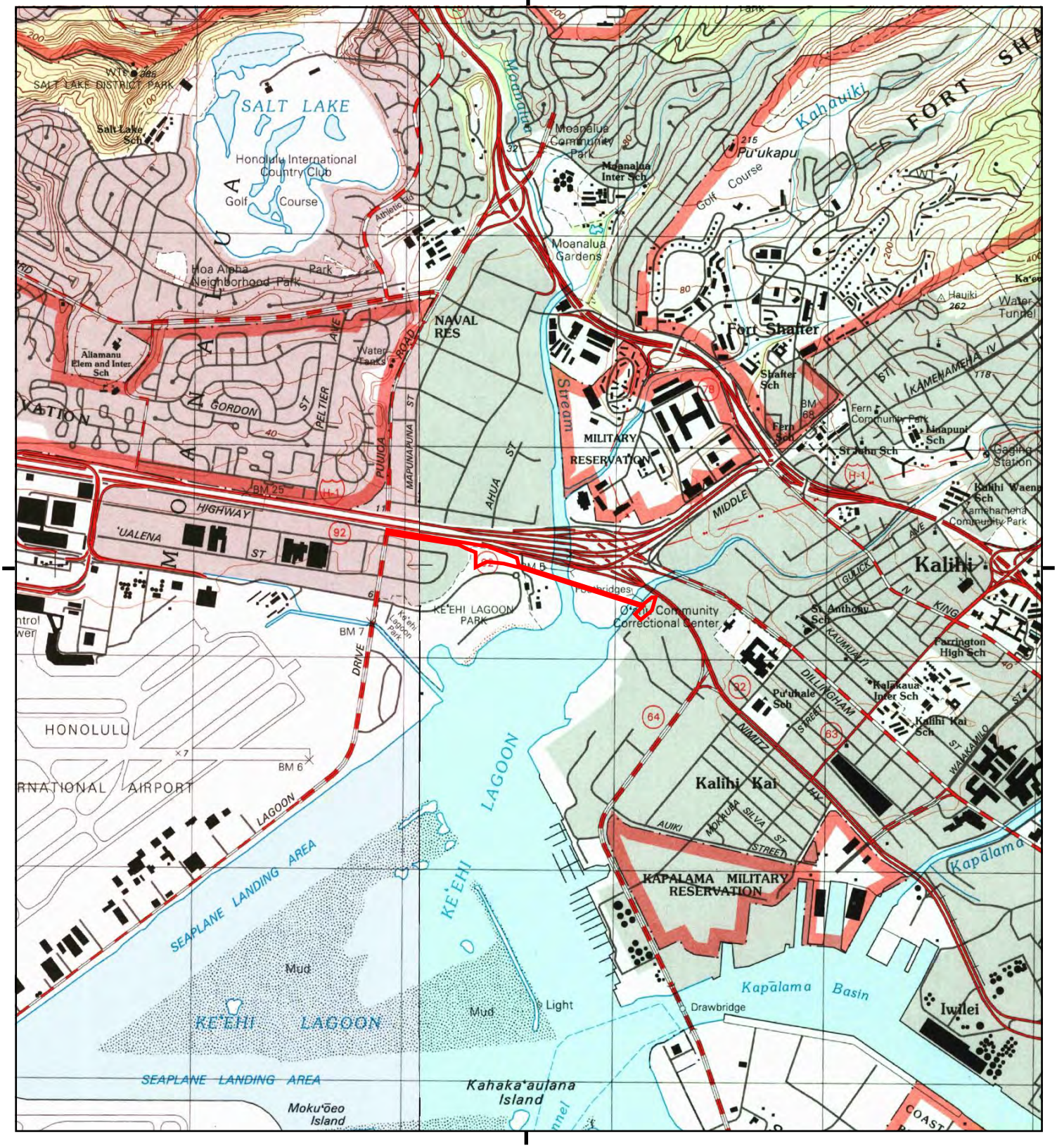
TP, Honolulu, 2013, 7.5-minute
W, Pearl Harbor, 2013, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

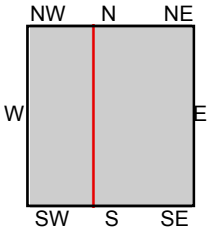
Historical Topo Map

1998, 1999



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



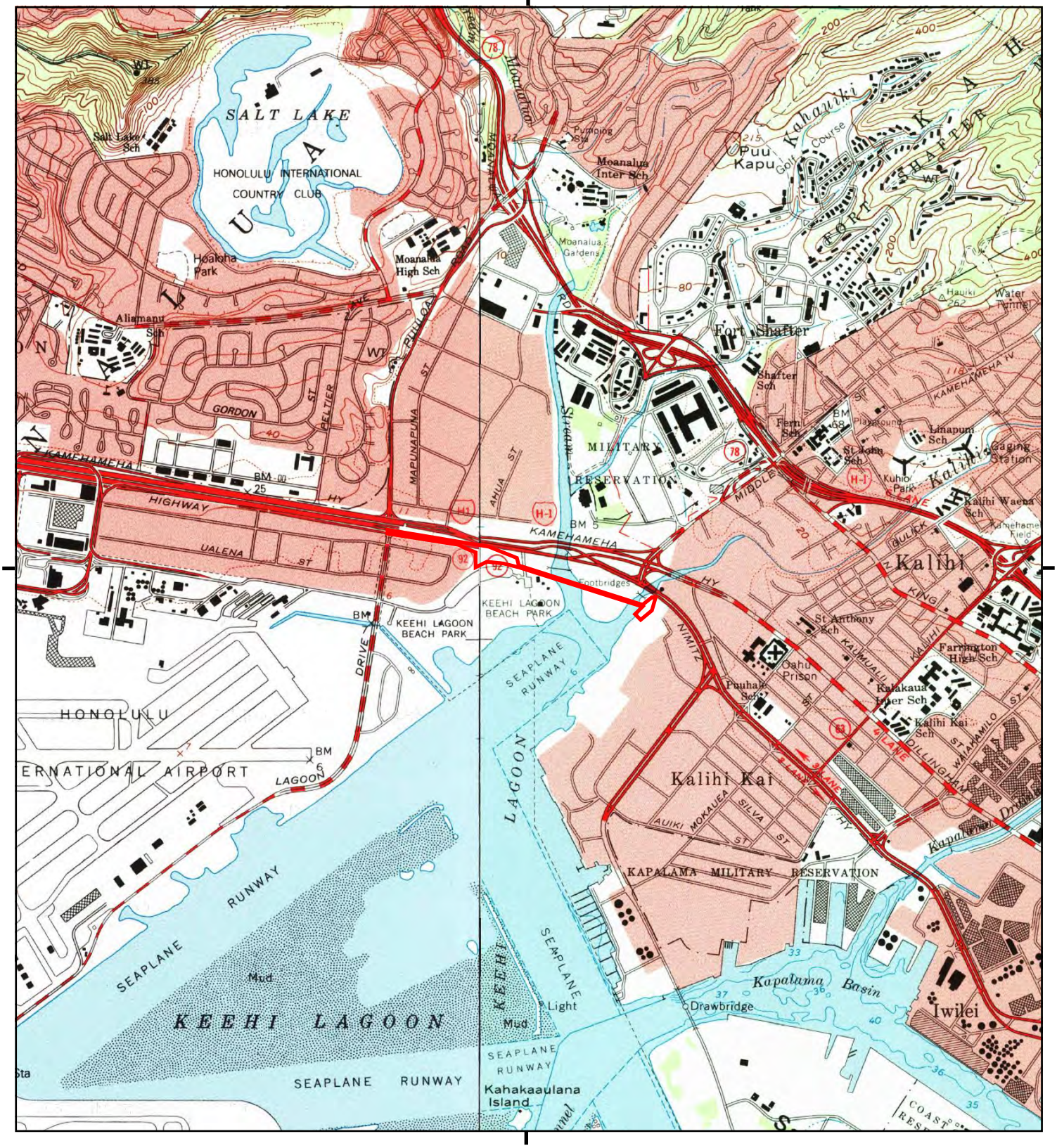
TP, Honolulu, 1998, 7.5-minute
W, Pearl Harbor, 1999, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

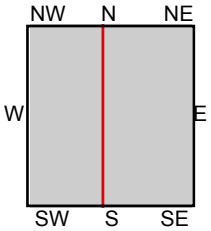
Historical Topo Map

1983



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



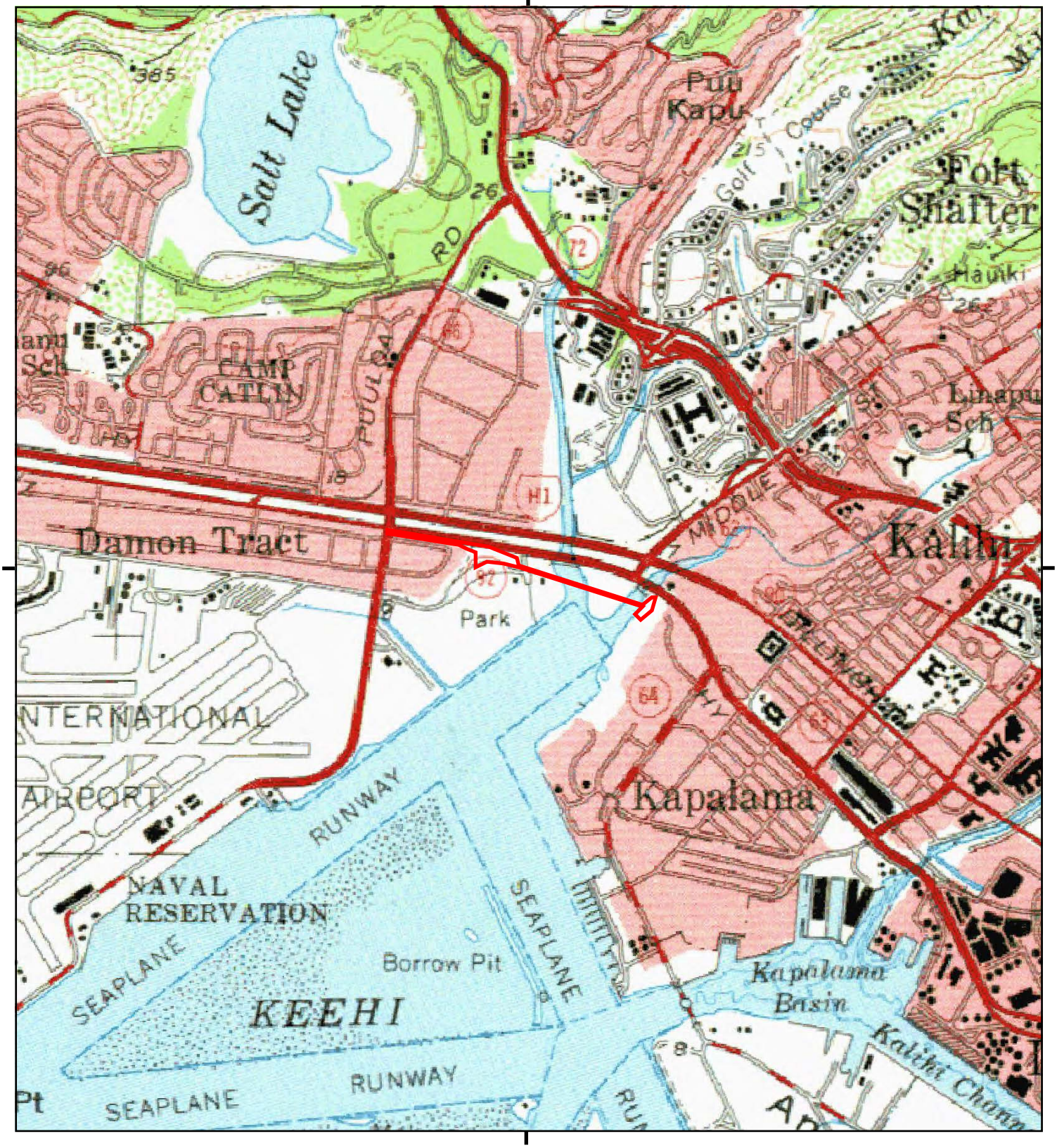
TP, Honolulu, 1983, 7.5-minute
E, Honolua, 1983, 7.5-minute
W, Pearl Harbor, 1983, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

Historical Topo Map

1970



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

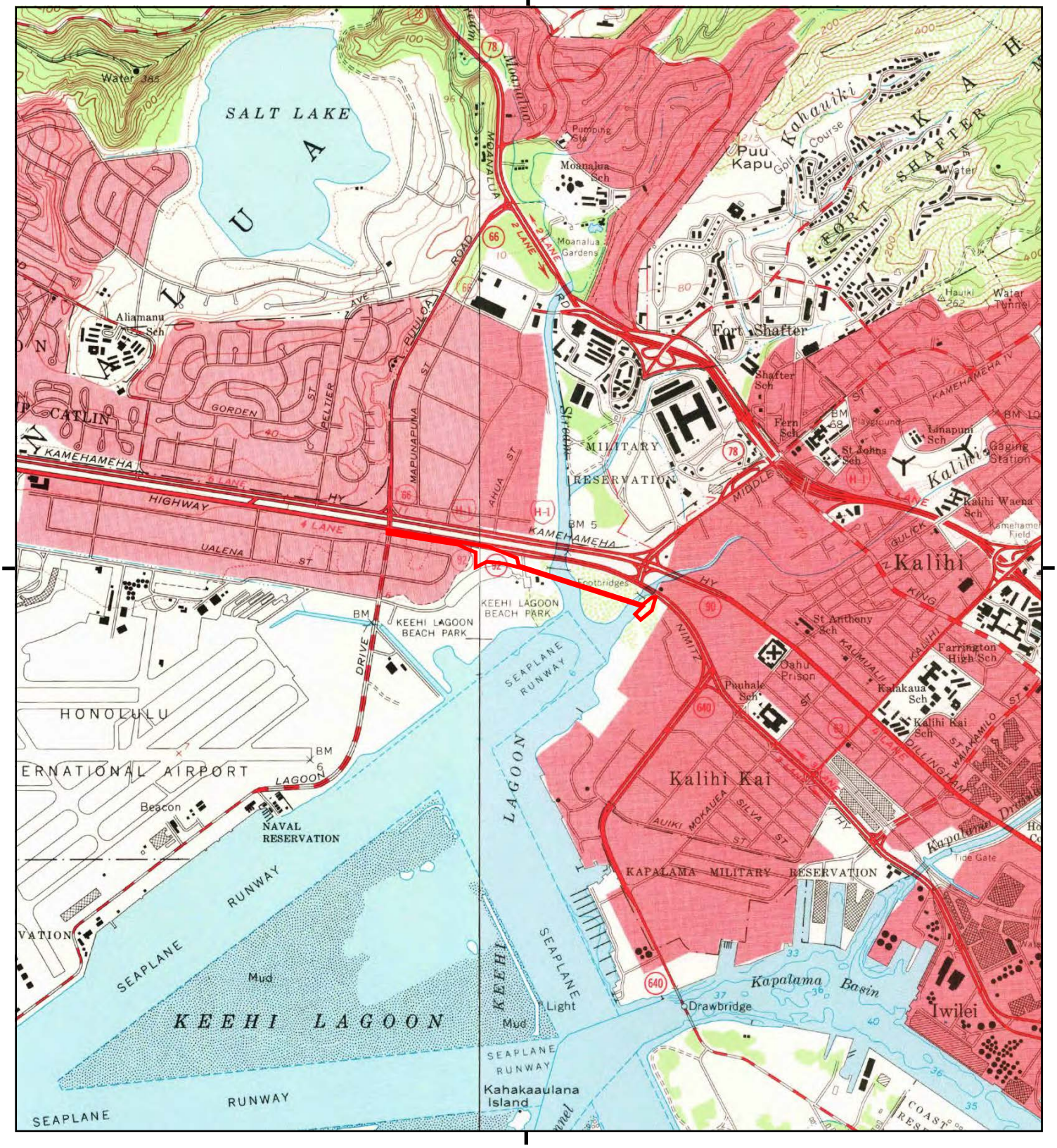
TP, OAHU, 1970, 15-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

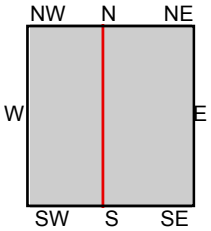
Historical Topo Map

1968, 1969



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



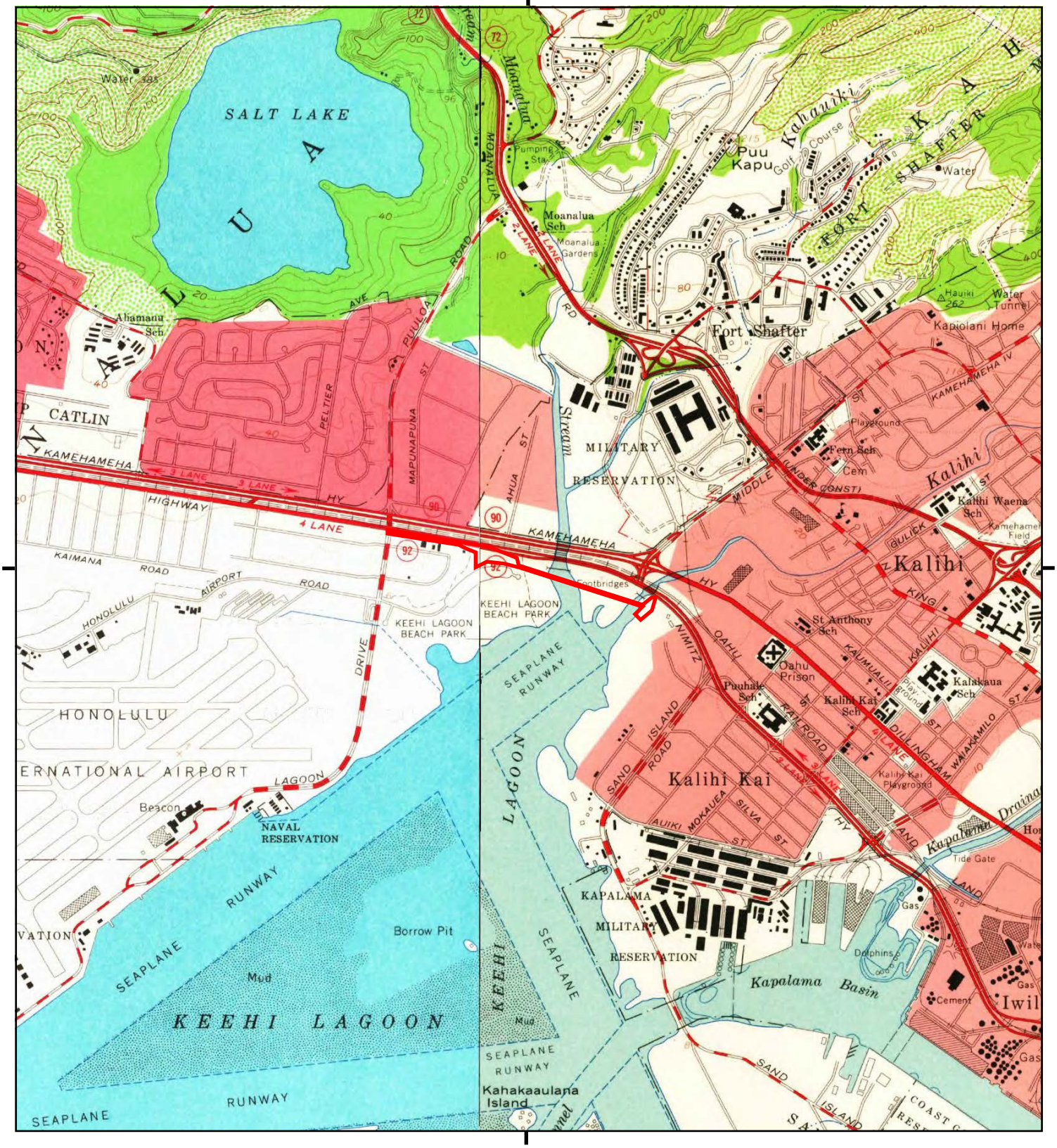
TP, Honolulu, 1969, 7.5-minute
W, Puuloa, 1968, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

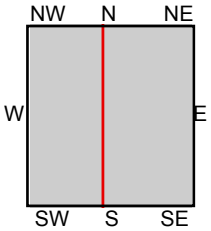
Historical Topo Map

1959



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



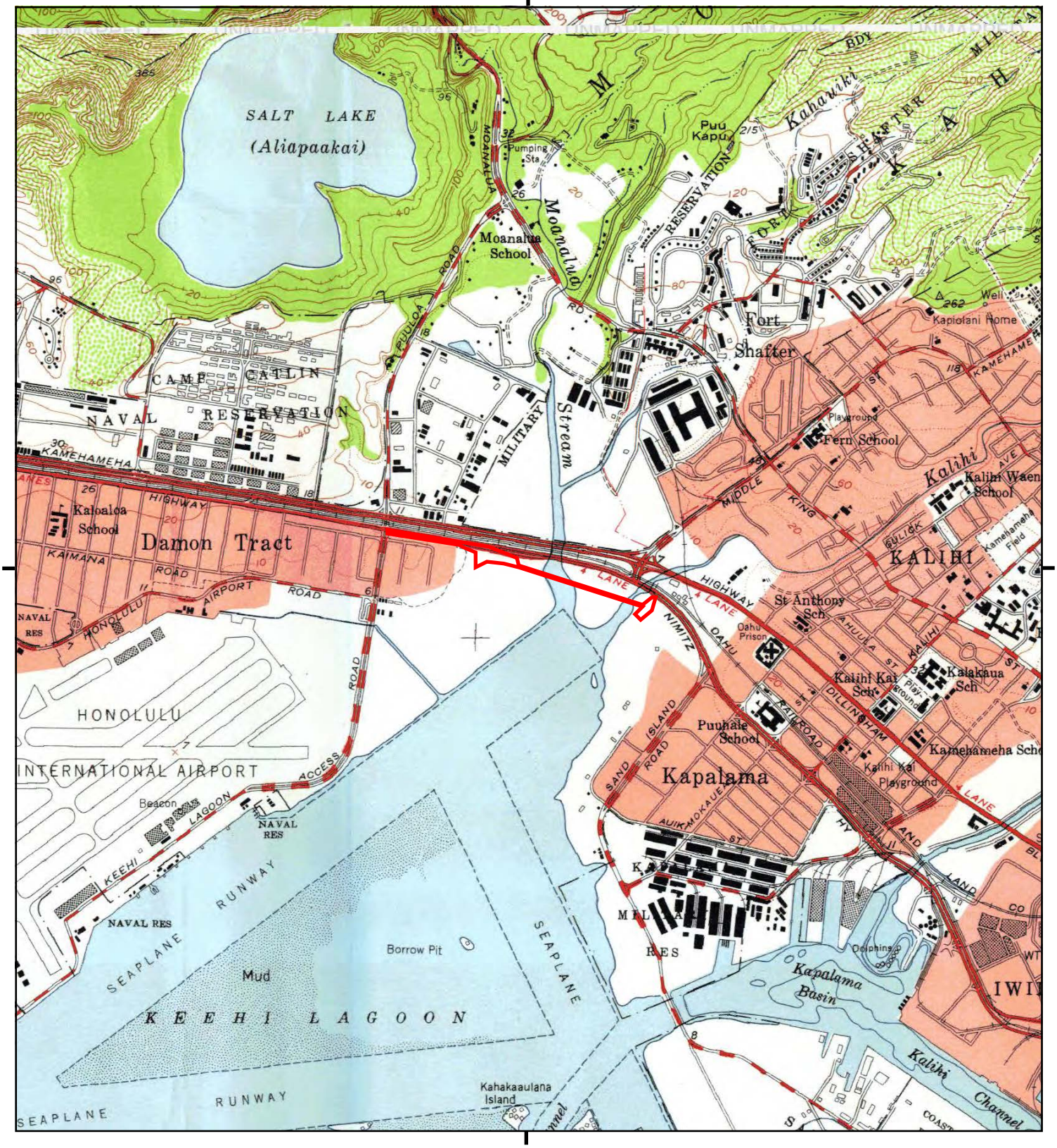
TP, Honolulu, 1959, 7.5-minute
W, Puuloa, 1959, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

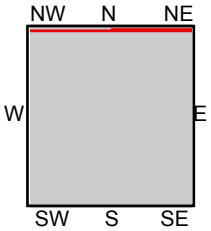
Historical Topo Map

1954



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



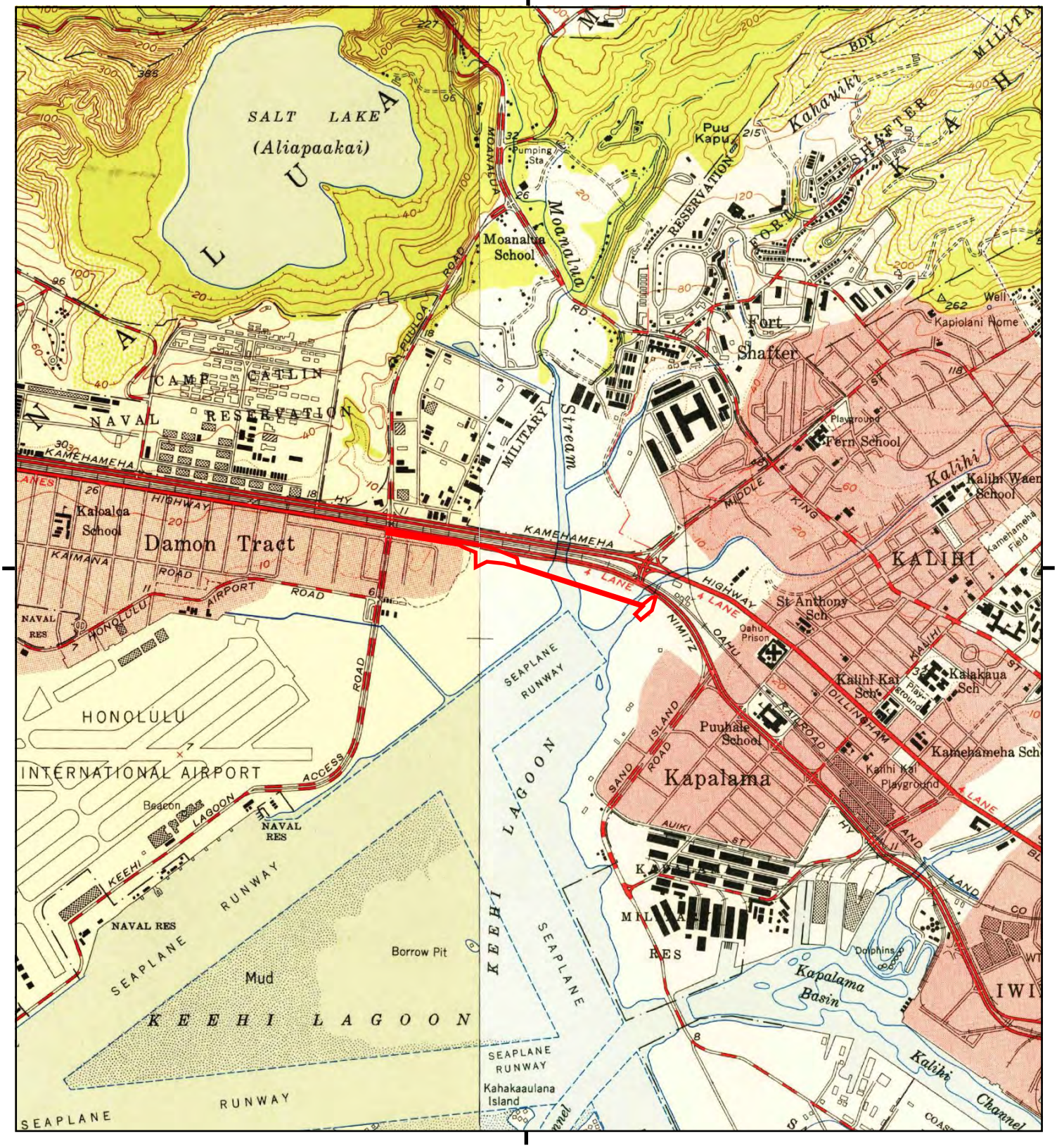
TP, HONOLULUVICINITYSOUTH, 1954, 7.5-minute
NE, HONOLULUVICINITYNORTH, 1954, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

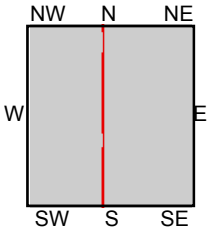
Historical Topo Map

1953



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



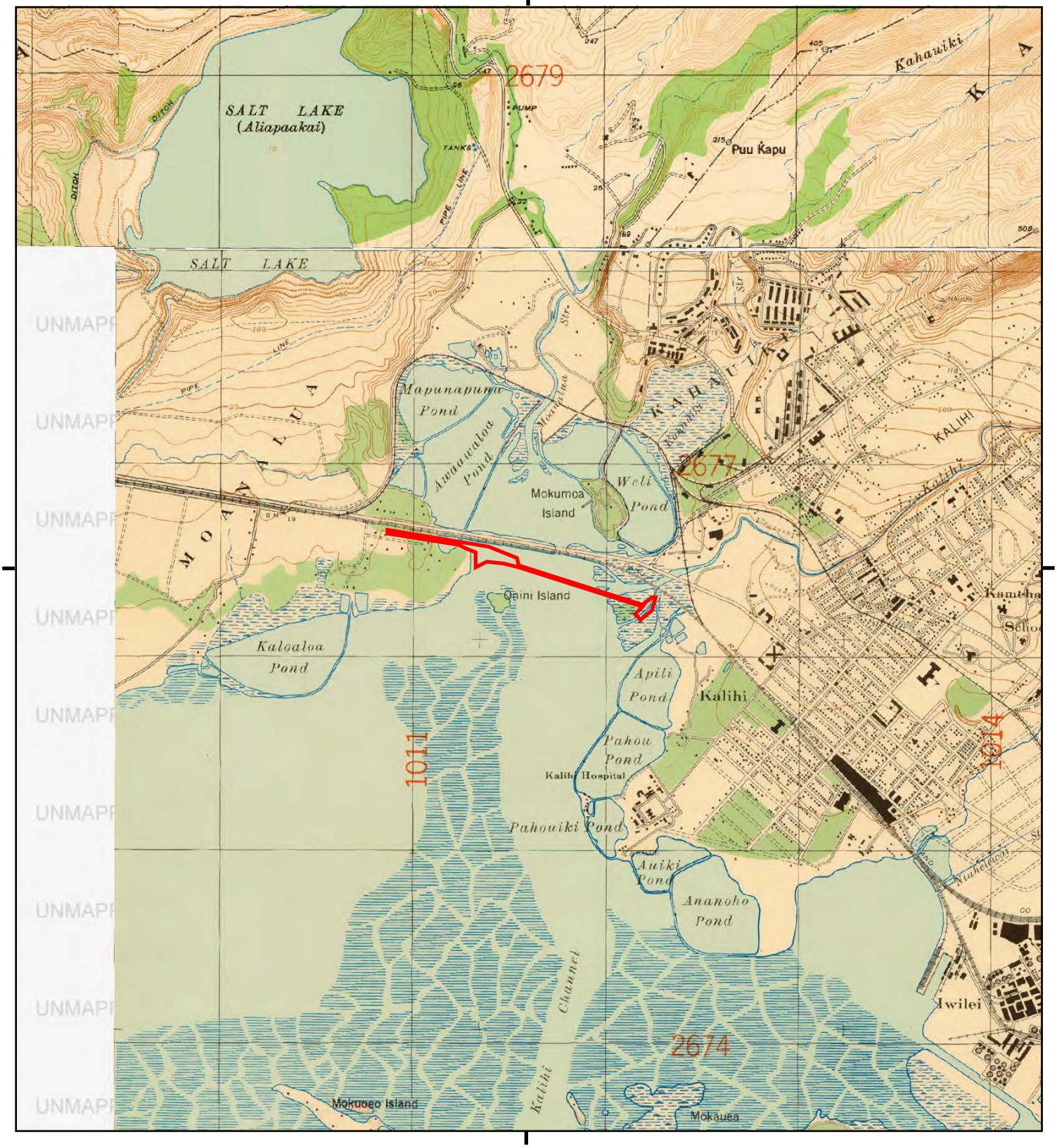
TP, Honolulu, 1953, 7.5-minute
W, Puuloa, 1953, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

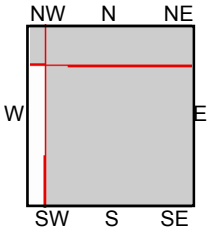
Historical Topo Map

1928



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



TP, HONOLULU, 1928, 7.5-minute
NE, KANEOHE, 1928, 7.5-minute
NW, WAIPAHU, 1928, 7.5-minute

SITE NAME: KHFM Environmental Assessment
ADDRESS: Kamehameha Highway
Honolulu, HI 96819
CLIENT: CH2M Hill

N

Attachment C
EDR Aerial Photo Decade Package

KHFM Environmental Assessment

Kamehameha Highway

Honolulu, HI 96819

Inquiry Number: 4928184.12

May 05, 2017

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

05/05/17

Site Name:

KHFM Environmental Assessm
Kamehameha Highway
Honolulu, HI 96819
EDR Inquiry # 4928184.12

Client Name:

CH2M Hill
1585 Kapiolani Blvd.
Honolulu, HI 96814
Contact: Belinda Turran

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2008	1"=500'	Flight Date: April 23, 2008	USGS
2004	1"=500'	Flight Date: February 16, 2004	USGS
2000	1"=500'	Acquisition Date: January 30, 2000	USGS/DOQQ
1992	1"=500'	Flight Date: September 19, 1992	USGS
1985	1"=500'	Flight Date: April 29, 1985	USGS
1978	1"=500'	Flight Date: January 05, 1978	USGS
1975	1"=500'	Flight Date: July 15, 1975	USGS
1968	1"=500'	Flight Date: February 06, 1968	USGS
1952	1"=750'	Flight Date: April 03, 1952	USGS

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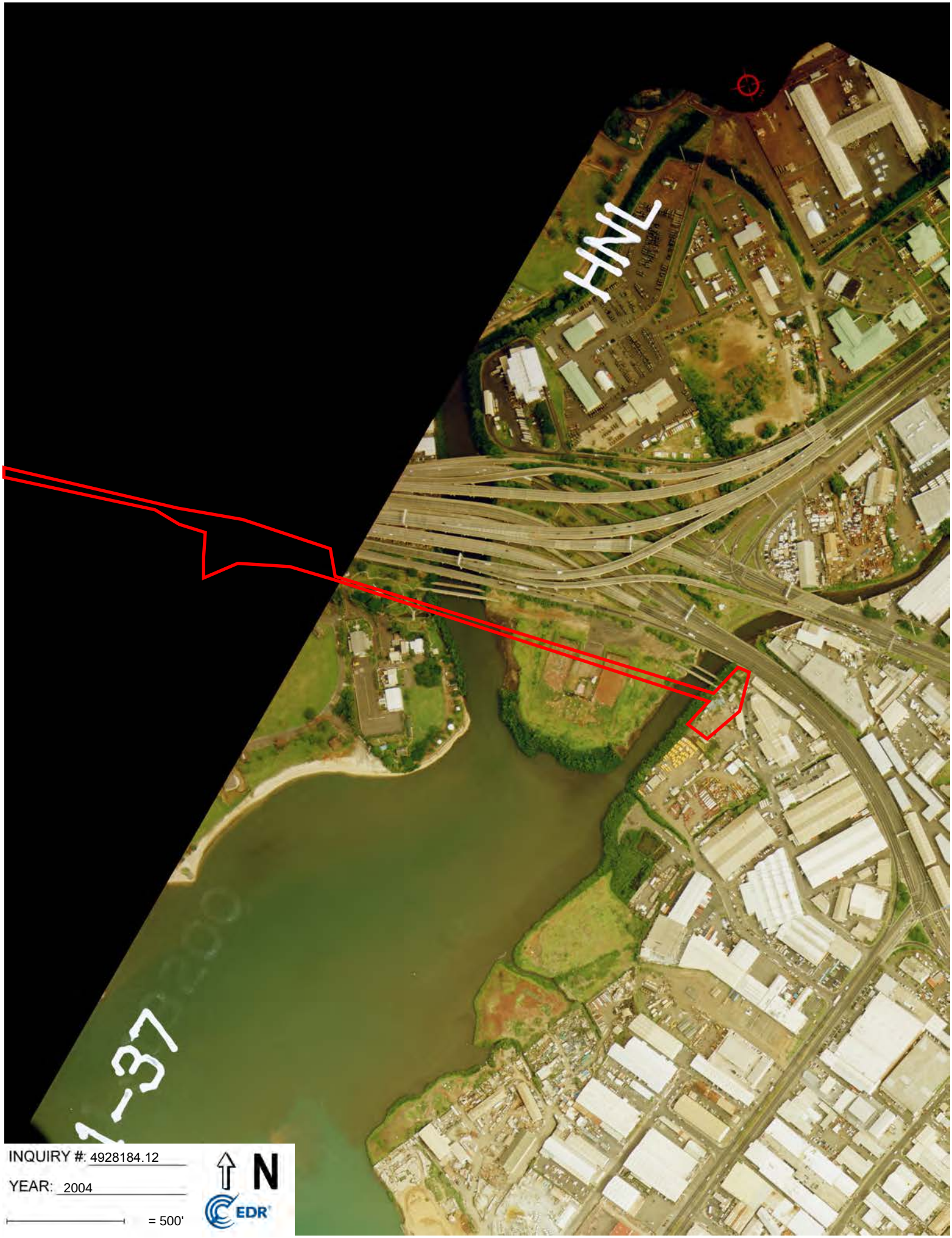
INQUIRY #: 4928184.12

YEAR: 2008

= 500'

N

EDR



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YEAR: 2004

= 500'

N

EDR

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YEAR: 2000
= 500'
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EDR

INQUIRY #: 4928184.12
YEAR: 1992
= 500'
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EDR

INQUIRY #: 4928184.12
YEAR: 1985
= 500'
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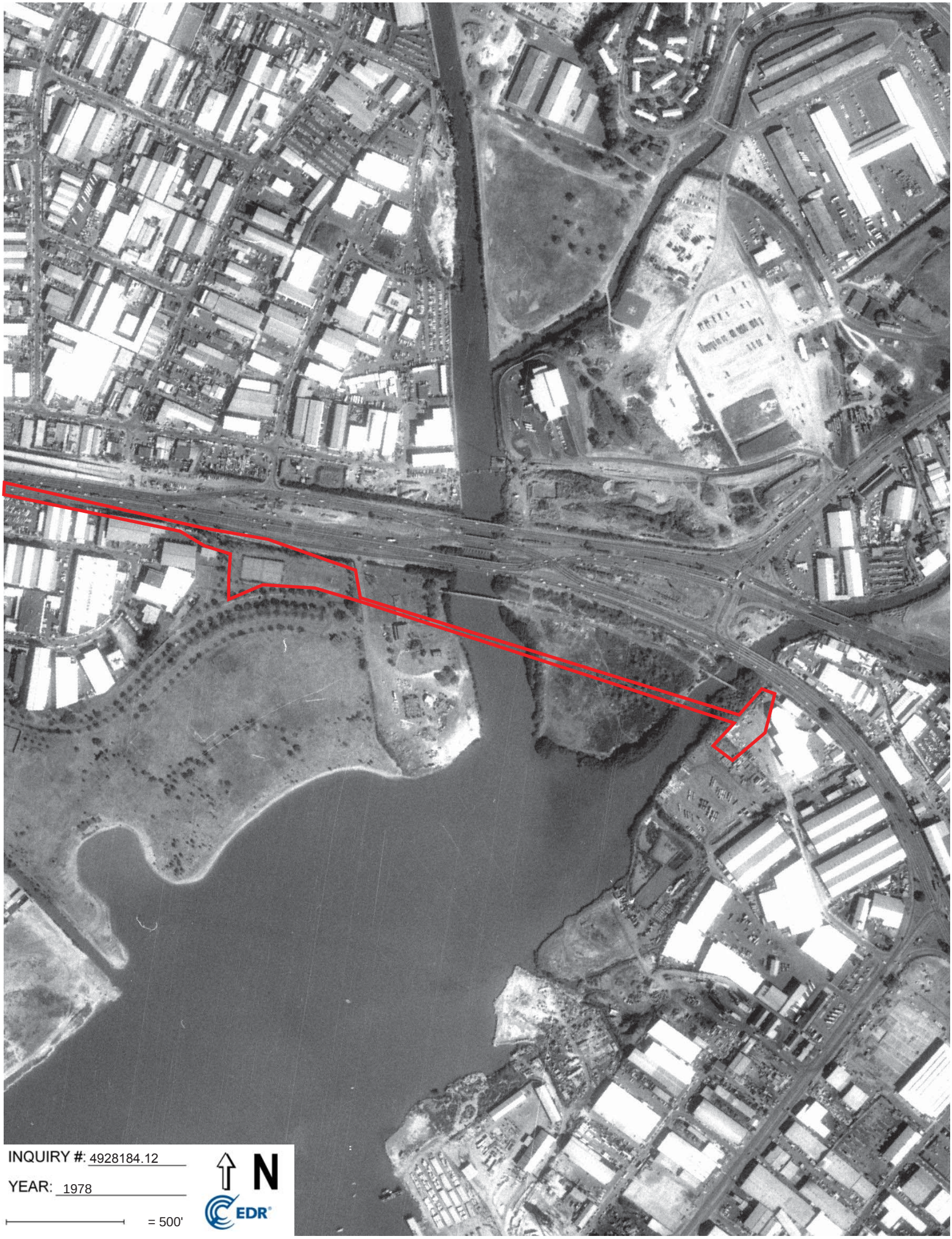
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EDR

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YEAR: 1975
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N
EDR

INQUIRY #: 4928184.12
YEAR: 1968
= 500'
N
EDR

Attachment D
Representative Site Reconnaissance Photographs

Photo No: 1	Date: 05/08/17
Direction of Photo Taken: West	
Area: North Nimitz Highway **Photo Description:** General setting	

Photo No: 2	Date: 05/08/17
Direction of Photo Taken: East	
Area: North Nimitz Highway **Photo Description:** General Setting	

Photo No: 3	Date: 05/08/17
Direction of Photo Taken: West	
Area: North Nimitz Highway **Photo Description:** Storm drain	

Photo No: 4	Date: 05/08/17
Direction of Photo Taken: East	
Area: Keehi Lagoon Park **Photo Description:** General Setting	

Photo No: 5	Date: 05/08/17
Direction of Photo Taken: West	
Area: Keehi Lagoon Park **Photo Description:** General setting	

Photo No: 6	Date: 05/08/17
Direction of Photo Taken: North	
Area: Keehi Lagoon Park **Photo Description:** Stressed vegetation	

Photo No: 7	Date: 05/08/17	
Direction of Photo Taken: North		
Area: Keehi Lagoon Park **Photo Description:** Fenced off area of unknown use.		

Photo No: 8	Date: 05/08/17	
Direction of Photo Taken: East		
Area: Keehi Lagoon Park **Photo Description:** Utility vaults, tennis courts.		

Photo No: 9	Date: 05/08/17	
Direction of Photo Taken: Southwest		
Area: Sand Island Industrial **Photo Description:** General setting		

Photo No: 10	Date: 05/08/17	
Direction of Photo Taken: Northwest		
Area: Sand Island Industrial **Photo Description:** General Setting		

Photo No: 11	Date: 05/08/17
Direction of Photo Taken: West	
Area: Sand Island Industrial **Photo Description:** Heavy machinery and equipment storage	

Photo No: 12	Date: 05/08/17
Direction of Photo Taken: Northeast	
Area: Sand Island Industrial **Photo Description:** Construction materials and connex containers of unknown contents	

Photo No: 13	Date: 05/08/17
Direction of Photo Taken: Southwest	
Area: Sand Island Industrial **Photo Description:** Drums of unknown contents	

Photo No: 14	Date: 05/08/17
Direction of Photo Taken: North	
Area: Sand Island Industrial **Photo Description:** Potential equipment cleaning area – cracking observed on ground surface	

Photo No: 15	Date: 05/08/17	
Direction of Photo Taken: Southwest		
Area: Sand Island Industrial **Photo Description:** Staining, heavy equipment, aggregate piles.		

Appendix C
Endangered Species Act Consultation

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.943.1133
Fax 808.954.4400

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

April 3, 2017

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
Request for Species and Critical Habitat List under Section 7, Endangered Species Act

Dear Ms. Abrams,

CH2M Hill is undertaking environmental studies on behalf of the City and County of Honolulu, Department of Design and Construction (DDC) for proposed construction of a new sewer force main that would connect the Kamehameha Highway Wastewater Pump Station (WWPS) located at the corner of Keehi Lagoon Park to the Kapalama Interceptor Relief Sewer located at the Sand Island industrial area. An environmental assessment is being prepared in compliance with Chapter 343, Hawaii Revised Statutes. In addition, we anticipate the need for permitting by the U.S. Army Corps of Engineers under Section 10 of the Rivers and Harbors Act.

In accordance with Section 7 of the Endangered Species Act, we are requesting a list of threatened, endangered, proposed, and candidate plant and animal species, and critical habitats in the vicinity of the project. Location maps are attached.

Project Location

The proposed project would involve constructing a new force main primarily by horizontal directional drilling (HDD) with a continuous tunnel passing under Moanalua Stream and Kalihi Stream, Keehi Lagoon Memorial Park, and the peninsula off Nimitz Highway that has been occupied by a paintball facility. The proposed force main alignment is shown in the attached *Figures 1 and 2, Proposed Alignment*.

Project Background and Purpose

The Kamehameha Highway WWPS was constructed and began operations in 1959. Originally, a 36-inch concrete cylinder pipe force main conveyed raw sewage from the WWPS. In 1997, the City constructed a 42-inch force main to replace the aging pipe with a history of breaks. The 1997 force main now serves as the active primary force main and the original 36-inch force main was abandoned in place. A Force Main Flow Diversion Plan, required for the Kamehameha Highway Force Main under the First Amended 2010 Wastewater Consent Decree, calls for the City to identify a means of diverting flows if the active force main fails.

The City undertook a comprehensive evaluation of alternatives for improving wastewater conveyance to meet the Consent Decree requirements. The preferred alternative forms the basis for the project description.

Project Description

Based on conceptual engineering, the new force main is estimated to extend for a total of 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by HDD and 800 linear feet would be installed using open trench construction. The portions of open trench construction are estimated to include approximately 200 feet on the east end and 600 feet on the west end and would connect the force main to the existing sewer system. No in-water construction activity is expected since the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. The proposed alignment and profile are shown in the attached *Figure 3, Preliminary Plan and Profile.*

The new pipe that is proposed to be installed using HDD would be high density polyethylene (HDPE) with an inner diameter of 36 inches to match the diameter of the existing, abandoned force main. The sections of pipe to be installed using open trench construction would be 36 inch HDPE or PVC pipe.

In addition to the pipeline alignment, major components of the project would include the following:

- Launch Site. The launch site is where the drill rig and ancillary equipment would be set up and drilling for the new pipeline would begin. The proposed launch site would be located in the industrial yard directly east of Kalihi Stream and is expected to occupy an area of approximately 25,000 square feet. The drill head would advance from this location westward to the receiving site. When the tunnel has been bored, the new HDPE pipe (laid out at the receiving end) would be pulled back through the tunnel.

- Receiving Site. The receiving site would be located in the northeast corner of Keehi Lagoon Beach Park (east of the tennis courts) and is expected to occupy an area of approximately 20,000 square feet.

- Temporary Layout of Pipeline. To construct the HDD portion of the pipeline, the 2,300 foot long HDPE pipe would need to be laid out in preparation for pull back through the bored hole. It is preferable to avoid stopping the pull back to accommodate an "intermediate" weld because there is a risk that the in-ground portion of pipe could become trapped in place, thereby complicating further advance. The current plan is to lay down the new pipe in two sections side by side, adjacent to Nimitz Highway. The pipe segments would not encroach into the Lagoon Drive intersection, but there are risks in execution due to the need for an "intermediate" weld to connect the two pipe segments together. The proposed layout is shown in the attached *Figure 4, HDD Pipe Layout Alignment*.

- Staging Areas and Construction Access. With the exception of temporary layout of the pipeline, all equipment staging and material storage would occur within the construction area at the launch and receiving sites. Access to the launch site would be through the industrial business area off Sand Island Access Road. Access to the receiving site would be through the Keehi Lagoon Beach Park driveway and parking lot.

Project Schedule

Construction of this project is expected to begin in Fall 2018 and take approximately 12 months to complete.

Request for Information

In addition to the species list, and to assist with our assessment, we respectfully ask for any input the USFWS may have in relation to specific avoidance and minimization measures that should be considered for the project.

Your response within 30 calendars of receipt of this letter would be appreciated. If you have questions, please contact me by phone at (808) 440-0208 or by email at tony.ali@ch2m.com, or Nancy Nishikawa, environmental planner, by phone at (808) 440-0272 or by email at nancy.nishikawa@ch2m.com
Mahalo.

Sincerely,

Tony Ali

Tony Ali
Project Manager

Enclosures

C: Kim Suzuki, DDC

CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, HI 96813
Tel 808.943.1133
Fax 808.954.4400

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

April 3, 2017

Subject: Kamehameha Highway Wastewater Pump Station New 36-Inch Force Main
Honolulu, Oahu, Hawaii
Request for Species and Critical Habitat List under Section 7, Endangered Species Act

Dear Mr. Tosatto,

CH2M Hill is undertaking environmental studies on behalf of the City and County of Honolulu, Department of Design and Construction (DDC) for proposed construction of a new sewer force main that would connect the Kamehameha Highway Wastewater Pump Station (WWPS) located at the corner of Keehi Lagoon Park to the Kapalama Interceptor Relief Sewer located at the Sand Island industrial area. An environmental assessment is being prepared in compliance with Chapter 343, Hawaii Revised Statutes. In addition, we anticipate the need for permitting by the U.S. Army Corps of Engineers under Section 10 of the Rivers and Harbors Act.

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Construction of this project is expected to begin in Fall 2018 and take approximately 12 months to complete.

Request for Information

In addition to the species list, and to assist with our assessment, we respectfully ask for any input the NMFS may have in relation to specific avoidance and minimization measures that should be considered for the project.

Your response within 30 calendars of receipt of this letter would be appreciated. If you have questions, please contact me by phone at (808) 440-0208 or by email at tony.ali@ch2m.com, or Nancy Nishikawa, environmental planner, by phone at (808) 440-0272 or by email at nancy.nishikawa@ch2m.com
Mahalo.

Sincerely,

Tony Ali

Tony Ali
Project Manager

Enclosures

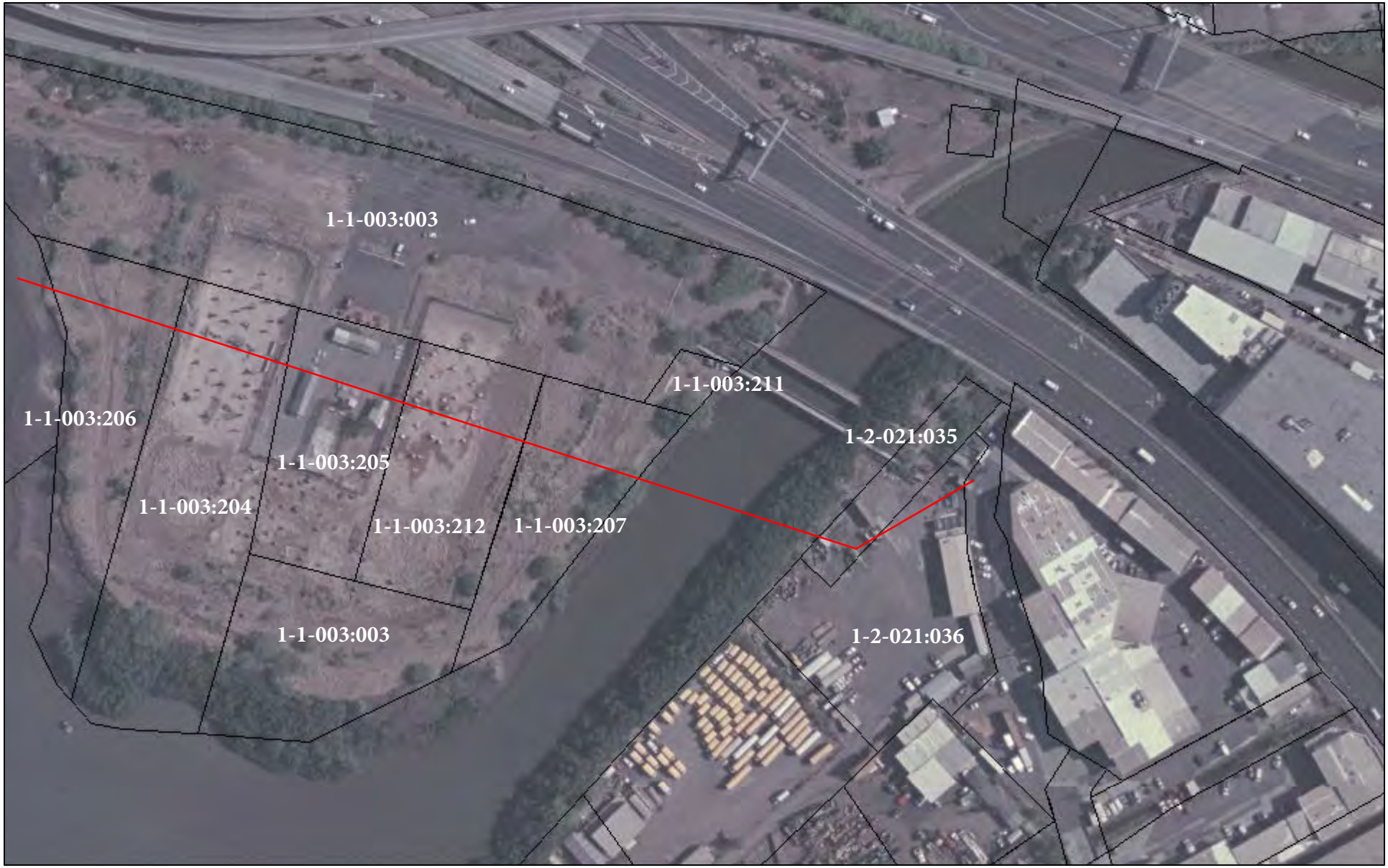
C: Kim Suzuki, DDC

August 31, 2016

Figure 1

New Kamehameha Highway Force Main - *Proposed* Alignment

———	Proposed New Force Main
SMH	Existing Sewer Discharge Manhole
KHPS	Kamehameha Highway Wastwater Pump Station



August 31, 2016

Figure 2

Proposed New Force Main

New Kamehameha Highway Force Main - *Proposed* Alignment

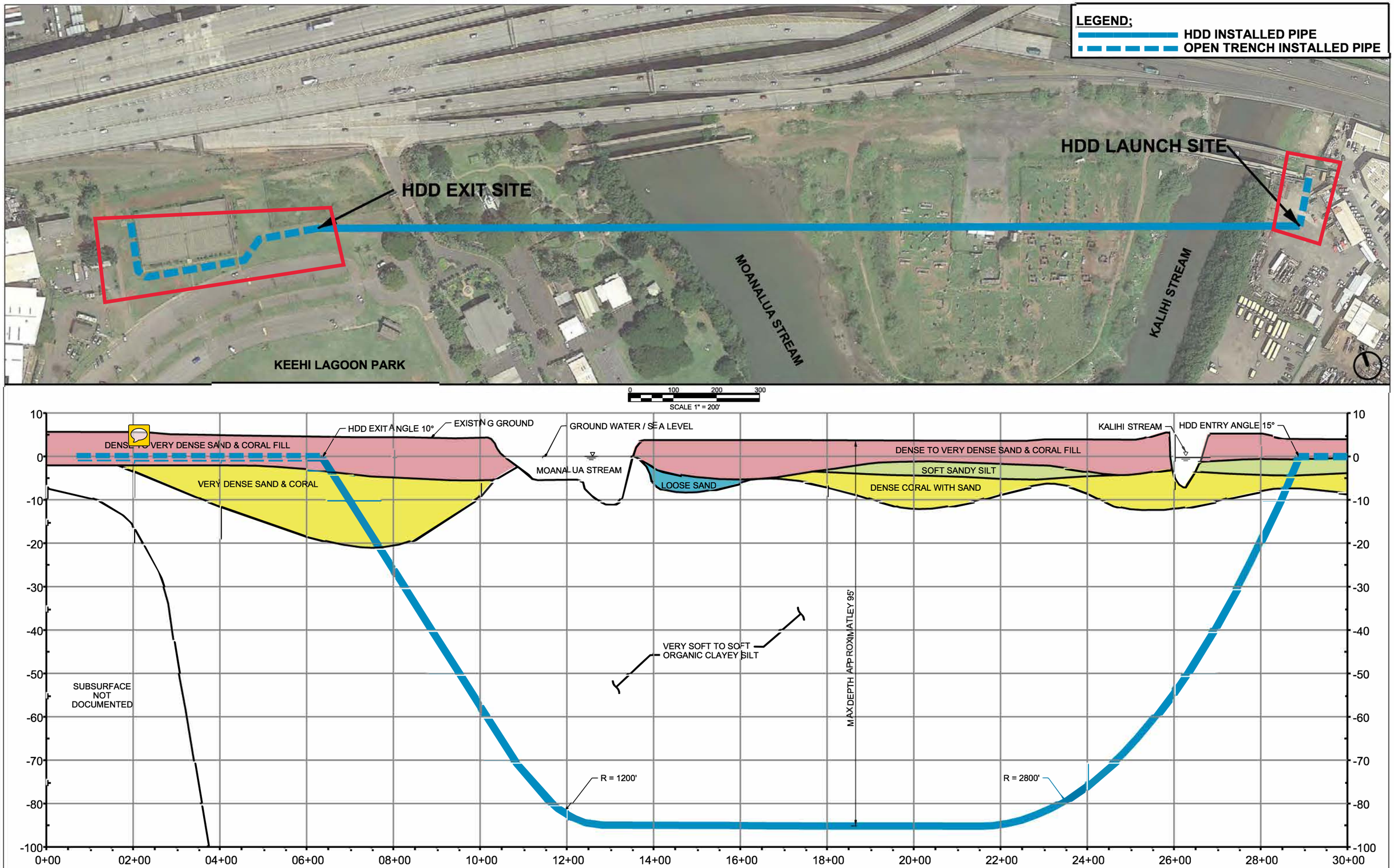
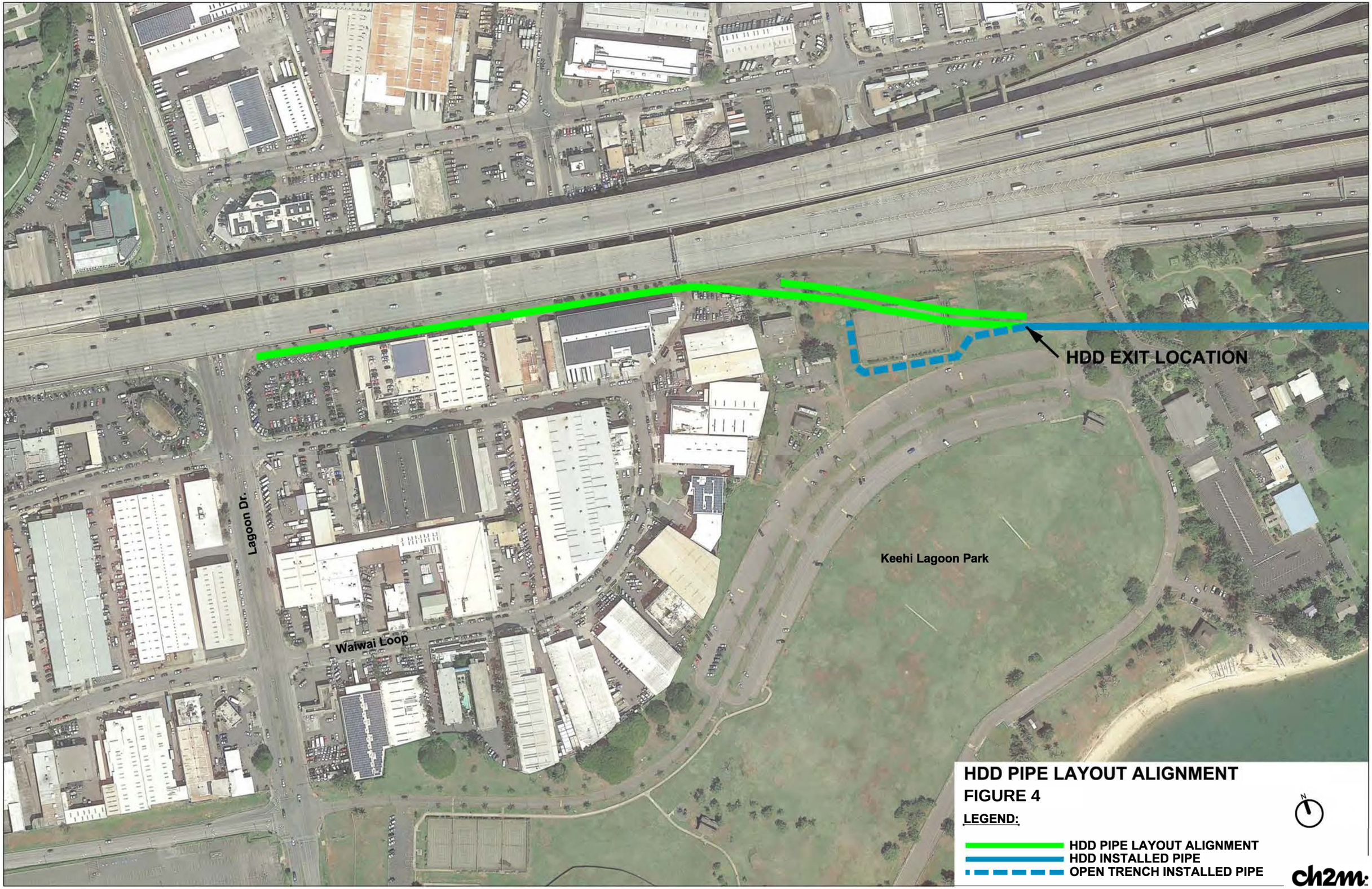


FIGURE 3. PRELIMINARY PLAN AND PROFILE

ch2m


HDD EXIT LOCATION
Keehi Lagoon Park
Lagoon Dr.
Waiwai Loop
HDD PIPE LAYOUT ALIGNMENT
FIGURE 4
LEGEND:
HDD PIPE LAYOUT ALIGNMENT
HDD INSTALLED PIPE
OPEN TRENCH INSTALLED PIPE
N
ch2m

United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2017-TA-0205

APR 28 2017

Mr. Toni Ali
CH2M Honolulu
1132 Bishop Street, Suite 1100
Honolulu, Hawaii 96813

Subject: Technical Assistance for the Proposed Kamehameha Highway Wastewater Pump Station, Oahu

Dear Mr. Ali:

The U.S. Fish and Wildlife Service (Service) received your letter, dated April 5, 2017, requesting a list of threatened and endangered plant and animal species and designated critical habitat in the vicinity of the proposed Kamehameha Highway wastewater pump station in Honolulu. CH2M, on behalf of the City and County of Honolulu, is proposing to construct a new sewer force main that would connect the Kamehameha Highway wastewater pump station to the Kapalama Interceptor Relief sewer. The proposed project would utilize horizontal directional drilling (HDD) with a continuous tunnel passing under the Moanalua Stream, Kalihi Stream, Keehi Lagoon Memorial Park, and the peninsula off the Nimitz Highway. The Service offers the following comments to assist you in your planning process so that impacts to trust resources can be avoided. Our comments are provided under the authorities of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 *et seq.*) and the Migratory Bird Treaty Act (16 U.S.C. 703-712) (MBTA).

Based on the information in our database and records, including data provided by the Hawaii Biodiversity and Mapping Program, the following are known threatened or endangered species that occur or transit through the vicinity of your proposed project area: the federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and the threatened Newell's shearwater (*Puffinus auricularis newelli*). Also within the vicinity of the proposed project are the wedge-tailed shearwater (*Puffinus pacificus*), a species protected under the MBTA. There is no designated critical habitat present in the vicinity of the proposed project area. We offer the following comments for your consideration:

Hawaiian hoary bat

The endangered Hawaiian hoary bat may be present within the proposed project area. The Hawaiian hoary bat roosts in both exotic and native woody vegetation and will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants

greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15).

Hawaiian seabirds (Newell's shearwater and Wedge-tailed shearwater)
Hawaiian seabirds may traverse the project area at night during the breeding season. Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may collide with nearby wires, buildings, or other structures or they may land on the ground due to exhaustion. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their nests to the sea, are particularly vulnerable. To minimize potential project impacts to seabirds during their breeding season, all outdoor lights should be fully shielded so the bulb can only be seen from below bulb height and only used when necessary. Automatic motion sensor switches and controls should be installed on all outdoor lights or lights should be turned off when human activity is not occurring in the lighted area. Any increase in night-time lighting, particularly during each year's peak fallout period (September 15 through December 15), could result in seabird injury or mortality. Nighttime construction should be avoided during the seabird fledging period, September 15 through December 15.

Because the proposed project includes horizontal directionally drilled (HDD) bore pipes, we are attaching the Service's recommended Best Management Practices regarding the use of this method. We encourage you to incorporate the relevant practices into your project design.

If additional information becomes available, or it is determined that the proposed project may affect federally listed species, we recommend you coordinate with our office early in the planning process so that we may further assist you with Endangered Species Act compliance. We thank you for your efforts to conserve listed species and native habitats. Please contact Stacey Lowe, Fish and Wildlife Biologist (phone: 808-792-9400, email: stacey_lowe@fws.gov) should you have any questions pertaining to this response or require further guidance. When referring to this project, please include this reference number: 01EPIF00-2017-TA-0205.

Sincerely,

Aaron Nadig
Island Team Manager
Oahu, Kauai, Northwestern
Hawaiian Islands and American Samoa

Enclosure: Service BMPs for horizontal directional drilling

US Fish and Wildlife Service
Recommended Standard Best Management Practices for
Horizontal Directional Drilling

The U.S. Fish and Wildlife Service recommends that the following measures be incorporated into projects to minimize the degradation of water quality and impacts to fish and wildlife resources as a result of Horizontal Directional Drilling (HDD):

a. A site-specific spill response plan shall be developed. Prior to HDD operations, all construction personnel shall be properly trained in spill containment and clean-up and shall be familiar with the site-specific response plan.

b. Plastic barriers shall be placed under the drilling equipment and oil absorbent blankets shall be placed around hydraulic components to add protection between the rig and the ground surface in the order to contain any spill.

c. Drilling shall use proven environmentally "friendly" drilling fluids (i.e., mud). Oil-based mud (OBM) shall not be used. Synthetic-based or water-based mud (WBM), such as those containing bentonite, are currently recommended for drilling activities.

d. Discharge of any drilling mud into shallow marine or aquatic environments is discouraged. Techniques for mud-free drill exits shall be employed.

e. Drilling should not be conducted during coral spawning periods.

f. During HDD operation, the drill path shall be constantly monitored for surface release by trained personnel and constant communication between the monitors and the control cab shall be maintained at all times. The monitors shall be kept constantly informed of the progress of the drill head so as to be able to concentrate their search for any indications of an inadvertent release of drilling fluid.

g. In the event of a subsurface release in a marine or aquatic environment, divers equipped with water lifts (pumps) and filter bags shall be used to remove drilling fluids from the bottom.

h. In the event of drilling fluid release on land, the spill shall be immediately contained and the fluid transferred back to the drill site for reuse or into storage tanks and removed from the site.

i. Once the HDD operation is complete, the work area shall be returned to its original condition or better.

j. All drilling fluids shall be disposed in an approved land disposal facility and not into the marine or aquatic environment.

The Fish and Wildlife Service believes that incorporation of these measures into projects will greatly minimize the potential for project-related adverse impacts to fish and wildlife resources.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

April 24, 2017

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
2017 APR 24 AM 10:52
RECEIVED LAND DIVISION

DAR # 5508

MEMORANDUM

TO: Bruce Anderson, Administrator
DATE: 4-25-17
FROM: Glenn Higashi, Aquatic Biologist GKH

SUBJECT: Request for Comments: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main, Honolulu, Oahu

Comment	Date Request	Receipt	Referral	Due Date
	03/30/17	04/03/17	04/05/17	04/26/17

Requested by: Russell Y. Tsuji, Land Administrator
Land Division

Summary of Proposed Project

Title: Request for Comments: Pre-Assessment Consultation for Kamehameha Highway Wastewater Pump Station New 36-inch Force Main, Honolulu, Oahu

Project by: City and County of Honolulu, Department of Design and Construction

Location: Tax Map Key: (1) 1-1-003:004, 138, 204-207, 212 and 239; 1-2-021:035 and 036

Brief Description:

The applicant, City and County of Honolulu, Department of Design and Construction is proposing to construct a new force main primarily by horizontal directional drilling (HDD) with a continuous tunnel passing under Moanalua Stream and Kalihi Stream, Keehi Lagoon Memorial Park, and the peninsula off Nimitz Highway that has been occupied by a paintball facility. The proposed force main alignment is on the makai side of Nimitiz Highway and is estimated to extend for a total of 3,100 linear feet. Of this length, approximately 2,300 linear feet would be installed by HDD and 800 linear feet would be installed using open trench construction. The portions of open trench construction are estimated to include approximately 200 feet on the east end and 600 feet on the west end and would connect the force main to the existing sewer system. No in-water construction activity is expected since the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams.

The new pipe that is proposed to be installed using HDD would be high density polyethylene {HDPE) with an inner diameter of 36 inches to match the diameter of the existing, abandoned force main. The sections of pipe to be installed using open trench construction would be 36 inch HDPE or PVC pipe.

In addition to the pipeline alignment, major components of the project would include the following:

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- Staging Areas and Construction Access. With the exception of temporary layout of the pipeline, all equipment staging and material storage would occur within the construction area at the launch and receiving sites. Access to the launch site would be through the industrial business area off Sand Island Access Road. Access to the receiving site would be through the Keehi Lagoon Beach Park driveway and parking lot.

Comments:

The proposed project is not expected to have adverse impacts on the aquatic environment as there is no in-water construction activity expected since the new force main would be pulled through a tunnel at an elevation well below the depth of the existing streams. Also, the open trench construction of approximately 800 feet are not in close proximity to the aquatic environments. However, the following Best Management Practices (BMPs) should still be incorporated to minimize the potential for erosion, siltation and pollution of the aquatic environment particularly at the HDD Launch and Exit Sites:

1) Lands denuded of vegetation should be planted or covered as quickly as possible to prevent further erosion and soil from falling or flowing into the stream environment;
2) Scheduling site work (particularly the open channel construction) during periods of minimal rainfall; and
3) Prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment.

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

Appendix D
Archaeological Literature Review and Field Investigation

Draft

Archaeological Literature Review and Field Inspection in Support of Consultation with the SHPD for the Kamehameha Highway Force Main Project, Moanalua and Kalihi Ahupuaʻa, Honolulu (Kona) District, Oʻahu TMKs: [1] 1-1-003:239 por.; 1-2-021:035 por. and 036 por.

Prepared for
CH2M Hill

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(Job Code: MOANALUA 30)

June 2017

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Management Summary

Reference	Archaeological Literature Review and Field Inspection in Support of Consultation with the SHPD for the Kamehameha Highway Force Main Project, Moanalua and Kalihi Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKs: [1] 1-1-003:239 por.; 1-2-021:035 por. and 036 por. (Hammatt et al. 2017)
Date	June 2017
Project Number	Cultural Surveys Hawai‘i, Inc. (CSH) job code: MOANALUA 30
Investigation Permit Number	CSH completed the fieldwork component of this study under archaeological fieldwork permit number 17-08, issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-282.
Agencies	SHPD, City and County of Honolulu, Department of Design and Construction (the Department of Environmental Sciences will own the facility after construction)
Project Funding and Land Jurisdiction	City and County of Honolulu
Project Location	In general terms, the project area is just *makai* (seaward, south) of North Nimitz Highway between Lagoon Drive on the west and Alahao Place just west of Sand Island Access Road on the east (1998 Honolulu and 1999 Pearl Harbor U.S. Geological Survey [USGS] 7.5-minute topographic quadrangles).
Project Description	The project will construct an underground force main, primarily through horizontal directional drilling under the Keehi Lagoon Memorial, the mouth of Moanalua Stream, and the mouth of Kalihi Stream. This directional drilling is understood to be below the water table and below any culture-bearing sediments. The directional drilling per se will not impact any historic properties other than the associated excavations at the two ends and possibly through impacts associated with the staging areas and pipe layout. At the two ends of the project, spaced approximately 650 m apart, are two stretches of proposed open trench excavations. While this is one project, the spacing between the areas of open trenching (and associated staging areas) makes it useful to think of the project as involving effectively two discrete areas of ground disturbance to potential historic properties; a western project area between Lagoon Drive on the west and the Keehi Lagoon Memorial on the east and an eastern project area between the east bank of Kalihi Stream on the west and Alahao Place just west of Sand Island Access Road on the east.

Project Acreage	The project area comprises approximately 6.6 acres (2.367 hectares).
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 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 investigation does not fulfill the requirements of an archaeological inventory survey investigation, per HAR §13-276. Consequently, this report cannot be used to make formal recommendations for SHPD review and acceptance.
Fieldwork Effort	Fieldwork was accomplished on 17, 19 May and 23 June, 2017 by CSH archaeologist David Shideler, M.A., under the general supervision of principal investigator Hallett Hammatt, Ph.D.
Results Summary	The entirety of the western open trench area and the majority of the western project area lies within Ke‘ehi Lagoon Beach Park. The most notable feature of Ke‘ehi Lagoon Beach Park within the project area is the enclosure of four tennis courts. While the tennis courts appear utilitarian, there are distinctive appurtenances such as the style of the adjacent drinking fountains and an adjacent seating area comprising two sets of three concrete benches, each surrounded by eight moss rock pillars. Another potential historic property, a concrete slab on grade, was noted in the northeast corner of the western project area. The flat slab is approximately 2 inches above the surrounding ground surface and seems unremarkable other than the presence of 12 U-shaped brackets along the perimeter (six spaced along each long side), each set in a concrete cylinder (10 inches in diameter). The U-brackets were intended to support structural posts or walls. The time period (other than post-dating 1941) and purpose of the slab are unclear, and efforts to locate aerial photographs or maps depicting this small structure were unsuccessful. The nature of construction is thought likely to date from the 1940s or 1950s, and the slab is thought to have possible military associations. The eastern project area is the locus of a discrete stretch of proposed open trench excavation within a JSR Equipment base yard. The base yard includes a wide variety of construction equipment, material, and vehicles, which made traverse of the base yard problematic. As a result, the extreme north portion of the eastern project area could not be accessed from the base yard during the field inspection. The indicated specific alignment of the open trenching in the eastern project area was followed, and nothing suggestive of archaeological concern was observed.

Recommendations	As all of the area of proposed open trenching area (and virtually all of the project area) is post 1940 fill land, no archaeological inventory survey or archaeological monitoring program is recommended. Early consultation with the SHPD archaeology branch is recommended in this regard and particularly regarding the possible need for further documentation of an 8-ft by 30-ft concrete slab noted east of the tennis courts that may constitute a historic property. While highly utilitarian, Keehi Lagoon Beach Park has a distinctive style that merits further consideration by an architectural historian, should the present plans damage elements of the park. Early consultation with the SHPD Architecture Branch is recommended to discuss any potential impacts to potential historic architectural amenities within the park. In addition, if alteration is anticipated to either of the pedestrian bridges adjacent to the extreme northwest portion of the eastern project area, then early consultation with the SHPD Architecture Branch is recommended.

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Section 1 Introduction

1.1 Project Background

At the request of CH2MHill and on behalf of the City and County of Honolulu, Cultural Surveys Hawai‘i, Inc. (CSH) has completed this archaeological literature review and field inspection report in support of consultation with the State Historic Preservation Division (SHPD) for the Kamehameha Highway Force Main project in Moanalua and Kalihi Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKs: [1] 1-1-003:239 por.; 1-2-021:035 por. and 036 por. In general terms, the project area is just *makai* (seaward, south) of North Nimitz Highway between Lagoon Drive on the west and Alahao Place just west of Sand Island Access Road on the east. The project area addressed in this archaeological literature review and field inspection is depicted on a portion of the 1998 Honolulu and 1999 Pearl Harbor U.S. Geological Survey (USGS) topographic quadrangles (Figure 1), two tax map plats (Figure 2 and Figure 3), and a 2013 aerial photograph (Figure 4). The project area comprises approximately 2.367 hectares (6.6 acres).

This force main project will involve primarily horizontal directional drilling under the Keehi Lagoon Memorial, the mouth of Moanalua Stream, and the mouth of Kalihi Stream. This directional drilling is understood to be below the water table and below any culture-bearing sediments. The directional drilling per se will not impact any historic properties, other than possibly through the associated excavations at the two ends and impacts associated with the staging areas and pipe layout. At the two ends of the project area, spaced approximately 650 m apart, are two stretches of proposed open trench excavations. While this is one project, the spacing between the areas of open trenching and associated staging areas makes it useful to think of the project as involving effectively two discrete areas of ground disturbance to potential historic properties: a western project area between Lagoon Drive on the west and the Keehi Lagoon Memorial on the east and an eastern project area between the east bank of Kalihi Stream on the west and Alahao Place just west of Sand Island Access Road on the east.

1.2 Historic Preservation Regulatory Context

This government Kamehameha Highway Force Main project is subject to historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and Hawai‘i Administrative Rules (HAR) §13-275. This study has been prepared to support project planning and consultation with concerned parties, including potentially Native Hawaiian Organizations (NHOs), and specifically to facilitate HAR §13-275-3 obtaining a determination letter from the SHPD for this project. This study may be appended to a City and County request for an SHPD determination letter for the project to facilitate SHPD review as per HAR §13-275-3.

1.3 Environmental Setting

1.3.1 Natural Environment

The Kamehameha Highway Force Main project is on the central south shore of O‘ahu, east of the Honolulu International Airport and Lagoon Drive and west of Alahao Place just west of Sand Island Access Road. The project area was relatively close to the former shoreline and sea level

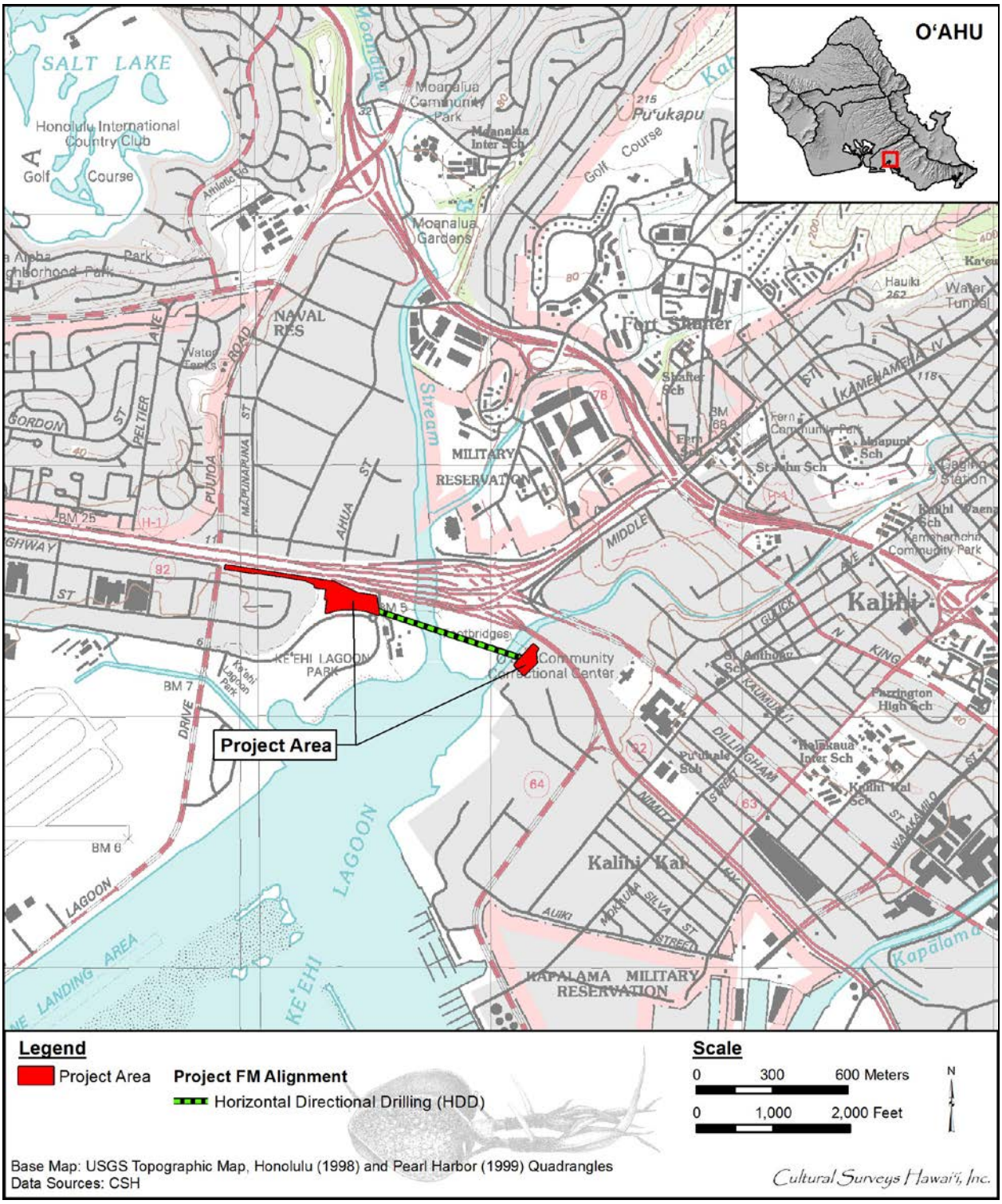


Figure 1. Portions of 1998 Honolulu and 1999 Pearl Harbor USGS 7.5-minute topographic quadrangles showing the project area

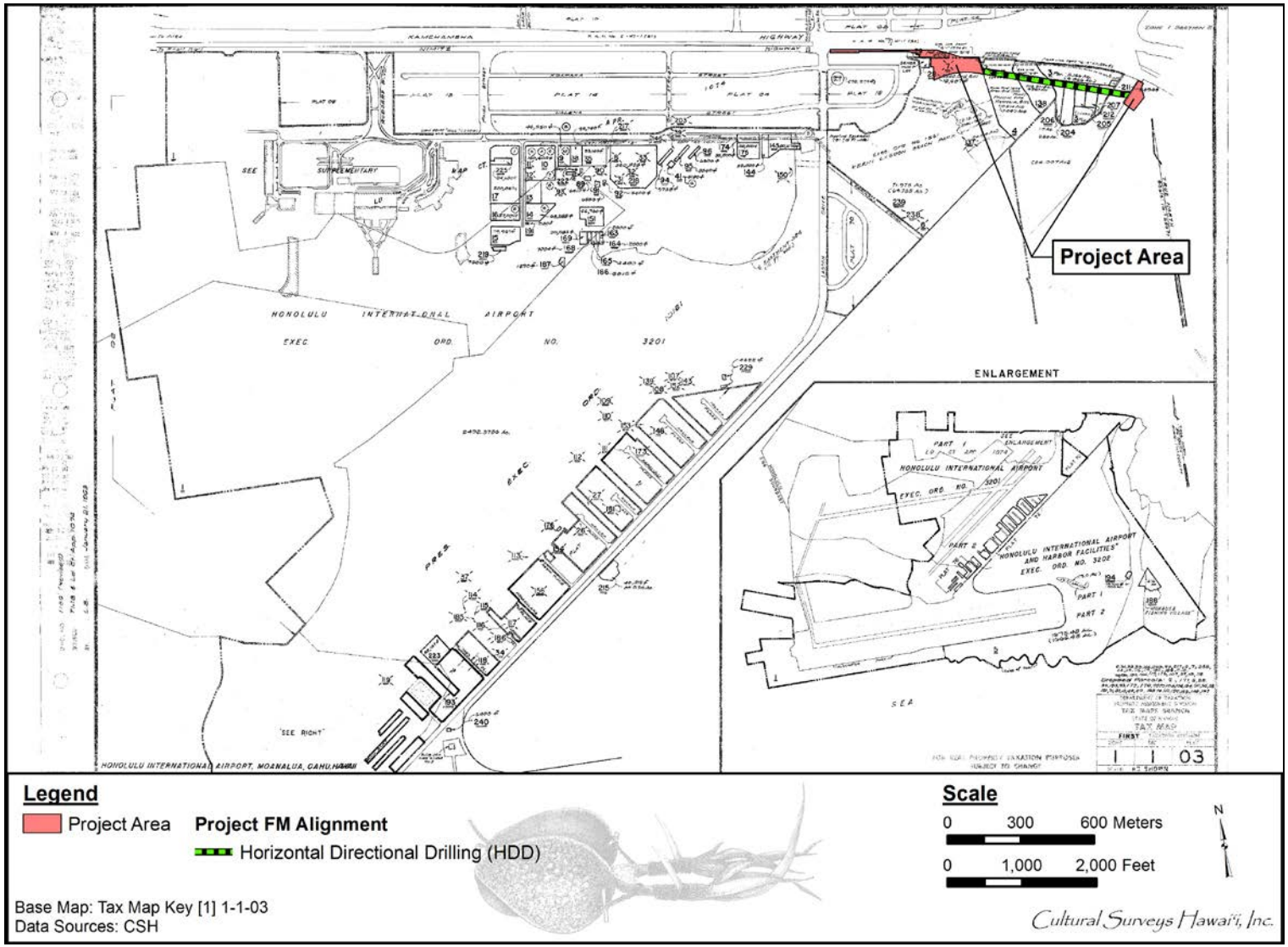


Figure 2. Tax Map Key (TMK) [1] 1-1-003 showing the project area (Hawai‘i TMK Service)

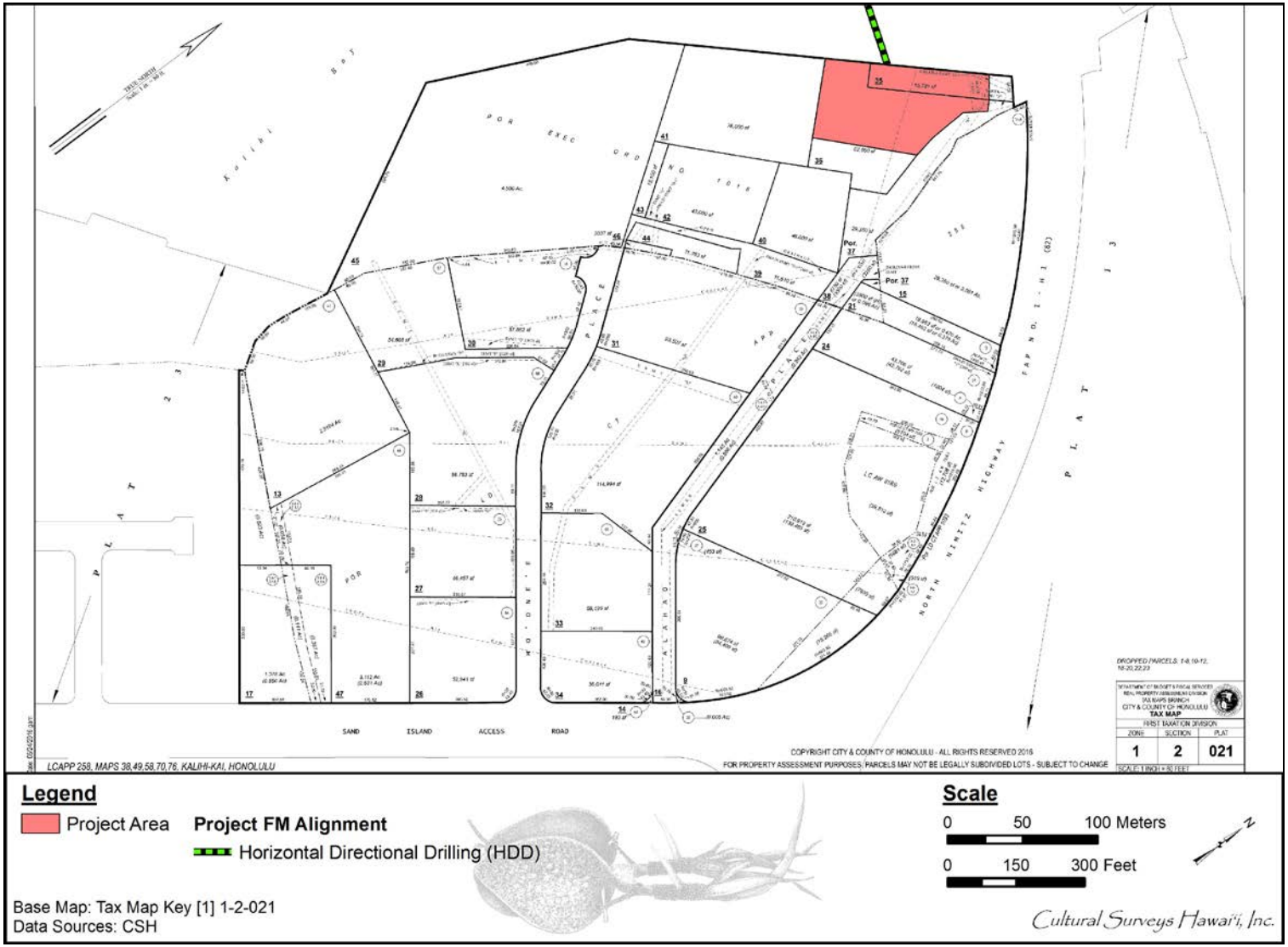


Figure 3. TMK: [1] 1-2-021 showing the project area (Hawai‘i TMK Service)

Figure 4. 2013 Google Earth aerial image showing the project area

until fill activities ca. 1931–1943. The project area spans the vicinity of natural confluence of three stream mouths (Moanalua Stream, Kahauiki Stream, and Kalihi Stream). Currently, the project area is less than 2 m above mean sea level (AMSL). Several pre-Contact Hawaiian fishponds (*loko*) were in the vicinity of the project area; these included Ka‘ihikapu Fishpond (designated as State Inventory of Historic Places [SIHP] # 50-80-13-0081) to the southwest, Kaloaloa Fishpond (SIHP # -0080) to the south, and Lelepaua Fishpond (SIHP # -0082) to the west.

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), soils within the western project area are composed of Ewa silty clay loam, moderately shallow, 0 to 2% slopes (EmA) (Figure 5). 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 igneus rock. They are nearly level to moderately sloping. Elevations range from near sea level to 150 feet. The annual rainfall amounts to 10 to 30 inches. Most of it occurs between November and April. The mean annual soil temperature is 73° F…
>
> 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]

The eastern project area consists of Fill Land (FL), which is described by Foote et al. (1972:31) as “areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources.” Most of the fill material in this region is likely of marine origin relating to either dredging of the Pearl Harbor entrance or dredging of a seaplane airstrip in Ke‘ehi Lagoon.

This is a particularly dry area of O‘ahu, receiving a mean annual rainfall of 600 to 800 mm (25.33 inches) annually, according to the University of Hawai‘i 2011 *Rainfall Atlas of Hawai‘i* (Giambelluca et al. 2013). This amount of rainfall typically is insufficient for non-irrigated agriculture. Vegetation in undeveloped portions of the project area may include *kiawe (Prosopis pallida)*, *koa haole* (*Leucana glauca*), and a variety of exotic weeds.

1.3.2 Built Environment

The project area vicinity includes Keehi Lagoon Park (mostly *makai* of the project area but including a portion of the western project area), which contains tennis courts, a baseball diamond, and other outdoor recreational facilities. *Mauka* (inland, toward the mountains) of the project area is the H-1 Freeway and Nimitz Highway interchange. Infrastructure related to the Honolulu International Airport, located approximately 0.5 km west of the project area, is also in the vicinity; this includes car rental lots, commuter terminals, parking structures, and roadways.

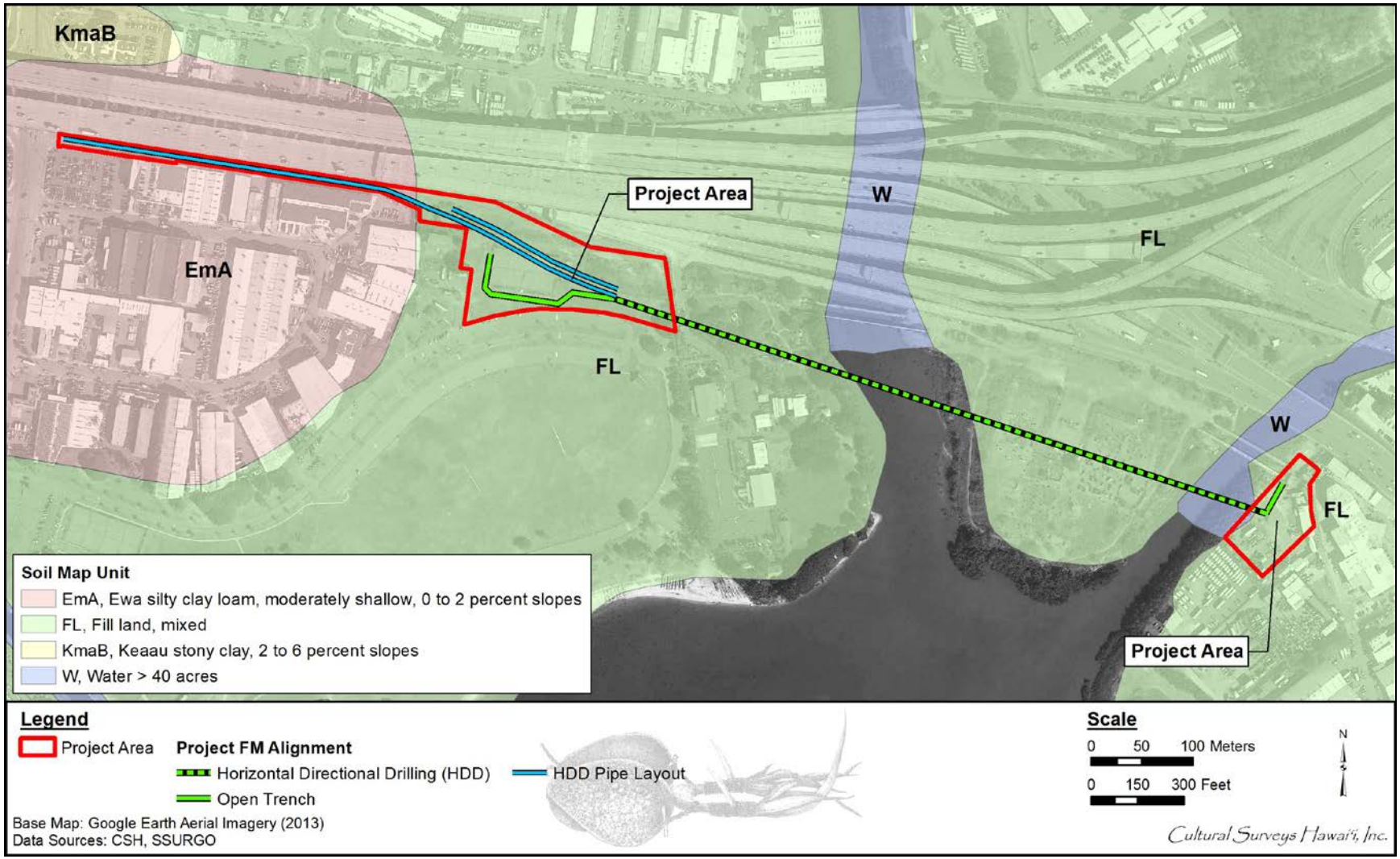


Figure 5. Overlay of the *Soil Survey of the State of Hawaii* (Foote et al. 1972) indicating the soil types around the project area

Section 2 Background Research

2.1 Traditional and Historical Background

2.1.1 Mythological and Traditional Accounts

The majority of the present project area, including the larger western project area and most of the horizontal directional drilling, lies within the seaward portion of Moanalua Ahupua‘a, the westernmost of the traditional Hawaiian land divisions (*ahupua‘a*) of the traditional Kona District (*Kona Moku*). There are numerous references to Moanalua in the traditional literature that may provide preliminary clues to the character of life—including patterns of settlement and land usage—within the *ahupua‘a* of Moanalua during pre-Contact times. For instance, the nineteenth century Hawaiian archivist and historian Samuel Kamakau mentions Moanalua in an account of the *mo‘olelo* (legend) surrounding the arrival of the gods Kū and Lono to the Hawaiian Islands:

> Kū and Lono are spoken of in the *mo‘olelo* of the *lono-pūhā* practitioners and of the medical *kāhuna* as having come from Kahiki [Tahiti]. They landed first on Kaua‘i, and from there they spread forth.
>
> In the *mo‘olelo* of Pele *mā*, it says that they first landed at Kalihi on Kaua‘i and from there went to Ka‘ena Point on O‘ahu and at Moana-lua left the salt pond. Then they went to Ka-uha-kō on Moloka‘i, to ‘Aleamai in Hāna, Maui, and then went to live at Kīlauea in Puna and Ka‘ū on Hawai‘i. [Kamakau 1991:112]

The “salt pond” of Moanalua is Āliapa‘akai, or Salt Lake, which was once a 0.9-mile wide body of water that stretched across a crater of the same name. However, “[i]n 1966, after muddy political scuffles, the state decided to fill most of the lake” (Chun 2006).

Another tradition associates the creation of Āliapa‘akai (Salt Lake) and the nearby Āliamanu Crater with the goddess Pele:

> . . . [Pele] left Kauai and went to Oahu, to a place near Honolulu, to Moanalua, a beautiful suburb. There she dug a fire pit. The earth, or rather the eruption of lava, was forced up into a hill which later bore the name Ke-alia-manu (The Bird White Like a Salt Bed or The White Bird). The crater which she dug filled up with salt water and was named Ke-alia-paa-kai (The White Bed of Salt, or Salt Lake). [Westervelt 1987:40]

Near Aliapa‘akai and Aliamanu was Leilono, an entrance to the nether world:

> Leilono at Moanalua, Oahu, was close to the rock Kapukaki and easterly of it (*a ma ka na‘e aku*), directly in line with the burial mound of Aliamanu and facing toward the right side of the north Star (*a huli i ka ‘ao‘ao ‘akau o ka Hokupa‘a*). On the bank of the old trail there was a flat bed of pahoehoe lava, and on it there was a circular place about two feet in circumference. This was the entrance to go down . . . (*ka puka o Leilono*). [Kamakau 1964:48]

Additional legendary personages associated with Moanalua include the “cannibal dog-man Kaupe who overthrew the government of Ka-hānai-a-ke-akua (‘Reared by the gods’) and ruled

the land from Nu‘uanu to the sea” (Beckwith 1940:345). Another legend tells of a father and son who “flee and hide under a rock at Moanalua while Kaupe goes on to look for them on Hawaii” (Beckwith 1940:345).

Other traditions identify Moanalua with historical personages, including the most prominent Hawaiian *ali‘i* (royalty). For example, Kamakau (1961) recounts the story of a Maui chief:

> . . . named Kalai-koa who lived at Moanalua built a long house and named it Kauwalua and, perhaps in order to make his name famous, had it filled with the bones of persons stripped, bound, and set up inside the house and all around the outside enclosure of the house. The bones of Elani, Kona-manu, and Ka-laki-o‘o-nui were bundled up and placed beside the entrance. The house stood at Lapakea on the slope into Moanalua on the upper side of the old road. Eyewitnesses said, ‘It was a terrible and gruesome sight. The bones were stripped, bundled together, and the skulls set upon each bundle so that, seen from a distance, it looked like a company of living men.’ [Kamakau 1961:138–139]

The existence of the “house of bones” into the nineteenth century is confirmed in accounts by early western visitors to Moanalua, and its conjectured location (far from the present project area) was recorded as an archaeological site during the first archaeological survey of O‘ahu during the 1930s.

2.1.2 Early Historic Period

Records of European visitors to Moanalua during the first quarter of the nineteenth century provide clear evidence that by the time of Western Contact late in the eighteenth century, a sizeable population of Hawaiians lived within the *ahupua‘a* of Moanalua. Moanalua was a rich environment that, through feats of engineering and ingenuity, amplified the natural resources of the terrain. This environment included abundant plant life that provided sustenance and building materials. A botanical survey by Bishop and Herbst (1970) recorded 197 endemic and indigenous plant species in Moanalua. The physical characteristics of the *ahupua‘a* also provided an especially rich environment. The land form created by streams deeply cutting into the Ko‘olau Volcano and the embayment created by offshore reefs produced a broad zone of rich alluvial lands bordering a shallow lagoonal environment. In the alluvium, the Hawaiians of Moanalua created an irrigated system of pond-field taro gardens fringed with bananas and sugarcane growing on the embankments that outlined the fields. The stream water that supported the field system continued into the shallow bay and distributed organic nutrients that would have attracted large populations of fish to the bay. These locations provided appropriate environments for the construction of fishponds.

The navigator Otto von Kotzebue, in the employ of the Russian navy, visited Honolulu in November and December 1816. He decided “to undertake a little excursion on foot [in order to survey the coast] to the river called Pearl River by the English, lying half a day’s journey to the west of Gana-Rura [Honolulu].” Von Kotzebue and two shipmates set out on 8 December 1816:

> On our way, we met now sugar plantations, now taro fields, now scattered huts; and so, without noticing it, we covered the five miles to the large village of Mauna-Roa [i.e., Moanalua; the Russians had misheard the name and thought it the same as Mauna Loa on the island of Hawai‘i], situated in a delightful valley on a mountain slope. From here, there winds to the sea a fast-flowing river of the

> same name. It is visible at a great distance and wanders through the mountains and cliffs in the most picturesque fashion. In front of the village, consisting of pretty little reed huts, one encounters two groves, one of coconut palms, the other of breadfruit. We passed through these little groves, to take a rest on the hill lying immediately behind. [Barratt 1988:232]

On the hill where von Kotzebue and his companions stopped, he noted “a general view of Honolulu Harbour opened up to us. Our compass was set up and I took a number of angles with my sextant” (Barratt 1988:232). The following year, in 1817, von Kotzebue drew a map of the south coast of O‘ahu (Fitzpatrick 1986:48-49) (Figure 6). Von Kotzebue (1817) identifies Salt Lake (Āliapa‘akai) (“*Озеро Соленое*”), Mauna-Roa (Moanalua) River (“*Р. Моина-роа*”), and fishponds (“*Рыбныя Пруды”*) along the shoreline of Moanalua, as well as numerous taro *lo‘i* (irrigated fields) in the lowlands of Moanalua below Salt Lake, spreading out from Moanalua Stream and back from the fishponds at the shore. Due to the early period of the map, reflecting the area in 1816, the depictions are believed to represent a detailed sketch map rather than a surveyed map. Most of the present project area appears to lie within the harbor at this time, with major areas of agriculture and habitation to the north and east.

Salt Lake would have provided a valuable resource to the Hawaiians of Moanalua both before and after Western Contact. The missionary William Ellis presented the following description of Salt Lake in the 1820s:

> About six miles to the west of Honoruru, and nearly as far from the village of Eva, on the Pearl river, there is a singular natural curiosity—a small circular lake, situated at a short distance from the sea shore, so impregnated with salt, that twice in the year the natives take out between two and three hundred barrels of fine clear, hard, crystalized salt: this lake is not only an interesting natural curiosity, but an important appendage to the island. It belongs to the king, and is not only useful in curing large quantities of fish, but furnishes a valuable article of commerce; quantities of it having been sent for sale to Kamtschatka, and used in curing seal skins at the different islands to which the natives have sent their vessels for that purpose, or sold in the islands to Russian vessels, from the settlements on the north-west coast of America. [Ellis 1969:18–19]

The trade in salt dwindled by the mid-nineteenth century and, as a visitor of that time noted, the salt in the lake had “almost wholly disappeared” (Bates 1854:102).

The grove of coconut palms at Moanalua mentioned by von Kotzebue was described in more detail by a visitor of the 1830s:

> But to return to the little valley, about three miles from Honolulu on the road to Ewa over. . . On looking down, you behold a large grove of cocoanut trees, some of which give evidence of having been blown upon with no ordinary breath; appearing to have been nearly prostrated when about twenty feet high, they again shot up in a perpendicular direction and now present the curious phenomenon of living trees, the upper half of whose trunks are almost at right angles from the lower. It is a little remarkable that the surrounding trees on every side are perfectly straight. [Hall 1839:97]

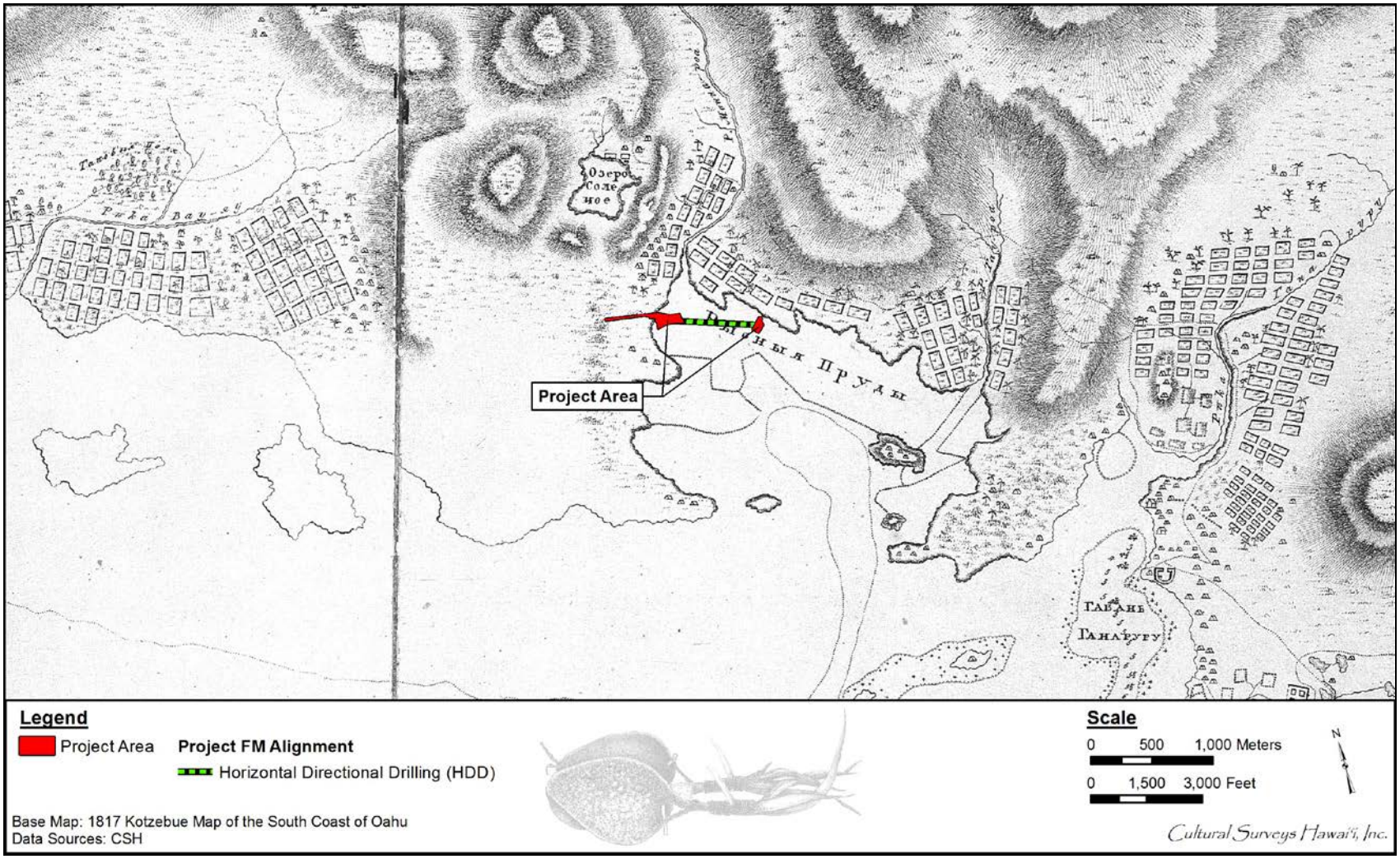


Figure 6. 1817 von Kotzebue schematic map of southern O‘ahu showing the project area; note the identification of Salt Lake (“*Озеро Соленое*”), Moanalua River (“*Р. Моина-роа*”), fishponds (“*Рыбныя Пруды*”) along the shoreline, and a profusion of taro *lo‘i* in the lowlands spreading out from the rivers and fishponds

Maps of Moanalua produced during the second half of the nineteenth century (i.e., before substantial twentieth century alterations to the landscape) display the development by Hawaiians of the "large village" (Kotzebue 1817) of Moanalua. A map by Covington (1881) (Figure 7) has an annotation of "Ancient Coast Line" lying along the inland side of the Lelepaua and Ka‘ihikapu fishponds. Covington (1881) indicates these fishponds had been constructed outward from the former shoreline, while the Ahua sandpit to the south was an even later shoreline accretion. An 1883 Brown map and an 1890 Monsarrat and Lyons map depict the expanse of fishponds that extended along the shores of Moanalua and the adjacent *ahupua‘a* of Kahauiki and Kalihi (Figure 8 and Figure 9). Numerous fishponds lay to the north and east of the present project area.

In a 1977 interview discussing the Tripler Army Medical Center, ethnobotanist Beatrice Krauss suggested the probable traditional Hawaiian usage of the upland ridges of Moanalua as follows:

> Tripler is on, what is called by the Hawaiians, a kula. That's a long slope from the marine plain going up toward the mountains and that was ideal for sweet potatoes. And also, just below the forest they would have grown dry taro. So, I have a feeling where Tripler is did have farms and there were people occupied [in that area]. [Rosendahl 1977]

That access to the uplands of Moanalua was an inalienable component of the traditional Hawaiian livelihood is suggested by a proviso within a lease agreement dated 6 November 1839. The lease involved Hoapilikane, the ruler of Moanalua, and William Sumner, a sea captain who had settled at Moanalua (Native Register 1847). The lease was for upland and mountain land of Moanalua to be used for pasturage:

> Hoapilikane does hereby lease to William Sumner the kula and the kuahiwi of Moanalua for fifty five years, from this day onward, and on this day William Sumner shall pay to Hoapilikane, or his heirs, fifty dollars . . . William Sumner may not sell said land; the land shall be inherited by his heirs born here in Hawaii. His animals shall continue to be looked after in this place of Moanalua, not at any other place if they go there . . . But if the makaainana wish to go up for wood for their houses, or firewood, they may go to fill their needs. Only the makaainana of Moanalua—not any others . . . [Native Register 1847:2:136]

The stipulation guaranteeing access to the uplands clearly intends to protect for the *maka‘āinana* (commoners) of Moanalua a synergistic interplay of upland and lowland-derived sustenance that comprised the traditional way of life within the *ahupua‘a*.

In 1826, ten years after von Kotzebue had observed the "large village" of Moanalua, Hiram Paulding, a naval officer following the same route from Honolulu to Pearl River, recorded a different scene, stating that "the country was thinly inhabited . . . with no considerable village or rich valley" (Paulding 1971:205). The diminished population of Moanalua in 1826 likely reflects changes that were taking place throughout the Hawaiian Islands during the years following Western Contact. At the time of the first large-scale census by American missionaries in 1835–1836, the population of Moanalua totaled 625 individuals consisting of 234 adult females, 252 adult males, 48 female children, and 91 male children (Schmitt 1973:19). These statistics reflect

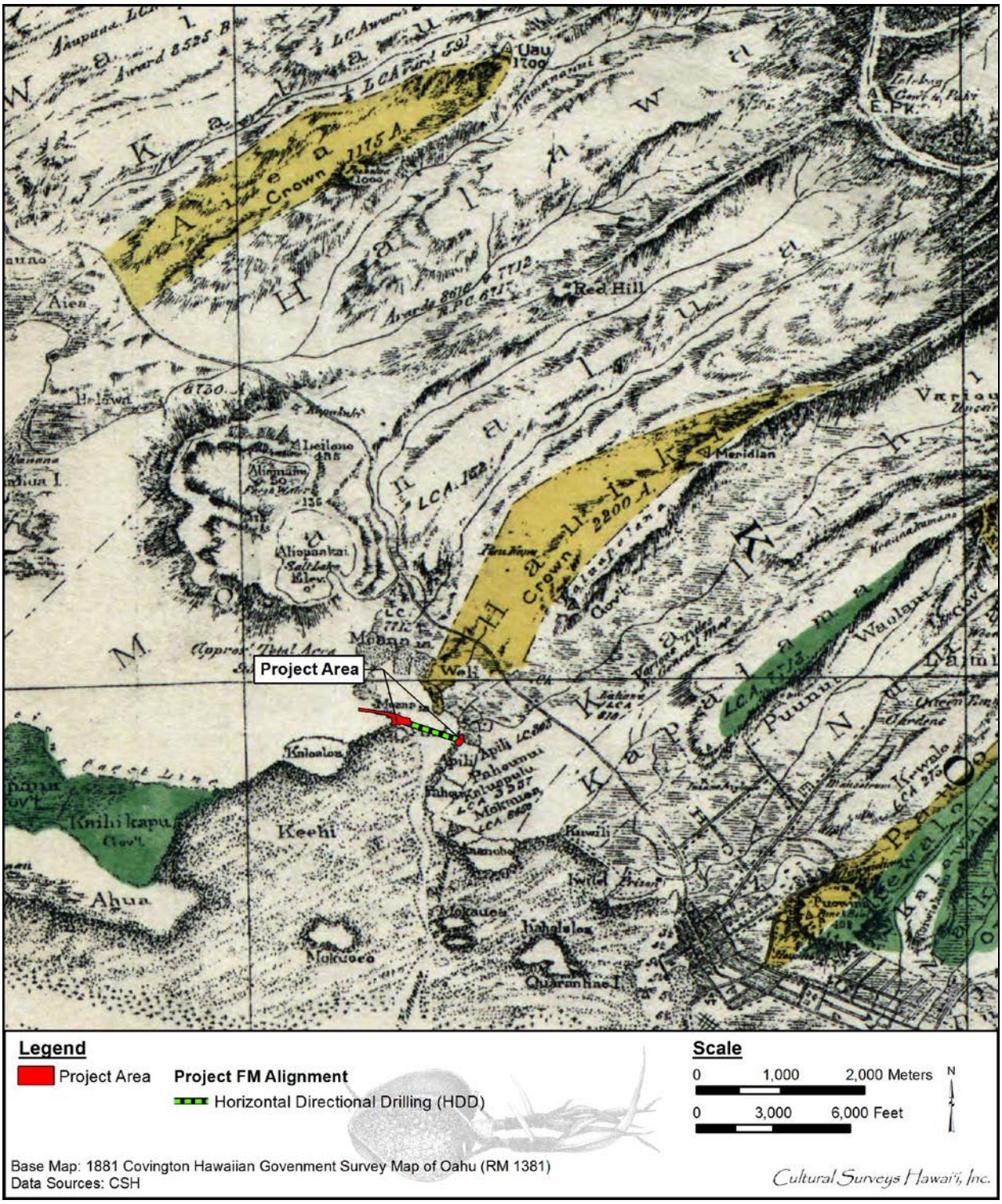


Figure 7. 1881 Covington Hawaiian Government Survey map of O‘ahu showing the project area

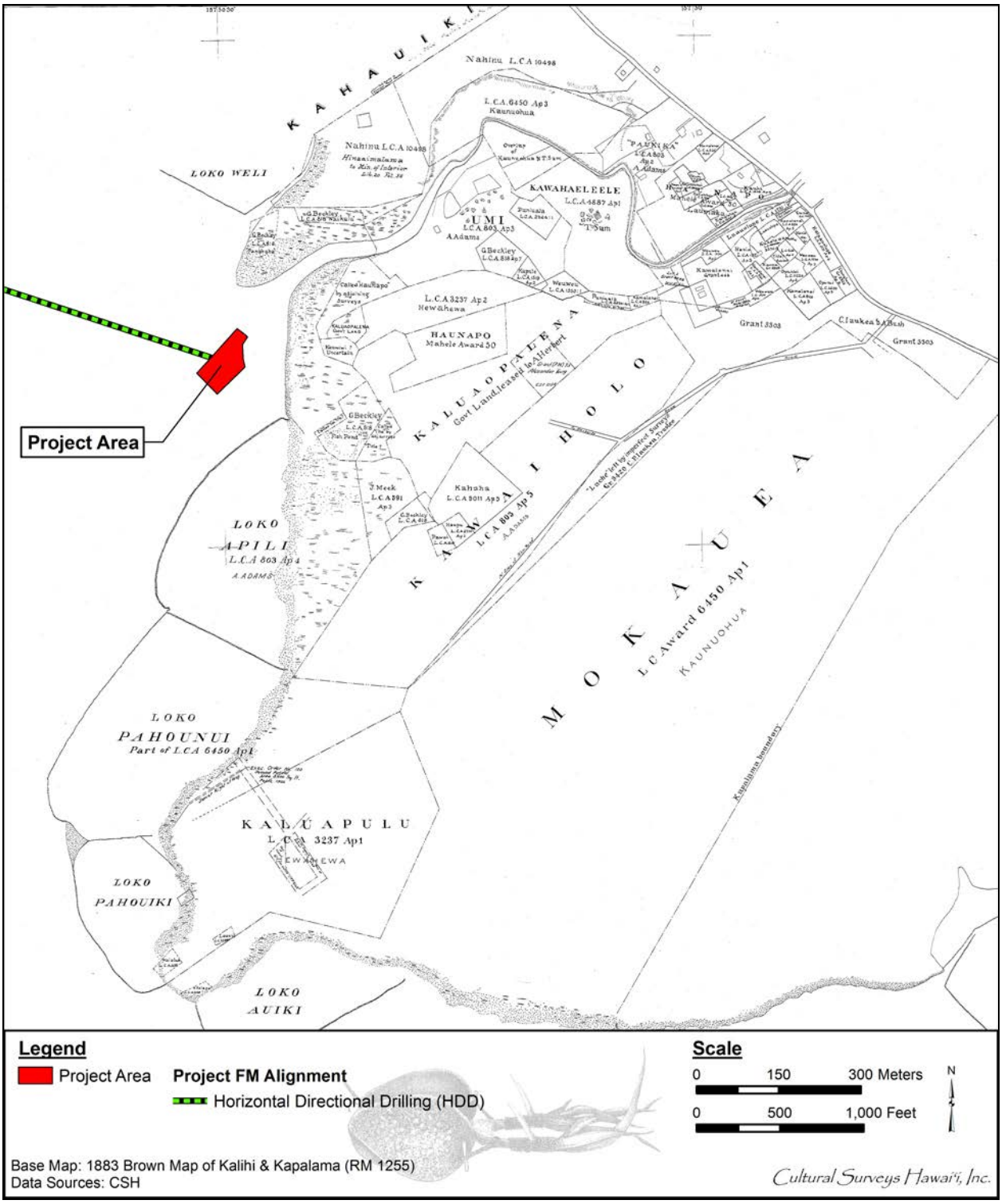


Figure 8. 1883 Brown map of Kalihi and Kapālama showing project area

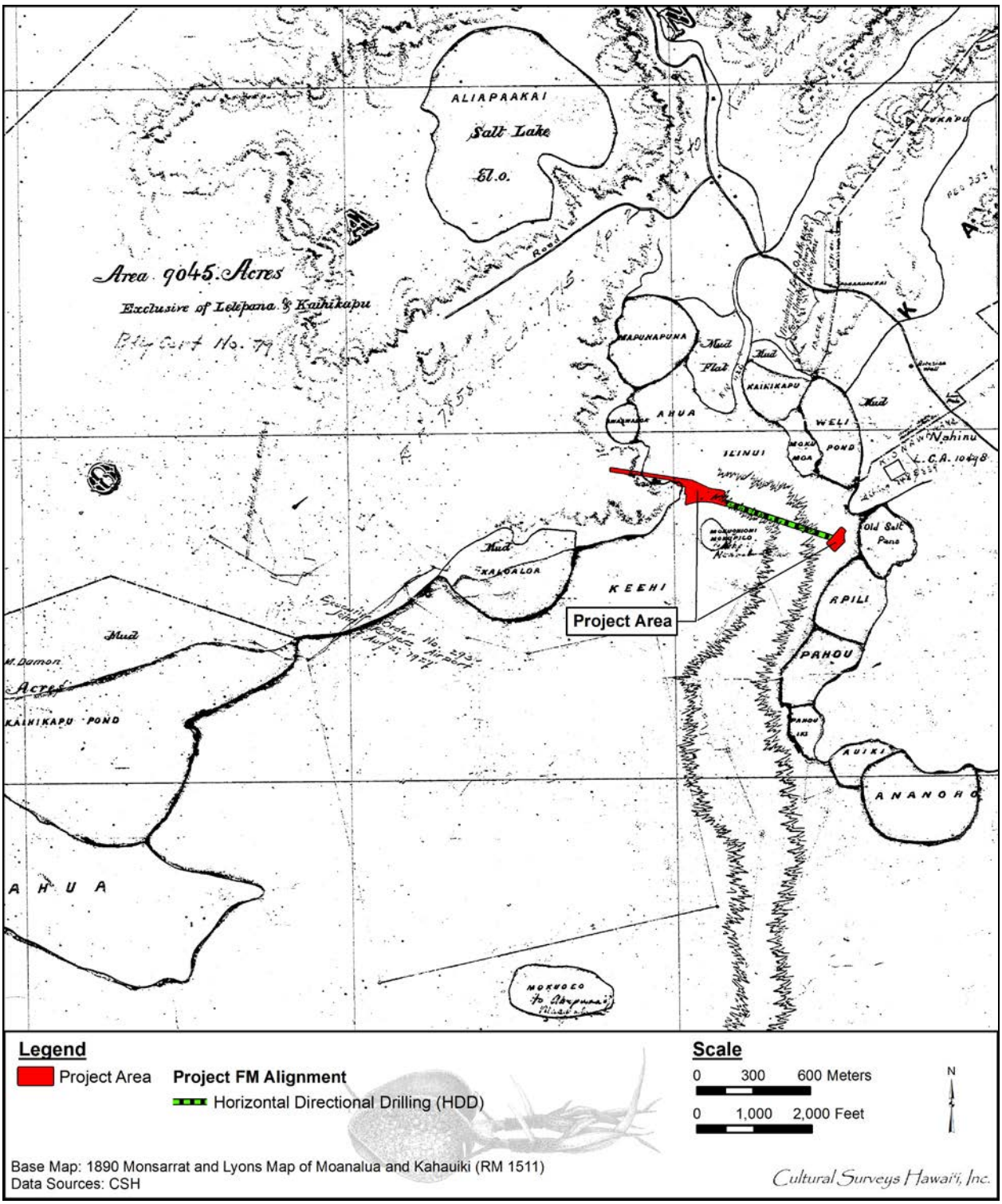


Figure 9. 1890 Monsarrat and Lyons map of Moanalua and Kahauiki showing the project area within the airport property

the decimation of the native population by Western-introduced diseases and the upset of traditional social patterns by the influx of western commercial ideals.

Anderson and Bouthillier (1996:26) document two early areas of coastal settlement in the Hālawa-Moanalua coastal plain, an unnamed settlement (annotated as “Settlement 1840”) located southwest of the area that would become known as “Watertown” in the Pearl Harbor entrance (in the vicinity west of the airport) and another community known as “Poi Village” on the former coast within the airport lands, southwest of the current project area. These areas are assumed to have been traditional Hawaiian fishing villages. Settlement closer to the present project area was likely prevented by the low-lying marshy ground in the vicinity.

2.1.3 Fishponds of Moanalua

The fishponds along the shoreline of Moanalua were a resource that must have greatly increased the productivity of the area. Of the numerous pre-Contact Hawaiian fishponds in Moanalua Ahupua‘a, several were in the vicinity of the current project area including Kaloaloa Fishpond to the southwest, Mapunapuna and Awa‘awaloa fishponds to the northwest, Weli fishpond to the northeast, and Apili and Pahou fishponds to the southeast (see Figure 9 and Figure 10). A 1913 Monsarrat map of O‘ahu fisheries actually depicts part of the western project area as within an unnamed fishpond (Figure 11), while the rest is within the Mokumoa and Kaliawa fisheries. The 1902 Donn Hawaii Territory Survey map of O‘ahu (see Figure 10) also depicts “Old Salt Pans” directly east of the project area.

The fishponds were *loko kuapā*, meaning they were controlled by the *ali‘i*. The fishponds of Moanalua can be seen as evidence of a thriving chiefly class in the *ahupua‘a*. However, commoners also received significant benefits from the fishponds through redistribution during fish harvests and compensation for required work on the ponds. Apple and Kikuchi (1975:2) discuss the impact that such fishponds would have had on the general population of an area as follows:

> Accessibility to these ponds and their products was limited to the elite minority of the native population—the chiefs and priests. Prehistoric ponds and pond products appear to have been taboo to the vast majority of Hawaiians and to have yielded them no direct benefit. However, indirect public benefit came from ownership by the chiefs of exclusive food sources. Royal fishponds . . . insured less demand on the commoners' food production resources. Every fish taken from a royal fishpond left its counterpart in natural habitat available to lesser chiefs and commoners. Ownership of one or more fishponds was one of the ultimate, high-status symbols in the status-conscious Hawaiian culture. [Apple and Kikuchi 1975:2]

2.1.4 Mid- to Late 1800s

The Organic Acts of 1845 and 1846 initiated the process of the Māhele, the division of Hawaiian lands, which introduced private property into Hawaiian society. In 1848, the crown and the *ali‘i* received their land titles, and in 1850 the *maka‘āinana* received their *kuleana* awards (individual land parcels).

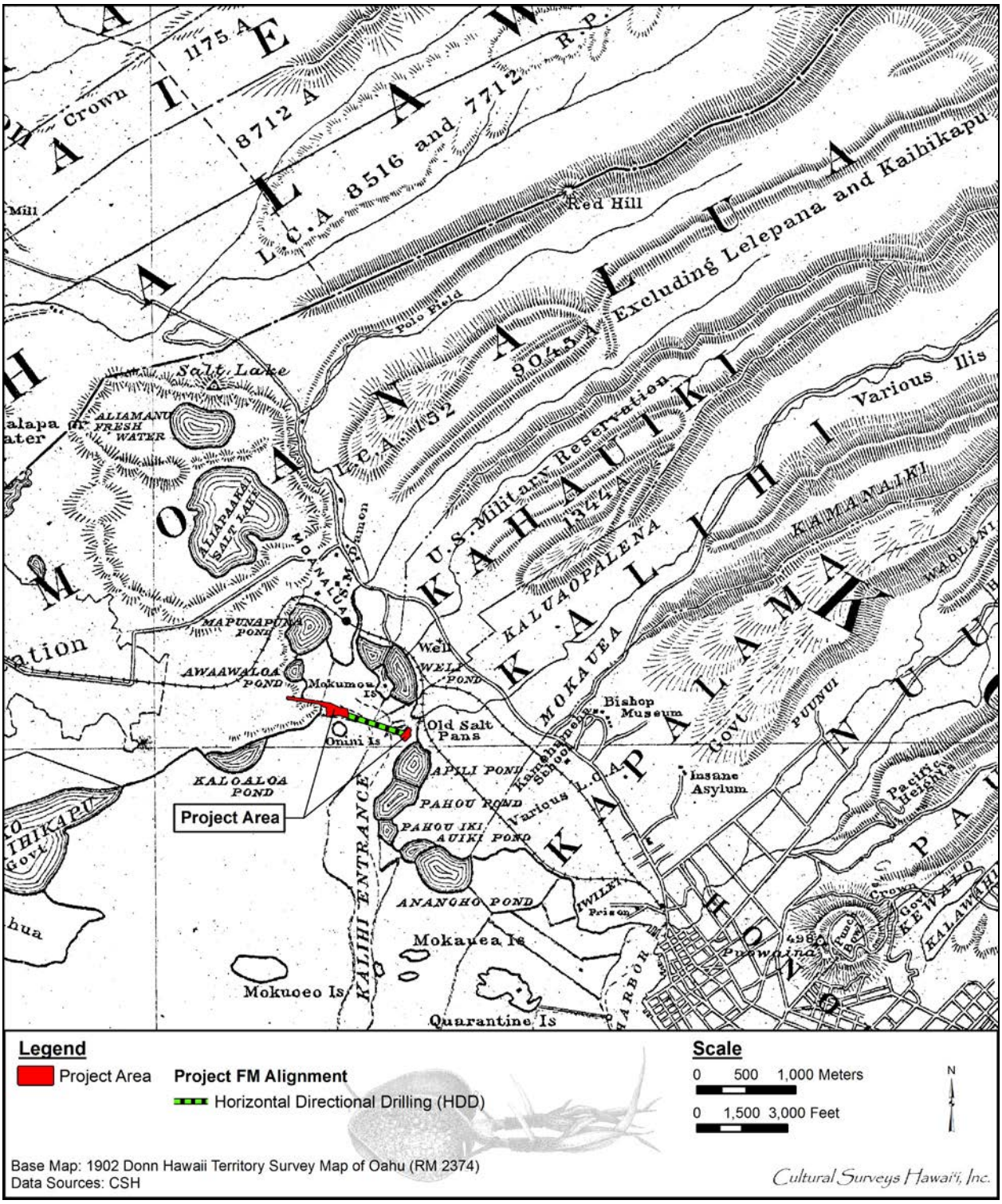


Figure 10. 1902 Donn Hawaii Territory Survey map of O‘ahu showing project area

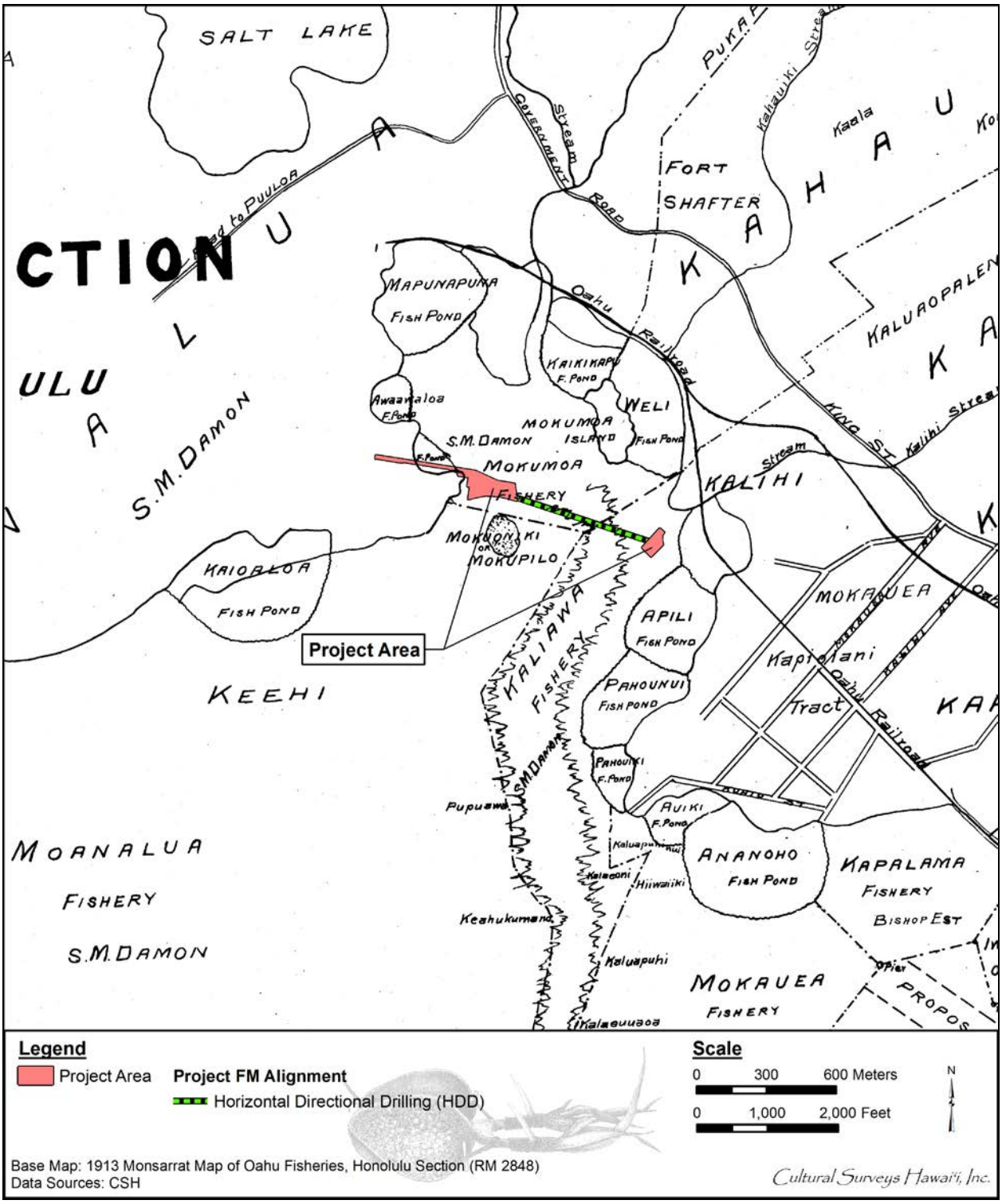


Figure 11. 1913 Monsarrat map of O‘ahu fisheries, Honolulu Section

It is through records for Land Commission Awards (LCAs) generated during the Māhele that the first specific documentation of life in Hawai‘i as it had evolved up to the mid-nineteenth century comes to light. Although many Hawaiians did not submit or follow through or were not granted the claims for their lands, the distribution of LCAs can provide insight into patterns of residence and agriculture; many of these patterns likely had existed for centuries past. Therefore, examination of the patterns of *kuleana* (commoner) LCA parcels in the vicinity of the project area can provide insight into the likely intensity and nature of Hawaiian activity in the area.

During the Māhele of 1848 the *ahupua‘a* of Moanalua was granted to Lot Kamehameha (later Kamehameha V) with fee simple title to native tenants. Subsequently, LCAs were granted to 101 commoners for parcels they were actively cultivating or residing upon. The LCAs were heavily concentrated north of the present project area, Moanalua Stream, and the two tributaries. No commoner LCAs are known in the vicinity of the present project area. It was common for the *ali‘i* and/or their overseers (*konohiki*) to retain fishponds and unique cultural resources such as the coastline at the mouth of Pearl Harbor.

Upon the death of King Kamehameha V in 1872, Princess Ruth Ke‘elikōlani received the *ahupua‘a* of Moanalua. When Princess Ruth died in 1883, the land was left to Princess Bernice Pauahi Bishop. A codicil of Princess Bernice’s will granted Moanalua to Samuel M. Damon upon her death in 1884. Damon and his heirs began buying up the *kuleana* lands of the *ahupua‘a*. Damon kept much of Moanalua in pasture, with portions leased to rice, sugar, and banana growers.

In the late 1800s, there were a number of developments on the Hālawa-Moanalua coastal plain that were not well documented (cf. Anderson and Bouthillier 1996). Starting from the east side of the Pearl Harbor entrance and moving to the east, these included four coastal communities: Halekahi, Holokahi, Queen Emma’s property, and Kumumau. These, however, are located well west of the present project area.

2.1.5 1900s

At the end of the nineteenth century, the Honolulu Sugar Company (later Honolulu Plantation Company) began leasing portions of Moanalua for sugarcane cultivation. A Honolulu Plantation railroad line was northwest of the present project area, in an east-west alignment. The Oahu Rail and Land (OR&L) railroad line ran just north of the project area, adjacent to the western project area, along the alignment of the present-day Nimitz Highway (Tomonari-Tuggle 1998) (Figure 12 through Figure 14). By the mid-1930s, the Honolulu Sugar Company leased more than 23,000 acres of land in the *ahupua‘a*. Sugarcane planting extended seaward as far as the OR&L alignment but not into the current project area. A sugar plantation community developed at Puuloa Camp around 1930, and another community at Watertown developed adjacent to the east side of the Pearl Harbor entrance. By the late 1940s, OR&L operations were shut down completely (Tomonari-Tuggle 1998:16).

2.1.5.1 Honolulu International Airport

The Honolulu International Airport is the site of the former John Rodgers Airport (see Figure 13 and Figure 14), southwest of the current project area. The John Rodgers Airport was the first established airport in the Territory of Hawaii. The airport “was named after pioneer aviator John Rodgers who made the first trans-Pacific flight on August 31, 1925” (Hawaii Aviation 2015a:1)

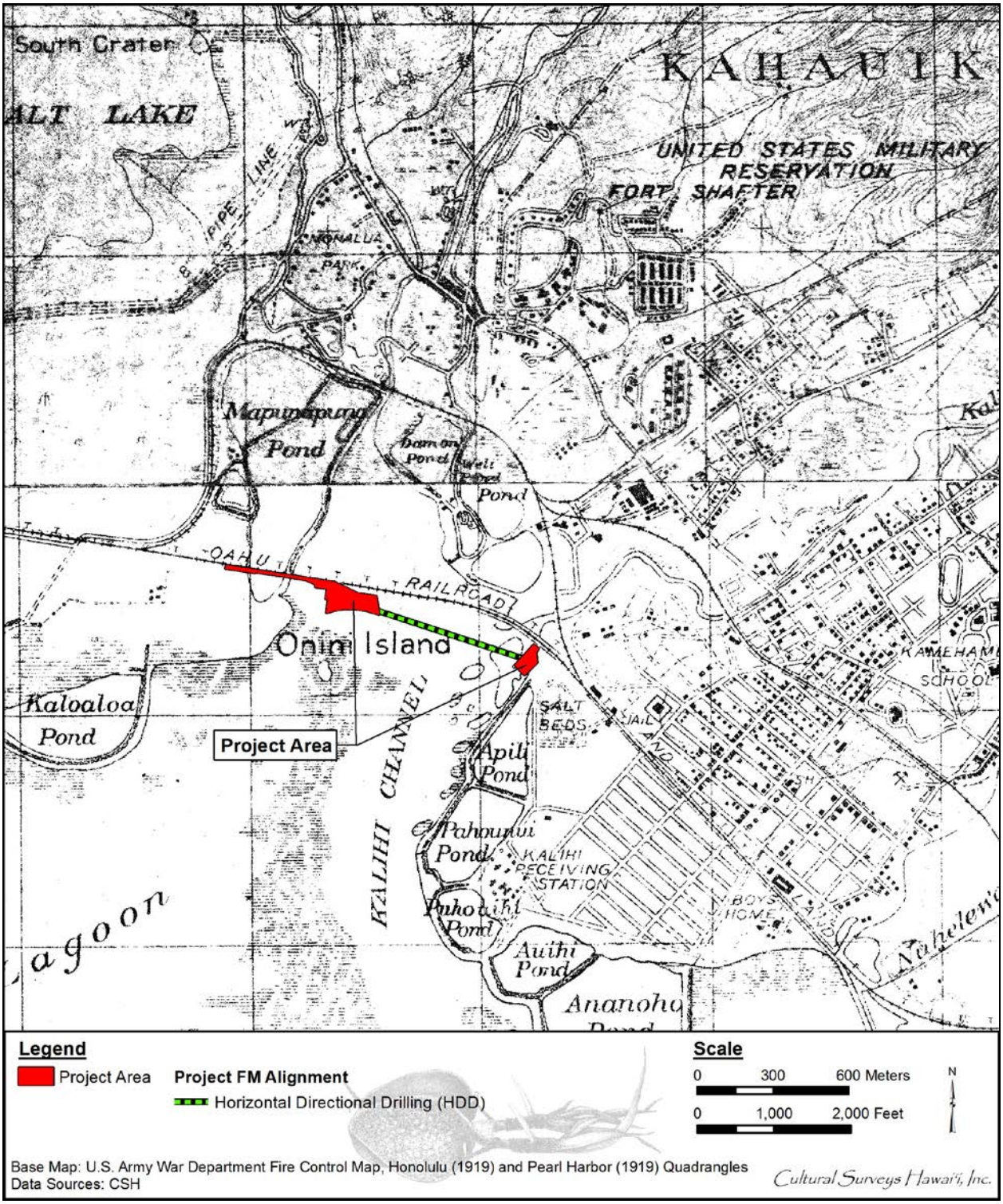


Figure 12. 1919 U.S. Army War Department fire control map, Honolulu and Pearl Harbor quadrangles; note the railroad line running along the northern edge of the west project area

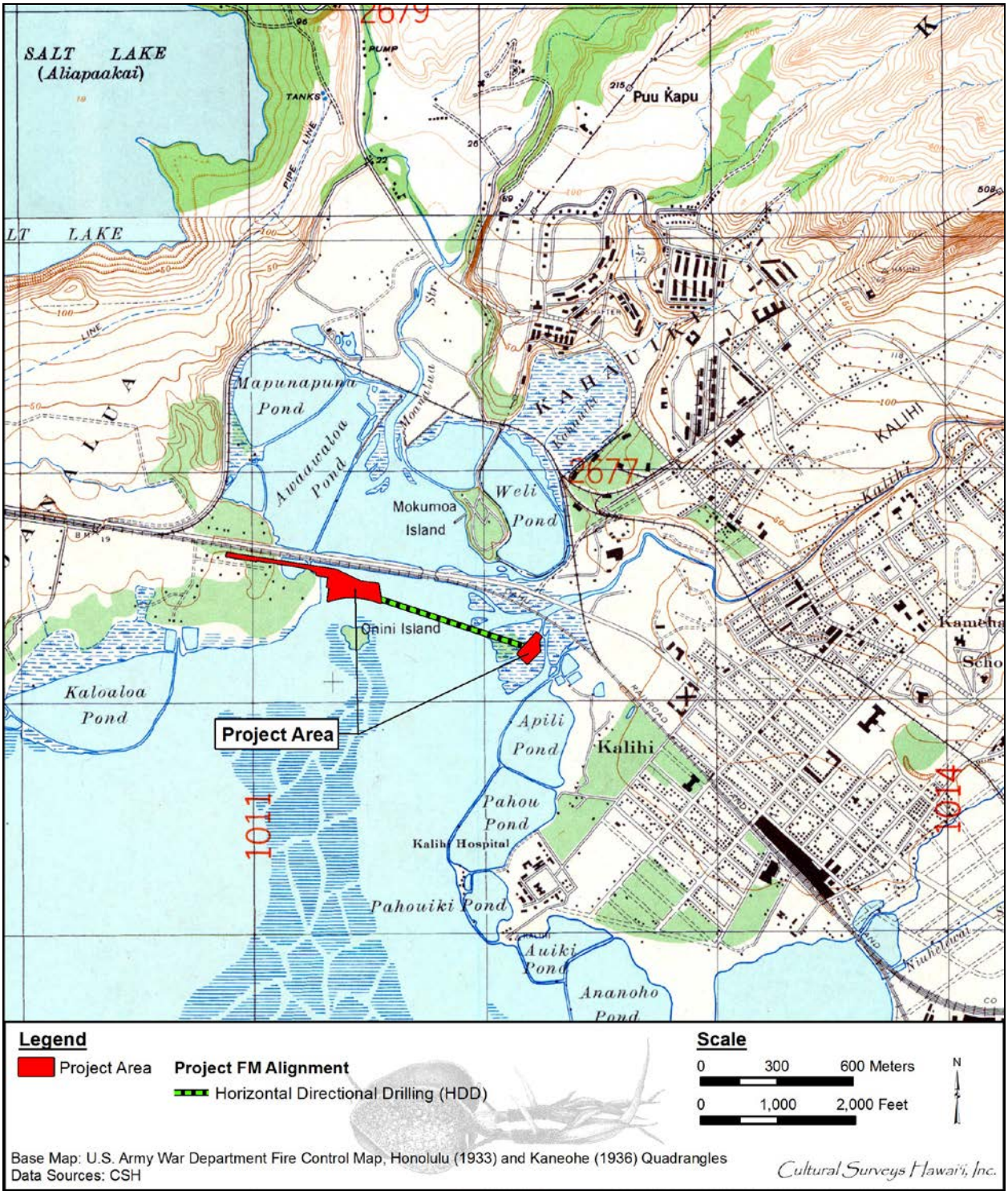


Figure 13. 1933 U.S. Army War Department fire control map, Honolulu (1933) and Kaneohe (1936) quadrangles; note the railroad lines running along the northern edge of the airport property and the depiction of John Rodgers Airport

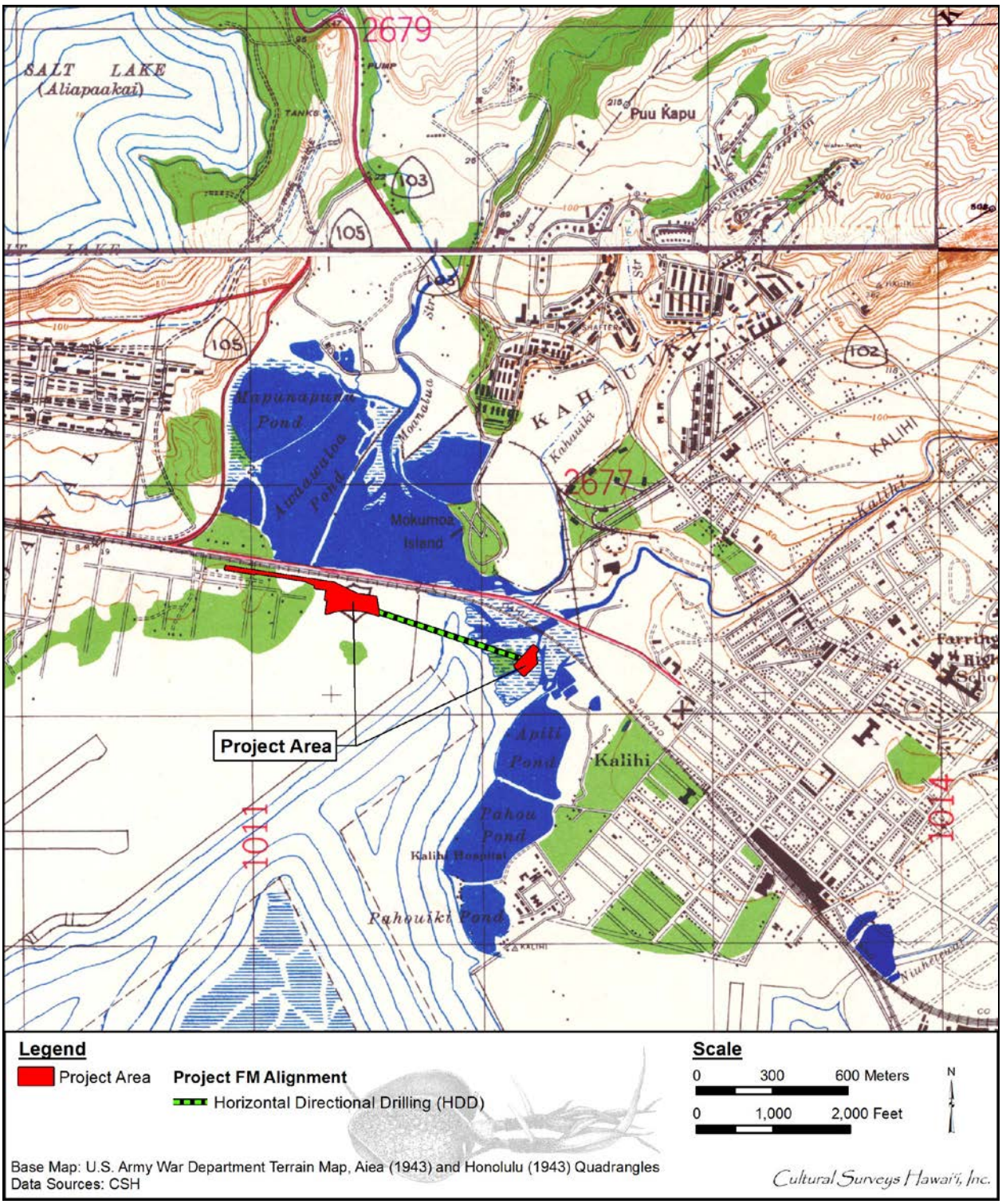


Figure 14. 1943 U.S. Army War Department terrain map, Aiea and Honolulu quadrangles, showing the project area in relation to surrounding development

and it was dedicated on 21 March 1927 (Hawaii Aviation 2015b:1). The Inter-Island Airways service began in November 1929 and has been known as Hawaiian Airlines since 1 October 1941. In 1930, John Rodgers Airport had two runways; during the early 1930s, additional runway areas were graded with coral and were “resurfaced during the year with a surface coating of bitumuls and fine rock” (Hawaii Aviation 2015b:2). In October 1941, construction and dredging of the Keehi Lagoon seaplane basin for additional runways began (Hawaii Aviation 2015b:4). Following the 7 December 1941 attacks on Pearl Harbor, the U.S. military took control of all Territorial airports for the duration of the war and “extensive improvements were made at John Rodgers Airport” (Hawaii Aviation 2015b:6). As a result of the military improvements and land provided from the neighboring Hickam Field, the airport had become one of the largest in the U.S. by 1946 (Hawaii Aviation 2015b:7).

In 1947, following the end of World War II, the John Rodgers Airport was returned to the Territory of Hawaii and renamed the Honolulu Airport. The airport continued to expand. “By 1950, the boundaries of Honolulu Airport, including the Seadrome channels, comprised an area of 1,019.476 acres” (Hawaii Aviation 2015c:1). By 1951, the Honolulu Airport traffic began to increase, forcing new demands on the airport terminal. Not only did this result in a name change to the Honolulu International Airport, but it also involved the development of a runway connecting the airport and the former Hickam Air Force Base (AFB) (now Joint Base Pearl Harbor-Hickam [JBPHH]), creating one of the longest runways in the world at the time (Hawaii Aviation 2015c) (Figure 15, Figure 17).

The 1953 USGS map (Figure 16) shows urban development largely associated with the “Damon Tract,” which includes a portion of the western project area. The Damon Tract was an extensive area of low income housing owned by the Trustees of the Damon Estate until 1956, when they sold the entire tract to Kan Jung Luke and Mrs. Lilian Tom Loo (Cooper and Daws 1990:301). The Tract was also known as the Kaloaloa Neighborhood, taking its name from the nearby elementary school (torn down in 1960), which was named for the already gone Kaloaloa Fishpond. Life in the Damon Tract was fondly remembered, as in the following song by the hula instructor, composer, recording artist, musician, and entertainer John Piilani Watkins (Hawaiian Music Hall of Fame 2012):

“Kaloaloa”

Kaulana mai nei ‘o Kaloaloa la, eaea

‘Opu‘u kaimana pua kalaunu la, eaea.

Ke kani kapalulu kahi mokulele la,eaea

‘O ku‘u aloha a‘e keia la, eaea.

Ho‘okipa ‘ia mai ke aloha la, eaea

Me pua kalaunu kau i ka ‘iu la, eaea.

Ha‘ina ‘ia mai ana ka puana la, eaea

‘Opu‘u kaimana e hulali nei la, eaea.

Figure 15. Aerial photograph of the Honolulu International Airport on 26 December 1951 showing the joining runways with Hickam Air Force Base; north is to the right (Hawaii Aviation 2015c)

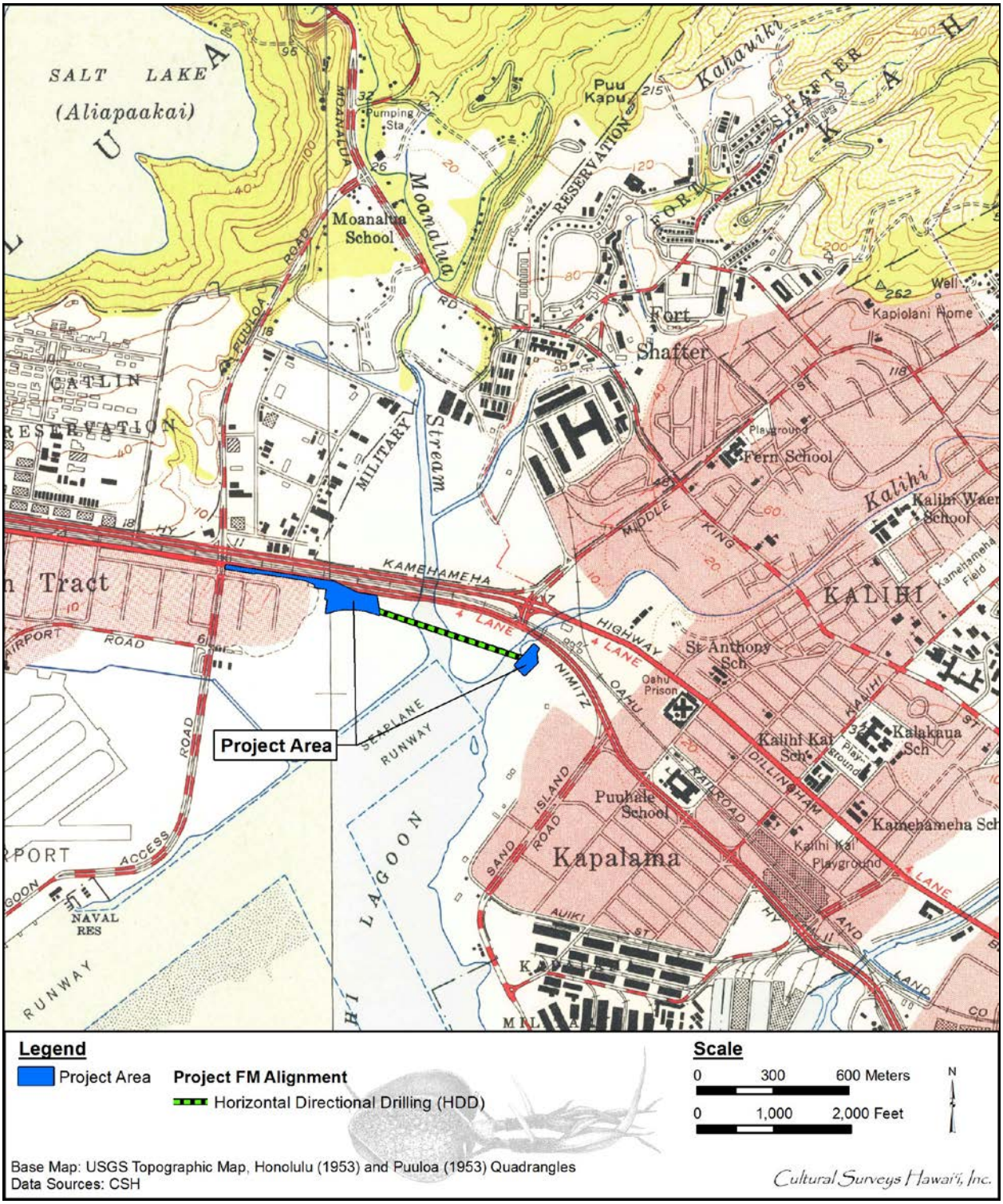


Figure 16. Portion of the 1953 USGS topographic Honolulu and Puuloa quadrangles, showing the project area in relation to the Honolulu International Airport

Figure 17. 1962 aerial photograph of the Honolulu International Airport, view to southwest (Hawaii Aviation 2015e)

The Damon Tract was famous for its crown flowers, which the song compares to diamond gems (Hawaiian Music Hall of Fame 2012). When the new owners tripled the land rent, sale prices also tripled within a few months:

> One hundred and sixty three families found their leases terminated abruptly and the total value of all the ‘improvements’ that the entire sixty families had put in were to be compensated for by exactly one dollar! [*Honolulu Record* 1957:10 (20):7]

The very substantial fill activities, including the filling of Kaloaloa Fishpond, Ka‘ihikapu Fishpond, and Lelepaua Fishpond, and construction associated with the development of the John Rodgers Airport and the neighboring Hickam AFB in 1942-1943, are readily apparent when comparing early maps and photographs. It is unknown whether the fishpond walls were preserved or destroyed during the land reclamation and filling activities associated with construction.

2.1.5.2 Keehi Lagoon Beach Park

A portion of the western project area is within Keehi Lagoon Beach Park, while horizontal drilling will occur beneath the adjacent Pacific War Memorial Site (Figure 18). Keehi Lagoon Beach Park comprises approximately 70 acres operated and maintained by the City Department of Parks and Recreation. It contains 12 tennis courts, a baseball diamond, walking trails, picnic areas, restrooms, and access to the ocean (Figure 19 and Figure 20). Adjacent to the Beach Park is the Pacific War Memorial Site (Disabled American Veterans Keehi Lagoon Memorial). Although loosely referred to as a park in various planning documents prepared by the Ke‘ehi Memorial Organization and the Hawai‘i Disables American Veterans (KMO-DAV), which manage the property for the Department of Lands and Natural Resources Parks Division, the property has not been designated for park or recreational use by the governor, nor is it listed in the state’s inventory of parks. The Memorial comprises approximately 11 acres and is managed for multiple uses, including both memorial and recreational uses. Facilities on the property include a rental office, memorial obelisk, community centers with meeting rooms, the DAV headquarters, a storage building, a rehabilitation facility, and two chapels. In addition, the property also contains a basketball/volleyball court, a grass field with a baseball backstop, small pavilions, and a picnic area (SMA 2013).

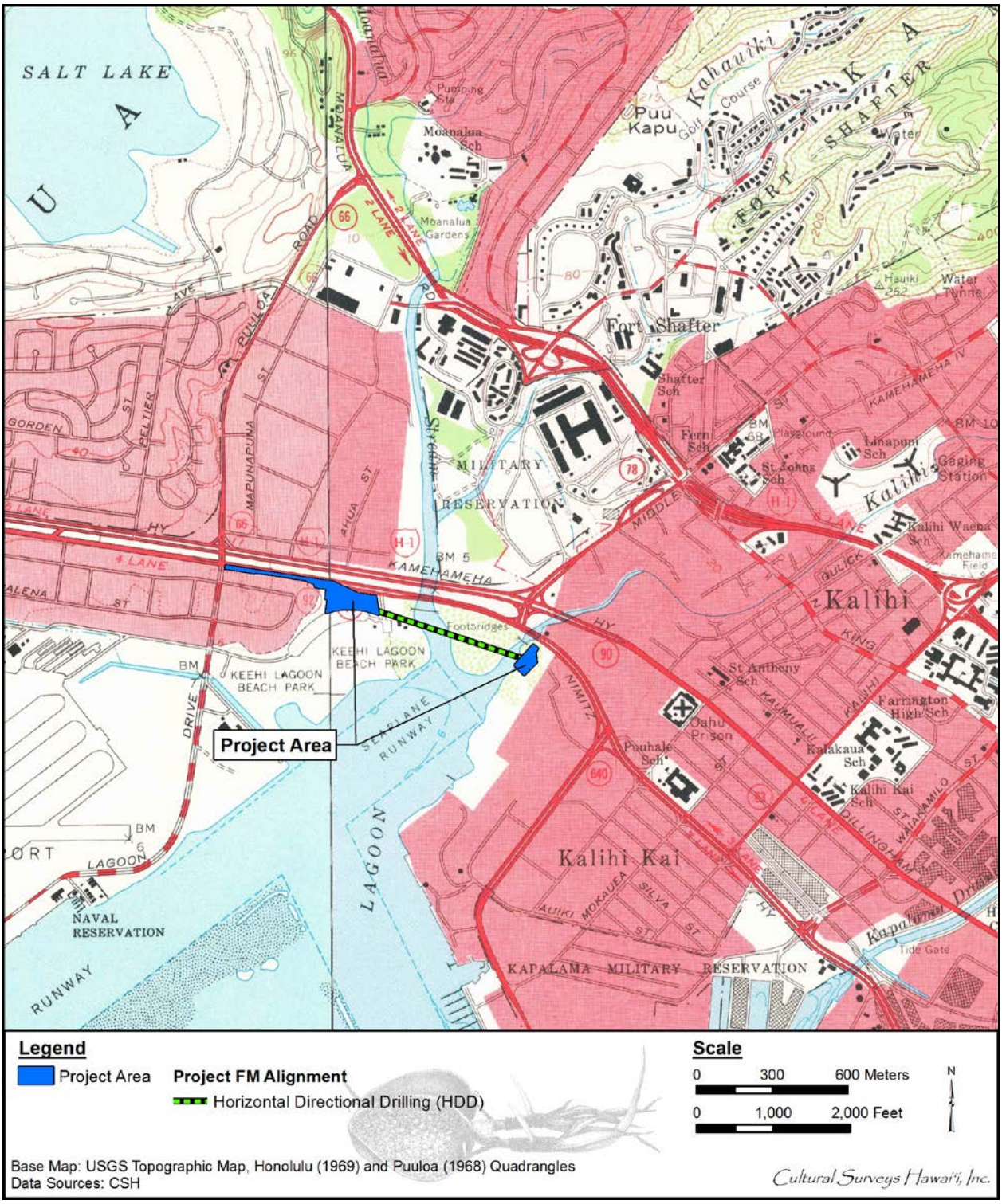
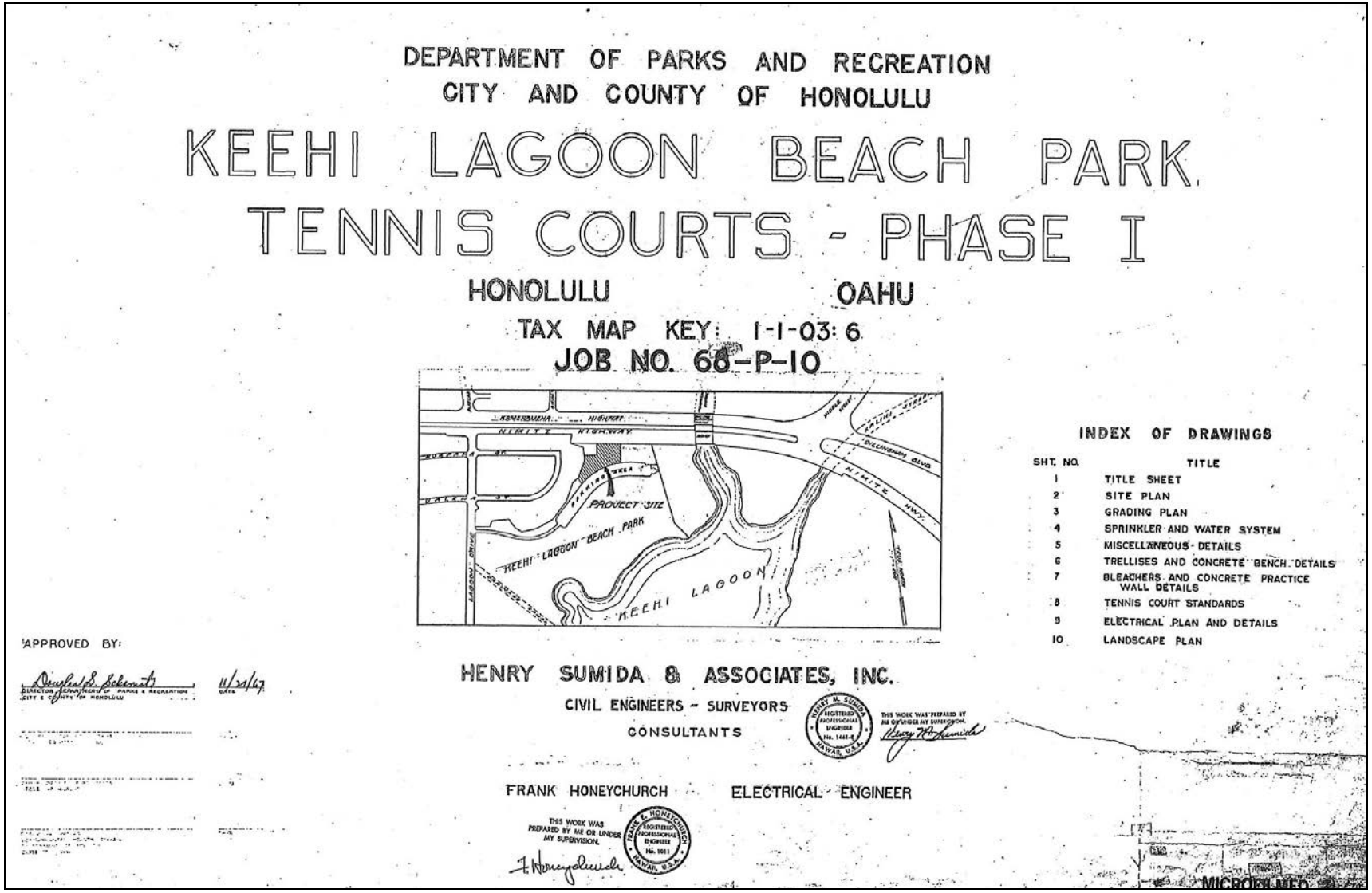


Figure 18. 1968 Honolulu and 1969 Puuloa USGS topographic quadrangles



DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

KEEHI LAGOON BEACH PARK
TENNIS COURTS - PHASE I

HONOLULU OAHU

TAX MAP KEY: 1-1-03: 6

JOB NO. 68-P-10

KAMEHAMEHA HIGHWAY
NIMITZ HIGHWAY
PARKING AREA
PROJECT SITE
KEEHI LAGOON BEACH PARK
KEEHI LAGOON
LAGOON DRIVE
DALEIGHAWAY BLVD
NIMITZ HWY.

INDEX OF DRAWINGS

SHT. NO.	TITLE
1	TITLE SHEET
2	SITE PLAN
3	GRADING PLAN
4	SPRINKLER AND WATER SYSTEM
5	MISCELLANEOUS DETAILS
6	TRELLISES AND CONCRETE BENCH DETAILS
7	BLEACHERS AND CONCRETE PRACTICE WALL DETAILS
8	TENNIS COURT STANDARDS
9	ELECTRICAL PLAN AND DETAILS
10	LANDSCAPE PLAN

APPROVED BY:
DIRECTOR, DEPARTMENT OF PARKS & RECREATION
CITY & COUNTY OF HONOLULU
DATE 11/21/67

HENRY SUMIDA & ASSOCIATES, INC.
CIVIL ENGINEERS - SURVEYORS
CONSULTANTS

FRANK HONEYCHURCH ELECTRICAL ENGINEER

Figure 19. Cover page for Keehi Lagoon Beach Park – Phase 1 plans dated 21 November 1967

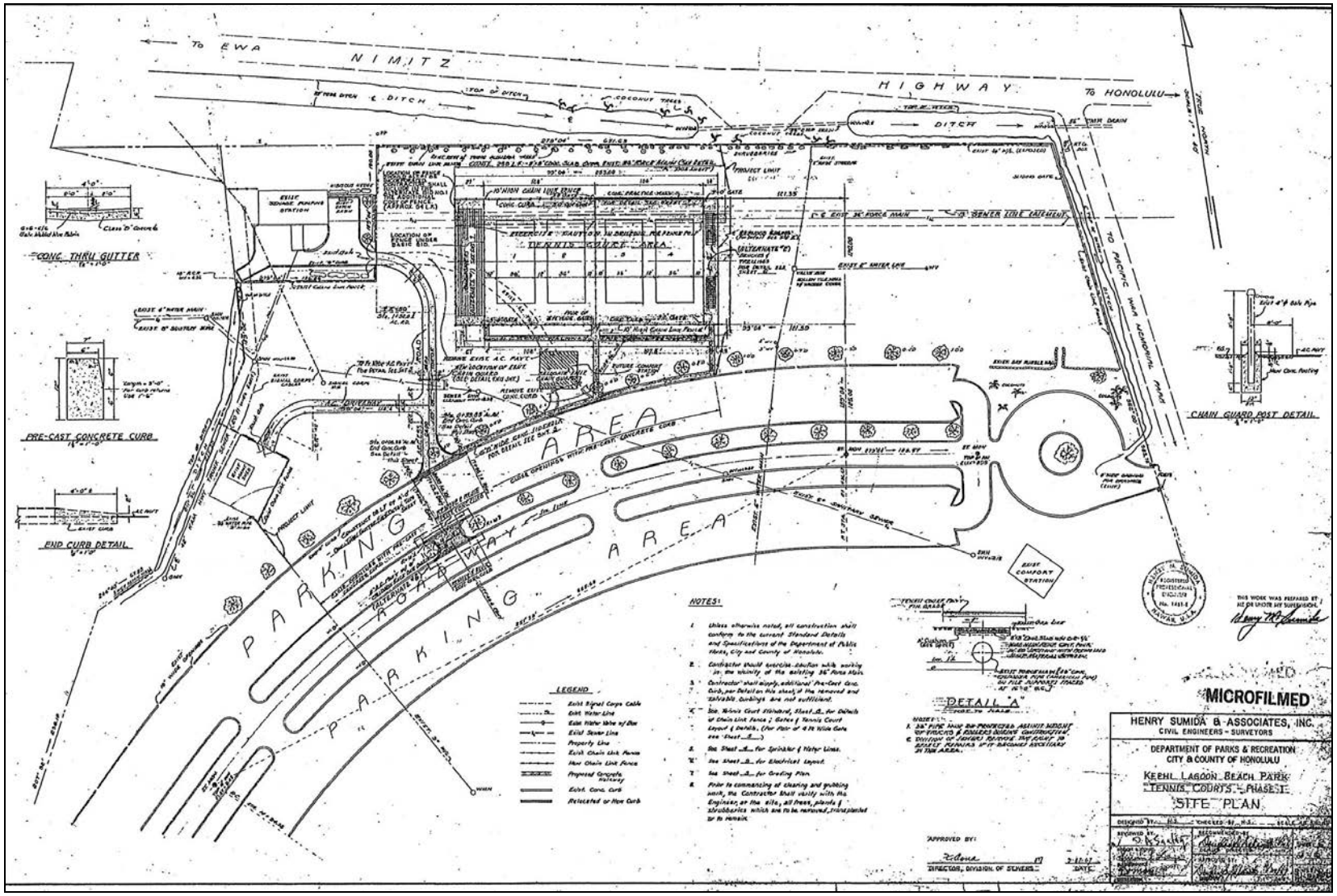


Figure 20. Site Plan for Keehi Lagoon Beach Park

Section 3 Previous Archaeological Research

Previous archaeological studies in the vicinity of the project area are summarized in Table 1 and depicted on Figure 21. Previously identified historic properties in the vicinity are summarized in Table 2 and are depicted on Figure 22. A synopsis of prior studies in the vicinity follows.

3.1 Early Studies in the Vicinity of the Project Area

3.1.1 McAllister (1933)

In 1930, J. Gilbert McAllister of the Bishop Museum conducted a comprehensive survey of archaeological sites on O‘ahu. McAllister (1933) recorded the approximate location and described the condition of 19 sites within Moanalua Ahupua‘a. Of the 19, seven were in the immediate vicinity of the current project area. These are described below.

> Site 73. Ananoho fishpond, is an oval-shaped pond 52 acres in area. The walls approximate 4700 feet in length, and average 6 feet in width. They are primarily of coral and average 3 feet in height. There are now two houses on the wall, but houses and makaha are modern. Auiki is a small adjoining pond partly filled. It is 12 acres in area with a 900-foot wall. [McAllister 1933:90]
>
> Site 74. Pahouiki, Pahonui, and Apili, three adjoining fishponds off Kalihi. Pahouiki is the smallest, being 14 acres in area with a wall 1,050 feet in length. The wall is of coral, with one house and two *makaha*. now. It is open to Pahounui, a pond of 26 acres with a wall 2,600 feet long. The walls are also of coral with one house and two *makaha*. It adjoins but does not open to Apili pond, which is 28 acres in extent, with a wall 1,500 feet long. [McAllister 1933:91]
>
> Site 75. Weli fishpond, between Kahauiki and Mokumoa Island. Said to be 30 acres in area. The greater part of its walls appear to be earth embankments, mostly natural. It is now separated from Kaikikapu pond by a roadway. Kaikikapu is 20 acres in area with a wall from Mokumoa Island to Moanalua 900 feet long. [McAllister 1933:91]
>
> Site 76. Oven (*imu*), Moanalua gardens. A story is told by Namakahelu relating to an old imu which was once which was once in the Moanalua gardens at the present [circa 1931] site of the Damon “Chinese house . . .” [McAllister 1933:91–92].
>
> Site 78. Mapunapuna fishpond, Moanalua. The pond is 40 acres in area with a wall 1,600 feet long. The wall, 10 feet wide, 1 foot above the water on the inside, and 2.5 feet high outside, is almost straight, inclosing a small inlet. There are now four outlets (*makaha*). The wall is principally of coral. Adjoining it on the landward side and near the Damons’ house, is a small pond said to have been called Keawamalia. It is surrounded by earth embankments. [McAllister 1933:93]

Table 1. Previous archaeological studies in the vicinity of the project area

Source	Type of Investigation	Project Location	Results (SIHP # 50-80-14)
McAllister 1933	Archaeological reconnaissance	O‘ahu Island	Documented seven historic properties near current project area: Auiki and Anaho fishponds (Site 73), Apili, Pahouiki and Pahounui fishponds (Site 74), Weli Fishpond (Site 75), an *imu* or earth oven (Site 76), Mapunapuna Fishpond (Site 78), Awaawaloa Fishpond (Site 79), and Kaloaloa Fishpond (Site 80)
Rosendahl 1977	Archaeological inventory and evaluation	U.S. Army Support Command, Hawaii (USASCH) Installations	Study addresses a number of military installations, including Fort Shafter north of current project area; no historic properties identified near current project area
Hammatt 1986	Archaeological reconnaissance	TMKs: [1] 1-2-024: 36 por. and 37 por., parcels on Sand Island proposed for U.S. Postal Service use	Determined entire study area consisted of imported fill associated with development of Honolulu Harbor; no further archaeological work recommended
Landrum and Klieger 1991	Historical literature review	City Bus Repair Facility, TMK: [1] 1-2-016:007	Historical research indicated area a prominent traditional Hawaiian agricultural complex during pre- and early post-Contact periods
Wickler et al. 1991	Archaeological monitoring	Fort Shafter Flats	No historic properties identified
Hammatt and Folk 1992	Burial treatment plan	City Bus Repair Facility, TMK: [1] 1-2-016:007	Addresses burial components of SIHP # -4525 (see Folk et al. 1993 below)
Folk and Hammatt 1993	Mitigation plan	City Bus Repair Facility, TMK: [1] 1-2-016:007	Mitigation plan for SIHP # -4525 (see above) describes strategy for disinterment of human burials
Folk et al. 1993	Archaeological inventory survey	City Bus Repair Facility, TMK: [1] 1-2-016:007	One historic property identified: SIHP # -4525, a post-Contact cultural layer containing three human burials, two of which in coffins

Source	Type of Investigation	Project Location	Results (SIHP # 50-80-14)
Williams and Anderson 1997	Archaeological monitoring and sampling	Shafter Flats	No historic properties identified
Erkelens and Tomonari-Tuggle 2000	Archaeological subsurface testing	Fort Shafter Flats	Testing at six locations revealed no significant historic properties
Tomonari-Tuggle et al. 2000	Inventory of historic properties	Fort Shafter	Recorded 21 new and seven previously identified historic properties; most common formal types structural rock features, rock shelters, and military sites
Athens and Ward 2002	Paleoenvironmental study	Auiki and Ananoho fishponds	Analysis of five sediment cores extracted from SIHP # -0073 identified layer compatible with fishpond origin
Hammatt and Shideler 2002	Archaeological inventory survey (literature review and field inspection; recorded as an archaeological assessment)	Proposed Middle St Transit Center, TMKs: [1] 1-2-018:001–003 and 008–010	Recommended inventory survey
Moore et al. 2004	Archaeological inventory survey	Property along Ke‘ehi Lagoon	Pollen and radiocarbon dating of geotechnical boring sample from location of Pahounui and Apili fishponds (SIHP # -0074) documented sediments deposited prior to Hawaiian arrival in islands
Dega and Davis 2005	Archaeological inventory survey	Proposed Middle St Intermodal Center, near intersection of Middle St and Dillingham Blvd	One historic property identified: SIHP # -6683, a subsurface historic refuse pit and material remains associated with a slaughterhouse
Athens and Ward 2007	Paleoenvironmental study	Ananoho Fishpond	Analysis of two sediment cores from SIHP # -0073 indicated stratigraphic integrity compromised

Source	Type of Investigation	Project Location	Results (SIHP # 50-80-14)
Kahahane and Cleghorn 2008	Archaeological inventory survey (recorded as an archaeological assessment)	Oahu Community Correctional Center	Review of photographs indicated no potential for surface historic properties and low likelihood of subsurface historic properties
Dey and Hammatt 2009	Archaeological monitoring	Middle Stt, by H-1 Freeway	No historic properties identified; very little natural sediment observed
Pestana and Spear 2009	Archaeological monitoring	TMKs: [1] 1-2-015 and 016; 3-1-001: various parcels	No significant historic properties identified; isolated deposits of historic artifacts (e.g., glass bottles, ceramics) identified in disturbed contexts
Hunkin et al. 2012	Archaeological monitoring	Kalihi/ Nu‘uanu Sewer Rehabilitation	Isolated human skeletal fragment (no SIHP number assigned)
Athens and Ward 2013	Archaeological inventory survey	Runway Safety Areas 22R and 22L, NE Honolulu International Airport, TMK: [1] 1-1-003:001	Kaloaloa Fishpond Cores indicated intact sediments likely; useful data not present
Hammatt 2013	Archaeological inventory survey	City Center (Section 4) of the Honolulu High-Capacity Transit Corridor project	Documented seven new and 12 previously identified historic properties; SIHP # -7425 (*imu*) approx. 450 m east of current project area
Hammatt et al. 2013	Archaeological inventory survey	Airport (Section 3) of the Honolulu High-Capacity Transit Corridor project	Documented two newly identified historic properties: SIHP # -7420, historic roadway remnants, and SIHP # -7421, buried concrete, a crushed coral road surface, and base course associated with foundation and road surface
Vernon et al. 2015	Archaeological monitoring	Intersection of Auiki and Mokauea streets	No significant historic properties identified; 52 isolated historic artifacts documented

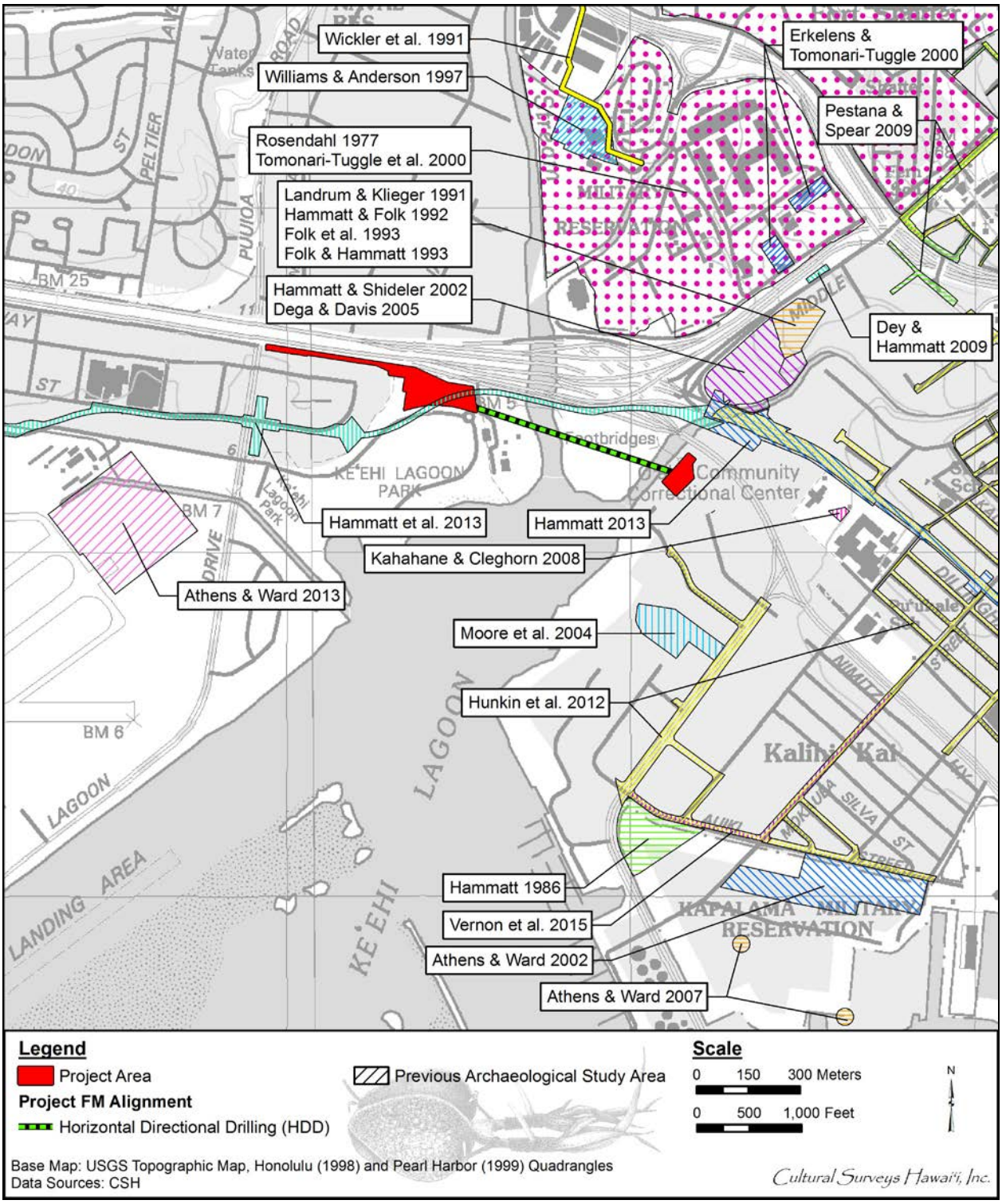


Figure 21. Previous archaeological studies in the immediate vicinity of the project area

Table 2. Previously identified historic properties in the vicinity of the current project area

SIHP # 50-80-14-	Nature of Historic Property	Comments	Source
0073	Auiki and Ananoho fishponds	Ananoho fishpond is an oval-shaped pond comprising 52 acres in area. The walls approximate 4,700 feet in length and average 6 feet in width. They are primarily composed of coral and average 3 feet in height. There are now two houses on the wall, but houses and *mākāhā* (outlets) are modern. Auiki is a small adjoining pond that has been partly filled. It comprises 12 acres in area, with a 900-foot wall.	McAllister 1933:90
0074	Apili, Pahouiki, and Pahounui fishponds	These are three adjoining fishponds off Kalihi. Pahouiki is the smallest, comprising 14 acres in area, with a wall 1,050 feet in length. The wall is made of coral, with one house and two *mākāhā*. It is open to Pahounui, a pond of 26 acres with a wall 2,600 feet long. The walls are also of coral, with one house and two *mākāhā*. It adjoins but does not open to Apili pond, which is 28 acres in extent, with a wall 1,500 feet long.	McAllister 1933:91
0075	Weli Fishpond	Weli fishpond, between Kahauiki and Mokumoa Island, is said to be 30 acres in area. The greater part of its walls appear to be earth embankments, mostly natural.	McAllister 1933:91
0076	*Imu* (earth oven)	This oven (*imu*) was identified in Moanalua Gardens. A story is told by Namakahelu relating to an old *imu*, which was once in the Moanalua Gardens at the present [circa 1931] site of the Damon “Chinese house”	McAllister 1933:91–92
0078	Mapunapuna Fishpond	The pond is 40 acres in area, with a wall 1,600 feet long. The wall, 10 feet wide, 1 foot above the water on the inside, and 2.5 feet high outside, is almost straight, enclosing a small inlet. There are now four *mākāhā*. The wall is principally made of coral. Adjoining it on the inland side and near the Damons’ house is a small pond said to have been called Keawamalia. It is surrounded by earth embankments.	McAllister 1933:93

SIHP # 50-80-14-	Nature of Historic Property	Comments	Source
13-0079	Awaawaloa Fishpond	This is a small 8.8-acre pond with a coral rock wall 900 feet long. There are now two *mākāhā*.	McAllister 1933
13-0080	Kaloaloa Fishpond	This pond comprises 36 acres in area, with a semicircular wall 2,700 feet long and with coral walls measuring 6 feet wide and 3 feet high, and three *mākāhā*.	McAllister 1933; Athens and Ward 2013
4525	Subsurface cultural layer	This is a post-Contact cultural layer containing three human burials, two of which were in coffins.	Folk et al. 1993
5365	Kaikikapu Fishpond	This pond comprised approximately 20 acres and was connected to Weli Pond.	McAllister 1933:91
6683	Historic trash pit	Historic-era refuse pit and material remains associated with the site’s use by slaughterhouse and cold storage companies.	Dega and Davis 2005
7425	Subsurface fire feature remnant	Subsurface *imu* feature	Hammatt 2013

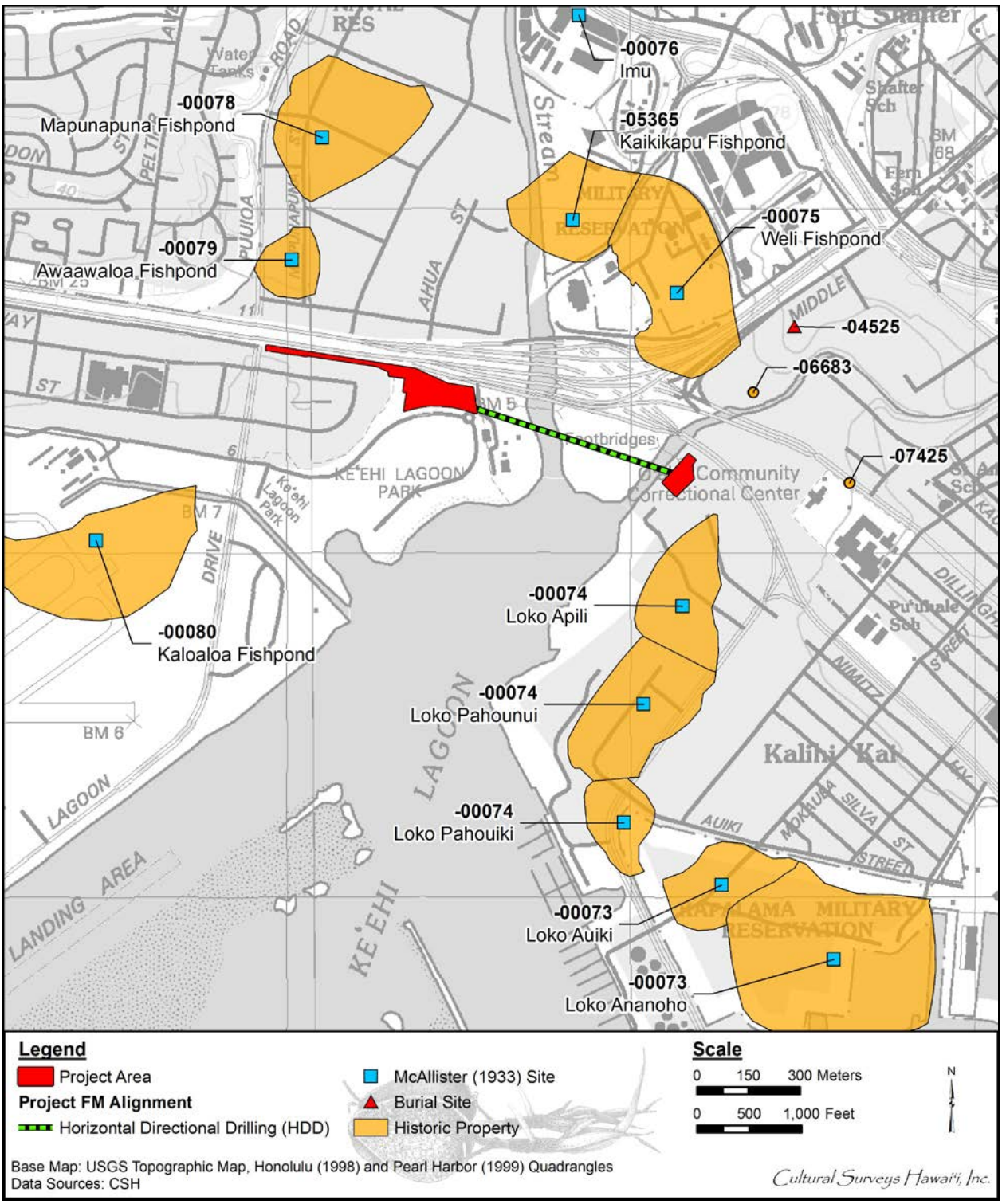


Figure 22. Previously identified historic properties in the immediate vicinity of the project area

> Site 79, Awaawaloa Fishpond, is a small 8.8-acre pond with a coral rock wall 900 feet long. There are now two outlets (*makaha*). The wall is broken. The adjoining pond, known as Ahua, is said to be recent [McAllister 1933:93]

Site 80, Kaloaloa Fishpond, is located east of the project area and was described by McAllister (1933:93) as being “36 acres in area, with a semicircular wall 2700 feet long” with coral walls measuring 6 ft wide and 3 ft high, and “three outlets (*makaha*)” (McAllister 1933:93).

3.2 Recent Archaeological Studies in the Vicinity of the Project Area

3.2.1 Rosendahl 1977

Paul Rosendahl (then with the Bernice Pauahi Bishop Museum) carried out an archaeological inventory and evaluation report for a number of military installations, including Fort Shafter north of the current project area. At Fort Shafter, Rosendahl (1977:2–37) discusses five historic properties, of which only two were actually seen. Rosendahl (1977:2–37) reports McAllister’s (1933) Weli Fishpond (SIHP # -0075) and McAllister’s *heiau* (pre-Christian place of worship) site (SIHP # -86) as destroyed. Rosendahl also identified no evidence of a reported burial ground and posits it was possibly destroyed. Two historic properties were newly reported: SIHP # -9502, reported as a Kahauiki occupation complex on the northwest branch of Kahauiki Stream Gulch, and SIHP # -9503, Kahauiki dryland agricultural terraces adjacent to Area 1200 housing. Neither were in close proximity to the current project area.

3.2.2 Hammatt 1986

In 1986, CSH conducted an archaeological reconnaissance of TMKs: [1] 1-2-024:036 por. and 037 por. on Sand Island. Surface investigations determined the entire land surface of the study area consisted of dredged fill material derived from the expansion and improvement of Honolulu Harbor. No additional archaeological work was recommended for the study area.

3.2.3 Wickler et al. 1991

In 1991, International Archaeological Research Institute, Inc. (IARII) conducted archaeological monitoring of sewer line repairs between Tripler Army Medical Center and Fort Shafter, within an area commonly referred to as the Fort Shafter Flats. No historic properties were observed during archaeological monitoring, although sediments indicative of wetland taro cultivation were encountered throughout most of the study area. These sediments were underlying historic fill material, which forms the present ground surface. A radiocarbon date of AD 769-997 obtained from sediments directly beneath the potential agricultural sediments suggests a late pre-Contact to post-Contact age for pond-field agriculture in the area (Wickler et al. 1991:53).

3.2.4 City and County of Honolulu Bus Repair Shop Facility in Kalihi (Landrum and Klieger 1991, Hammatt and Folk 1992, 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 4.2-acre City and County of Honolulu Bus Repair Shop Facility at 711 Middle Street in Kalihi, O‘ahu (TMK: [1] 1-2-016:017). Beginning in 1991,

the studies for this 4.2-acre lot included a historical literature search (Landrum and Klieger 1991); an archaeological inventory survey with subsurface testing (Folk et al. 1993); a burial treatment plan (Hammatt and Folk 1992); and a mitigation plan (Folk and Hammatt 1993). During the historical literature research, it was found that the project area was used extensively for habitation and agriculture from the pre-Contact period through the late 1800s. This was due in part to its proximity to the Weli Fishpond. The research did not identify any existing archaeological remains (Landrum and Klieger 1991:35). During the archaeological inventory survey, 19 trenches were excavated by backhoe. Three burials were exposed during testing; these included two coffin burials and one burial without a coffin. The burials were situated between 0.6 and 1.1 m below the existing ground surface and were within a reddish-brown silty clay loam buried A horizon (former land surface), which was capped by modern fill. In addition, a cultural layer was identified. The burials and cultural layer were assigned SIHP # 50-80-14-4525 (Folk et al. 1993:28). Based on recommendations during the AIS, a burial treatment plan was written to address the human remains, and a mitigation plan was written to address any potential impacts during facilities construction.

3.2.5 Williams and Anderson 1997

Ogden Environmental and Energy Services Company, Inc. reported on archaeological monitoring and sampling during construction for a warehouse/administrative facility within the Fort Shafter Flats (Williams and Anderson 1997). No historic properties were observed during monitoring of building footing excavations, nor during the collection of sample cores. Sample core analysis suggested the Shafter Flats area is composed of “mixed sediments, primarily terrigenous in origin, deposited by an active meandering stream in a channel or valley that had been cut during a lower stand of the sea” (Williams and Anderson 1997:51). Williams and Anderson (1997) concluded the Fort Shafter Flats area is “made up of a series of deposits representing repeated erosion and re-deposition, thus making it less than ideal for studying paleoenvironmental and anthropogenic change” (Williams and Anderson 1997:i).

3.2.6 Erkelens and Tomonari-Tuggle 2000

In 1995, IARII conducted subsurface testing at project areas for two proposed buildings at the U.S. Army Reserve Training Facility at Fort Shafter Flats (Erkelens and Tomonari-Tuggle 2000). No significant historic properties were documented. On-call monitoring was recommended to ensure possible unidentified archaeological deposits or burials were treated in a manner consistent with historic preservation legislation.

3.2.7 Tomonari-Tuggle et al. 2000

During 1995–1996, IARII performed an evaluation of historic properties at Fort Shafter. Background archival research was conducted, and fieldwork consisted of a pedestrian survey of lands potentially undamaged by development. Limited subsurface testing of developed land and of historic properties identified during the survey was also carried out. Twenty-one new and seven previously identified historic properties were investigated during the survey. The three most common types were structural rock features, rock shelters, and military sites.

3.2.8 Athens and Ward 2002

IARII conducted a paleoenvironmental study of the now filled Auiki and Ananoho fishponds (SIHP # -0073) (Athens and Ward 2002). Sedimentary analysis performed on five sediment cores identified a layer with characteristics compatible with a fishpond origin. These characteristics include the physical/textural qualities of the sediment and its depth below mean sea level. Pollen analysis of the cores indicated the putative fishpond sediment and the underlying layer either dated to the historic period or had been disturbed during that time. Because a historic date for the construction of the fishponds seems unlikely, Athens and Ward (2002:iii) conclude the putative fishpond layer is a fill deposit or was subjected to significant disturbance when the ponds were filled. They recommend future additional coring in the *makai* portions of the two fishponds, where disturbance may have been less severe.

3.2.9 Vicinity of the Middle Street Transit Center Station (Hammatt and Shideler 2002, Dega and Davis 2005)

In a locale adjacent to the southwest portion of the 711 Middle Street facility, including the immediate vicinity of the proposed Middle Street Transit Center Station, several studies were undertaken based on historic properties identified and information collected during the investigations for the Bus Repair Shop Facility. These studies included an archaeological assessment (Hammatt and Shideler 2002) and a follow-up inventory survey with subsurface testing (Dega and Davis 2005). The archaeological assessment uncovered no new data regarding their project area; however, it was recommended that a program of subsurface testing be implemented to provide paleoenvironmental information, particularly in regards to Waikulu Fishpond, which historical records indicate was under the southern half of the subject parcel (Hammatt and Shideler 2002). Scientific Consultant Services, Inc. (SCS) was contracted to perform the archaeological inventory survey with subsurface testing to mitigate the potential impacts to Waikulu Fishpond. Although many sediment samples were taken, it was impossible to distinguish between naturally deposited stream sediments and fishpond sediments in that project area. Evidence of pre-Contact cultural activity was inconclusive; however, evidence of historic-era industrial activity was abundant and was designated as SIHP # -6683 (Dega and Davis 2005:42). SIHP # -6683 comprises a subsurface historic refuse pit and material remains associated with a slaughterhouse.

3.2.10 Sand Island Access Road (Moore et al. 2004)

In 1999, Archaeological Consultants of the Pacific, Inc. completed an inventory survey for a property along Ke‘ehi Lagoon in the previous location of Pahounui and Apili fishponds in Kalihi Kai. Subsurface testing identified one historic property, SIHP # -0074, three contiguous fishponds (Apili, Pāhounui, and Pāhouiki), originally identified by McAllister (1933) but filled in by the mid-twentieth century during the industrial development of coastal Kalihi. Moore et al. (2004) identified the subsurface remnants of Apili and Pāhounui fishponds, which comprised buried fishpond sediments. Pollen and radiocarbon analyses of a geotechnical boring sample documented sediments deposited prior to Hawaiian arrival in the islands (BC 2602-2429).

3.2.11 Athens and Ward 2007

IARII conducted a paleoenvironmental study of Ananoho Fishpond (SIHP # -0073) (Athens and Ward 2007). Two sediment cores were recovered from the fishpond, at the former Kapalama Military Reservation. A single layer within each core was determined to be the most likely candidate for fishpond sediment. Dating and pollen analyses were performed on one of the cores, but the resulting date (ca. 5000 cal. BP) was too old to be useful. Incongruously, pollen analysis showed an abundance of naturalized species at the same interval, suggesting there had been considerable mixing of older and younger sediments. Athens and Ward (2007:iii) conclude, based on this study and a previous study (Athens and Ward 2002), that all evidence of the former fishpond has disappeared or been compromised as a result of the industrial development undertaken in the 1940s and 1950s.

3.2.12 Kahahane and Cleghorn 2008

Pacific Legacy, Inc. conducted an archaeological assessment for the construction of a prefabricated temporary structure at the Oahu Community Correctional Center in Kalihi (Kahahane and Cleghorn 2008). Photographs of the area indicated no potential for surface historic properties and an extremely low likelihood for subsurface historic properties. No field survey was conducted, and no further work was recommended.

3.2.13 Dey and Hammatt 2009

CSH performed archaeological monitoring for the Traffic Management System PH 1 project at Middle Street, near the H-1 Freeway (Dey and Hammatt 2009). No historic properties were identified. The subsurface deposits consisted of landscaping and imported gravel fill layers above naturally deposited clay sediment and bedrock. In general, very little natural sediment was observed.

3.2.14 Pestana and Spear 2009

SCS conducted archaeological monitoring along several residential streets in Kalihi for the final phase of the Board of Water Supply’s Kalihi Water System Improvement project (Pestana and Spear 2009). No significant historic properties were identified, although isolated deposits of historic artifacts (e.g., glass bottles, ceramics) were observed in disturbed subsurface contexts.

3.2.15 Hunkin et al. 2012

CSH conducted archaeological monitoring for Phase 1 of the Kalihi/Nu‘uanu Sewer Rehabilitation project (Hunkin et al. 2012). No cultural deposits or features were identified. The observed subsurface deposits appeared to have been disturbed by previous land use, which likely included extensive earthmoving activity and the importation of fill sediments. A single human bone fragment was discovered in fill material (no SIHP # assigned). Custody of the skeletal fragment was transferred to the SHPD.

3.2.16 Athens and Ward 2013

IARII (Athens and Ward 2013) conducted an archaeological inventory survey for Runway Safety Areas 22R and 22L in the northeast corner of Honolulu International Airport (TMK: [1]

1-1-003:001) immediately southwest of the present project area. Subsurface fieldwork consisted of five 3.5-inch diameter paleoenvironmental cores within the former Kaloaloa Fishpond (SIHP # -0080). The study obtained radiocarbon dates indicating stratigraphic inversions, as well as plentiful pollen from historically introduced species in the possible fishpond layer and the underlying marine layer. The study concluded soil deposits had likely been compromised through dredging and filling operations.

3.2.17 Hammatt 2013

CSH performed an archaeological inventory survey for Section 4 (City Center) of the Honolulu High-Capacity Transit Corridor Project (HHCTCP) (Hammatt 2013). The city center corridor comprises the easternmost 6.9 km (4.3 miles) of the overall HHCTCP area, extending from Kalihi Stream/Middle Street Station in the west to Ala Moana Center in the east. Nineteen historic properties were identified within or immediately adjacent to the Section 4 survey area. The historic property nearest to the current project area is SIHP # -7425, a subsurface *imu* feature. SIHP # -7425 is approximately 450 m east of the current project area.

3.2.18 Hammatt et al. (2013)

Between March and October 2012, CSH conducted an archaeological inventory survey for Section 3 (Airport) of the HHCTCP (Hammatt et al. 2013). The airport corridor section of the HHCTCP project extends 4.8 miles from Aloha Stadium to approximately the Middle Street Interchange. A portion of the corridor overlapped with the current western project area (see Figure 21). The survey included 47 test excavations along the airport corridor, and two new historic properties were identified: SIHP #s -7420 and -7421. Hammatt et al. (2013:398) note, “it seems clear that the crushed coral road surface and concrete slab features of SIHP # 50-80-13-7421 relate directly to World War II activities while the SIHP # 50-80-13-7420 features may relate more to general patterns of increasing development in the 1930s to 1950s.” Neither historic property is in the immediate vicinity of the current project area.

Section 4 Results of Field Inspection

A brief field inspection was undertaken of the project lands by CSH archaeologist David W. Shideler, M.A., on 17 and 19 May 2017 and 24 June 2017. The project area was considered in terms of a western project area east of Lagoon Drive and west of the Keehi Lagoon Memorial and Moanalua Stream and an eastern project area (a JSR Equipment base yard) on the east bank of Kalihi Stream. A track log of the archaeologist's traverse of the western project area is provided in Figure 23, and a track log of the archaeologist's traverse of the eastern project area is provided in Figure 24.

The west portion of the project area was approached first from the west end by Lagoon Drive at North Nimitz Highway. For approximately 300 m east of the intersection of North Nimitz Highway and Lagoon Drive, the project area is a narrow (approximately 20 m wide) swath supporting the southern pylons of the H-1 Freeway viaduct, with a pedestrian path *makai* of Nimitz and *mauka* of a row of commercial properties (Figure 25 and Figure 26). The western project area then widens considerably, with the north side still extending along the *makai* edge of North Nimitz Highway, but with the project area expanding seaward (south) to include a complex of four tennis courts and the *mauka* lands of Ke‘ehi Lagoon Beach Park (Figure 27 through Figure 31). For most of its length, the open trenching alignment in the western project area parallels the west and south sides of a tennis court complex and then continues east toward the Ke‘ehi Lagoon Memorial and the mouth of Moanalua Stream (Figure 29 through Figure 35).

The entirety of the western open trench area and the majority of the western project area lies within Ke‘ehi Lagoon Beach Park. However, the vast majority of Ke‘ehi Lagoon Beach Park is outside the project area. While highly utilitarian, Ke‘ehi Lagoon Beach Park has a distinctive style that may merit further consideration by an architectural historian, should the present plans damage elements of the park. The most notable feature of Ke‘ehi Lagoon Beach Park within the project area is the enclosure of four tennis courts (see Figure 32 and Figure 33). While the tennis courts appear utilitarian, there are distinctive appurtenances such as the style of the adjacent drinking fountains (see Figure 33) and an adjacent seating area comprising two sets of three concrete benches, each set surrounded by eight moss rock pillars (see Figure 34 through Figure 36). The seating area is labelled "Benches & Trellises" on the Ke‘ehi Lagoon Beach Park site plan from 1967 (see Figure 20). Each of the low seating benches measures 2 ft by 7 ft and is supported by two short pillars. There are four moss rock pillars on the ‘Ewa (west) side and four on the Diamond Head (east) side of each set of three benches. Each of the 16 pillars is approximately 14 inches by 14 inches square and 8 ft 4 inches high. Each set of four pillars has a board attached at the top on the outside, as may have been intended to support a roof or trellis shade canopy (not present now).

Another potential historic property, a concrete slab on grade, was noted in the northeast corner of the western project area. The corners of the approximately 8-ft by 30-ft slab are reported as four yellow dots on Figure 23. The flat slab (Figure 37 and Figure 38) is approximately 2 inches above the surrounding ground surface and seemed unremarkable other than the presence of 12 U-shaped brackets along the perimeter (six spaced along each long side), each set in a concrete cylinder (10 inches in diameter) (Figure 39).The U-brackets are understood to have been intended to support structural posts or walls. The time period (other than post-

Figure 23. Archaeologist’s track log for the western project area

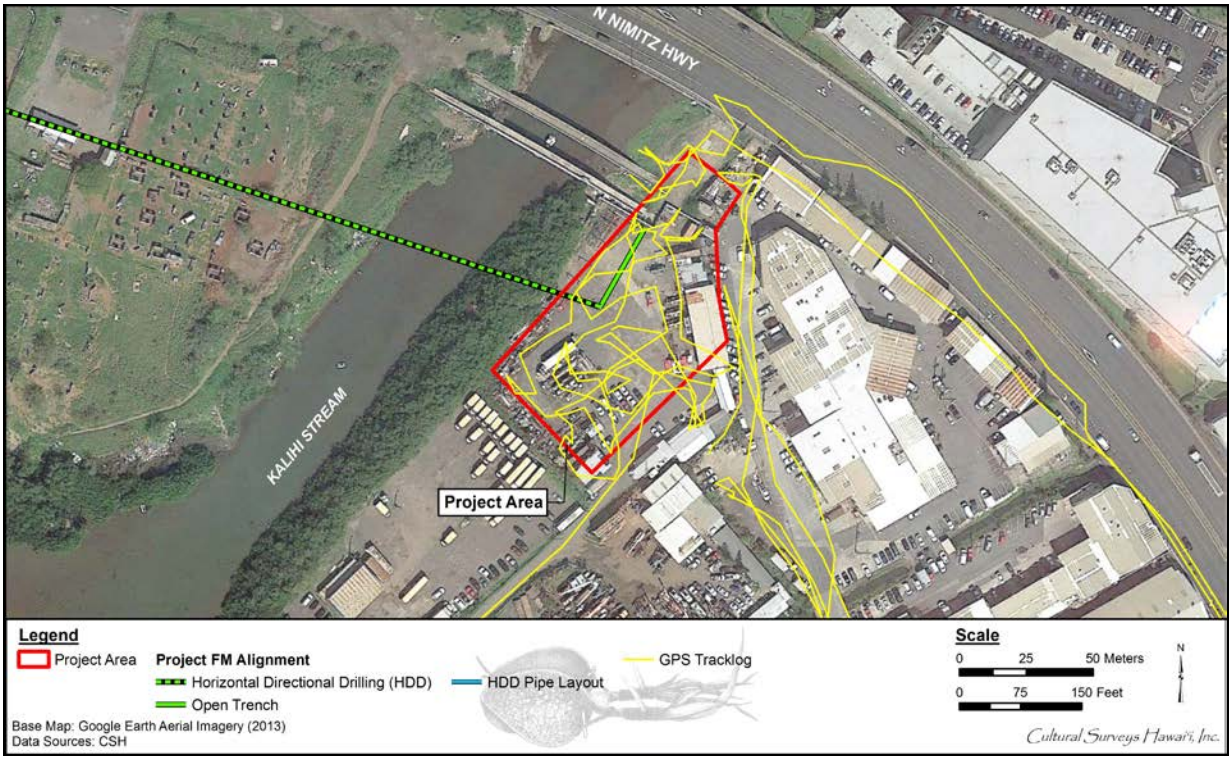


Figure 24. Archaeologist’s track log for the eastern project area

Figure 25. General view of the west end of the western project area at the intersection of North Nimitz Highway (left) and Lagoon Drive (lower right corner), view to east; the project area is a narrow swath supporting the pylons of the H-1 Freeway viaduct and a pedestrian path *makai* of Nimitz and *mauka* of a row of commercial properties

Figure 26. General view of the west portion of the western project area, which is a narrow swath supporting the pylons of the H-1 Freeway viaduct and a pedestrian path *makai* of Nimitz and *mauka* of a row of commercial properties, view to east

Figure 27. General view of the west portion of the western project area, where it widens out *makai*; tennis courts are at upper right, view to southeast

Figure 28. General view of the western project area from the southwest corner of the western project area; the proposed force main would extend along the south (*makai*) side of the tennis courts (closer to viewer) in mid-ground, view to northeast

Figure 29. General view of approximate northwest end of open trench alignment in the western project area, where the open trench will extend south (*makai*) just outside and parallel to the west side of the tennis courts, view to south

Figure 30. General view of approximate southwest corner of open trench alignment in the western project area, where the open trench will extend east just outside and parallel to the south side of the tennis courts (at upper left), view to east

Figure 31. General view of approximate east end of open trench alignment in the western project area; tennis courts are at upper right, view to west

Figure 32. General view of tennis courts from the west side, view to east

Figure 33. General view of tennis courts and distinctive water fountains from *makai*, view to north

Figure 34. General view of area of six benches and 16 pillars on east side of tennis courts, view to north

Figure 35. General view of area of six benches and 16 pillars on east side of tennis courts, view to south

Figure 36. Close-up of one of the 16 pillars on east side of tennis courts, view to west

Figure 37. View of 8-ft by 30-ft concrete slab east of the tennis courts, view to west

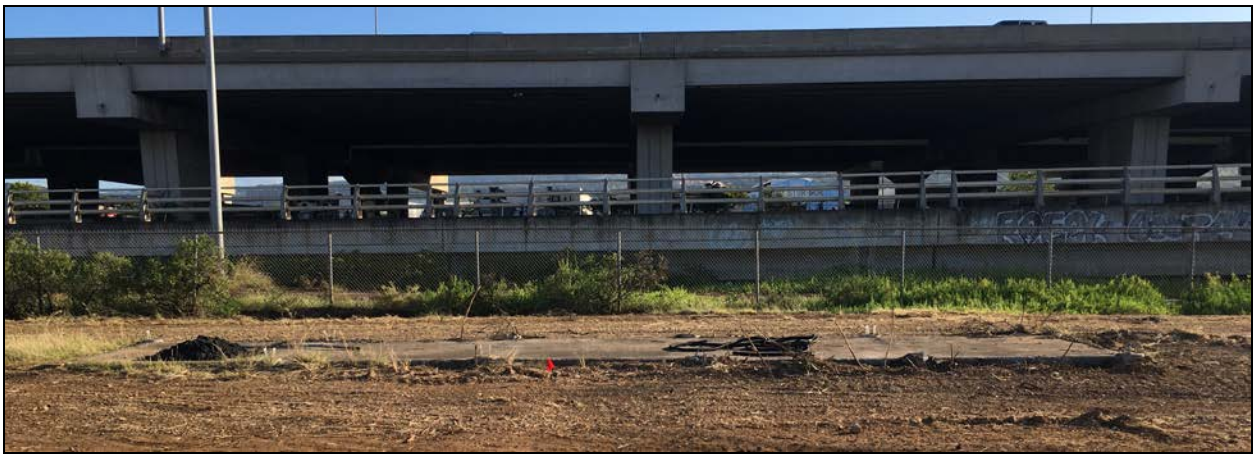


Figure 38. View of 8-ft by 30-ft concrete slab east of the tennis courts, view to north

Figure 39. Close-up view of one of 12 U-shaped brackets (six on each side) on perimeter of concrete slab (each set in a concrete cylinder 10 inches in diameter)

Figure 40.General view of eastern project area (JSR equipment), from near the south corner of that project area, view to north

Dating 1941) and purpose of the slab are unclear. Subsequent efforts to search for aerial photographs or maps depicting this small structure were unsuccessful. The nature of construction was thought likely to date from the 1940s or 1950s, and the slab was thought to have possible military associations. The indicated specific alignment of the open trenching in the western project area was followed, and nothing suggestive of archaeological concern was observed.

The eastern project area is the locus of a discrete stretch of proposed open trench excavation mostly or entirely within a JSR Equipment base yard. This base yard, on the east bank of the mouth of Kalihi Stream, includes a large stockpile of construction equipment and material (see Figure 40 through Figure 42). The JSR Equipment base yard was approached through a somewhat circuitous access from the south. The base yard includes a wide variety of construction equipment, material, and vehicles, making traverse of the base yard problematic.

The extreme north portion of the eastern project area could not be readily accessed from the JSR Equipment base yard. This area was accessed via the pedestrian bridges spanning Kalihi Stream to the west and also from the “Futura Stone” enterprise to the east. Photos of what appears to be graded fill land in the northwest side of the east project area from the pedestrian bridges and vicinity are presented in Figure 43 through Figure 45. A general view of the northeast side of the east project area is provided in Figure 46

The only historic property concerns noted in this area are the two pedestrian bridges (Figure 43, Figure 44, Figure 47, and Figure 48). The impact of the project on these bridges, if any, is unclear at this time. We note that no pedestrian bridges are depicted on the 1953 USGS map (Figure 16) but that a 1968 USGS map (Figure 18) shows one of these pedestrian bridges. It is possible the SHPD architecture branch would regard one or both of these bridges as a historic property.

Figure 41. General view of eastern project area (JSR equipment), from near the north corner of that project area, view to south

Figure 42. General view of the open trench alignment in the eastern project area, from near the north end of the open trench alignment, view to southwest

Figure 43. General view of north portion of the eastern project area from the *mauka* pedestrian bridge crossing Kalihi Stream *makai* of Nimitz Hwy (foreground), view to southeast

Figure 44. General view of north portion of the eastern project area from *makai* pedestrian bridge crossing Kalihi Stream *makai* of Nimitz Hwy (foreground) view to southeast

Figure 45. General view of north portion of the eastern project area from near pedestrian bridges over Kalihi Stream, view to southwest

Figure 46. General view of north portion of the eastern project area from near the Futura Stone entrerprise , view to southwest

Figure 47. General view of the *makai* pedestrian bridge crossing Kalihi Stream just northwest of the east project area , view from the *mauka* pedestrian bridge (at lower left), view to southeast

Figure 48. General view of the *mauka* pedestrian bridge crossing Kalihi Stream just northwest of the east project area, view to southeast

Section 5 Summary and Recommendations

5.1 Summary

At the request of CH2MHill and on behalf of the City and County of Honolulu, CSH has completed this archaeological literature review and field inspection for the Kamehameha Highway Force Main project in Moanalua and Kalihi Ahupua‘a. In general terms, the project area is just *makai* of North Nimitz Highway between Lagoon Drive on the west and Alahao Place just west of Sand Island Access Road on the east. This force main project will involve primarily horizontal directional drilling under the Keehi Lagoon Memorial, the mouth of Moanalua Stream, and the mouth of Kalihi Stream. This directional drilling is understood to be below the water table and below any culture-bearing sediments. At the two ends of the project area, spaced approximately 650 m apart, are two stretches of proposed open trench excavations. While this is one project, the spacing between the areas of open trenching and associated staging areas makes it useful to think of the project as involving effectively two discrete areas of ground disturbance to potential historic properties: a western project area between Lagoon Drive on the west and the Keehi Lagoon Memorial on the east and an eastern project area between the east bank of Kalihi Stream on the west and Alahao Place just west of Sand Island Access Road on the east.

The majority of the present project area, including the larger western project area and most of the horizontal directional drilling area, lies within the seaward portion of Moanalua Ahupua‘a, the westernmost of the traditional *ahupua‘a* of the traditional *Kona Moku*. Records of European visitors to Moanalua during the first quarter of the nineteenth century provide clear evidence that, by the time of Western Contact late in the eighteenth century, a sizeable population of Hawaiians lived within the *ahupua‘a*. Moanalua was a rich environment that, through feats of engineering and ingenuity, amplified the natural resources of the terrain. Salt Lake would have provided a valuable resource to the Hawaiians of Moanalua both before and after Western Contact, while the fishponds along the shoreline were a resource that must have greatly increased the productivity of the area.

During the Māhele of 1848, the *ahupua‘a* of Moanalua was granted to Lot Kamehameha (later Kamehameha V). Subsequently, LCAs were granted to 101 commoners for parcels they were actively cultivating or occupying; however, no *kuleana* awards were granted in the vicinity of the present project area, as it was common for the *ali‘i* and/or their *konohiki* to retain fishponds and unique cultural resources such as the coastline at the mouth of Pearl Harbor. At the end of the nineteenth century, the Honolulu Sugar Company (later Honolulu Plantation Company) began leasing portions of Moanalua for sugarcane cultivation, and the OR&L railroad line ran adjacent with the western project area, on its north side along the alignment of the present-day Nimitz Highway (Tomonari-Tuggle 1998) (see Figure 12 through Figure 14). Sugarcane planting extended seaward as far as the OR&L alignment but not into the current project area.

Substantial fill activities including the filling of the fishponds and construction of the John Rodgers Airport (later the Honolulu International Airport) are readily apparent when comparing early maps and photographs with later ones. Virtually the entire project area (the extreme west

portion of the western project area may have natural dry land) is fill land to below the water table with the fill understood as dating to 1942/1943 (compare Figure 13 and Figure 14). All of the area of proposed open trenching is post 1940 fill land (compare Figure 4 and Figure 13). The 1953 USGS map (see Figure 16) shows urban development largely associated with the “Damon Tract,” which includes a portion of the western project area. However, the majority of the western project area is within Ke‘ehi Lagoon Beach Park, while horizontal drilling will occur beneath the adjacent Pacific War Memorial Site (see Figure 18).

No historic properties have been identified previously within the project area, nor within approximately 100 m of the project area. One previous archaeological study (Hammatt et al. 2013) overlapped with a portion of the western project area, but no historic properties were recorded there. The historic properties nearest the current project area comprise former fishponds (e.g., SIHP #s -0074, -0075, -0079; now filled), a historic trash pit (SIHP # -6683), and an *imu* (SIHP # -7425). Human burials (SIHP # -4525) were discovered approximately 450 m northeast of the current project area.

A brief field inspection of the project lands was conducted by CSH archaeologist David W. Shideler, M.A., on 17 and 19 May 2017 and 23 June 2017. As mentioned above, the entirety of the western open trench area and the majority of the western project area lies within Ke‘ehi Lagoon Beach Park, although the vast majority of Ke‘ehi Lagoon Beach Park is outside the project area. The most notable feature of Ke‘ehi Lagoon Beach Park within the project area is the enclosure of four tennis courts (see Figure 32 and Figure 33). While the tennis courts appear utilitarian, there are distinctive appurtenances such as the style of the adjacent drinking fountains (see Figure 33) and an adjacent seating area comprising two sets of three concrete benches, each surrounded by eight moss rock pillars (see Figure 34 through Figure 36). This seating area is labelled “Benches & Trellises” on the Ke‘ehi Lagoon Beach Park site plan from 1967 (see Figure 20).

Another potential historic property, a concrete slab on grade, was noted in the northeast corner of the western project area. The flat slab (see Figure 37 and Figure 38) is approximately 2 inches above the surrounding ground surface and seems unremarkable other than the presence of 12 U-shaped brackets along the perimeter (six spaced along each long side), each set in a concrete cylinder (10 inches in diameter) (see Figure 39). The U-brackets are understood to have been intended to support structural posts or walls. The time period (other than post-dating 1941) and purpose of the slab are unclear, and efforts to locate aerial photographs or maps depicting this small structure were unsuccessful. The nature of construction was thought likely to date from the 1940s or 1950s, and the slab was thought to have possible military associations.

The eastern project area is the locus of a discrete stretch of proposed open trench excavation largely or entirely within a JSR Equipment base yard. The base yard includes a wide variety of construction equipment, material, and vehicles, which make traverse of the base yard problematic. The indicated specific alignment of the open trenching in the eastern project area was followed, and nothing suggestive of archaeological concern was observed.

The extreme north portion of the eastern project area was accessed via the pedestrian bridges spanning Kalihi Stream to the west and also from the “Futura Stone” enterprise to the east. The only historic property concerns noted in this area are the two pedestrian bridges (Figure 43, Figure 44, Figure 47, and Figure 48). The impact of the project on these bridges, if any, is

unclear at this time. We note that no pedestrian bridges are depicted on the 1953 USGS map (Figure 16) but that a 1968 USGS map (Figure 18) shows one of these pedestrian bridges. It is possible the SHPD architecture branch would regard one or both of these bridges as a historic property.

5.2 Recommendations

As all of the area of proposed open trenching (and virtually all of the project area) is post 1940 fill land (compare Figure 4 and Figure 13), no archaeological inventory survey or archaeological monitoring program is recommended. Early consultation with the SHPD archaeology branch is recommended in this regard and particularly regarding the possible need for further documentation of an 8-ft by 30-ft concrete slab east of the tennis courts (see Figure 37 through Figure 39) that may constitute a historic property.

While highly utilitarian, Ke‘ehi Lagoon Beach Park (construction plans dated 21 November 1967) has a distinctive style that may merit further consideration by an architectural historian, should the present plans damage elements of the park. Early consultation with the SHPD Architecture Branch is recommended to discuss any potential impacts to potentially significant architectural amenities within the park.

In addition, if alteration is anticipated to either of the pedestrian bridges adjacent to the extreme northwest portion of the eastern project area, then early consultation with the SHPD Architecture Branch is recommended.

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