DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
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DIRECTOR

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DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
WEC.CSE 19-105

December 13, 2019

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

Dear Mr. Glenn,

SUBJECT: Draft Environmental Assessment
Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Kailua, Oahu, Hawaii

The City and County of Honolulu, Department of Environmental Services, prepared the Draft Environmental Assessment for the subject project and anticipates a Finding of No Significant Impact. Please publish an appropriate notice in the December 23, 2019, issue of the OEQC *Environmental Notice*.

We have enclosed a completed OEQC Publication Form, two (2) hardcopies of the Draft EA, and one (1) CD containing electronic files of these documents in MS-Word and PDF format, respectively.

Should you have any questions or concerns, please contact Clifford Kanda of the Division of Wastewater Engineering and Construction at (808) 768-8753.

Sincerely,

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

Enclosures

20-163

AGENCY
PUBLICATION FORM

Project Name:	Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair
Project Short Name:	(please use no more than five succinct words; count not to include document status, e.g., EA)
HRS §343-5 Trigger(s):	Propose the use of state and county lands and the use of county funds
Island(s):	Oahu
Judicial District(s):	Koolaupoko
TMK(s):	N/A
Permit(s)/Approval(s):	Department of the Army Nationwide Permit (Section 404 of the Clean Water Act) Blanket Section 401 Water Quality Certification (Section 401 of the Clean Water Act) National Pollution Discharge Elimination System Construction Dewatering Permit
Proposing/Determining Agency:	City and County of Honolulu, Department of Environmental Services
Contact Name, Email, Telephone, Address	Mr. Clifford Kanda, P.E. ckanda@honolulu.gov (808) 768-8753 Division of Wastewater Engineering and Construction Department of Environmental Services City and County of Honolulu 650 South King Street, 14th Floor Honolulu, HI 96813
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Fukunaga & Associates, Inc.
Contact Name, Email, Telephone, Address	Mr. Lance Fukumoto, P.E. lfukumoto@fukunagaengineers.com (808) 944-1821 1357 Kapiolani Blvd., Suite 1530 Honolulu, HI 96814

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 project proposes to plug a void beneath an existing concrete structure encasing the 8-inch diameter wastewater force main crossing under Maunawili Stream downstream of the Maunawili Wastewater Pump Station and to restore the eroded streambed and stream banks in the vicinity, which will restore protection and support to the force main. The original design plans of the force main indicate an 8-inch ductile iron pipe encased in a reinforced concrete jacket buried beneath the stream bed and overlaid by a cement rubble masonry (CRM) layer to provide additional protection. Investigations have revealed that the CRM layer has been washed away and the original stream bed and stream banks have eroded, creating a void under the concrete jacket which is now partially suspended and unsupported from the bottom. The actions of the proposed project will greatly reduce the risk of a structural failure of the force main which would result in the discharge of untreated wastewater into Maunawili Stream. The proposed project will have short-term minor impacts associated with construction which will be coordinated with city, state and federal agencies and the general public. No adverse long-term impacts are anticipated.

Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair

DRAFT
ENVIRONMENTAL ASSESSMENT

Prepared for:
City and County of Honolulu
Department of Environmental Services
Division of Wastewater Engineering and Construction

Prepared by:
Fukunaga & Associates, Inc.
1357 Kapiʻolani Blvd., Suite 1530
Honolulu, Hawaiʻi 96814

December 2019

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LIST OF ABBREVIATIONS

ALISH	Agricultural Lands of Importance to the State of Hawai‘i
ARV	Air Release Valve
BMP	Best Management Practices
CCH	City and County of Honolulu
CDP	Census Designated Place
CRM	Cement Rubble Masonry
CWRM	State of Hawai‘i, Department of Land and Natural Resources, Commission on Water Resource Management
CWSRF	Clean Water State Revolving Fund
CWA	Clean Water Act
CWB	State of Hawai‘i, Department of Health, Clean Water Branch
CZM	Coastal Zone Management
DA	Department of the Army
DBEDT	State of Hawai‘i, Department of Business, Economic Development, and Tourism
DIP	Ductile Iron Pipe
DLNR	State of Hawai‘i, Department of Land and Natural Resources
DOH	State of Hawai‘i, Department of Health
DPP	City & County of Honolulu, Department of Planning and Permitting
EA	Environmental Assessment
EIS	Environmental Impact Statement
ENV	City and County of Honolulu, Department of Environmental Services
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
HAR	Hawai‘i Administrative Rules
HBWS	Honolulu Board of Water Supply
HECO	Hawaiian Electric Company
HFD	Honolulu Fire Department
HPD	Honolulu Police Department

HRS	Hawai‘i Revised Statutes
I/I	Infiltration and Inflow
IRH	State of Hawai‘i, Department of Health, Indoor and Radiological Health Branch
KPWMP	Ko’olau Poko Watershed Management Plan
LUC	Land Use Commission
LUO	Land Use Ordinance
MGD	Million Gallons per Day
MPH	Miles Per Hour
MSL	Mean Sea Level
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRCS	National Resources Conservation Service
NWP	Nationwide Permit
OCCL	State of Hawai‘i, Department of Land and Natural Resources, Office of Conservation and Coastal Lands
OTS	O‘ahu Transit Services
OWMP	O‘ahu Water Management Plan
PIFWO	United States Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
PJD	Preliminary Jurisdictional Determination
PUC	Primary Urban Center
RCJ	Reinforced Concrete Jacket
RHA	Rivers and Harbors Act of 1899
RLS	Selective Reconnaissance Level Survey
ROH	Revised Ordinances of Honolulu
SCAP	Stream Channel Alteration Permit
SCP	Sustainable Communities Plan
SDWA	Safe Drinking Water Act
SHPD	State of Hawai‘i, Department of Land and Natural Resources, Historic Preservation District
SIP	State Implementation Plan
SMA	Special Management Area
SRF	State Revolving Fund
TCP	Traffic Control Plan
TMP	Transportation Management Plan
TMK	Tax Map Key
UHERO	University of Hawai‘i, Economic Research Organization

U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQC	Water Quality Certification
WWPS	Wastewater Pump Station

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EXECUTIVE SUMMARY

Project Name:

Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair
Kailua, O‘ahu, Hawai‘i

Approving Agency:

Division of Wastewater Engineering & Construction
Department of Environmental Services
City and County of Honolulu
650 South King Street, 14th Floor
Honolulu, Hawai‘i 96813

Proposing Agency:

Division of Wastewater Engineering & Construction
Department of Environmental Services
City and County of Honolulu
650 South King Street, 14th Floor
Honolulu, Hawai‘i 96813

Consultant:

Fukunaga & Associates, Inc.
1357 Kapi‘olani Boulevard, Suite 1530
Honolulu, O‘ahu, Hawai‘i 96814

Project Summary:

The City and County of Honolulu, Department of Environmental Services, Division of Wastewater Engineering & Construction, proposes a restoration repair project at the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 at Maunawili Stream. The project proposes to plug the void beneath the existing concrete structure encasing the 8-inch diameter force main and restore the eroded streambed and stream banks at the crossing. The original design plans of the force main indicate an 8-inch ductile iron pipe encased in a reinforced concrete jacket buried beneath the stream bed, overlaid by a cement rubble masonry (CRM) layer to provide additional protection. Investigations have revealed that the CRM layer has been washed away and the original stream bed and stream banks have eroded, creating a void under the concrete jacket which is now partially suspended and unsupported from the bottom. The proposed project will restore the eroded streambed and banks at the force main stream crossing, which will restore protection and support to the concrete structure encasing

the force main. This will greatly reduce the risk of a structural failure of the force main which would result in the discharge of untreated wastewater into Maunawili Stream.

The project is located within the Maunawili Estates subdivision in Kailua, next to Maunawili Road Bridge No. 3 which crosses over Maunawili Stream, and adjacent to the City and County of Honolulu parcel TMK 4-2-067:028. The project area is located within the Urban and Agricultural State Land Use District; and within in AG-2 and R-20 City and County of Honolulu Land Use Zoning Designations. The repairs are limited within the City right-of-way.

Permits Required:

Department of the Army Nationwide Permit (Section 404 of the Clean Water Act)
Blanket Section 401 Water Quality Certification (Section 401 of the Clean Water Act)
National Pollution Discharge Elimination System Construction Dewatering Permit

Determination:

A Finding of No Significant Impact (FONSI) is anticipated for this project.

CHAPTER 1. INTRODUCTION

1.1 Purpose for Environmental Assessment

The City and County of Honolulu (CCH), Department of Environmental Services (ENV), Division of Wastewater Engineering & Construction, proposes a restoration repair project at the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 at Maunawili Stream. The project will plug the void beneath the existing concrete structure encasing the 8-inch diameter force main and restore the eroded streambed and stream banks at the crossing.

Pursuant to Hawai‘i Revised Statutes (HRS), Chapter 343, an environmental review is required because the proposed project involves the following triggers:

- Propose the use of state and county lands and the use of county funds

Through the environmental review process, environmental concerns from reviewing agencies and the general public regarding working in the stream will be addressed. Parties consulted for this Environmental Assessment (EA) are listed in Chapter 6.

1.2 Existing Facilities and Operations

The Maunawili and Maunawili Estates subdivisions are located in the Maunawili Valley, Kailua south of Kalaniana’ole Highway bordered by the Ko’olau Mountains to the south and southwest. The wastewater system serving these subdivisions consists of two separate gravity sewer systems, two wastewater pump stations (WWPS) and two force mains. Wastewater from the Maunawili Estates Subdivision flows by gravity to the Maunawili Estates WWPS and is pumped through the Maunawili Estates WWPS force main into the Maunawili Subdivision sewer system. The wastewater from the Maunawili Subdivision then flows by gravity to the Maunawili Park WWPS. From the Maunawili Park WWPS, the wastewater is pumped through a force main along Kalaniana’ole Highway to the Kailua Road WWPS. See **Figure 1-1**.

There are four stream crossings along the Maunawili Estates WWPS force main. Force Main Crossing No. 1 crosses the Maunawili Stream to the north of the Maunawili Estates WWPS and downstream of Maunawili Road Bridge No. 3. Per the design plans, this crossing consisted of an existing 8-inch ductile iron pipe force main encased by a reinforced concrete jacket (RCJ) that was buried under the stream bed and protected by a cement rubble masonry (CRM) layer flush with the stream bed. Deficiencies are observed at this location. See Section 1.3. Force Main Crossing No. 2 crosses beneath ‘Oma’o Stream approximately 500 feet down from the Maunawili Estates WWPS. At this crossing there is a concrete structure that spans the width of ‘Oma’o Stream and is approximately 48 inches wide. This crossing appears intact and has a stream flow over the structure. Force Main Crossings No. 3 and No. 4 cross beneath an unnamed stream approximately 1,030 feet and 2,000 feet, respectively, from the Maunawili Estates WWPS. At both crossings no

force main concrete structures were clearly observed. See **Figure 1-2** for the Force Main Crossing locations and **Figure 1-3** for Force Main Crossing No. 1 at Maunawili Road Bridge No. 3.

1.3 Project Need and Objective

During a site visit in 2013, ENV discovered an exposed concrete structure within Maunawili Stream spanning the width of the stream downstream of the Maunawili Road Bridge No. 3. Because the concrete structure was found in the same general location as Force Main Crossing No. 1 indicated by record drawings, ENV suspected that this structure was the RCJ encasing the force main crossing Maunawili Stream as part of Force Main Crossing No. 1. To determine the likelihood of this, Fukunaga & Associates, Inc. was retained under the Maunawili Wastewater Pump Stations, Force Mains and Sewer Improvements Project, Contract No. SC-DDC-140089, to gather information and prepare an engineering report. The report, entitled "Preliminary Maunawili Estates Wastewater Pump Station Force Main Investigation" (hereafter referred to as "Preliminary Investigation"), was completed in August 2016.

The Preliminary Investigation concluded that the observed concrete structure was indeed the RCJ encasing the force main for Force Main Crossing No. 1. Other documented observations included the following:

- The CRM layer shown on the design plans across the stream bed over top of the concrete jacket has washed away
- The wing walls on the downstream side of Maunawili Road Bridge No. 3 are missing
- The original stream bed and stream banks have eroded
- There is a void beneath the concrete structure of varying depth, resulting in the stream water surface level under the concrete structure during low conditions

Because the concrete structure encasing the force main is exposed and undermined, the force main is at risk of a structural failure, which would result in the discharge of untreated wastewater into Maunawili Stream. The Maunawili Estates WWPS force main carries an average wastewater flow of 0.1 million gallons per day (MGD) and a peak hour flow rate of up to 1 MGD during rainfall events; therefore, a wastewater discharge could be in the order of magnitude of thousands to millions of gallons. See **Figure 1-4** for a section view of the existing condition at Force Main Crossing No. 1 based on information from the Preliminary Investigation.

The project objectives therefore are to diminish the risk of a structural failure of the force main, protect the downstream water quality and provide more reliable wastewater collection service to the residents in the area.

1.4 Project Description

The Preliminary Investigation identified and evaluated several alternatives to address the force main stream crossing No. 1 at the Maunawili Stream. See Chapter 4 for detailed descriptions of the alternatives evaluated. The Preliminary Investigation recommended the following:

1. A restoration repair that will plug the void beneath the existing concrete structure and provide adequate structural support to the force main.

2. A restoration repair by constructing riprap in the stream from the bridge to approximately 2 feet past the concrete structure to control erosion.

3. A restoration repair by slope stabilization methods along the streambanks immediately downstream of the bridge culvert to protect the streambanks from further erosion.

The Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair project (hereafter referred to as the "project"), is anticipated to address these proposed repairs.

1.5 Construction Schedule and Cost

The project has the following estimated key project milestones and associated dates:

a.	Design Completion	June 2021
b.	Bid Advertisement	July 2021
c.	Bid Open	August 2021
d.	Construction Start	January 2022
e.	Construction Completion	December 2022

A cost estimate will be developed for the construction of the project.

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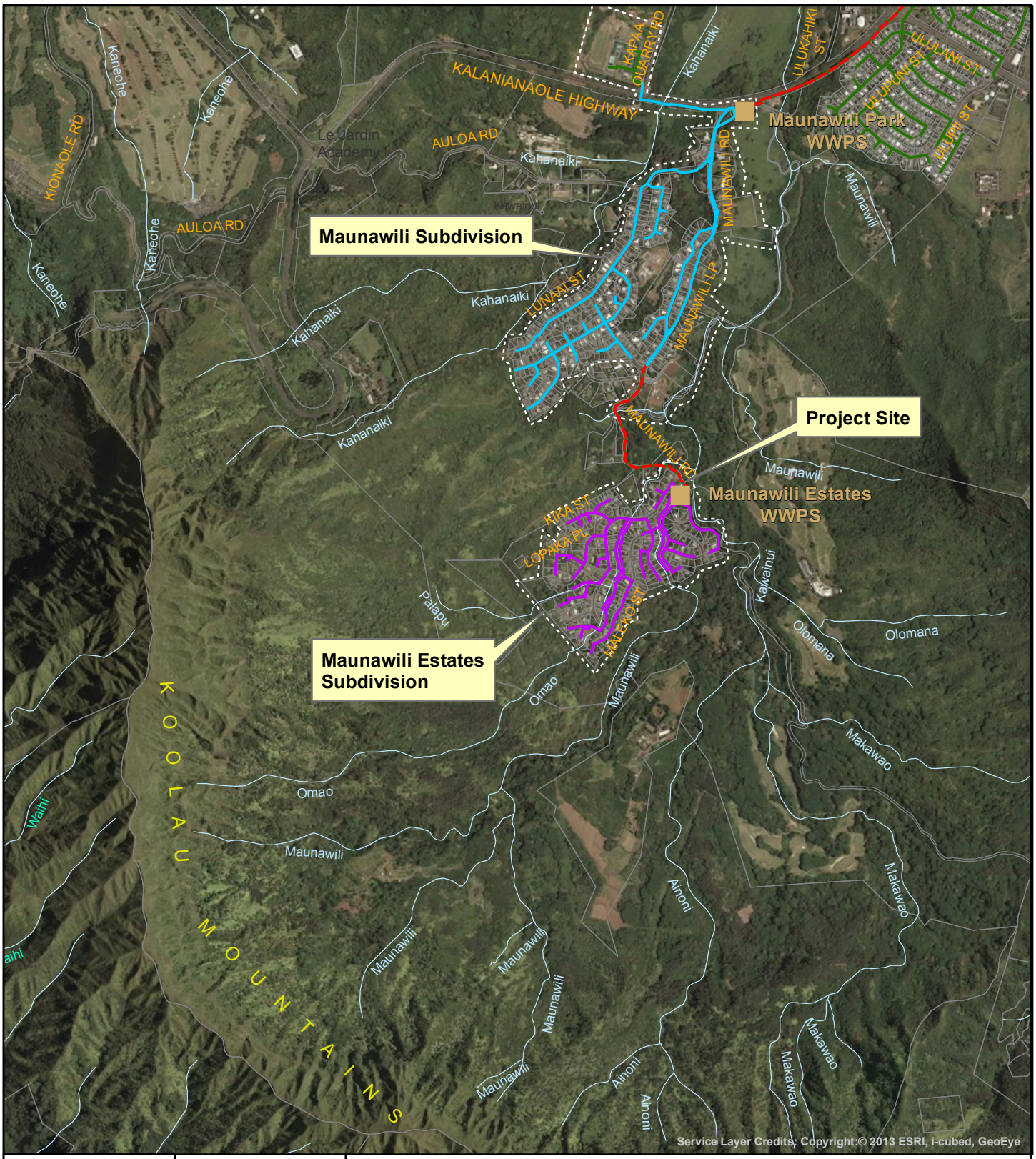

Island of O'ahu

NORTH

0 1,000 2,000

Feet

LEGEND:

- Pump Station
- Maunawili Park System Sewer Mains
- Maunawili Estates System Sewer Mains
- Force Main
- Sewer Mains
- Streams

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

LOCATION MAP AND EXISTING SEWER SYSTEM

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 1-1

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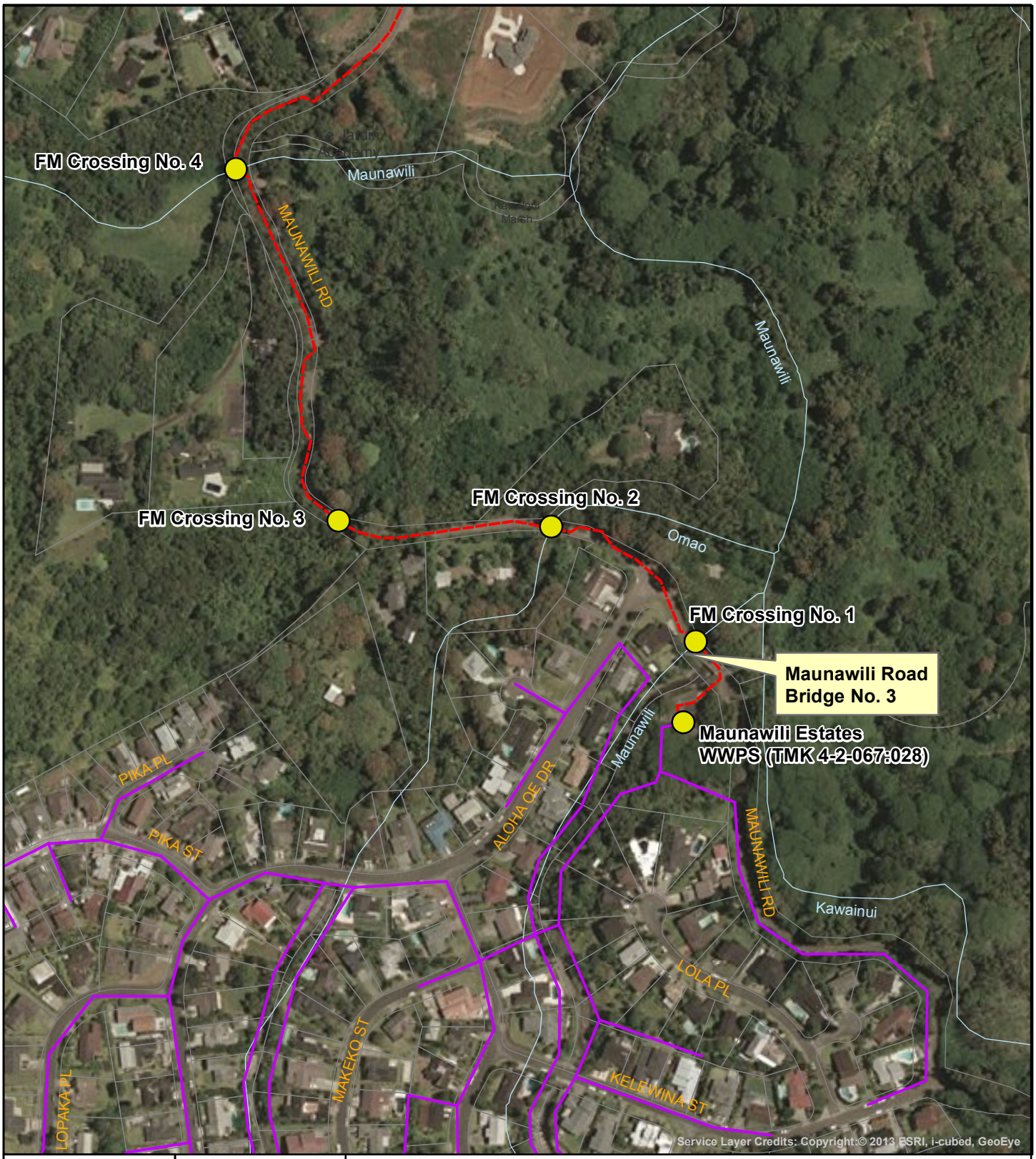

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Force Main Crossing No. 1 Repair
Draft Environmental Assessment

FORCE MAIN CROSSINGS LOCATION MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 1-2

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Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

MAUNAWILI ESTATES WWPS FORCE MAIN CROSSING NO. 1 SITE MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 1-3

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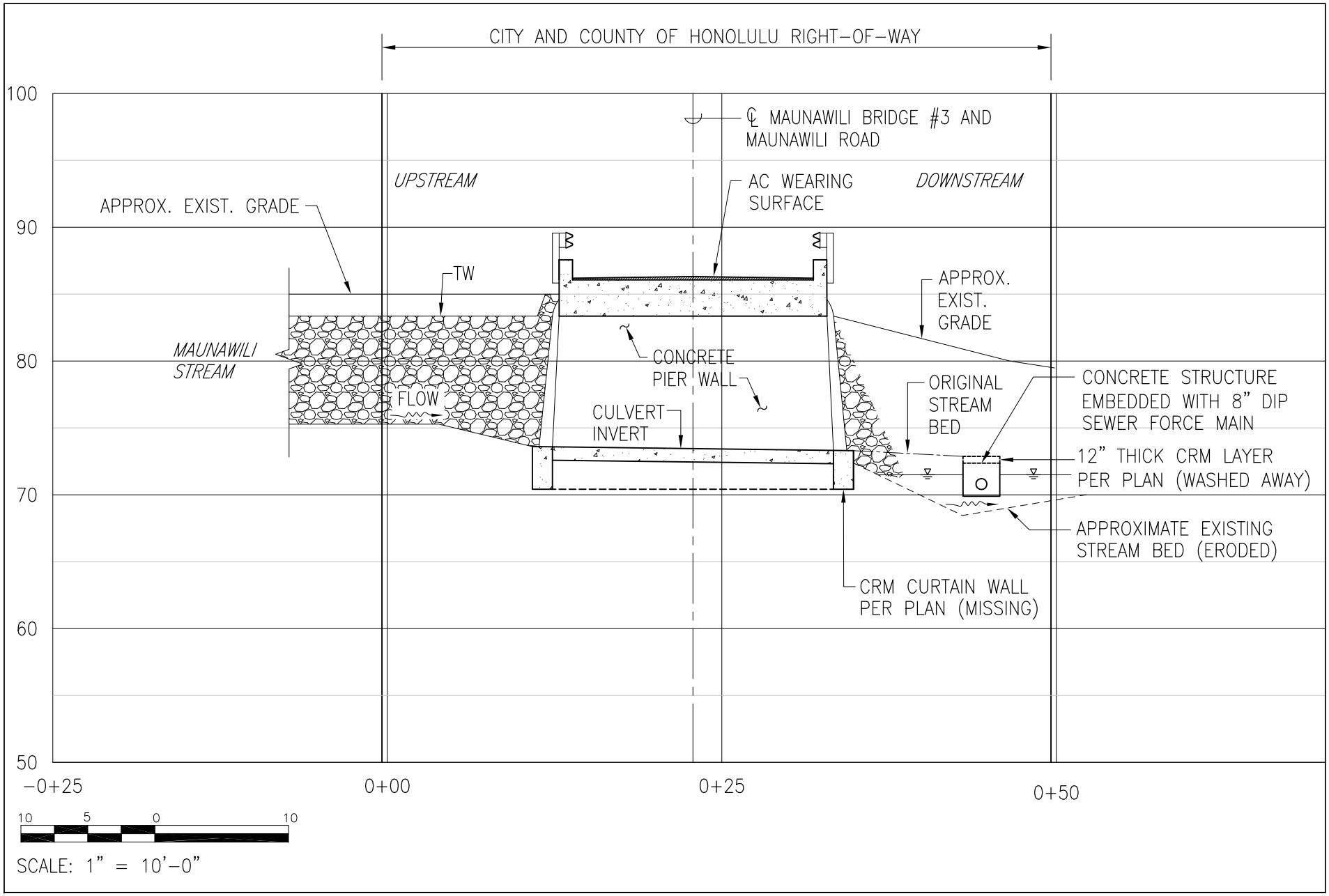

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
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MAUNAWILI ESTATES WWPS FORCE MAIN CROSSING NO. 1 SECTION VIEW

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 1-4

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CHAPTER 2. DESCRIPTION OF THE ENVIRONMENT, IMPACTS AND MITIGATIVE MEASURES

2.1 Climate

The island of O'ahu is characterized by a tropical savanna climate with little seasonal and diurnal variability in temperature. The average monthly temperatures in Maunawili is about 84 degrees F for the highs and 68 degrees F for the lows, with January being the coolest month and August being the warmest. The average annual precipitation is over 76 inches, predominantly between the months of October and April. Trade winds flow from east to west and prevail during the greater part of the year.

2.2 Topography

The island of O'ahu was formed by two different shield volcanoes, the Wai'anae and the Ko'olau, with the former being the older of the two. Formation of the island began approximately 4 million years ago. Both volcanoes have undergone erosion and coral reef growing stages and have experienced submarine landslides.

The topography throughout the Maunawili Estates area increases generally from northeast to southwest. At the top of Puualoha Street, it is approximately 170 feet MSL as the Maunawili Stream begins to flow through homeowner lots and reduces to 86 feet MSL at the bridge next to Force Main Crossing No. 1. The stream flows north for approximately 1,800 feet where it merges with Kawainui Stream. **See Figure 2-1.**

2.3 Soils

2.3.1 Soil Survey

The United States Department of Agriculture (USDA), Soil Conservation Service 1972 "Soil Survey" provides detailed information on soil classifications, characteristics and maps showing their locations on the islands. The survey is useful for engineers and builders because the information includes descriptions of soil properties and the relative stability of soils for engineering purposes. According to the survey, the following soil type is found at the project site as described below. **Figure 2-2** shows the United States Geological Survey (USGS) location of this soil and the soils types surrounding the project area.

- Hanalei stony silty clay, 2-6% slopes (HoB): The Hanalei series consist of somewhat poorly drained to poorly drained soils that formed in alluvium derived from basic igneous rock. Hanalei soils are on bottom lands and have slopes of 0 to 6 percent. The mean annual rainfall is about 80 inches and the mean annual temperature is about 72 degrees F. A representative profile includes a dark grey silty clay layer 6 inches thick. The next layer is mixed very dark gray and dark gray silty clay that has a weak coarse prismatic structure

and is about 7 inches thick. The following layer is dark grayish brown silty clay loam that has a weak coarse prismatic structure parting to weak fine and medium angular blocky and is 8 inches thick. The sub soil is dark grayish brown silty clay loam about 10 inches thick. The soil is sticky and plastic. Runoff is slow and the permeability is moderate.

2.3.2 Land Study Bureau

The University of Hawai‘i, Land Study Bureau 1972 “Detailed Land Classification – Island of O‘ahu” grouped all non-urban lands into five categories based on their soil properties and capabilities for agricultural productivity measured by their performance for selected crops. The categories were assigned letters “A” through “E” in order of highest to least productive. The project area is entirely within state Urban land and therefore is not associated with a Land Study Bureau category. See **Figure 2-3**.

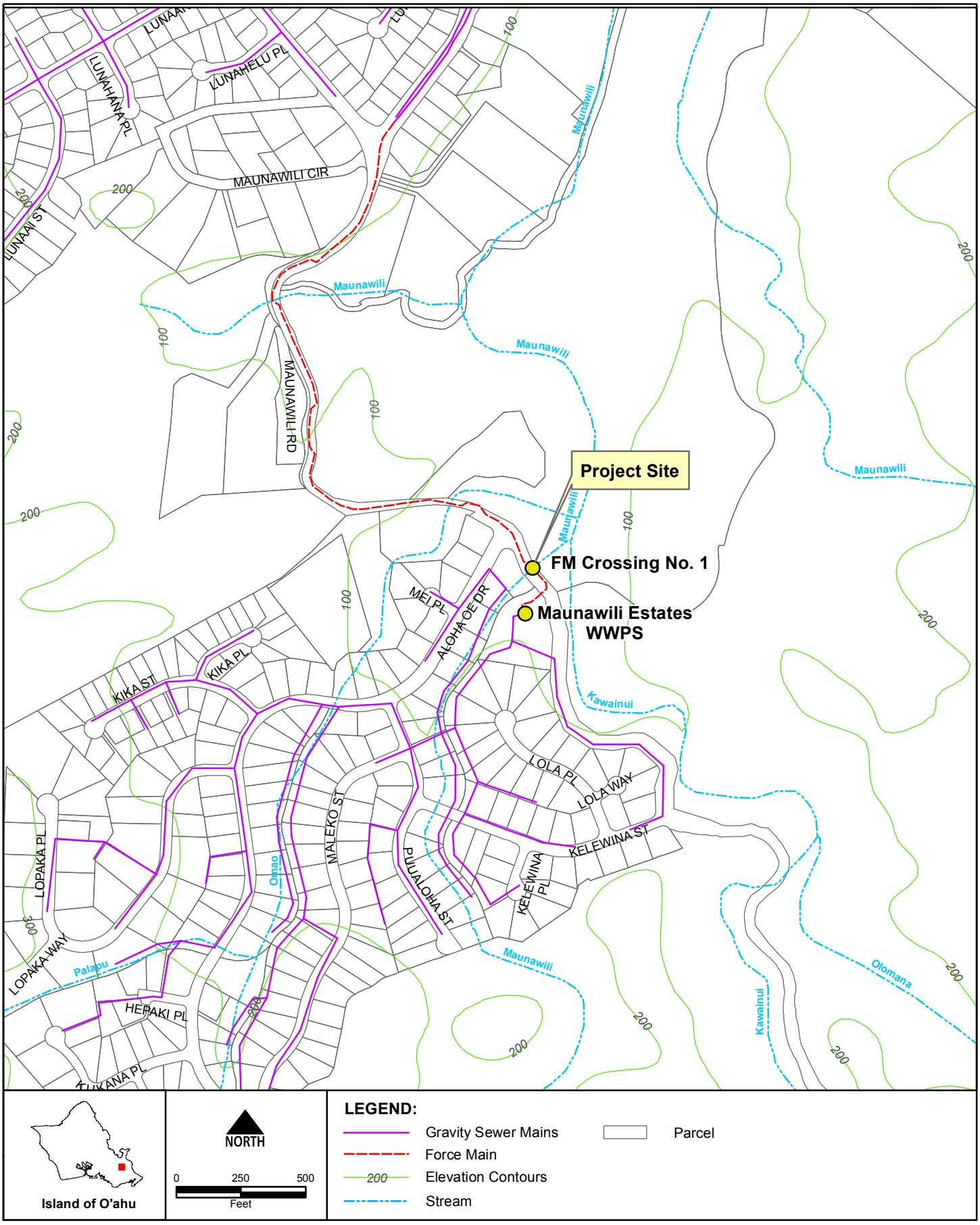
2.3.3 Agricultural Lands of Importance to the State of Hawai‘i

The Department of Agriculture “Agricultural Lands of Importance to the State of Hawai‘i” (ALISH) provided a classification system for identification of agriculturally important lands to the state, which established three classes of agricultural lands primarily, but not exclusively, on the basis of soil characteristics. The classifications are: Prime Agricultural Land, Unique Agricultural Land and Other Agricultural Land. These classifications provide decision makers understanding of long-term implications of several land use options for production of food, feed, forage, and fiber crops, however, do not designate areas to any specific land use. Lands not considered for classification as ALISH are: 1) Developed urban land over 10 acres; 2) Natural or artificial enclosed bodies of water over 10 acres; 3) Forest reserves; 4) Public use lands, e.g. parks and historic sites; 5) Lands with slopes in excess of 35%; and 6) Military installations, except undeveloped areas over 10 acres. The project area is entirely within lands not considered for classification. See **Figure 2-4**.

2.4 Natural Hazards

As shown on **Figure 2-5 and Figure 2-6**, the Flood Hazard Map and the Flood Hazard Assessment Report, which is based on the Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA), indicates that the entire project area is located in Zone D. This is an unstudied area where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

According to the CCH, Department of Emergency Management’s Tsunami Evacuation Maps, the entire project area is within the “Safe Zone”. The area is therefore not considered to be vulnerable to tsunamis.



Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

ELEVATION MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 2-1

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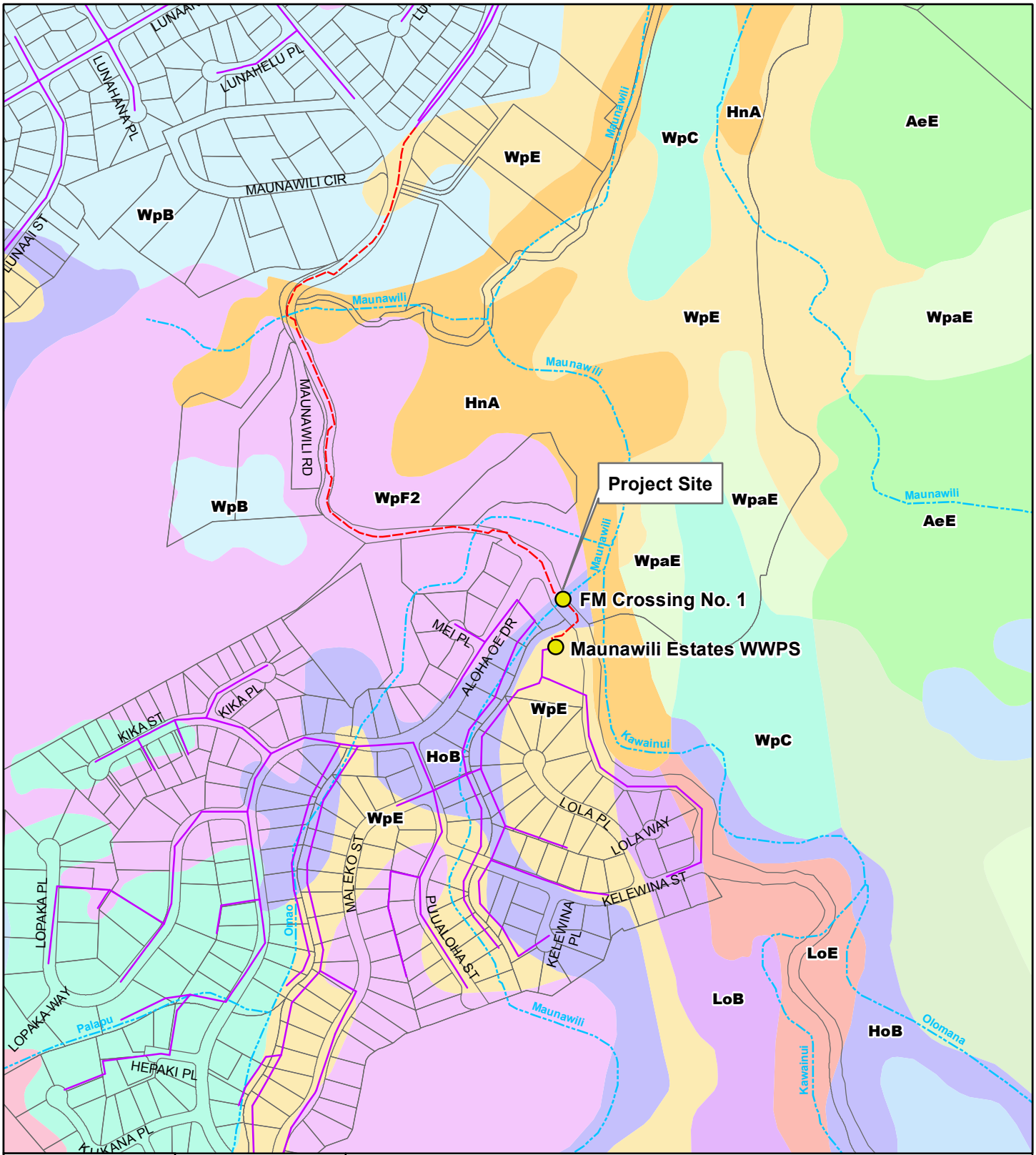

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

USGS SOIL MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 2-2

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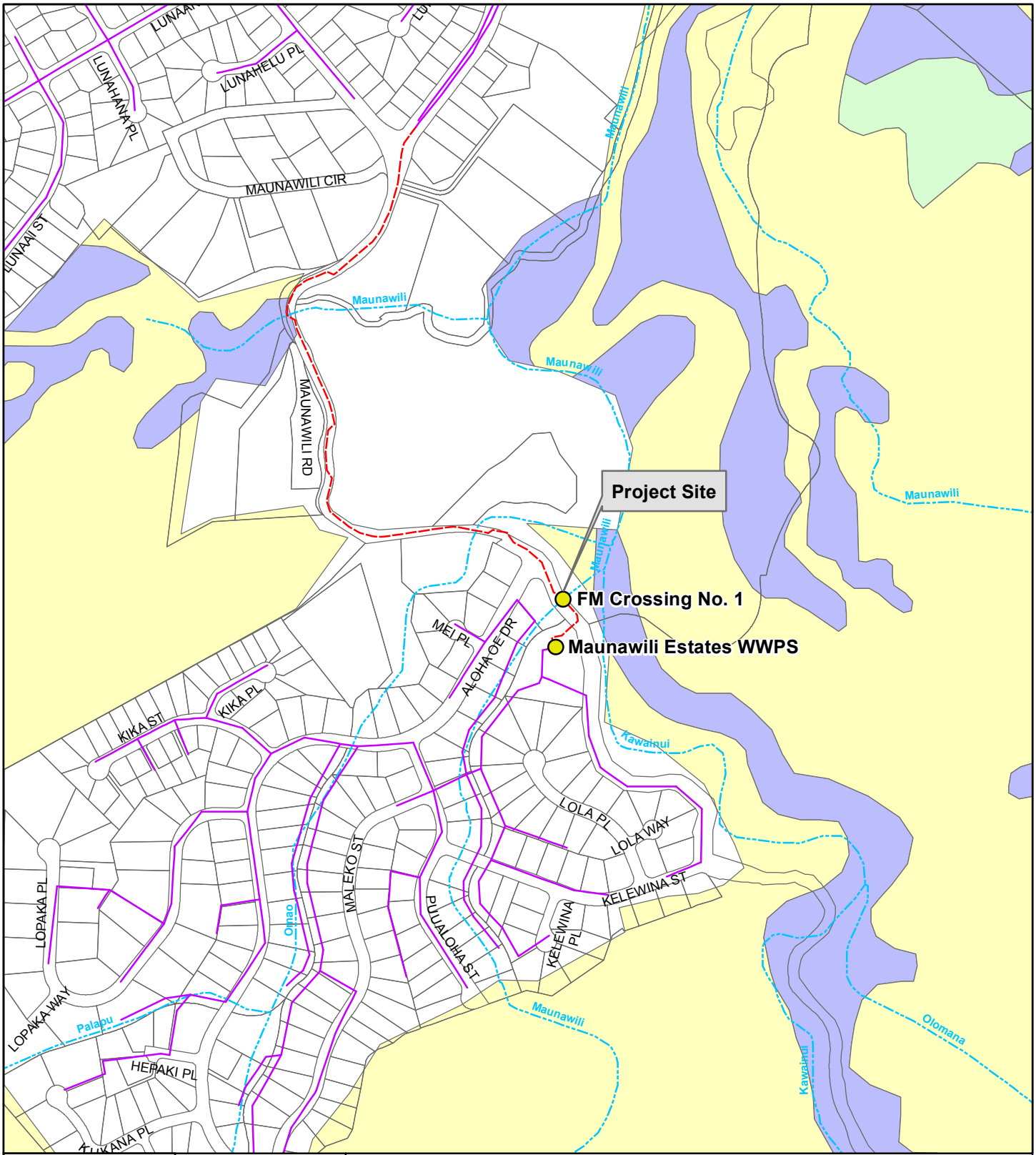

Maunawili Estates Wastewater Pump Station
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Draft Environmental Assessment

LAND STUDY BUREAU MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 2-3

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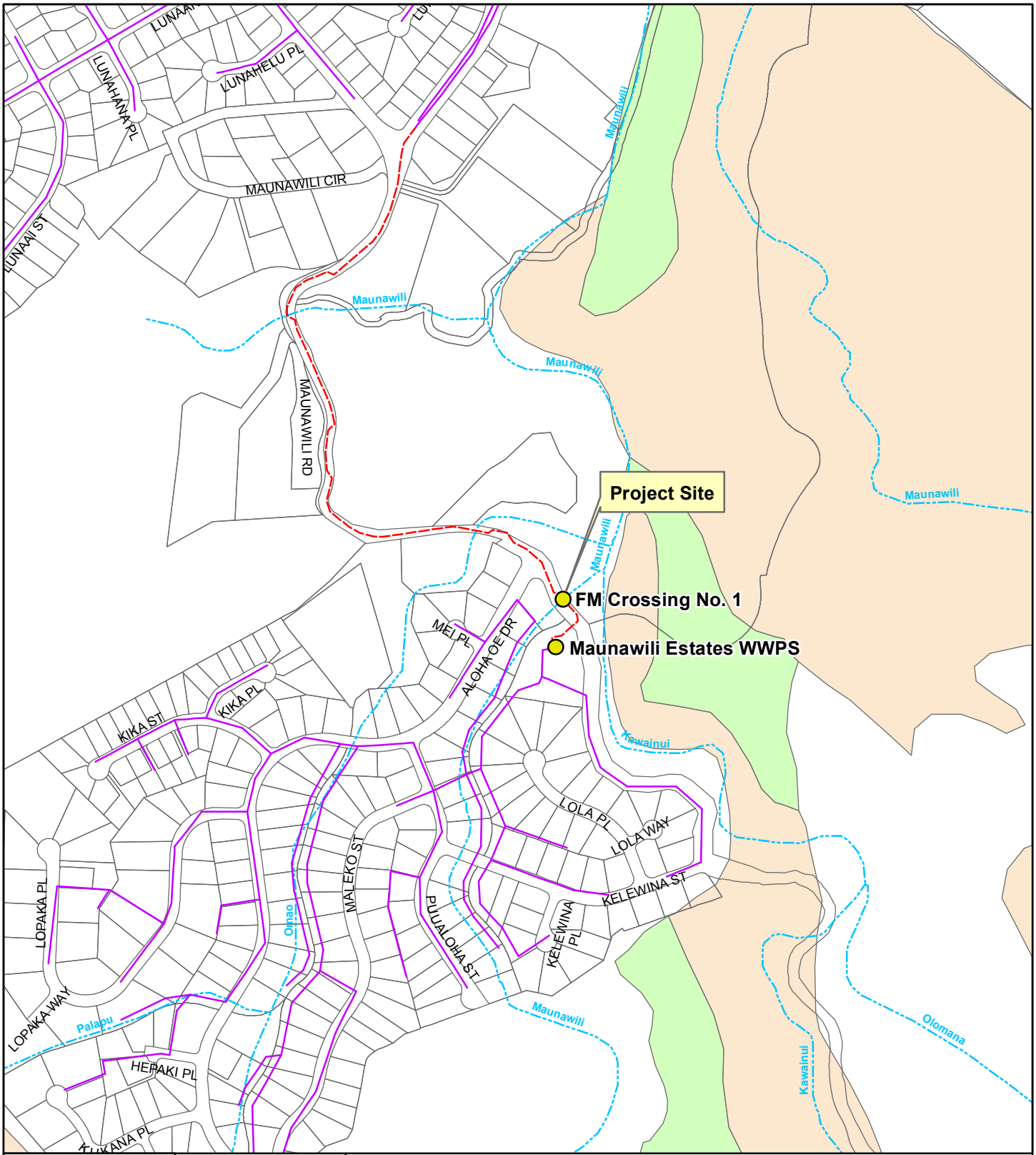

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

ALISH MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 2-4

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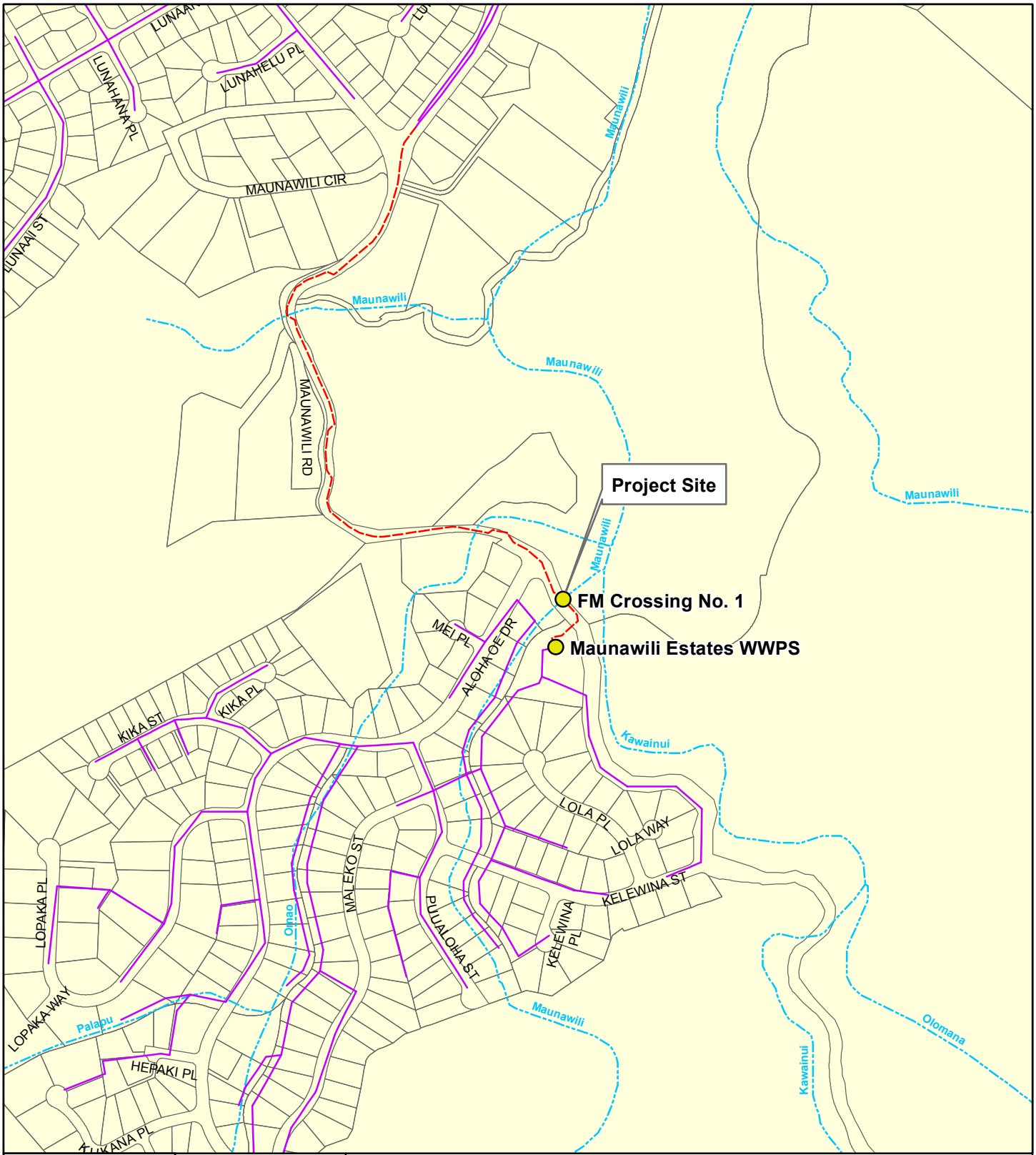

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

FLOOD HAZARD MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 2-5

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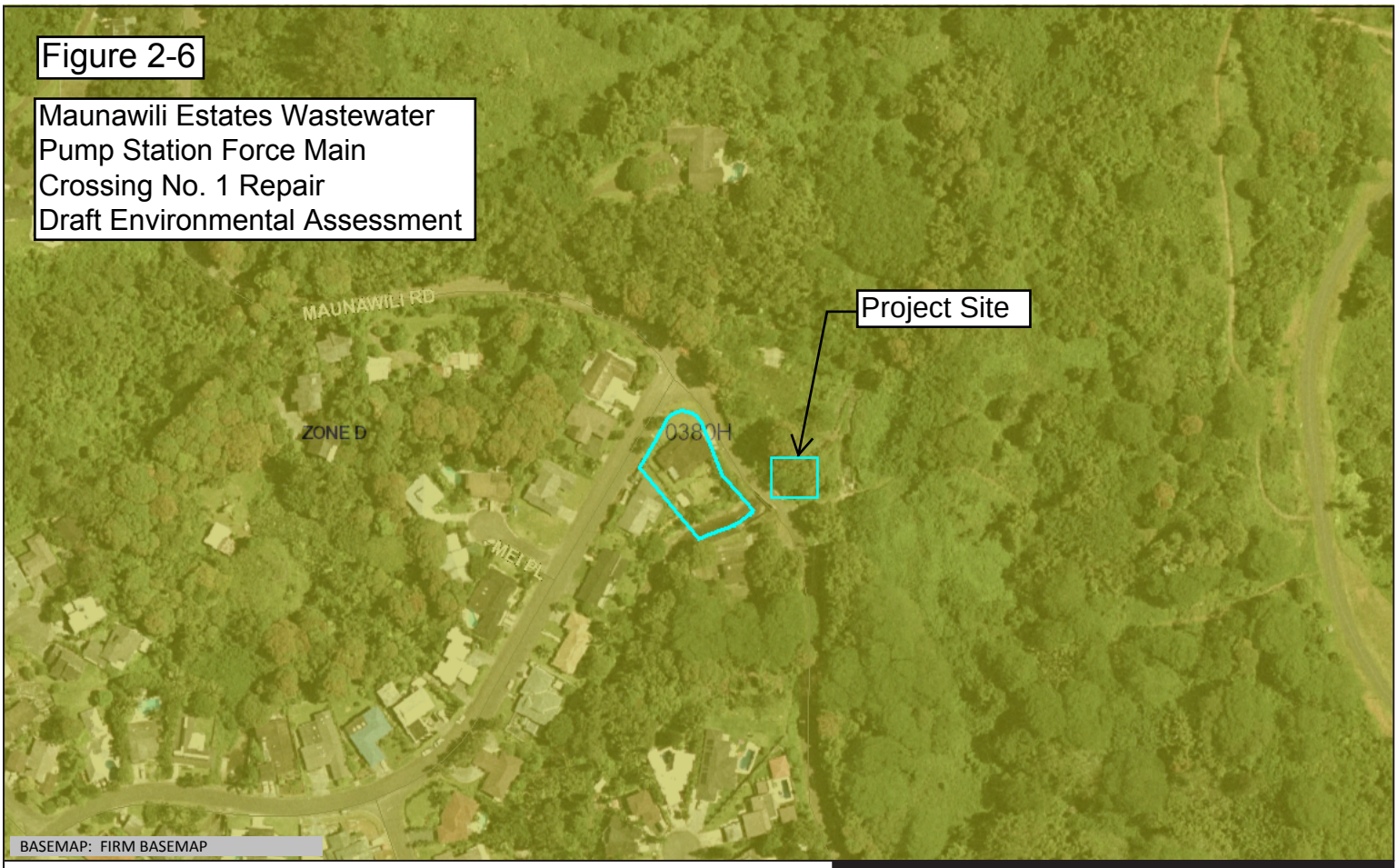
Figure 2-6

Maunawili Estates Wastewater
Pump Station Force Main
Crossing No. 1 Repair
Draft Environmental Assessment



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-2-067:001
WATERSHED:	KAWAINUI
PARCEL ADDRESS:	1204 ALOHA OE DR KAILUA, HI 96734

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0380H
PANEL EFFECTIVE DATE:	NOVEMBER 05, 2014

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: NO
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 200 400 ft

Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(*Note: legend does not correspond with NFHL)*

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also know as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

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2.5 Hydrology

The Commission on Water Resource Management (CWRM) has established hydrologic units for both groundwater and surface water resources. Groundwater is described in the State Water Code as: "any water found beneath the surface of the earth, whether in perched supply, dike-confined, flowing, or percolating in underground channels or streams, under artesian pressure or not, or otherwise". Surface water is defined as: "both contained surface water—that is, water upon the surface of the earth in bounds created naturally or artificially including, but not limited to, streams, other watercourses, lakes, reservoirs, and coastal waters subject to state jurisdiction—and diffused surface water—that is, water occurring upon the surface of the ground other than in contained water bodies. Water from natural springs is surface water when it exits from the spring onto the earth's surface".

Groundwater hydrologic units have been delineated by Aquifer Sector Areas which are further subdivided into Aquifer System Areas. The project lies within the Windward Aquifer Sector Area [306], and is in the Waimanalo Aquifer System Area [30604]. The Sustainable Yield for the aquifer system is 10 MGD.

Surface water hydrologic units are divided by watershed units which are comprised of one or more drainage basins. The project is located within the Kawainui surface water hydrologic unit [3033]. According to the Hawai'i Stream Assessment, the Maunawili Stream is a perennial stream at the project site and with no listed tributaries in the Hawai'i Stream Assessment data.

Ground elevations at the project site are sufficiently high above MSL that potential effects of climate change on ground water levels will not have any impact on the proposed project.

2.6 Flora and Fauna

The Pacific Islands Fish and Wildlife Office (PIFWO) of the United States Fish and Wildlife Service (USFWS) and the Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife, were contacted during the pre-Environmental Assessment consultation stage of the project. In letters dated December 23, 2016 and May 22, 2019, PIFWO provided general information and guidance on federally listed species and designated critical habitat under the authorities of the Endangered Species Act of 1973, as amended (ESA).

In 2019, a natural resources survey was completed by AECOS Inc. that consisted of water quality, botanical, aquatic biological, avian, mammalian and critical habitat surveys within the project area. The physical survey was conducted on May 9, 2019 (hereafter called "present survey"). The draft report, entitled: "Natural resources survey for the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 repair at Maunawili Stream" (hereafter referred to as "NRS") assessed the condition of and evaluated project impact upon these resources. The findings and conclusions of NRS are discussed in the following sections, and the full report can be found in **Appendix B**.

2.6.1 Botanical Resources

Botanical resources of interest or potential concern from a conservation perspective are native endangered, threatened, or rare species, valuable landscape plants, or exceptional trees. No plants proposed or listed as endangered or threatened under ESA or the State of Hawai‘i endangered species statute were observed during the present survey. The NRS also affirmed that no trees in the project area are listed by the CCH, Exceptional Trees program.

2.6.2 Aquatic Biological Resources

No aquatic species protected by state or federal endangered species statutes were observed in Maunawili Stream at the project site during the course of the present survey. However, prior studies have reported protected species from Maunawili Stream and Kawainui Watershed. The crimson damselfly, blackline Hawaiian damselfly, and Oceanic Hawaiian damselfly are listed as endangered on state and federal endangered species lists, and reported in the middle to upper reaches of Kawainui Watershed. USFWS advises that Best Management Practices (BMPs) for work in aquatic environments be incorporated into the project plan to minimize the degradation of water quality and impacts to biological resources.

Native gobies were not observed during the present survey, however, were reported in prior studies from Maunawili Stream and Kawainui Watershed. DLNR administrative rules regulate fisheries in the state, including the taking of native gobies.

Many Hawaiian endemic and indigenous freshwater fish and crustaceans have an amphidromous life cycle: eggs are laid in freshwater stream reaches, and hatched larvae drift downstream and out into the ocean to develop then migrate back into freshwater streams where they reach maturity. The NRS advised that project activities must not impede this amphidromous cycle and that maintenance of good water quality in the stream should be a priority:

- Downstream and upstream migration pathways should be maintained.
- New structures should not include drains or grates that may entrain drifting larvae, nor overhanging culverts that may obstruct upstream movement of recruiting juveniles.

2.6.3 Avian Resources

The avian assemblage surveyed is consistent with the lowland wet forest and urban environment within the project area, although waterbirds were notably absent from the modified stream channel. All birds observed during the present survey are non-native species naturalized to Hawai‘i.

In its December 23, 2016 letter, PIFWO indicated that Hawaiian waterbirds are known to occur within the vicinity of the project area as well as at various sites within the vicinity (Kaelepulu Pond, Hamakua March Waterbird Sanctuary, and Kawainui Marsh). On O‘ahu, the endangered waterbirds consist of the Hawaiian Duck, Hawaiian Common Gallinule, Hawaiian Coot, and Hawaiian Stilt. PIFWO further noted that Hawaiian waterbirds may use the area near the proposed project site for loafing, foraging, and possibly nesting. Hawaiian stilt nesting occurs from mid-

February through August, Hawaiian coot and Hawaiian gallinules nesting occurs year-round but mostly from March through August, and Hawaiian duck nesting can occur year-round.

No endangered Hawaiian waterbirds were observed during the present survey. The NRS determined that that optimal habitats for endangered waterbird species are not present in the project area; however, suitable habitat for endangered waterbirds may be found downstream of the project area in Kawainui Marsh, and potentially along water features at the nearby Royal Hawaiian Golf Course.

USFWS recommends that if water resources are located within or adjacent to a project site, the following measures should be incorporated to minimize impacts to Hawaiian waterbirds:

- In areas where waterbirds are known to be present, post and implement reduced speed limits and inform project personnel and contractors about the presence of endangered species on-site or nearby.
- Incorporate the applicable BMPs regarding work in aquatic environments into the project design.
- A qualified biological monitor should conduct Hawaiian waterbird nest surveys at appropriate times at the proposed project site prior to project initiation. Surveys should be repeated again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the beds may attempt to nest).
- Any documented nests or broods within the project vicinity should be reported to USFWS within 24 hours.
- A 100-foot buffer should be established and maintained around all active nests and broods until the chicks have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
- USFWS should be notified immediately prior to project initiation and provided with the results of pre-construction Hawaiian waterbird surveys.
- A biological monitor should be present on the site during all construction or earth moving activities to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Endangered Hawaiian forest birds on O‘ahu include the ‘Elepaio. The NRS noted that critical habitat for ‘Elepaio occurs less than a mile from the project site, along the upper ridges and valleys of Ko‘olau Mountain; however, given the relatively low elevation of the project area, ‘Elepaio are unlikely to utilize the project area or immediate vicinity. The following USFWS endangered forest bird recommendation may still apply for project activities:

- Avoid increasing mosquito populations by creating stagnant water habitat.

Hawaiian seabird species of concern include protected Wedge-tailed Shearwater, threatened Newell’s Shearwater, endangered Hawaiian Petrel, endangered Band-rumped Storm-Petrel, and White Tern. Protected seabirds may overfly the project area, and have some potential to utilize cliff habitat in upper Maunawili Valley; however, White Tern was not observed (or expected to

occur) in the project area and are not anticipated to be impacted by project activities. USFWS advises that Hawaiian seabirds may traverse the project area during the breeding, nesting, and fledging seasons (March 1 to December 15). Night lights can disorient seabirds, resulting in their potential downing and harm from collision with objects and/or predation by dogs and cats if downed. If the project will utilize additional night-time lighting sources for night-time construction, USFWS recommends incorporating the following measures to avoid and minimize potential project impacts to seabirds:

- Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.
- Install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid night-time construction during the seabird fledging period from September 15 through December 15.

2.6.4 Mammalian Resources

The endangered 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 since they are too young to fly or may not move away. Additionally, Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing. USFWS provides the following general BMP recommendations for areas with bat roosting habitat:

- No woody vegetation taller than 4.6 m (15 ft) should be disturbed, removed or trimmed during the bat pupping season between June 1 and September 15.
- The use of barbed wire to top fence lines must be avoided.

The Hawaiian Hoary Bat is known to forage for insects along waterways, such as those found in the project area along Maunawili and Olomana streams. The NRS reasoned that, because Hawaiian Hoary Bat is a noted habitat generalist that forages in multiple locations over a wide geographic home range, and the proposed project activities along Maunawili Stream are not expected to reduce stream forage habitat, deleterious impacts to Hawaiian Hoary Bat are not anticipated provided the appropriate aforementioned BMPs are followed.

2.6.5 Critical Habitat

In its December 23, 2016 letter, PIFWO reported that there is no federally designated critical habitat within the immediate vicinity of the proposed project. The NRS confirmed that federally delineated critical habitat is not present within the project area. Thus, the project as currently proposed, will not impinge on federally designated critical habitat. No equivalent habitat designation exists under state law.

Critical habitat for three native damselflies, O‘ahu ‘Elepaio, and several endemic plant species begin less than one-mile upslope from Maunawili Road Bridge No. 3. The NRS concluded that, despite this lateral proximity, critical habitat and the project area are separated by a distinct elevational buffer. Deleterious impacts to critical habitat and federally protected species upslope of the project area therefore are not anticipated, provided the appropriate aforementioned BMPs are followed.

2.7 Water Quality

The Department of Health (DOH), Water Quality Standards Map, indicates that the majority of the project area are designated inland Class “2” inland waters. See **Figure 2-7**. HAR §11-54-3 defines Class “2” waters as follows:

> *The objective of Class “2” waters is “to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping and navigation”. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation on and in these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new treated sewage discharges shall be permitted within estuaries.*

Maunawili Stream appears on the list of impaired water bodies in the 2018 State of Hawai‘i, Water Quality Monitoring and Assessment Report. The report defines impaired waters as waters that do not meet the State’s water quality standards. Maunawili Stream is listed as impaired for trash, turbidity, nitrate+nitrite, total nitrogen, and total phosphorus based solely on visual assessments.

The NRS discussed in Section 2.6 confirmed the Maunawili Stream as Class 2 “freshwater, flowing waters” and determined that base flow conditions prevailed and represent typical, non-runoff conditions. The NRS also included a water quality assessment that compared selected water parameters to the Hawai’i state criteria. The assessment determined that the temperature, pH, conductivity, and dissolved oxygen saturation levels were all within the state criteria at the time of sampling, and that concentrations for all nutrients, except Kjeldahl nitrogen, were typical of higher elevation reaches of Hawai‘i streams during base flow conditions. For more details, refer to **Appendix B**.

The NRS concluded that project work to repair the force main crossing can be completed with minimal impacts to stream water quality and without negative impacts to long-term water quality if proper BMPs are implemented, and made the following recommendations:

- Repair activities must be restricted to one-half of the stream at a time. This will allow amphidromous animals to use the stream during repair operations as a migratory pathway and maintain stream flow through the reach.
- Cofferdams constructed of sand bags interwoven with thick plastic sheeting to minimize leakage should be employed around in-water work areas. Cofferdams should be surrounded

on in-water sides by an anchored silt curtain to prevent discharge of work-related sediments to downstream waters.

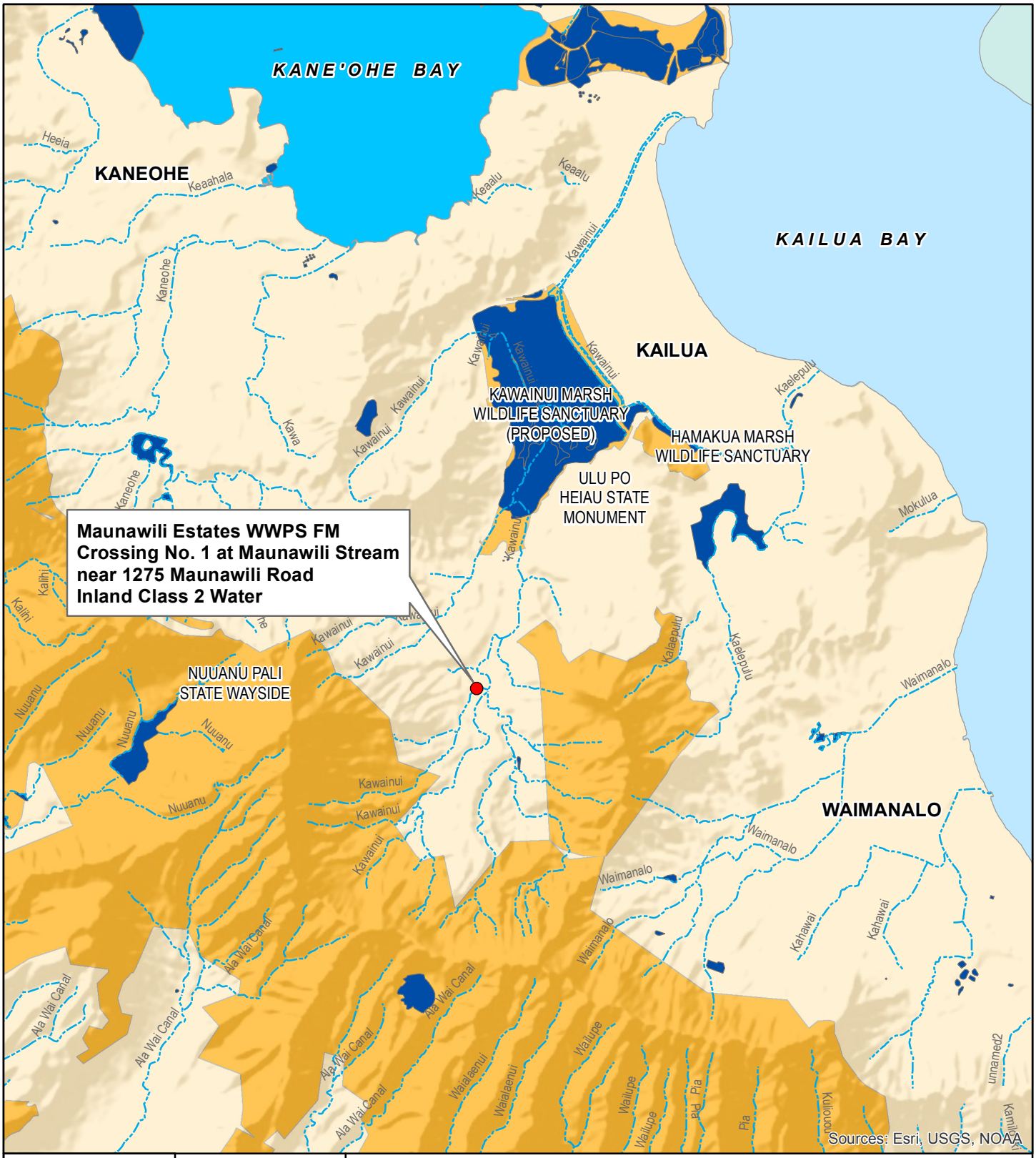
- Filter socks should be placed along the lower edge of stream banks in work areas to prevent movement of eroded material into downstream waters.

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants in to the waters of the United States and regulating quality standards for surface waters. Section 401 of the CWA requires that an applicant for a Federal license or permit to conduct any activity which may result in a discharge into the navigable waters, shall provide certification that any such discharge will comply with the CWA. Section 404 of the CWA requires approval prior to discharging dredged or fill material into the waters of the United States. Since the proposed project will be constructed within the Maunawili Stream and the stream banks, both Sections 401 and 404 of the CWA will apply. Compliance with Section 404 will be administered by the U.S. Army Corps of Engineers (USACE) and will likely be verified through a Department of the Army (DA) Nationwide Permit (NWP). Refer to Section 3.8 for additional information. In March 2018, the DOH Clean Water Branch (CWB) obtained a Blanket Section 401 Water Quality Certification (WQC) for certain DA NWPs, which will expire on March 18, 2022. Coverage for the proposed project will be sought under this Blanket Section 401 WQC.

Supporting documents to be submitted along with the Blanket Section 401 WQC application include an Applicable Monitoring and Assessment Plan, which will describe the proposed methods and means to monitor the quality and characteristics of the discharge and to monitor/maintain all pollutant control measures, and a Site-Specific Best Management Practices Plan to properly isolate and confine the discharge activities and to contain and prevent any potential pollutant discharges from adversely impacting Maunawili Stream. In addition to the recommendations in the NRS, typical BMPs employed may include in-water turbidity silt screens and gabion inflow protection, and cease of construction during significant rains.

Other required approvals for the project may include a NPDES Dewatering Permit and adherence to the updated CCH, Department of Planning and Permitting's (DPP) rules on storm drainage, water quality and erosion control.

As required by the State Water Code, HRS Chapter 174C, the CWRM administers a statewide instream use protection program through the Stream Channel Alteration Permit (SCAP). A SCAP is required for any temporary or permanent activity within the stream bed or banks that may: 1) Obstruct, diminish, destroy, modify, or relocate a stream channel; 2) Change the direction of flow of water in a stream channel; 3) Place any materials or structures in a stream channel; or 4) Remove any material or structure from a stream channel. This project is located in the Maunawili Stream previously shown on **Figure 1-2** and discussed in Section 1.4 potentially requiring a SCAP. A request for determination was submitted to CWRM on August 29, 2016 and in a letter dated September 6, 2016, CWRM confirmed that a SCAP would not be required because the proposed work involves routine streambed and drainage way maintenance activities and maintenance of existing facilities are exempt from obtaining a permit.



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WATER QUALITY STANDARDS CLASSIFICATION MAP

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Figure 2-7

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2.8 Hazardous Materials

The DOH, Solid and Hazardous Waste Branch, Hawai‘i Leaking Underground Storage Tank Database listed one 1000-gallon diesel tank in the vicinity of the project area, located at the Maunawili Estates Wastewater Pump Station at 1275 Maunawili Road. The database indicated seven underground storage tank inspections completed since 2001. The DOH, Hazard Evaluation and Emergency Response Office records did not list any incidents in the vicinity of the project area.

It is unlikely that excavation operations will encounter contaminated soil. However, in the event that contaminated soil is discovered, the Contractor will be responsible for notifying the appropriate agencies and coordinating remedial procedures.

Construction activities may involve small quantities of materials that could be considered hazardous such as petroleum and cleaning products, and resins. Measures will be taken to ensure that these materials are not discharged into the environment. Impacts are not anticipated.

2.9 Air Quality

The DOH, Clean Air Branch monitors ambient air for several air pollutants at 14 monitoring stations throughout O‘ahu, Big Island, Maui and Kauai. Station air quality is reported as an index value, with 0-50 Good, 51-100 Moderate, 101-150 Unhealthy for Sensitive Groups, 151-200 Unhealthy, 201-300 Very Unhealthy and 301-500 Hazardous. The closest station to the project area is located in Honolulu at the DOH building on Punchbowl Street across from Queen’s Medical Center. The air quality at this station typically falls within the Good range. While air quality in the vicinity of the project area is not measured, the only existing sources of air pollution are emissions from motor vehicles traveling on adjacent roadways.

Short term impacts during the construction period may arise from construction activity. Emissions from construction vehicles may slightly increase air pollution; however, these will likely be dispersed by the prevailing trade winds. Fugitive dust arising from trenching activities and construction vehicles must comply with the provisions of HAR 11-60.1-33. The contractor will be encouraged to implement a dust control plan, which may include several measures, including using dewatering trucks and covering stockpiles of excavated material.

2.10 Noise

The two predominant existing source of noise at the project site is vehicular traffic on the existing bridge and noise from the Maunawili Stream. HAR Title 11, Chapter 46 describes the regulations for community noise control and sets forth maximum noise tolerances by zoning district, which are to be administered by DOH, Indoor and Radiological Health Branch (IRH). Noise from construction activities will be short-term and localized, but will likely exceed these tolerances. An approved Community Noise Permit will be required for construction during the hours from 7:00 am to 6:00 pm Monday through Friday, and 9:00 am through 6:00 pm Saturdays. Construction outside of these hours and with a noise exceeding 78 decibels (dBa) will require an approved

Community Noise Variance from the DOH IRH Branch. These permits will be the responsibility of the construction contractor. All permits and variances will be secured prior to construction.

2.11 Archaeological and Cultural Resources

Consultation with the State Historic Preservation Division (SHPD) was initiated in early 2017 and on April 19, 2017, SHPD requested a site visit and a Reconnaissance Level Survey (RLS) to identify potential historic properties at the project site per HAR §13-275-5.

Fung Associates Inc., was retained to conduct the required survey and assessment. A joint site visit by Fung Associates Inc. and SHPD was conducted on July 18. 2017 and the final report, entitled "Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Reconnaissance Level Survey" was completed in January 2018 and submitted to SHPD for acceptance. The Selective Reconnaissance Level Survey (RLS) involves a single structure, the Maunawili Road Bridge No. 3 – Maunawili Stream, which is located next to the proposed project. The RLS found that although the Maunawili Road Bridge No. 3 meets the criteria of a historic property, it was altered in 2009. Due to the alterations of the bridge, it has lost its historic integrity and is not eligible for listing on the Hawaii or National Register of Historic Places. The RLS concluded that "no historic properties affected" and "no adverse effect" for the proposed project. Subsequently, SHPD accepted this conclusion on March 23, 2018. The RLS report can be found in **Appendix C**.

In the unlikely event that historical or cultural resources are encountered during construction, work will be halted in the immediate area of the discovery and SHPD will be contacted as outlined in HRS Chapter 6E.

2.12 Socio-Economic Characteristics

According to the U.S. Census Bureau, the population, percent non-Caucasian, and median household income of the communities within the project vicinity area are as follows:

Table 2-1: Selected Socio-Economic Data

Census Designated Place	Population	% Minorities	Median Household Income
Maunawili[1]	2,020	63.8	$143,750

[1]Source: U.S. Census Bureau American Community Survey (ACS), 2013-2017 5-Year Estimates

The University of Hawai'i, Economic Research Organization (UHERO) prepared a county economic forecast update in May 2018. The study concludes that chances of continued growth in all four counties are good, with robust economic conditions. Tourism is gaining and construction activity remains at healthy levels. There is record low unemployment rates which will limit the job growth but welcome income gains. The common risk to all four counties primarily is continuing vulnerability to adverse developments. The predictions relevant to O'ahu are as follows:

- Tourism continues to profit from healthy economic conditions in the U.S. and the Asia-Pacific region. O‘ahu will benefit from buoyant international arrivals as airlines are adding capacity and as the weaker dollar makes a Hawaii trip more affordable. Although the room stock will experience some growth, occupancy rates will remain high, which will support higher room rates.
- Construction has bounced back from last year on O‘ahu, but Neighbor Island industry jobs are low. Home building on O‘ahu remains well below levels needed to satisfy household formation. As local income grows and interest rates rise, cost for developers rise and affordability concerns persist.
- Job growth will be more limited going forward with non-farm payrolls surpassing pre-recession levels and unemployment now at all-time lows. Net outmigration from the state caused labor shortages and has led to a recent labor force decline in all four counties. However, the tourism industry will create new jobs to satisfy visitor demand.
- All four counties face common uncertainties, both for specific industries and generally. The large number of visitors has led to congestion in many communities and an increase in home vacation rentals has a negative impact on the housing markets. Homelessness continues to be an issue and county governments are struggling to finance non-discretionary expenses. Trade wars, Federal interest rate hikes, or rising geopolitical tension could upset the current expansion.

The proposed project is not expected to have any long-term economic impacts; however, it will have minor positive short-term impacts associated with construction. These impacts include the creation of jobs for the anticipated duration of construction, assuming the project is awarded to a local contractor; and indirect economic stimulus from those workers spending their income on goods and services.

2.13 Utilities

Existing utilities at the project site other than sanitary sewers include electrical, telephone, cable television, storm water management and potable water. Storm water management infrastructure includes drains which flow into the Maunawili Stream. Potable water service is provided by the Honolulu Board of Water Supply (HBWS), and infrastructure includes a 2 inch waterline. Electrical service is provided by Hawaiian Electric Company (HECO), telephone service is provided by Hawaiian Telcom, and cable television service is provided by Spectrum.

Several precautions will be taken during design and construction of the restoration of the eroded streambed and stream banks within the Maunawili Stream at the force main crossing No. 1 to minimize the potential for conflicts with the existing utilities. The restoration design will adhere to minimum clearances from existing utilities. Utility companies will be provided plans for review during the design stage, and contractors will be required to coordinate field toning of the infrastructure prior to construction.

2.14 Transportation

Maunawili Road is owned and maintained by CCH and is the main road connecting Maunawili Valley to Kailua. The section of Maunawili Road in the vicinity of the project site is a two-way, two-lane, undivided County roadway road with a posted speed limit of 15 mile per hour (MPH) serving approximately 825 local residents plus Maunawili Falls Trail hikers. Maunawili Road also provides transport for the TheBus, operated by O'ahu Transit Services (OTS), which has Route 672 (Lanikai - Maunawili) running in and out of the subdivision. The route follows a loop around Aloha Oe Drive, Maleko Street, and Puualoha Street and does not cross Maunawili Road Bridge No. 3 adjacent to the project site. The time between buses varies approximately between 55 minutes and 100 minutes. The impact to TheBus service is expected to be minimal.

The proposed project is not expected to involve work within CCH roadways; however, because Maunawili Road is the only public access to the Maunawili Estates subdivision, and because deliveries to and from the site could potentially impact traffic, a temporary traffic control plan (TCP) will be included as part of the design. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours. Road closures for construction activities are not anticipated. As shown in **Figure 2-8**, Aloha Oe Drive, Puualoha Street and Kelewina Street provides an alternate route to the rest of the subdivision in the event that access to Maunawili Road Bridge No. 3 is temporarily restricted.

Design and construction of this project will be coordinated with all other projects in the vicinity with overlapping schedules and potential shared traffic impacts. No other projects are known at the time of this Draft EA. A detailed traffic management plan (TMP) for this project is not considered necessary.

2.15 Police Protection

The nearest Honolulu Police Department (HPD) station is the Kailua Substation located northeast of the project area on Kuulei Road. There is also an HPD station located northwest of the project area on Waikalua Road in Kaneohe. In a letter dated May 22, 2019, HPD expressed short- and long-term impacts to pedestrian and vehicular traffic around the area of the project. HPD recommended that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor to facilitate the flow of traffic during the construction phase of the project. As discussed in Section 2.14, a temporary TCP may be designed for the project and if developed, extensive coordination and outreach will be established to minimize impacts.

2.16 Fire Protection

The nearest Honolulu Fire Department (HFD) station is the Olomana Fire Station located northeast of the project area on Kalaniana'ole Highway. During construction, measures will be taken to maintain access to fire hydrants, and to ensure safe access to and from the fire stations. Additionally, as discussed in Section 2.14 a temporary TCP will be designed, early coordination will apprise HFD and any other emergency services of any lane reductions or turning movement restriction well in advance; therefore, impacts to fire protection services will be minimized.

2.17 Educational Facilities

There are several schools in the vicinity of the project area. These schools include Trinity Christan School – Mauka Campus, Le Jardin Academy, Maunawili Elementary School, Olomana School, Kailua High School and Kailua Methodist Pre-School. The school located closest to the project area is Trinity Christian School – Mauka Campus, which is 1.1 miles north of the project area. As discussed in Section 2.14, a temporary TCP and early coordination and outreach will minimize the impacts of construction on the nearby schools.

2.18 Other Facilities

Other facilities in the vicinity include the water tank by Lopaka Way owned by HBWS, the stream intakes located along Maunawili Ditch owned by Hawaii State Department of Agriculture, and the stream gauging stations owned by USGS. Access to these facilities will not be restricted.

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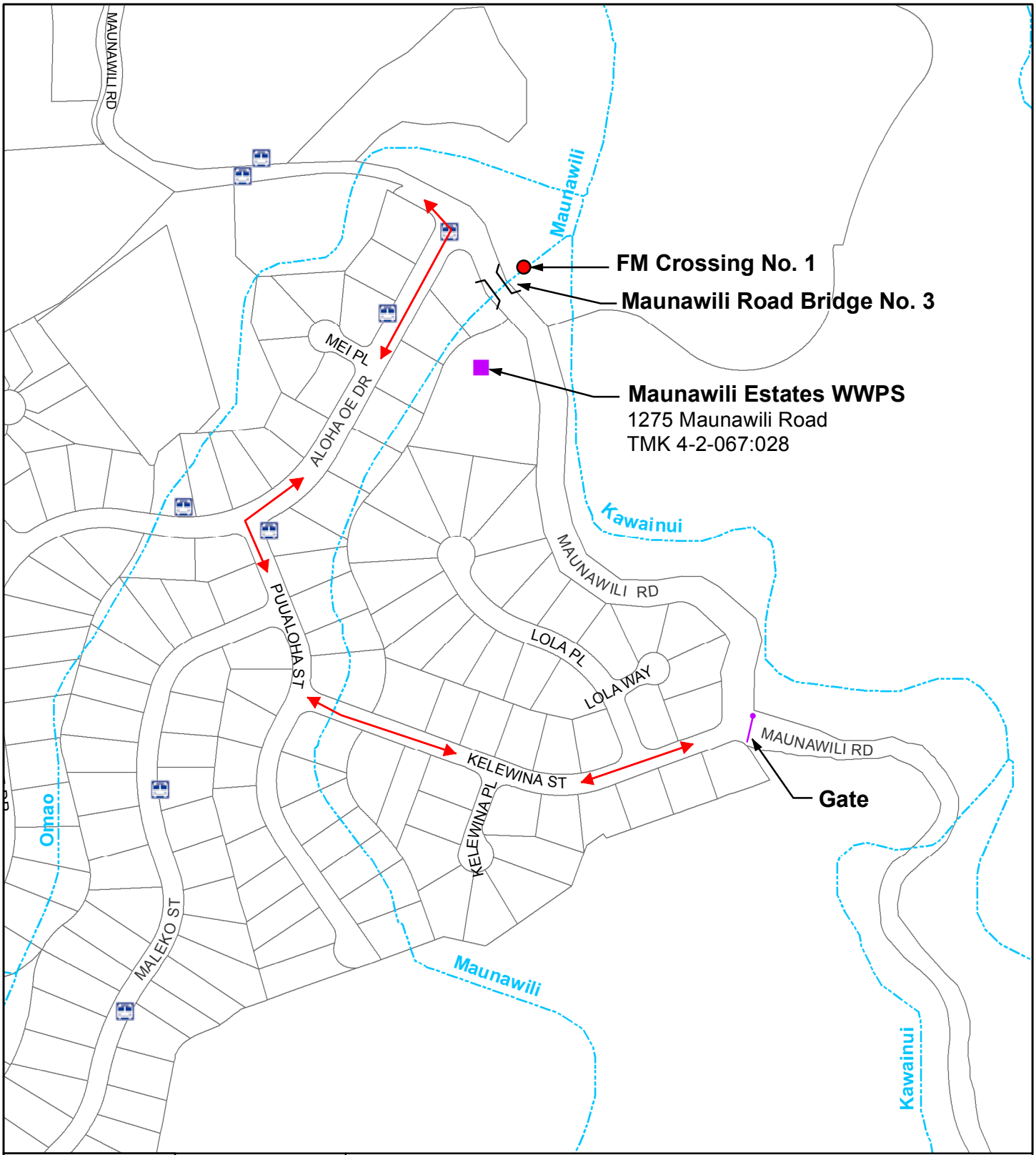

Maunawili Estates Wastewater Pump Station
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MAUNAWILI ESTATES SUBDIVISION ROAD MAP

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Consulting Engineers

Figure 2-8

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CHAPTER 3. RELATIONSHIP TO FEDERAL, STATE AND COUNTY PLANS AND POLICIES

3.1 Hawai‘i State Plan

The Hawai‘i State Planning Act, Chapter 226 of the Hawai‘i Revised Statutes, was first adopted in 1978. It serves as a guide for the future long-range development of the state through identification of goals, objectives, policies, and priorities. The state goals are discussed below, and the objectives relevant to the proposed project are indicated in **Table 3-1**.

> ***§226-4 State goals.*** In order to guarantee, for present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:
> (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations.
> (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
> (3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.

As stated in Section 1.3 Project Need and Objective, the proposed project supports these overall state goals.

Table 3-1: Hawai‘i State Plan Objectives

Objective	Description	Applicable
Population	It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives	No
Economy--in general	Planning for the State's economy in general shall be directed toward achievement of the following objectives: (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i'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. (2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.	No

Objective	Description	Applicable
Economy--agriculture	Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives: (1) Viability of Hawai‘i's sugar and pineapple industries. (2) Growth and development of diversified agriculture throughout the State. (3) An agriculture industry that continues to constitute a dynamic and essential component of Hawai‘i's strategic, economic, and social well-being.	No
Economy--visitor industry	Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai‘i's economy.	No
Economy--federal expenditures	Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai‘i's economy.	No
Economy--potential growth activities	Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawai‘i's economic base.	No
Economy--information industry	Planning for the State's economy with regard to telecommunications and information technology shall be directed toward positioning Hawai‘i as a leader in broadband communications and applications in the Pacific Region.	No
Physical environment--land-based, shoreline, and marine resources	Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives: (1) Prudent use of Hawai‘i's land-based, shoreline, and marine resources. (2) Effective protection of Hawai‘i's unique and fragile environmental resources.	Yes
Physical environment-- scenic, natural beauty, and historic resources	Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai‘i's scenic assets, natural beauty, and multi-cultural/historical resources.	Yes
Physical environment--land, air, and water quality	Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives: (1) Maintenance and pursuit of improved quality in Hawai‘i's land, air, and water resources. (2) Greater public awareness and appreciation of Hawai‘i's environmental resources.	Yes

Objective	Description	Applicable
Facility systems--in general	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.	Yes
Facility systems--solid and liquid wastes	Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives: (1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes. (2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	Yes
Facility systems--water	Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.	No
Facility systems--transportation	Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives: (1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods. (2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.	No
Facility systems--energy	Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all: (1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people; (2) Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased; (3) Greater energy security and diversification in the face of threats to Hawai‘i's energy supplies and systems; and (4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use.	No
Facility systems--telecommunications	Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.	No

Objective	Description	Applicable
Socio-cultural advancement--housing	Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives: (1) Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population. (2) The orderly development of residential areas sensitive to community needs and other land uses. (3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.	No
Socio-cultural advancement--health	Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives: (1) Fulfillment of basic individual health needs of the general public. (2) Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities.	No
Socio-cultural advancement--education	Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.	No
Socio-cultural advancement--social services	Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.	No
Socio-cultural advancement--leisure	Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.	No
Socio-cultural advancement--individual rights and personal well-being	Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.	No
Socio-cultural advancement--culture	Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people.	No

Objective	Description	Applicable
Socio-cultural advancement--public safety	Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives: (1) Assurance of public safety and adequate protection of life and property for all people. (2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances. (3) Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.	No
Socio-cultural advancement--government	Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives: (1) Efficient, effective, and responsive government services at all levels in the State. (2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.	No

The objectives and policies relevant to the proposed project are listed and discussed below.

§226-11 Objectives and policies for the physical environment—land-based, shoreline, and marine resources.

(a) Planning for the state's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:
  (1) Prudent use of Hawai'i's land-based, shoreline, and marine resources.
  (2) Effective protection of Hawai'i's unique and fragile environmental resources.

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
  (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
  (3) Take into account the physical attributes of areas when planning and designing activities and facilities.
  (4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

§226-12 Objective and policies for the physical environment—scenic, natural beauty, and historic resources.

(a) Planning for the state's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty, and multi-cultural/historic resources.

(b) To achieve the scenic, natural beauty, and historic resources objectives, it shall be the policy of this state to:

(1) Promote the preservation and restoration of significant natural and historic resources.
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawai‘i’s ethnic and cultural heritage.
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

§226-13 Objective and policies for the physical environment—land, air, and water quality.

(a) Planning for the state’s physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:
(1) Maintenance and pursuit of improved quality in Hawai‘i’s land, air, and water resources.
(b) To achieve the land, air, and water quality objectives, it shall be the policy of this state to:
(2) Promote the proper management of Hawai‘i’s land and water resources.
(3) Promote effective measures to achieve desired quality in Hawai‘i’s surface, ground, and coastal waters.

§226-14 Objectives and policies for facility systems—in general.

(a) Planning for the state’s facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.
(b) To achieve the general facility systems objective, it shall be the policy of this state to:
(1) Accommodate the needs of Hawai‘i’s people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.

§226-15 Objectives and policies for facility systems—solid and liquid wastes.

(a) Planning for the state's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.
(b) To achieve solid and liquid waste objectives, it shall be the policy of this state to:

(1) Encourage the adequate development of sewerage facilities that complement planned growth.
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.

The proposed project will involve plugging the void beneath the existing concrete structure encasing the 8-inch diameter force main and restore the eroded streambed and stream banks at the crossing and therefore, the physical and scenic attributes of the area will be restored and maintained. The proposed project will greatly reduce the risk of a structural failure of the force main which would result in the discharge of wastewater to spill into Maunawili Stream. Hence, the proposed project is in compliance with the aforementioned goals and objectives.

The CCH, Department of Environmental Services has not developed functional plans, and other priority guidelines of the Hawai'i State Planning Act are not applicable to the proposed project.

3.2 State Land Use Law

Chapter 205 of the Hawai‘i Revised Statutes, the State Land Use Law, classifies four major land use districts in which all lands are placed and establishes a framework of land use management and regulation for these lands. The four land use districts are: Rural, Urban, Agricultural and Conservation. The State Legislature established the Land Use Commission (LUC) to administer the State Land Use Law.

The Conservation District is regulated by the Department of Land and Natural Resources, Office of Conservation and Coastal Lands (OCCL), and is divided into five subzones: Protective, Limited, Resource, General and Special. The first four subzones are arranged in a hierarchy of environmental sensitivity, ranging from the most to the least sensitive; the Special subzone is applied in special cases specifically to allow a unique land use on a specific site. As established in Hawai‘i Administrative Rules (HAR) Chapter 13-5, Subchapters 2 and 3, these subzones define a set of "identified land uses" which may be allowed by discretionary permit or some sort of approval from the DLNR. Major permits are required for land uses which have the greatest potential impact, and an EA and/or an Environmental Impact Statement (EIS) and potentially Public Hearing are required; minor permits are required for land uses which may have fewer impacts.

The project area is adjacent to Agricultural land use district, and entirely within the Urban land use district. See **Figure 3-1**. HRS Section 205-2(b) states that "Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated". Therefore, guidance regarding the Urban district is deferred to the CCH.

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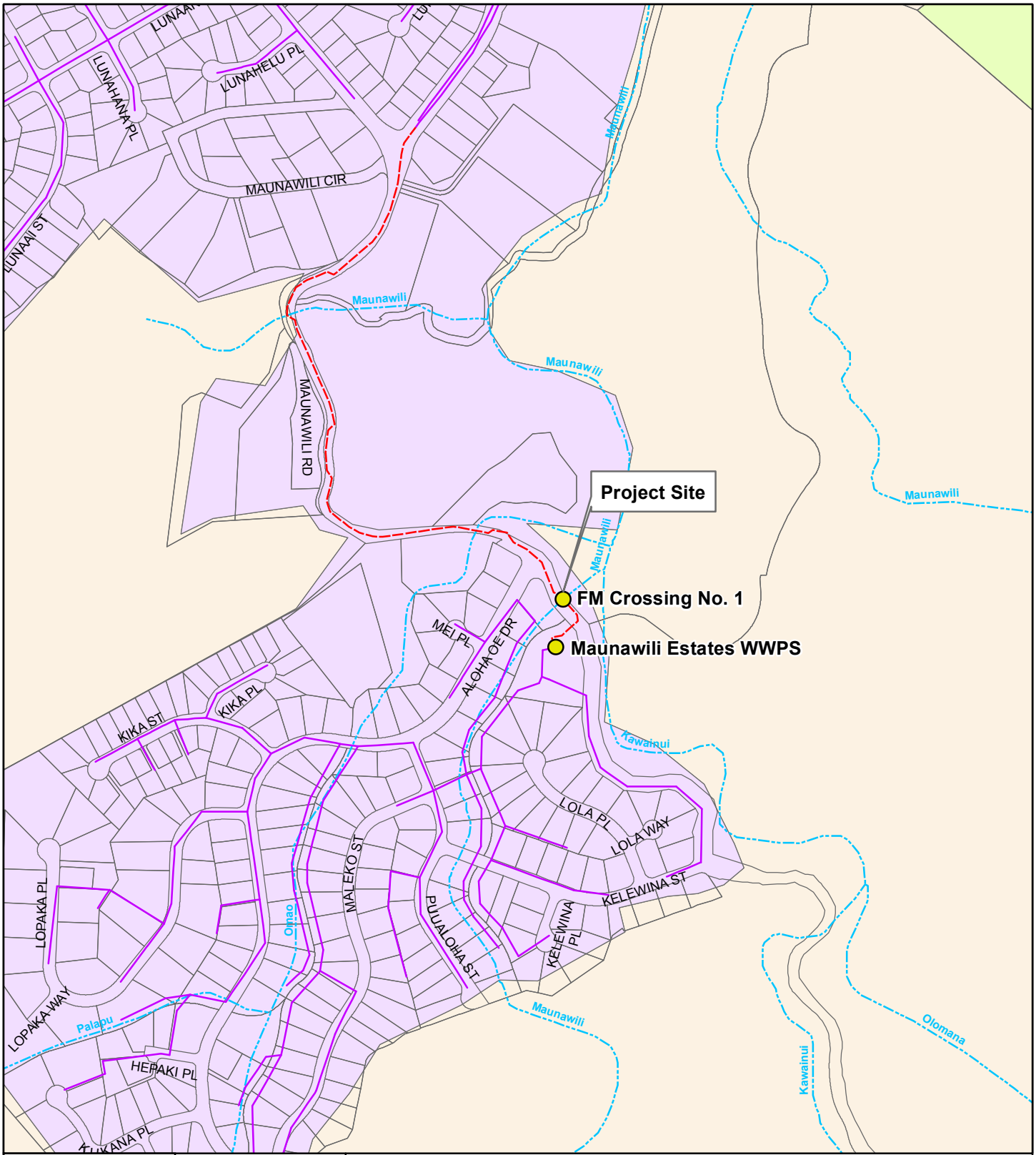

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

STATE LAND USE MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 3-1

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3.3 City and County of Honolulu General Plan

The City and County of Honolulu General Plan, a requirement of the City Charter, is a broad but comprehensive statement of objectives and policies which sets forth the long-range aspirations of O‘ahu's residents and the strategies of actions to achieve them within an approximate 20-year planning horizon. The Department of Planning and Permitting strives to maintain the dynamic nature of the General Plan; the current edition was released in 1992, and amended in 2002, and a proposed revised O’ahu General Plan was released in December 2017. It is the focal point of a comprehensive planning process that, together with the regional development plans, provides a direction and framework to addresses physical, social, economic and environmental concerns affecting the CCH. This planning process serves as the coordinative means by which the CCH government provides for the future growth of the metropolitan area of Honolulu.

There are eleven (11) areas of concern outlined in the General Plan:

(1) population;
(2) economic activity;
(3) the natural environment;
(4) housing,
(5) transportation and utilities;
(6) energy;
(7) physical development and urban design;
(8) public safety;
(9) health and education;
(10) culture and recreation; and
(11) government operations and fiscal management

The General Plan does not define specific land uses or area.

The policies and objectives for the Natural Environment, Section 3 and Transportation and Utilities, Section 5, relevant to the proposed project, are as follows:

Natural Environment:

Objective A: To protect and preserve the natural environment.

Policy 2: Seek the restoration of environmentally damaged areas and natural resources.

Transportation and Utilities:

Objective B: To meet the needs of the people of O‘ahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 5: Provide safe, efficient, and environmentally sensitive waste-collection and waste-disposal services.

Objective C: To maintain a high level of service for all utilities.

Policy 1: Maintain existing utility systems in order to avoid major breakdowns.

Objective D: To maintain transportation and utility systems which will help O‘ahu 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.

The proposed project is consistent with the aforementioned policies.

3.4 Ko’olau Poko Sustainable Communities Plan

Chapter 24 of the Revised Ordinances of Honolulu (ROH) sets out the requirement for the preparation of development plans, which are community-oriented plans intended to help guide public policy, investment, and decision-making through a planning horizon over a 20± year timeframe. Each of these plans covers a geographic planning region on O‘ahu, addressing the specific conditions and community values of each region. Two of the eight planning regions, ‘Ewa and the Primary Urban Center (PUC), were areas to which major growth in population and economic activity were anticipated to be directed over the next 20 years and beyond, and the remaining six planning regions were envisioned to remain relatively stable. The plans for the former regions were titled “Development Plans,” and the plans for the latter regions were titled “Sustainable Communities Plans”. The six planning regions title Sustainable Communities Plans (SCP) are East Honolulu, Central O‘ahu, Ko‘olau Poko, Ko’olau Loa, North Shore and Waianae. The Ko’olau Poko planning region extends from the Makapu‘u Point to Ka‘oio Point at the northern end of Kaneohe Bay, and is bound by the Ko‘olau mountain range and the sea. This region includes the rural communities of Waiahole, Waikane, Kahalu‘u, He‘eia, and Waimanalo and the urban fringe communities of ‘Ahuimanu, Kane‘ohe, and Kailua. The function of the Ko’olau Poko SCP is to serve as the policy guide for the development decisions and actions to prevent an undesirable spreading of development.

These plans were adopted and revised by ordinance and are required to implement objectives and policies set forth in the General Plan.

The 2017 Ko’olau Poko Sustainable Communities Plan was adopted on August 24, 2017 by Ordinance No. 17-42. Review of each of the plans begins five years after adoption to revalidate and adjust as necessary vision elements, policies, and guidelines, and evaluate how implementation can be improved. The CCH, Department of Planning and Permitting will conduct a comprehensive review of the Ko’olau Poko SCP every five years. The 2017 Ko’olau Poko SCP is organized in five chapters addressing the role of the Ko’olau Poko in O‘ahu’s development pattern; the vision for Ko’olau Poko’s future; land use and guidelines; public facilities and infrastructure policies and guidelines; and implementation. Consistent with the provisions of the General Plan, Ko’olau Poko is expected to remain relatively stable over the 20-year timeframe of the plan. The vision for Ko’olau Poko SCP describes the communities of 2035, with two principal concepts. The first concept is to protect the communities’ natural, scenic, cultural historic and agricultural resources and the second concept is to address the need to improve and replace the region’s aging infrastructure systems.

Section 3.1 of the Ko'olau Poko's SCP deals with open space preservation and the elements of open space resources and Section 4.3 deals with wastewater management. The elements/policies and guidelines relevant to this project state the following:

Section 3.1:

Element: Natural Gulches, Streams and Drainageways

Guideline: Incorporate erosion control measures and best management practices, as cited in the Hawaii Coastal Nonpoint Pollution Control Program Management Plan to prevent pollution of wetlands, streams, estuaries and nearshore waters.

Section 4.3:

Policy: Mitigate visual, noise, and odor impacts associated with wastewater collection and treatment systems, especially when they are located adjacent to residential designated areas.

Guideline: Complete planned improvements to the Kailua Regional Wastewater Treatment Plant service area facilities.

The proposed project will facilitate achievement of these elements/policies and guideline for the Ko'olau Poko's SCP open space preservation and wastewater system and therefore is in conformance with the principles and objectives outlined in the Ko'olau Poko SCP.

3.5 Ko'olau Poko Watershed Management Plan

The Honolulu Board of Water Supply, in collaboration with the DPP, is in the process of updating the O'ahu Water Management Plan (OWMP) in accordance with the State Water Coad and the Hawaii Water Plan, and CCH Ordinance 90-62 that established the OWMP. HBWS will develop eight district-specific plans that together will form the updated O'ahu Water Management Plan, each providing watershed management guidance over a 20-year timeframe. The Ko'olau Poko Watershed Management Plan (KPWMP) was completed in 2012.

The overall goal of the KPWMP is to formulate an environmentally holistic, community-based, and economically viable watershed management plan that will provide a balance between: (1) the preservation and management of O'ahu's watersheds, and (2) sustainable ground water and surface water use and development to serve present users and future generations. The five major objectives are as follows:

Objective #1: Promote sustainable watersheds

Objective #2: Protect and enhance water quality and quantity

Objective #3: Protect Native Hawaiian rights and traditional and customary practices

Objective #4: Facilitate public participation and education, and project implementation

Objective #5: Meet future water demands at a reasonable cost

The proposed project is consistent with the KPWMP because it will address objective #2 in protecting the water quality of the Maunawili Stream.

3.6 City and County of Honolulu Land Use Ordinance

Chapter 21 of the Revised Ordinances of Honolulu, Land Use Ordinance (LUO), regulates Honolulu's land use in a manner that will encourage orderly development in accordance with adopted land use policies while providing reasonable development and design standards. Section 21.3 sets forth CCH's zoning district classifications and prescribes the permitted land uses and activities within those designations. The proposed project is within the AG-2 Agricultural General district and adjacent to the R-20 Residential district. See **Figure 3-2**. The LUO states the following regarding these districts:

Sec. 21-3.50 Agricultural districts—Purpose and intent.

(a) The purpose of the agricultural districts is to maintain a strong agricultural economic base, to prevent unnecessary conflicts among incompatible uses, to minimize the cost of providing public improvements and services and to manage the rate and location of physical development consistent with the city's adopted land use policies. To promote the viability and economic feasibility of an existing agricultural operation, accessory agribusiness activities may be permitted on the same site as an adjunct to agricultural uses. Theses accessory activities must be compatible with the on-site agricultural operation and surrounding land uses.

(d) The intent of the AG-2 general agricultural district is to conserve and protect agricultural activities on smaller parcels of land.

(e) The following guidelines shall be used to identify lands which may be considered for the AG-2 general agricultural district:

(1) Lands which are in the state designated agricultural or urban district and designated agricultural by adopted city land use policies;

(2) Lands which are predominantly classified as other under the agricultural lands of importance of the State of Hawaii system; and

(3) Lands which are used or suitable for agricultural purposes and where a substantial number of parcels are less than five acres in size.

Sec. 21-3.70 Residential districts--Purpose and intent.

(a) The purpose of the residential district is to allow for a range of residential densities. The primary use shall be detached residences. Other types of dwellings may also be allowed, including zero lot line, cluster and common wall housing arrangements. Nondwelling uses which support and complement residential neighborhood activities shall also be permitted.

(b) The intent of the R-20 and R-10 districts is to provide areas for large lot developments. These areas would be located typically at the outskirts of urban development and may be applied as a transitional district between preservation, agricultural or country districts and urban districts. They would also be applied to

lands where residential use is desirable but some development constraints are present.

Per 21-3.50-1(a) and 21-3.70-1(a), within general agricultural and residential districts, respectively, permitted uses and structures shall be as enumerated in Table 21-3. This table, the "Master Use Table", indicates that for all zoning districts, under Social and Civic Service, public uses and structures are permitted uses.

Section 21.9 of the LUO sets forth the requirements for development within Honolulu's special districts with the purpose of guiding development to protect and/or enhance the physical and visual aspects of communities in need of restoration, preservation, redevelopment or rejuvenation. The proposed project is not within any Special District.

Based on the objective of the proposed project stated in Section 3.1, it is in conformance with the City and County of Honolulu LUO.

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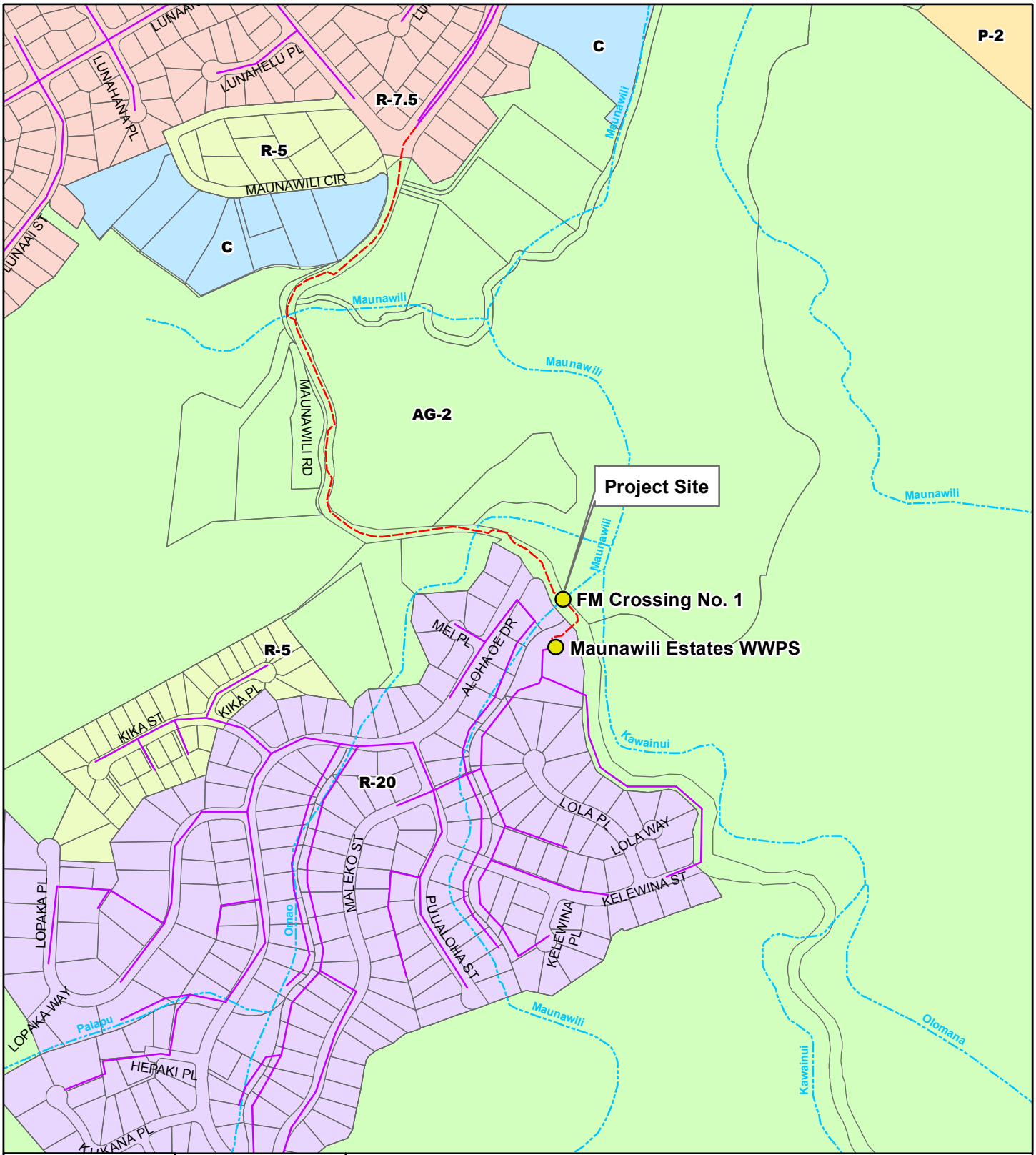

Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Draft Environmental Assessment

CITY & COUNTY OF HONOLULU ZONING MAP

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers

Figure 3-2

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3.7 Coastal Zone Management Program

Hawai‘i’s Coastal Zone Management (CZM) Program was approved in 1977 though HRS Chapter 205A subsequent to the passage of the federal CZM Act in 1972. The program was enacted to provide a common focus for state and county actions dealing with land and water uses and activities. It is administered by the State Department of Business, Economic Development and Tourism (DBEDT), Office of Planning; however, each county has been delegated local authority and is responsible for issuing permits for activities within its lands. The CZM establishes two areas in which special controls and rules are applied, the Special Management Area (SMA) and the Shoreline Setback. The SMA is a land area extending inland from the shoreline as delineated by the maps developed through the CZM program in which development is regulated, and the Shoreline Setback serves to protect and preserve the natural shoreline, public pedestrian access and open space by regulating any structure or activity within this shoreline area. Permit requirements are set forth in ROH Chapter 25 and Chapter 23, respectively, and are under the jurisdiction of the DPP.

The project area is not within the SMA or the shoreline; therefore, neither an SMA permit nor a Shoreline Setback variance will be required.

Chapter 205A of the Hawaii Revised Statues also requires legal and operational compliance with CZM objectives and policies as described in §205A-2. These objectives applicable to the proposed project are indicated in **Table 3-1**.

The policy relevant to the proposed project are as follows:

§205A-2(c)(2) Historic Resources:
(A) Identify and analyze significant archaeological resources;
(B) Maximize information retention through preservation of remains and artifacts or salvage operations;
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

As discussed in Section 2.11, a Selective Reconnaissance Level Survey (RLS) was completed and it concluded that no historic properties will be affected by this project. Based on the objective of the proposed project stated in Section 3.1, it is in conformance with the aforementioned policy.

Table 3-2: Coastal Zone Management Progam Objectives

Objective	Description	Applicable
Recreational resources	Provide coastal recreational opportunities accessible to the public.	No
Historic resources	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.	Yes
Scenic and open space resources	Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.	Yes
Coastal ecosystems	Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.	No
Economic uses	Provide public or private facilities and improvements important to the state's economy in suitable locations.	No
Coastal hazards	Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.	No
Managing development	Improve the development review process, communication, and public participation in the management of coastal resources and hazards.	No
Public participation	Stimulate public awareness, education, and participation in coastal management.	No
Beach protection	Protect beaches for public use and recreation.	No
Marine resources	Promote the protection, use, and development of marine and coastal resources to assure their sustainability.	No

3.8 Department of the Army

The mission of the U.S. Army Corps of Engineers (USACE) is to protect the aquatic resources of the United States. The USACE has jurisdiction over waters of the United States, which include navigable waters and wetlands, and assumes authority through issuance of permits for activities above, below or within these waters. The USACE is responsible for administration of Department of the Army (DA) permits under the following legislative acts:

- Rivers and Harbors Act 1899 (RHA) – §10: Section 10 of the Rivers and Harbors Act of 1899 requires prior authorization to complete any work in or over, or which affects the course, location, condition or capacity of navigable waters of the United States.
- Clean Water Act (CWA) – §401 and §404: Section 401 of the Clean Water Act requires that an applicant for a Federal license or permit to conduct any activity which may result in a discharge into the navigable waters, shall provide certification that any such discharge will comply with the Clean Water Act. Section 404 of the Clean Water Act requires approval prior to discharging dredged or fill material into the waters of the United States.

- Coastal Zone Management Act – §307: Section 307 of the Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1458(c)), requires the applicant and State certify that the project is in compliance with an approved State Coastal Zone Management Program.
- Endangered Species Act (ESA) – §7: Section 7 of the Endangered Species Act of 1973 requires certainty that any Federally funded or authorized action will likely not jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of their critical habitat. The USACE is required to consult with the USFWS and/or the National Oceanic and Atmospheric Administration (NOAA) Fisheries to assess the potential of a project to affect listed species.
- National Historic Preservation Act – §106: Section 106 of the National Historic Preservation Act requires the USACE to take into account the effect of a project on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The USACE is required to consult with the DLNR, State Historic Preservation Division, in order to determine a project's potential to impact resources of historic or cultural significance.
- Magnuson-Stevens Fisheries Conservation Act: Also known as Magnuson Fishery Conservation and Management Act, this is the primary law governing marine fisheries management in U.S. federal waters. Under this Act, regional councils were established to manage fish stocks within coastal zones.

In August 2016, the USACE Honolulu District was contacted for a jurisdictional determination of the project work within Maunawili Stream. After reviewing the project information pursuant to Section 404 of the CWA and Section 10 of the RHA, the USACE preliminarily determined that the Maunawili Stream may be waters of the U.S. under its regulatory jurisdiction and provided a Preliminary Jurisdictional Determination (PJD) for the proposed project. The CCH accepted the PJD on September 28, 2016; consequently, for purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of this PJD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the United States. Therefore, the following DA permits may be required if the corresponding actions occur:

- Under Section 10 of the RHA for any structures or activities occurring in, over, under, and affecting the Maunawili Stream.
- Under Section 404 of the CWA should the project activity result in discharge and/or placement of dredge or fill material into water of the Maunawili Stream.

The USACE issues nationwide permits (NWP) to authorize certain activities that require DA permits under Section 404 of the CWA and/or Section 10 of the RHA that have no more than minimal individual and cumulative adverse environmental effects. The NWPs can only be issued for a period of no more than five years and the current NWPs at the time of this Draft EA expire on March 18, 2022. NWP #12, Utility Line Activities, includes activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the loss of greater than 1/2-acre of waters of the U.S. for each single and complete project. Should one or both of these DA permits be required,

the proposed project may qualify for authorization under NWP #12, Utility Line Activities. To obtain such a NWP for this project, the CCH will file a Pre-Construction Notification (PCN) to the USACE for verification.

Before authorizing work under its statutory authorities, the USACE must ensure the project complies with applicable Federal laws and regulations, as described at the beginning of this section. In most instances, the USACE will coordinate directly with the appropriate agencies but may require additional information from the CCH to complete the coordination and consultation.

3.9 Federal Cross-Cutter Authorities

Federal environmental cross-cutting authorities shall be consulted for all federally funded and/or permitted projects to assess the potential effects of the proposed project under various federal environmental laws and Executive Orders. This project will require a DA permit which is a federal permit. The project may be funded by low-interest loan funding through the State of Hawai‘i’s Clean Water State Revolving Fund (SRF) Program, which will require the project to meet Hawai‘i SRF program requirements. Because the SRF receives some federal funding, SRF loan applicants are required to certify compliance with all the Federal Cross-Cutter regulations which are determined applicable to the SRF program. The Clean Water State Revolving Fund (CWSRF) program was established by U.S. Congress in 1987 under the Water Quality Act. The intent of the CWSRF is to assist the construction of publicly owned wastewater treatment works, the implementation of a nonpoint source pollution control management program, and the implementation of an estuary conservation and management program.

3.9.1 Archaeological & Historic Preservation Act, National Historic Preservation Act

The Archaeological & Historic Preservation Act, 16 U.S.C. §469a-1, deals with the threat of loss or destruction of significant data by federal construction projects; notification and request for preservation of data; and survey of sites, preservation of data and compensation. The National Historic Preservation Act (NHPA), 16 U.S.C. §470, requires the consideration of the effect of any project on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. Section 106 of the NHPA mandates a review process for all federally funded and permitted projects to assess the potential impacts on significant archaeological or historic sites, and allows interested parties an opportunity to comment on such impacts.

As discussed in Section 2.11, the RLS found that although the Maunawili Road Bridge No. 3 meets the criteria of a historic property, it was altered in 2009. Due to the alterations of the bridge, it has lost its historic integrity and is not eligible for listing on the Hawaii or National Register of Historic Places. The RLS concluded that no historic properties would be affected and that the proposed project would have no adverse effect. USACE Honolulu District is the review agency for the Section 106 process and will be provided a copy of the Draft EA for its concurrence.

3.9.2 Clean Air Act

The Clean Air Act, 42 U.S.C. §7506(c), requires each state to develop a State Implementation Plan (SIP) delineating how federal air quality standards will be attained and how this will be verified. The DOH, Clean Air Branch, Air Quality program is defined by HAR Chapter 11-60 and is a SIP approved by EPA.

As discussed in Section 2.9, the ambient air quality in the vicinity of the project is typically very good. The closest DOH station monitors only for sulfur dioxide, carbon monoxide and fine particulate matter. Construction activities may slightly increase airborne particulate matter and may cause temporary odors in the immediate vicinity; however, levels at the nearby monitoring stations should not be affected. Temporary, short-term construction impacts will be minimized by BMPs. Long-term operation will not produce any of the pollutants on the DOH monitoring list. The DOH, Clean Air Branch, will be provided a copy of the Draft EA for its concurrence.

3.9.3 Coastal Barrier Resources Act

The Coastal Barrier Resources Act, 16 U.S.C §3501, designated various undeveloped, unprotected coastal barriers on the Atlantic Ocean and Gulf of Mexico coasts, and is not applicable to the State of Hawai‘i.

3.9.4 Coastal Zone Management Act

As discussed in Section 3.7, HRS Chapter 205A sets forth Hawai‘i’s CZM Program, which is in compliance with the Coastal Zone Management Act, 16 U.S.C. 1456(c)(1). HRS §205A-2 describes the CZM program, its objectives, and policies.

Section 3.7 describes how the proposed project is in conformance with the objectives and policies of Hawai‘i’s CZM Program, thus this project is in conformance with this act. The DBEDT, Office of Planning, will be provided a copy of the Draft EA for its concurrence.

3.9.5 Endangered Species Act, Fish & Wildlife Coordination Act, Essential Fish Habitat

The Endangered Species Act, 16 U.S.C. §1536(a)(2) and (4), is administered by the USFWS and NOAA, National Marine Fisheries Service. The USFWS has primary responsibility for terrestrial and freshwater organisms, while NOAA is mainly responsible for marine wildlife. NOAA is also the agency consulted under the Essential Fish Habitat consultation process under the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §1801. The Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. §662(a), provides the basic authority for USFWS involvement in evaluating impacts of proposed water resource development projects on fish and wildlife, and requires federal agencies to take actions to prevent or mitigate loss or damage to wildlife resources.

As discussed in Section 2.6, no plants or animals proposed or listed as endangered or threatened under state or federal endangered species statutes were observed during the survey conducted for the NRS. However, endangered aquatic biota have been reported in the middle to upper reaches of Kawainui Watershed; endangered Hawaiian waterbirds may utilize the project area, although optimal habitat is not present; protected seabirds may overfly the project area; and the endangered Hawaiian Hoary Bat is known to forage for insects along waterways, such as those found in the project area. Adverse impacts to the protected and endangered species are not anticipated with the implementation of BMPs recommended by USFWS.

There is no federally designated critical habitat within the vicinity of the proposed project area. Deleterious impacts to critical habitat and federally protected species upslope of the project area are not anticipated provided the appropriate aforementioned BMPs are followed. A copy of the complete NRS is included as **Appendix B**.

The PIFWO will be provided a copy of the Draft EA for its concurrence.

3.9.6 Environmental Justice Executive Order

Executive Order 12898 was signed in 1994. It directs federal agencies to identify and address disproportionately high adverse human health or environmental effects of its activities on minority and low-income populations.

The percentage of minorities (non-Caucasian) in the Maunawili Census Designated Place (CDP) is 63.8 percent, which is significantly higher than the national average of 23.5 percent; however, the 2013-2017 median household income of $143,750 in the Maunawili CDP was also significantly higher than the national average of $57,652. Negative long or short-term health or environmental impacts associated with this project are very unlikely; rather, positive health impacts will be realized through a stabilized sanitary sewer force main which will carry a lower risk of sanitary sewer spills.

3.9.7 Farmland Protection Act

The Agriculture and Food Act (Public Law 97-98) was passed in 1981 and contained the Farmland Protection Policy Act (FPPA), Subtitle I of Title XV, Section 1539-1549. The intent of the FPPA was to minimize the impacts of federal programs on prime farmland, unique farmland, and other land of statewide or local importance. It is administered by the USDA, National Resources Conservation Service (NRCS). The three categories of farmland described in FPPA are translated to the ALISH classifications of “Prime”, “Unique”, and “Other” agricultural lands.

As indicated in Section 2.3.3, the project area is entirely within lands not considered for classification under ALISH as agricultural lands; therefore, this act is not applicable to the proposed project. The NRCS will be provided a copy of the Draft EA for its concurrence.

3.9.8 Floodplain Management Executive Order

The objective of Executive Order 11988 is to avoid to the extent possible the adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. To accomplish this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities."

As discussed in Section 2.4, the entire project area is located in Zone D. This is an unstudied area where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

3.9.9 Protection of Wetlands Executive Order

The purpose of Executive Order 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". Federal agencies, to meet these objectives, in planning their actions are required to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland is unavoidable. The procedures require the determination of whether or not the proposed project will be in or will affect wetlands.

The NRS explained that wetlands are typically found at the interface of aquatic and terrestrial environments. Wetlands regulated by the federal government under the auspices of the CWA are defined in the Clean Water Rule as:

> *"…those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."*

The NRS deduced that Maunawili Stream is a perennial stream, not a wetland, and that wetlands are not present in the project area.

As discussed in Section 2.7, a Blanket Section 401 WQC will be required from the DOH. This will ensure that water is adequately controlled and treated through the implementation of BMPs prior to discharging from the in-water work area. Construction will be halted during storm events. Adverse effects to any wetlands downstream of the project area from in-water construction activities are very unlikely. The USACE Honolulu District will be provided a copy of the Draft EA for its concurrence.

3.9.10 Safe Drinking Water Act

The Safe Drinking Water Act (SDWA), 42 U.S.C. §300f, was established to protect the quality of all waters actually or potentially designed for drinking use from both underground and above-ground sources. The SDWA authorizes the United States Environmental Protection Agency (EPA) to establish minimum standards to protect potable water with which all owners or operators of public water systems must comply; to oversee the agencies which can be approved to implement these rules on EPA's behalf, such as state governments; and to encourage attainment of secondary standards (nuisance-related). The SDWA also establishes the Sole Source Aquifer Program, under which EPA also may evaluate federal-funded projects to determine whether they have the potential to contaminate a sole source aquifer.

At present, there are two such aquifers in the State of Hawai'i: the Southern O'ahu Basal Aquifer, and the Molokai Aquifer. The former encompasses an area including the entire Pearl Harbor Aquifer Sector Area; part of the Central Aquifer Sector Area; and approximately half of the Honolulu Aquifer Sector Area. The project area is not within either aquifer and therefore does not require EPA review.

Potable water for drinking use in Kailua is provided by HBWS and the sources of this water are exclusively ground water. The nearest HBWS water facility is uphill about 0.5 miles from the project site, at the end of Lopaka Way. Due to its distance and location, it is extremely unlikely that project activities could contaminate the drinking water supply.

3.9.11 Wild & Scenic Rivers Act

The Wild and Scenic Rivers Act, 16 U.S.C. 1271-1287, declares to be the policy of the United States that certain selected rivers with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historical, cultural, or other similar values, shall be preserved in their free-flowing condition.

There are no such rivers designated in the State of Hawai'i; therefore, the act is not applicable to this project.

CHAPTER 4. ALTERNATIVES CONSIDERED

4.1 No Action

Under the No Action alternative, the erosion of the streambed and stream banks at the force main stream crossing will continue, which will be exacerbated by the absence of bridge wing walls. This will further expose and undermine the concrete structure encasing the force main, increasing the risk of a structural failure of the force main. Such a failure would result in the discharge of untreated wastewater into Maunawili Stream. The force main carries an average wastewater flow of approximately 0.1 MGD and a peak hour flow rate of up to 1 MGD during rainfall events; therefore, a wastewater discharge could be in the order of magnitude of thousands to millions of gallons. Any such wastewater discharges into the environment could be a threat to public health. The CCH could suffer economic losses due to potential to fines levied by EPA and/or DOH. For these reasons, the No Action alternative was not considered to be a viable alternative.

4.2 Alternatives Analysis

The Preliminary Investigation developed and evaluated several conceptual options for action at the Force Main Crossing No. 1. Below is a brief summary of the options:

Options	Description	Deficiencies Addressed		
		Undermined Concrete Structure & Force Main	Eroded Streambed	Eroded Stream Banks
1	Plug the void under the concrete structure	Yes	No	No
2	Plug the void under the concrete structure and restore the streambed and stream banks	Yes	Yes	Yes
3	Construct a new force main over the stream and a utility bridge to support the new	Yes	No	No
4	Construct a new force main beneath the streambed using trenchless technologies	Yes	No	No

Alternatives A, B, C, and D discussed below were developed based on Options 1, 2, 3, and 4, respectively.

4.2.1 Alternative A

Alternative A (Option 1) would plug the void beneath the concrete structure to stop the undermining flow that continues to erode the support to the force main. This represents the minimum repair necessary to address the issue of the erosion under the concrete structure.

4.2.2 Alternative B

Alternative B (Option 2) would plug the void beneath the concrete structure to stop the undermining flow that continues to erode the support to the force main and would also restore the eroded stream bed and stream banks. The design would need to prevent reoccurrence of the ongoing erosion at the force main crossing. The force main configuration and characteristics would remain the same. The construction within the stream would require consultation with Federal and State Regulatory agencies for permit requirements, including a Blanket Section 401 WQC, Section 404 DA permit, and other permits, such as the NPDES permit. This alternative represents the minimum repair necessary to address the erosion issues under the concrete jacket and the erosion issues in the stream bed and stream banks.

4.2.3 Alternative C

Alternative C (Option 3) would construct a 10-inch diameter section of the force main above the stream supported by a utility bridge. The larger diameter of pipe would accommodate future upsizing of the force main. The new section of the force main would be connected to the existing force main before and after the stream crossing through 8”x10” pipe reducers and bends, and the existing section of the concrete structure and force main at the crossing would be abandoned. An air release valve (ARV) would be required and would need routine maintenance. The change in force main configuration and design characteristics would require re-evaluation of the Maunawili Estates WWPS hydraulic conditions, such as development of a new system curve and establishment of new pump operating points. This work would also require NPDES (dewatering) and Section 404 DA permits. This alternative does not address the erosion issues, but the new force main will avoid the erosion issues from becoming a force main safety issue.

4.2.4 Alternative D

Alternative D (Option 4) would construct a 10-inch section of the force main beneath the streambed and abandon the existing section of the concrete structure and force main at the crossing. The larger diameter of pipe would accommodate future upsizing of the force main. The new section of the force main would be connected to the existing force main before and after the stream crossing through 8”x10” pipe reducers and bends. The construction at the stream crossing may be completed using trenchless technologies. The change in force main configuration and design characteristics would require re-evaluation of the Maunawili Estates WWPS hydraulic conditions, such as development of a new system curve and establishment of new pump operating points. This work would also require NPDES (dewatering) and potentially Section 404 DA permits. This alternative does not address the erosion issues, but the new force main will avoid the erosion issues from becoming a force main safety issue.

4.3 Selected Alternative

The alternative selection process considered the following factors:

1. At the time of this Draft EA, ENV was in the process of evaluating the entire wastewater system serving the Maunawili Subdivision and Maunawili Estates Subdivision (see **Figure 1-1).** The evaluation includes assessments of wet weather flow conditions in the sewer system based on an ongoing sewer rehabilitation program in the area, the force main interior and exterior physical conditions, and hydraulic capacity upgrades of the Maunawili Park WWPS, Maunawili Estates WWPS and the associated force mains. The ongoing sewer rehabilitation program includes efforts to reduce the inflow and infiltration (I/I) into the sewer system from extraneous sources, including storm water. If the I/I reduction from the rehabilitation program is not sufficient, the Maunawili Estates WWPS and force main may need to be reconstructed to accommodate high wet weather flow conditions. The entire process of implementing a new force main including planning, design and construction could take several years complete.

2. There is a need to address the existing Maunawili Estates WWPS Force Main Crossing No. 1 as soon as possible due to the increasing risk of a force main break from the ongoing erosion issues.

Based on the Preliminary Investigation, ENV indicated that upgrades to the wastewater system serving the area would focus on reduction of I/I with the goal of eliminating the need to upsize the existing Maunawili Estates WWPS and force main, and providing extra hydraulic capacity at the downstream wastewater system. With this objective, Alternatives C and D become less favorable because future upsizing of the force main is not anticipated and repairs could be limited to restoration and protection of the existing Force Main Crossing No. 1. Implementation of Alternative A and B are not contingent on further evaluation of the wastewater system and therefore could be completed in a shorter period of time than Alternatives C and D. However, Alternative A does not address the erosion issues in the stream bed and stream banks at the force main stream crossing. ENV also indicated that should a capacity upgrade of the Maunawili Estates WWPS eventually be necessary, and a new force main be required, the existing force main could still function as a backup.

For these reasons, Alternative B was selected as the preferred alternative and the basis for the proposed project for its long-term benefits and feasibility.

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CHAPTER 5. DETERMINATION

In accordance with Hawai‘i Administrative Rules §11-200-12, the potential effects of the proposed project are evaluated for the significance criteria which are summarized as follows:

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource:* As discussed in Sections 2.11 and 3.9.1, a RLS documented existing historic properties at the project site and concluded “no historic properties affected” by and “no adverse effect” from the proposed project. Therefore, the proposed project will not cause a loss to or destruction of any natural or cultural resource.

2. *Curtails the range of beneficial uses of the environment:* The proposed project is a restoration project and will be constructed entirely within the Maunawili Stream and its intended uses will not impact any activities occurring in the area and therefore will not curtail the beneficial uses of the environment.

3. *Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders:* The proposed project will conform to Chapter 344, HRS. All permits and approvals in accordance with state and county rules and regulations will be obtained.

4. *Substantially affects the economic welfare, social welfare, and cultural practices of the community or state:* The proposed project is not anticipated to significantly affect the cultural practices of the community or state. The proposed project will have a positive impact on the economic and social welfare of the community by creation of jobs for the anticipated duration of construction.

5. *Substantially affects public health:* The proposed project will improve public health by stabilizing the 8-inch ductile iron pipe force main encased in the reinforced concrete jacket and greatly reducing the risk of a structural failure of the force main which would result in the discharge of untreated wastewater into the Maunawili Stream.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities:* The proposed project will not trigger a population increase nor appreciably affect public facilities or utilities.

7. *Involves a substantial degradation of environmental quality:* The scale of the proposed project is small and it will not degrade environmental quality.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions:* There may be other future projects in the area which can include a pump station upgrade project, force main upgrade project, and/or an infiltration and inflow (I/I) project. However, there are no other projects that are developed at this time within the project are and therefore, the cumulative effect of the projects will not have a considerable negative effect on the environment.

9. *Substantially affects a rare, threatened, or endangered species, or its habitat:* The proposed project is not expected to substantially affect a rare, threatened, or endangered species, or its habitat, as discussed in Section 2.6 and Section 3.9.5.

10. *Detrimentally affects air or water quality or ambient noise levels: The proposed project will not permanently affect air or water quality or ambient noise levels:* Minor short term impacts associated with construction involving air quality, water quality and noise will be mitigated by appropriate measures discussed in Sections 2.7, 2.9 and 2.10, and required in the construction contract. Department of Health regulations for community noise will be followed. Permanent impacts are not anticipated.

11. *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:* As discussed in Section 2.4, the proposed project is not in an area prone to natural hazards and is not located within an environmentally sensitive area.

12. *Substantially affects scenic vistas and viewplanes identified in county or state plans or studies:* The proposed project involves the restoration of the eroded stream bed and stream banks and will not affect scenic vistas and viewplanes.

13. *Requires substantial energy consumption:* Both construction and operation and maintenance of the proposed project will involve minimal energy consumption.

This Environmental Assessment has henceforth determined that the proposed project will not have significant adverse impacts on the environment, and therefore, an Environmental Impact Statement (EIS) is not warranted. A Finding of No Significant Impact (FONSI) is anticipated for the proposed project.

CHAPTER 6. CONSULTED PARTIES

A pre-Environmental Assessment consultation letter was sent to various agencies and interested parties for the opportunity to provide preliminary comments prior to completing the Draft Environmental Assessment. The EA was also distributed to various agencies and interested parties for review and comment. The agencies and interested parties are listed below. Comments received are incorporated in Appendix A and Appendix B, respectively.

Agency or Interested Party	**Pre-Con Letter Sent**	**Response with comments**	**Response w/no comments**
Federal Agencies			
U.S. Department of Agriculture, National Resources Conservation Service	x		
U.S. Department of the Army, Army Corps of Engineers, Honolulu District	x	x	
U.S. Department of the Interior, Fish & Wildlife Service, Pacific Islands Fish and Wildlife Office	x	x	
State Agencies			
Department of Accounting and General Services	x		
Department of Agriculture	x	x	
Department of Business, Economic Development, and Tourism, Office of Planning	x	x	
Department of Education	x		
Department of Hawaiian Home Lands	x		
Department of Health, Clean Air Branch	x		
Department of Health, Clean Water Branch	x	x	
Department of Health, Indoor and Radiological Health Branch	x	x	
Department of Health, Safe Drinking Water Branch	x		
Department of Health, Solid and Hazardous Waste Branch	x		
Department of Health, Wastewater Branch	x		

Agency or Interested Party	Pre-Con Letter Sent	Response with comments	Response w/no comments
Department of Land and Natural Resources, Land Division	x	x	
Department of Land and Natural Resources, Division of Aquatic Resources	route	x	
Department of Land and Natural Resources, Engineering Division	route	x	
Department of Land and Natural Resources, Historic Preservation	route		
Department of Land and Natural Resources, Commission on Water Resource Management	route		
Department of Land and Natural Resources, Land Division – O‘ahu District	route	x	
Department of Land and Natural Resources, Division of Forestry and Wildlife	route	x	
Department of Land and Natural Resources, State Historic Preservation Division	x		
Department of Transportation, Director	x	x	
Office of Hawaiian Affairs	x		
City and County of Honolulu Agencies			
Board of Water Supply	x	x	
Department of Design and Construction	x		
Department of Environmental Services	x		
Department of Facility Maintenance	x	x	
Department of Parks and Recreation	x		x
Department of Planning and Permitting	x	x	
Department of Transportation Services	x	x	
Honolulu Fire Department	x		x
Honolulu Police Department	x	x	
Utility Companies			

Agency or Interested Party	Pre-Con Letter Sent	Response with comments	Response w/no comments
Hawaiian Telcom, Inc.	x		
Hawaiian Electric Company, Inc.	x	x	
Spectrum	x		
Hawai‘i Gas	x	x	
Other Individuals/Organizations			
Senator Laura Thielen, District 25, Hawai‘i State Legislature	x		
Representative Scot Matayoshi, District 49, Hawai‘i State Legislature	x		
Councilmember Ikaika Anderson, District 3, Honolulu City Council	x		
Kailua Neighborhood Board	x	x	
University of Hawai‘i, Water Resources Research Center	x		

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CHAPTER 7. REFERENCES

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APPENDIX A

Pre-Environmental Assessment
Comments and Responses

DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor

PHYLLIS SHIMABUKURO-GEISER
Chairperson, Board of Agriculture

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

May 20, 2019

Mr. Wei Chen, P.E.
Project Engineer
Fukunaga & Associates
1357 Kapiolani Blvd., Suite 1530
Honolulu, Hawaii 96814

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Maunawili Estates Wastewater Pumping Station Force Main 1 Repair

Dear Mr. Chen:

The State of Hawaii Department of Agriculture Agricultural Resource Management Division (ARMD) has reviewed the limited information provided for the subject project. Review comments are as follows:

1. Proposed work appears to be downstream of ARMD stream intakes and should not affect the water supplied to the irrigation system.
2. ARMD personnel will always require unrestricted use of all roads and bridges to access the irrigation system.
3. Department reserves the right to provide additional comments as necessary.

Please contact Kirk Saiki at (808)973-9468 if we can be of further assistance.

Sincerely,

Brian Kau, P.E.
Engineering Program Administrator

United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2019-TA-0314

May 22, 2019

Mr. Wei Chen
Fukunaga & Associates, Inc.
1357 Kapi‘olani Boulevard, Suite 1530
Honolulu, Hawai‘i 96814

Subject: Response to your Request for Technical Assistance Regarding the Draft EA for the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair Project

Dear Mr. Chen,

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq*.), as amended.

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the '**Occurs In or Near Project Area'** column. Please note this list is not comprehensive and should only be used for general guidance. We have added to the PIFWO website, located at https://www.fws.gov/pacificislands/promo.cfm?id=177175840 recommended conservation measures intended to avoid or minimize adverse effects to these federally protected species and best management practices to minimize and avoid sedimentation and erosion impacts to water quality.

If you are representing a federal action agency, please use the official species list on our web-site for your section 7 consultation. You can find out if your project occurs in or near designated critical habitat here: https://ecos.fws.gov/ipac/.

Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be

discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect, likely to adversely affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a "may affect, not likely to adversely affect" determination for your project. If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

Island Team Manager
Pacific Islands Fish and Wildlife Office

cc: Ms. Kacy Aoki

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance, we've marked species that may occur in the vicinity of your project, this list is not comprehensive and should only be used for general guidance.

Scientific Name	**Common Name / Hawaiian Name**	**Federal Status**	**May Occur In Project Area**
Mammals			
Lasiurus cinereus semotus	Hawaiian hoary bat/ ʻōpeʻapeʻa	E	☒
Reptiles			
Chelonia mydas	Green sea turtle/honu - Central North Pacific DPS	T	☐
Erectmochelys imbricata	Hawksbill sea turtle/ Honu ʻea	E	☐
Birds			
Anas wyvilliana	Hawaiian duck/ koloa	E	☐
Branta sandvicensis	Hawaiian goose/ nēnē	E	☐
Fulica alai	Hawaiian coot/ ʻalae kea	E	☒
Gallinula galeata sandvicensis	Hawaiian gallinule/ ʻalae ʻula	E	☒
Himantopus mexicanus knudseni	Hawaiian stilt/ Aeʻo	E	☒
Oceanodroma castro	Band-rumped storm-petrel/ ʻakēʻakē	E	☐
Pterodroma sandwichensis	Hawaiian petrel/ ʻuaʻu	E	☐
Puffinus auricularis newelli	Newell's shearwater/ ʻaʻo	T	☐
Ardenna pacificus	Wedge-tailed Shearwater/ ʻuaʻu kani	MBTA	☐
Gygis alba	White Tern/ manu-o-kū	MBTA	☐
Buteo solitarius	Hawaiian hawk/ ʻio	E	☐
Insects			
Manduca blackburni	Blackburn's sphinx moth	E	☐
Megalagrion pacificum	Pacific Hawaiian Damselfly	E	☐
M. xanthomelas	Orangeblack Hawaiian Damselfly	E	☐
M. nigrohamatum nigrolineatum	Blackline Hawaiian Damselfly	E	☐

Plants				
Scientific Name	**Common Name or Hawaiian Name**	**Federal Status**	**Locations**	**May Occur In Project Area**
Abutilon menziesii	Koʻoloaʻula	E	O, L, M, H	☐
Achyranthes splendens var. *rotundata*	ʻEwa hinahina	E	O	☐
Bonamia menziesii	No common name	E	K, O, L, M, H	☐
Canavalia pubescens	ʻĀwikiwiki	E	Ni, K, L, M	☐
Colubrina oppositifolia	Kauila	E	O, M, H	☐
Cyperus trachysanthos	Puʻukaʻa	E	K, O	☐
Gouania hillebrandii	No common name	E	Mo, M	☐
Hibiscus brackenridgei	Maʻo hau hele	E	O, Mo, L, M, H	☐
Ischaemum byrone	Hilo ischaemum	E	K, O, Mo, M, H	☐
Isodendrion pyrifolium	Wahine noho kula	E	O, H	☐
Marsilea villosa	ʻIhiʻihi	E	Ni, O, Mo	☐
Mezoneuron kavaiense	Uhiuhi	E	O, H	☐
Nothocestrum breviflorum	ʻAiea	E	H	☐
Panicum fauriei var. *carteri*	Carter's panicgrass	E	Molokini Islet (O), Mo	☐
Panicum niihauense	Lauʻehu	E	K	☐
Peucedanum sandwicense	Makou	E	K, O, Mo, M	☐
Pleomele (Chrysodracon) hawaiiensis	Halapepe	E	H	☐
Portulaca sclerocarpa	ʻIhi	E	L, H	☐
Portulaca villosa	ʻIhi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	☐
Pritchardia affinis (maideniana)	Loulu	E	H	☐
Pseudognaphalium sandwicensium var. *molokaiense*	ʻEnaʻena	E	Mo, M	☐
Scaevola coriacea	Dwarf naupaka	E	Mo, M	☐
Schenkia (*Centaurium*) *sebaeoides*	ʻĀwiwi	E	K, O, Mo, L, M	☐
Sesbania tomentosa	ʻŌhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	☐
Tetramolopium rockii	No common name	T	Mo	☐
Vigna o-wahuensis	No common name	E	Mo, M, L, H, Ka	☐

Location key: O=Oʻahu, K=Kauaʻi, M=Maui, H=Hawaiʻi Island, L=Lānaʻi, Mo=Molokaʻi, Ka=Kahoʻolawe, Ni=Niʻihau, Le=Lehua

HAWAI'I GAS
THE CLEAN ENERGY COMPANY

May 22, 2019

Mr. Wei Chen, P.E.
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Ste. 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment –
Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair

In response to your letter dated May 8, 2019, it has been determined that the area is currently clear of utility gas facilities.

Thank you for the opportunity to comment on the Pre-Assessment Consultation for Draft Environmental Assessment - Maunawili Estates Wastewater Pump Station. Should there be any questions, or if additional information is desired, please call Kristen Asato 596-1425.

Sincerely,

Hawaii Gas

Keith K. Yamamoto
Manager, Engineering

KKY:krs

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

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
JONATHON GREMS
DEPUTY CHIEFS

OUR REFERENCE EO-TS

May 22, 2019

Mr. Wei Chen, Project Engineer
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

This is in response to your letter of May 8, 2019, requesting comments on the Pre-assessment Consultation, Draft Environmental Assessment, for the City and County of Honolulu's Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair Project in Kailua.

The Honolulu Police Department (HPD) anticipates short- and long-term impacts to pedestrian and vehicular traffic around the area of the project. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor to facilitate the flow of traffic during the construction phase of the project.

If there are any questions, please call Major Crizalmer Caraang of District 4 (Kailua) at 723-8639.

Thank you for the opportunity to review this project.

Sincerely,

ALLAN T. NAGATA
Assistant Chief
Support Services Bureau

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

May 23, 2019

Mr. Wei Chen, P.E.
Project Engineer
Fukunaga and Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment Maunawili Estates Wastewater Pump Station Force Main Crossing Number 1 Repair
Kailua, Hawaii
Tax Map Key: 4-2-008: 001

In response to your letter dated May 8, 2019, regarding the abovementioned subject, the Honolulu Fire Department determined that there will be no significant impact to 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

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:gl

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
DIR 0484
STP 8.2673

May 23, 2019

Mr. Wei Chen
Project Engineer
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Subject: Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair
Pre-Assessment Consultation for Draft Environmental Assessment
Oahu, Hawaii
TMK: (1) 4-2-008:001

The Department of Transportation (DOT) understands the County is proposing this wastewater improvement project. The DOT does not anticipate that the subject project will have any significant impact to our State highway facilities; therefore, we have no comments at this time.

If there are any questions, please contact Mr. Blayne Nikaido of the DOT Statewide Transportation Planning Office at (808) 831-7979 or via email at blayne.h.nikaido@hawaii.gov.

Sincerely,

for JADE T. BUTAY
Director of Transportation

BOARD OF WATER SUPPLY

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

May 24, 2019

Mr. Wei Chen
Fukunaga & Associates
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Subject: Your Letter Dated May 8, 2019 Requesting Comments on the Pre-Assessment Consultation for Draft Environmental Assessment, Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair Near Tax Map Key: 4-2-008: 001

Thank you for the opportunity to comment on the proposed force main repair project.

The construction drawings should be submitted for our review.

The construction schedule should be coordinated to minimize impact to the water system.

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

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
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/

DTS201905231004NA

May 24, 2019

Mr. Wei Chen, P.E.
Project Engineer
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment – Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair, Kailua, Oahu, Hawaii
TMK: (1) 4-2-008: 001

Thank you for the opportunity to provide comments on the pre-assessment consultation request for the preparation of a Draft Environmental Assessment (Draft EA) on the Maunawili Estates wastewater pump station force main repair project located in Kailua, Oahu.

It is our understanding that an existing 8-inch cast iron pipe force main, encased in reinforced concrete, is in dire need of repairs. It was designed to be buried under the Maunawili Stream bed and protected by a cement rubble masonry (CRM) layer. However, since the force main's installation, the CRM layer has gradually eroded. The wing walls of the force main, along the downstream side of the Maunawili Stream Bridge, are damaged due to effects of erosion, along with the original stream bed.

A large space cavity has developed under the CRM jacket leaving it unsupported. This repair project seeks to plug the void beneath the existing reinforced CRM jacket and restore the eroded stream bed and stream banks at the force main crossing No. 1. The repairs are expected to greatly diminish the possibility of a force main failure and a sewer spill from occurring along Maunawili Stream.

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

1. Hawaii State Planning Act
   Hawaii Administrative Rules (HAR) § 11-200-10(4) requires an Environmental Assessment to provide a general description of an action's technical, economic, social, and environmental characteristics. The Draft EA should provide a discussion on the project and its ability to meet State goals and priorities as detailed in HRS Chapter 226.

The analysis on the Hawaii State Planning Act should examine the project's consistency with all three parts of HRS Chapter 226 or clarify where conflicts exist. If any of these statutes are not applicable to the project, the analysis should affirmatively state this determination, and include discussion paragraphs regarding this matter.

2. Hawaii Coastal Zone Management Program
The Hawaii 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" (HRS § 205A-1).

   Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the project is being proposed by the City and County of Honolulu, the Draft EA should include an assessment on the project's consistency with the objectives and supporting policies of the Hawaii CZM Program, HRS § 205A-2.

3. Coastal Zone Management Act - Federal Consistency.
We note that the proposed action involves repair and construction activity within the bed and banks of Maunawili Stream. If the U.S. Army Corps of Engineers determines that the proposed repair work requires a Department of the Army (DA) permit, then a Coastal Zone Management Act (CZMA) federal consistency review may be necessary.

   The national CZMA requires that federal actions be consistent with approved state coastal programs' enforceable policies. Federal actions include activities performed by a federal agency; activities that require federal permits or approvals; or state and local government projects that receive federal financial assistance.

   OP is the lead state agency with the authority to conduct CZMA federal consistency reviews. Please contact our office regarding the policies and procedures on federal consistency reviews if a DA permit is deemed necessary.

4. Drainage / Stormwater Runoff Mitigation / Erosion Control
Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; to ensure that water resources of nearby streams and wetlands, such as the Kawainui Marsh, and marine resources along Windward Coast of Oahu remain protected, the effects of stormwater inundation, resulting from the proposed action should be evaluated in the Draft EA.

   Issues that may be examined include, but are not limited to, project site characteristics in

relation to flood and erosion prone areas, the potential vulnerability of surface water resources to sewer spills, drainage infrastructure, and the state of the bed and banks of Maunawili Stream's vulnerability to erosion and sediment loss. These items should be considered when developing mitigation measures for the protection of surface water resources and the coastal ecosystem, pursuant to HAR § 11-200-10(7).

OP has developed guidance regarding stormwater runoff controls. We recommend consulting our "Stormwater Impact Assessment" when developing mitigation strategies to counteract the impact from polluted runoff. This guidance document can be used to identify and analyze information on hydrology, sensitivity of coastal and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area. Our stormwater runoff document can be accessed online 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.

Mahalo,

Mary Alice Evans

Mary Alice Evans
Director

DAVID Y. IGE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
File:

May 24, 2019

Mr. Wei Chen, P.E.
Fukunaga & Associates, Inc.
1357 Kapiolani Blvd., Ste. 1530
Honolulu, HI 96814

Dear Mr. Chen:

Thank you for your submittal requesting comments to the Pre-Assessment Consultation for Draft Environmental Assessment for the Maunawili Estates Wasterwater Pump Station Force Main Crossing No. 1 Repair.

Project activities shall comply with the following Administrative Rules of the Department of Health:

- Chapter 11-46 Community Noise Control

Should you have any questions, please contact me at (808) 586-4700.

Sincerely,

Jeffrey M. Eckerd
Program Manager
Indoor and Radiological Health Branch

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

May 24, 2019

Mr. Wei Chen, P.E.
Fukunaga & Associates
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

SUBJECT: Pre-Assessment Consultation Draft Environmental Assessment
Maunawili Estates Wastewater Pump Station Force Main
Crossing #1 Repair

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

The Department of Parks and Recreation has no comment. As the proposed project will have no impact on any program or facility of the Department, you may remove us as a consulted party to the balance of the EIS process.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(772074)

From:	William Hicks
To:	Fukunaga Office
Cc:	"Donna Wong"; "tapaka53"
Subject:	For Wei Chen or Kacy Aoki wrt Maunawili Estates Wastewater Repair DEA
Date:	Monday, May 27, 2019 8:35:57 AM
Attachments:	KNB notice wrt Maunawili Estates Wastewater Repair DEA of 5-8-2.pdf

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Aloha Wei…

I received the attached May 8, 2019 letter from you regarding the subject project.

Unfortunately, I was on the mainland until May 21st and didn't receive the letter until then.

I have consulted with our Planning, Zoning, and Environment Chair, Donna Wong, and because this is a pre-EA consultation, it would be good if someone can give a short presentation at our Tuesday June 16th PZE Committee meeting to be held at 7 PM at Kalama Beach Park, Kailua. Although this project seems fairly straightforward, our concern is that it is important to let the community know what is happening because the project entails working in a stream. I have included "Presentation on proposed Maunawili Estates Wastewater Pump Station Repair" near the top of the committee's agenda. Please let Donna Wong (cc'd) and I know if it will not be possible to present at this meeting. Mahalo.

Aloha,
Bill

Jasmyn Honda

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Wednesday, May 29, 2019 4:38 PM
To: Fukunaga Office
Cc: Kuwaye, Kristen
Subject: Pre-Assessment Consultation for Draft EA - Maunawili Estates Wastewater Pump Station Force Main Crossing no. 1 Repair - Hawaiian Electric Request for review and comment

Dear Ms. Wei Chen,

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should Hawaiian Electric have existing easements and/or facilities on the subject property or within the rights of way, we will need continued access for maintenance of our facilities. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Maunawili Estates Wastewater Pump Station Force Main Crossing project comes to fruition, please continue to keep us informed.

Should there be any questions, please contact me at 543-7245.

Thank you,

Rouen Liu
Permit Engineer
Hawaiian Electric Company

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 19-276

May 30, 2019

Mr. Wei Chen, P.E., Project Engineer
Fukunaga & Associates, Inc.
1357 Kapiolani Blvd., Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair

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

We have no objections at this time. However, please process any applicable permits for work in Maunawili Stream.

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

Sincerely,

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

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

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

June 3, 2019

2019/ELOG-931(JD)

Mr. Wei Chen
Fukunaga and Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

SUBJECT: Environmental Assessment (EA) Pre-Consultation
Maunawili Estates Wastewater Pump Station
Force Main Crossing No. 1 Repair
Adjacent to Maunawili Estates Subdivision and
Tax Map Key 4-2-008: 001

This in response to your request for comments, received May 13, 2019, for the preparation of an EA. We understand that the proposal is to repair a void beneath a reinforced concrete jacket, which contains an existing eight-inch force main, and restore the eroded streambed and stream banks located at a force main crossing along Maunawili Stream. We have provided some general information and comments based on the information in your letter.

1. From the provided location map, the proposed work will be within the AG-2 General Agricultural District and the State Land Use Agriculture District.

2. The Draft EA should explain how the proposed work is consistent with applicable county plans, such as the General Plan and Koolaupoko Sustainable Communities Plan.

3. The Draft EA should include any information regarding wetlands in the area. The U.S. Fish and Wildlife Service National Wetlands Inventory delineates Maunawili Stream as a freshwater forested/shrub wetland. We suggest that you contact the U.S. Army Corps of Engineers regarding wetlands.

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

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

June 13, 2019

LD 780

Wei Chen, P.E., Project Engineer
Fukunaga & Associates, Inc.
1357 Kapiolani Blvd., Ste. 1530
Honolulu, HI 96814

via email: fukunagaengineers.com

Dear Sirs:

SUBJECT: **Pre-Assessment Consultation for Draft Environmental Assessment for Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair**, Maunawili Estates Subdivision, Kailua, Island of Oahu, Hawaii; adjacent to TMK: (1) 4-2-008:001

Thank you for the opportunity to review and comment on the above subject matter. The Land Division of the Department of Land and Natural Resources ("DLNR") distributed a copy of your request pertaining to the subject matter to selected DLNR Divisions for their review and comments. An extension of the review period was granted to June 14, 2019.

Enclosed are comments from DLNR's a) Division of Aquatic Resources, b) Engineering Division, c) Division of Forestry and Wildlife, and d) Land Division—Oahu District. Should you have any questions, please feel free to contact Barbara Lee, Project Development Specialist, by phone at (808) 587-0453 or via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

FUKUNAGA & ASSOCIATES, INC.
CONSULTING ENGINEERS

May 8, 2019

Mr. Russell Y. Tsuji, Administrator
Land Division
Department of Land and Natural Resources
State of Hawai'i
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment – Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair

Dear Mr. Tsuji,

We presently are preparing the Draft Environmental Assessment for the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair Project. The project is located at the Maunawili Estates subdivision in Kailua, next to the Maunawili Stream bridge, adjacent to the City and County of Honolulu parcel TMK 4-2-008:001. See attached figure for the location.

Currently, there is an existing 8-inch cast iron pipe force main encased by a reinforced concrete jacket that was, by design, buried under the stream bed and protected by a cement rubble masonry (CRM) layer on top. Since being installed, the CRM layer has been washed away, the wing walls at the downstream side of the bridge are missing and the original stream bed has eroded away and a hole has developed under the concrete jacket leaving it unsupported from the bottom. The project proposes to plug the void beneath the existing reinforced concrete jacket and restore the eroded streambed and stream banks at the force main crossing No. 1. If the Force Main Crossing No. 1 Repair is developed, the 8-inch cast iron pipe force main encased in the reinforced concrete jacket will be stabilized and will eliminate the possibility of a force main failure and sanitary sewer spill into the Maunawili Stream.

Please provide us with any comments you may have regarding this City and County of Honolulu wastewater improvement project by ~~May 31, 2019~~. Your early response would be greatly appreciated. Per John Nishimura (5/30/19) { Extension granted to June 14, 2019 Internal BLNR due date is June 12, 209. BKa

Please call Wei Chen or Kacy Aoki at (808) 944-1821 if you have any questions.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Wei Chen, P.E.
Project Engineer

Attachment

1357 Kapiolani Blvd., Ste. 1530
Honolulu, Hawaii 96814
Ph: 808.944.1821
Fax: 808.946.9339
fukunagaengineers.com
office@fukunagaengineers.com

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji

Ref: Pre-Assessment Consultation for Draft Environmental Assessment– Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair
Location: Maunawili Estates Subdivision, Kailua, Island of Oahu
TMK(s): Adjacent to (1) 4-2-008:001
Applicant: Fukunaga & Associates, Inc. on behalf of City & County of Honolulu

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 Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency 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: 5/23/19

LD 988

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
JUN 13 AM 11:04
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

LD 780

May 16, 2019

RECEIVED
MAY 31 2019
Division of Aquatic Resources
DAR 5941

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: **Pre-Assessment Consultation for Draft Environmental Assessment— Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair**

LOCATION: Maunawili Estates Subdivision, Kailua, Island of Oahu; adjacent to TMK: (1) 4-2-008:001

APPLICANT: Fukunaga & Associates, Inc. on behalf of City & County of Honolulu

Attached hereto, for your review and comment, is information on the above-referenced repair project intended to stabilize an existing 8-inch cast iron pipe force main encased in reinforced concrete to eliminate possibility of a force main failure and resultant negative environmental impacts.

Please submit any comments to Land Division no later than ~~May 29, 2019~~ June 12, 2019 (extension was granted) BLee. 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 Barbara Lee by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: _____
Print Name: Brian J. Neilson, DAR Administrator
Date: 6/12/19

Attachments
cc: Central Files

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

Date: 6/12/19
DAR # 5941

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Ryan Okano, PhD, Aquatic Biologist

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment, Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair

Request Submitted by: Russell Tsuji, Land Administrator, Land Division

Location of Project: Maunawili Estates Subdivision, Kailua, Island of Oahu, adjacent to TMK: (1) 4-2-008:001

Brief Description of Project:

A Draft Environmental Assessment is being prepared for the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair Project. The project is located at the Maunawili Estates subdivision in Kailua, next to the Maunawili Stream bridge, adjacent to the City and county of Honolulu parcel TMK 4-2-008:001.

(continued on next page)

Comments:

☐ No Comments ☒ Comments Attached

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

Comments Approved: _____ Date: 6/12/19

Brian J. Neilson
DAR Administrator

DAR# 5941

Brief Description of Project

Currently, there is an existing 8-inch cast iron pipe force main encased by a reinforced concrete jacket that was, by design, buried under the stream bed and protected by a Cement Rubble Masonry (CRM) layer on top. Since being installed, the CRM layer has been washed away, the wing walls at the downhill side of the bridge are missing and the original stream bed has eroded away and a hole has developed under the concrete jacket leaving it unsupported from the bottom. The project proposes to plug the void beneath the existing reinforced concrete jacket and restore the eroded streambed and stream banks at the force main crossing No. 1. If the Force Main Crossing No. 1 Repair is developed, the 8-inch cast iron pipe force main encased in the reinforced concrete jacket will be stabilized and will eliminate the possibility of a force main failure and sanitary sewer spill into Maunawili Stream.

DAR# 5941

Comments

The Division of Aquatic Resources (DAR) is concerned about this proposed project due to the presence of a stream in the work area, and the potential the proposed work has to impact aquatic resources. DAR request that you include a section in the Draft Environmental Assessment pertaining to aquatic resources. Water quality is a primary factor that influences the status of aquatic resources. Therefore, we would also appreciate a detailed section pertaining to water quality. In addition Best Management Practices to address concerns relevant to aquatic resources and water quality should be incorporated.

LD 863

DAVID Y. IGE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION
2019 MAY 24 AM 11:36
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

LD 780

May 16, 2019

MEMORANDUM

'19 MAY 21 AM 11 02 ENGINEERING

~~TO:~~ Land

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

~~FROM:~~ DG
Russell Y. Tsuji, Land Administrator

SUBJECT: **Pre-Assessment Consultation for Draft Environmental Assessment— Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair**

LOCATION: Maunawili Estates Subdivision, Kailua, Island of Oahu; adjacent to TMK: (1) 4-2-008:001

APPLICANT: Fukunaga & Associates, Inc. on behalf of City & County of Honolulu

Attached hereto, for your review and comment, is information on the above-referenced repair project intended to stabilize an existing 8-inch cast iron pipe force main encased in reinforced concrete to eliminate possibility of a force main failure and resultant negative environmental impacts.

Please submit any comments to Land Division no later than ~~May 29, 2019.~~ June 12, 2009 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 Barbara Lee by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed:
Print Name: Carty S. Chang, Chief Engineer
Date: 5/23/19

Attachments
cc: Central Files

LD 908

19748

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

LD-780

RECEIVED
LAND DIVISION
2019 MAY 31 AM 10:41
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

May 16, 2019

MEMORANDUM

TO: FROM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: **Pre-Assessment Consultation for Draft Environmental Assessment—Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair**
LOCATION: Maunawili Estates Subdivision, Kailua, Island of Oahu; adjacent to TMK: (1) 4-2-008:001
APPLICANT: Fukunaga & Associates, Inc. on behalf of City & County of Honolulu

Attached hereto, for your review and comment, is information on the above-referenced repair project intended to stabilize an existing 8-inch cast iron pipe force main encased in reinforced concrete to eliminate possibility of a force main failure and resultant negative environmental impacts.

Please submit any comments to Land Division no later than ~~May 29, 2019~~ June 12, 2019. 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 Barbara Lee by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: RYTsuji for
Print Name: ~~DAVID G. SMITH, Administrator~~
Date:

Attachments
cc: Central Files

19748

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
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 FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

MAY 30 2019

MEMORANDUM

TO: RUSSELL Y. TSUJI, Administrator
Land Division

FROM: DAVID G. SMITH, Administrator

SUBJECT: **Division of Forestry and Wildlife Comments on the Pre-Assessment Consultation for Draft Environmental Assessment—Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding the pre-assessment consultation for Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair Draft Environmental Assessment in Kailua on the island of O'ahu, TMK: (1) 4-2-008:001. Proposed work would include repairing the existing reinforced concrete jacket under the Maunawili Stream bed and restoring the eroded stream bed and banks at the force main crossing.

The State listed Hawaiian Hoary Bat or ʻŌpeʻapeʻa (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea.

State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*), and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the DOFAW Office at (808) 587-0166.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible.

If you have any questions, please contact Jim Cogswell, Wildlife Program Manager at (808) 587-4187 or James.M.Cogswell@hawaii.gov.

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

LD 780

May 16, 2019

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
_X_Engineering Division
_X_Div. of Forestry & Wildlife
___Div. of State Parks
_X_Commission on Water Resource Management
___Office of Conservation & Coastal Lands
_X_Land Division – Oahu District
_X_Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: **Pre-Assessment Consultation for Draft Environmental Assessment— Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 Repair**

LOCATION: Maunawili Estates Subdivision, Kailua, Island of Oahu; adjacent to TMK: (1) 4-2-008:001

APPLICANT: Fukunaga & Associates, Inc. on behalf of City & County of Honolulu

Attached hereto, for your review and comment, is information on the above-referenced repair project intended to stabilize an existing 8-inch cast iron pipe force main encased in reinforced concrete to eliminate possibility of a force main failure and resultant negative environmental impacts.

Please submit any comments to Land Division no later than ~~May 29, 2019~~ June 12, 2019. 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 Barbara Lee by phone at 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: Darlene Bryant-Takamatsu
Print Name: Darlene Bryant-Takamatsu
Date: 5/21/19 for

Attachments
cc: Central Files

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

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP5/19-772339R

June 19, 2019

Mr. Wei Chen, P.E.
Project Engineer
Fukunaga & Associates, Inc.
1357 Kapiolani Boulevard, Suite 1530
Honolulu, Hawaii 96814

Dear Mr. Chen:

SUBJECT: Pre-Consultation Draft Environmental Assessment (DEA)
Maunawili Estates Wastewater Pump Station Force Main Crossing
No. 1 Repair

In response to your letter dated May 8, 2019, we have the following comments:

1. **Roadway Jurisdiction**. The DEA should include a map with the project location and adjacent road names and jurisdictions.

2. **Driveway Design**. All access driveways to the project site should be designed with the highest pedestrian and bicycle safety measures and constructed to current City standards.

3. **Traffic Management Plan (TMP).** A TMP should be prepared for this project that is jointly reviewed and accepted by the Department of Transportation Services (DTS) and the Department of Planning and Permitting. The TMP shall include the following:

   a. A discussion of the traffic impacts that the project may have on any surrounding City roadways and facilities, including short-term impacts during construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

b. 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.

4. **Sea Level Rise and Resilience.** Infrastructure improvements located within areas potentially exposed to chronic flooding with sea level rise shall be subject to an in-depth analysis of the potential impacts of sea level rise on elevation, tolerance for risk, and the lifetime of the proposed structure or infrastructure. Any significant improvements within existing footprints should be dependent on established, resilient design guidelines, or otherwise be subject to relocation to a more suitable area.

   The potential for chronic flooding with 3.2 feet of sea level rise exposure area (SLR-XA) shall be used as the vulnerability zone for planning purposes. Maps of the project area shall be provided for both the SLR-XA and flooded highways. The applicant shall recommend strategies and designs that increase the flood resiliency for new development or improvements within the SLR-XA that cannot be relocated, or seek opportunities to plan new development or projects well landward of the SLR-XA. See the following to determine vulnerability: http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/

5. **Roadway, Sidewalk and Crosswalk Closures**. If there are any roadway, sidewalk or crosswalk closures, alternate routes should be provided for vehicles, pedestrians, and bicyclists that are safe and clearly marked.

6. **Vehicle/Pedestrian Crossing**. Any existing pedestrian, bicycle and vehicle access/crossing shall be maintained with the highest safety measures during construction.

7. **Best Management Practice (BMP) Controls**. BMP controls should be included at the construction site to prevent trailing of dirt and debris onto adjacent roadways.

8. **Roadway Damage**. Any damage to the existing roadway and sidewalk area caused by the project should be repaired to current City standards as well as meet Americans with Disabilities Act requirements.

9. **Neighborhood Impacts**. The area representatives, 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 and status throughout the project and the impacts that the project may have on the adjoining local street area network.

10. **Street Usage Permit**. A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Virginia Sosh, of my staff, at 768-5461.

Very truly yours,

Wes Frysztacki
Director

APPENDIX B

Natural Resources Survey

AECOS Job No. 1582

Natural resources survey for the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 repair at Maunawili Stream Maunawili, Koʻolau Poko District, Oʻahu

Prepared by:

AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744-3221

August 8, 2019

Natural resources survey for the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 repair at Maunawili Stream Maunawili, Koʻolau Poko District, Oʻahu

August 8, 2019 | ***Draft*** | *AECOS* No. 1582

Bryson Luke, Susan Burr, and Allen Cattell
AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: sburr@aecos.com

Table of Contents

Executive Summary

AECOS, Inc. conducted a natural resources survey for the Maunawili Stream Crossing No. 1 Repair project on May 9, 2019. Our assessment included water quality measurements, surveys of terrestrial flora and fauna within the riparian corridor, observations of aquatic biota, and delineation of the ordinary high water mark (OHWM). Water quality in Maunawili Stream was good and typical of higher elevation reaches of Hawai'i streams during base flow conditions. No plants or animals proposed or listed as endangered or threatened under state or federal endangered species statutes were observed; the Project area does not contain critical habitat for these species. Maunawili Stream is a perennial stream that is regulated under the Clean Water Act. Federal jurisdiction extends to the OHWM, which was marked in the field on May 9, 2019. Wetlands are not present in the Project area.

If implemented, the following BMPs will protect natural resources in the project area:

- *Restrict repair activities to one-half of the stream at a time to allow native amphidromous animals to use Maunawili Stream as a migratory pathway.*
- *Employ cofferdams surrounded by an anchored silt curtain around in-water work areas.*
- *Place filter socks along lower edge of stream banks to prevent movement of eroded material.*
- *New structures should not include drains, grates, or overhanging culverts that could obstruct migration of native amphidromous animals.*
- *During construction, if an endangered waterbird is observed in the Project area, cease work until the animal leaves the Project area voluntarily.*
- *If an endangered waterbird nest is found during construction, establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.*
- *Avoid increasing mosquito populations by creating stagnant water habitat.*
- *Avoid night-time construction.*
- *Do not remove woody vegetation taller than 4.6 m (15 ft) during the bat pupping season between June 1 and September 15. Avoid the use of barbed wire to top fence lines.*

Introduction

The City and County of Honolulu, Department of Environmental Services proposes to repair the 8-in wastewater force main at the Maunawili Stream Crossing No. 1. Repair work includes filling an existing void between the force main and stream bed and restoring the stream bed and banks between Maunawili Road Bridge and the force main (the "Project"). *AECOS* Inc. was contracted by Fukunaga & Associates, Inc. to complete a natural resources survey within the City and County of Honolulu right-of-way for Maunawili Road and assess potential environmental impacts from the proposed Project[1]. Our assessment included water quality measurements, surveys of terrestrial flora and fauna within the riparian corridor, observations of aquatic biota, and delineation of the ordinary high water mark (OHWM).

Stream and Watershed Description

Maunawili Stream is the largest of eight named streams and numerous unnamed tributaries that drain Maunawili Valley (Figure 1). Maunawili Stream originates as numerous streamlets near the 470-m (1550-ft) elevation above sea level (ASL) in the upper reaches of the Kawainui Watershed. Maunawili Stream flows northeast from its origin, then north through Maunawili Valley and into Kawainui Marsh and Oneawa Canal before reaching its coastal outlet into the Pacific Ocean near Kapoho Point (Castle Point) at the north end of Kailua Bay. Kawainui Watershed is assigned code number 32013 (Parham et al, 2008) and the state stream assessment (HCPSU, 1990) describes Maunawili Stream as a continuous-flowing perennial stream.

Site Description

The Project area is located along Maunawili Stream immediately beneath and downstream of Maunawili Road Bridge (Figure 2). Upstream of Maunawili Road Bridge, Maunawili Stream is a slow, shallow run contained within a concrete-lined channel. Downstream of Maunawili Road Bridge, the stream channel has a natural bed and banks with pools and riffles. Within the Project area, the stream channel has a substratum of boulders and cobbles, with moderate water velocity and moderate siltation and embeddedness. A riparian forest lines the banks on the downstream side of the bridge, resulting in a mostly closed canopy that shades the stream channel. The confluence of Maunawili Stream and Olomana Stream (sometimes referred to as Makawao Stream) is approximately 35 m (115 ft) downstream of the bridge and Project area.

[1] This document will be used for permitting purposes and become part of the public record.

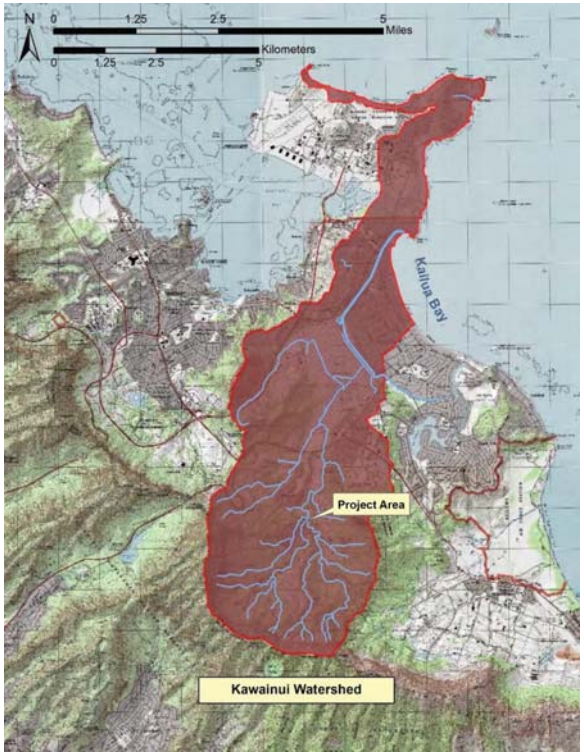

Figure 1. Location of the Project area and Kawainui Watershed in windward O'ahu.

Maunawili Stream and Kawainui Marsh appear on the list of impaired water bodies in the 2018 State of Hawai'i, water quality monitoring and assessment report (HDOH, 2018). Maunawili Stream is listed as impaired for trash, turbidity, nitrate+nitrite, total nitrogen, and total phosphorus based solely on

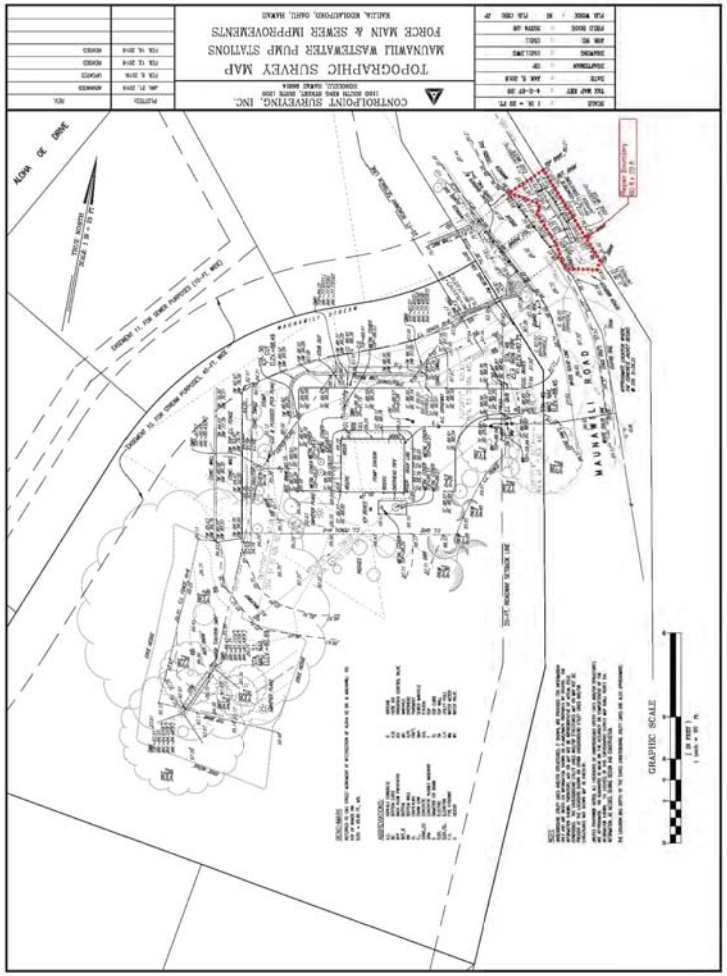

Figure 2. Force Main Crossing No. 1 Project area.

visual assessments. Kawainui Marsh impairment status is listed as unknown for all parameters.

The nearest NOAA rainfall gage to the Project, Maunawili (MAUH1), recorded 6.33 in (160 mm) of rain in April 2019, 105% of the monthly April average for the gage (NOAA-NWS, 2019). Rainfall conditions at the Project site were "typical" during the biological and water quality survey conducted by *AECOS* in early May.

Federal Jurisdictional Waters

Waters of the U.S. (jurisdictional waters) are surface waters that come under federal jurisdiction as authorized by the Clean Water Act (CWA) and Rivers and Harbors Act (RHA). Authority over these waters is granted to various federal agencies, including the U.S. Environmental Protection Agency (USEPA), with the U.S. Army Corps of Engineers (USACE) having permit authority for actions that impact jurisdictional waters. Jurisdictional waters include all tidal waters and a subset of streams (both perennial and intermittent), lakes, reservoirs, and wetlands.

A 2015 rule issued by USACE and USEPA, "The Clean Water Rule," (USACE and USEPA, 2015), clarified the scope of waters of the U.S. with the intent of increasing predictability and consistency of protections afforded by the CWA.

The basis for assuming jurisdiction of certain waters, as described in the Clean Water Rule, is the extent of connectivity to traditional navigable waters, interstate waters, or territorial seas, each of which is jurisdictional by rule (USEPA, 2015). In the four years since the rule was enacted, the validity of the rule has been contested through the courts and the rule is not implemented in many states. At the present time (as of July 5, 2019), the Clean Water Rule is in effect in Hawai'i (*South Carolina Coastal Conservation League et al. v. Pruitt* et al. No. 2-18-cv-330-DCN) [2].

As applicable to the Project, jurisdictional waters defined in the Clean Water Rule include: (1) tributaries to tidal waters and (2) waters adjacent to tributaries, including wetlands, impoundments, and similar waters. Non-tidal tributaries (such as Maunawili Stream in the Project area) are jurisdictional up to at least the "Ordinary High Water Mark" (OHWM). If a wetland is present adjacent to an OHWM, jurisdiction extends to include the wetland. Adjacent

[2]On February 14, 2019 the USEPA and USACE issued a proposed rule for a revised definition of waters of the U.S. (USACE and USEPA, 2019). This definition will not be applicable until after the public rulemaking process has been completed.

means bordering, contiguous, or neighboring. If a wetland is adjacent, CWA jurisdiction extends to the wetland/upland boundary.

OHWM is defined in the Clean Water Rule as:

> … the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Wetlands are typically found at the interface of aquatic and terrestrial environments. Wetlands regulated by the federal government under the auspices of the Clean Water Act are defined in the Clean Water Rule as:

> …those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Maunawili Stream is incorrectly depicted as a seasonally flooded, palustrine wetland, forested with broad-leaved evergreens (classification code PFO3C) in the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI; USFWS, 2006). Maunawili Stream is a perennial stream; wetlands are not present in the Project area.

Methods

Water Quality Survey

On May 9, 2019, *AECOS* biologists took *in situ* field measurements for temperature, conductivity, dissolved oxygen (DO), and pH and collected water samples for analyses of total suspended solids (TSS), turbidity, nitrate-nitrite nitrogen (NO_3+NO_2), total nitrogen (TN), and total phosphorus (TP) at three stations in Maunawili Stream (Figure 3). Methods and instruments used to analyze water quality for this project are presented in Table 1. A Swoffer Instruments® Model 3000 flow meter was utilized to record stream velocity at each station. Stream velocity, depth, and width of the flowing portion of the stream were used to estimate stream discharge during sampling.

Botanical Survey

A botanical survey was conducted by walking throughout the Project area and vicinity. Biologists identified all plant species encountered and, as the survey progressed, noted relative abundance of each species. Field notes were translated into a flora listing. Plant names given in the listing follow *Manual of the Flowering Plants of Hawai'i* (Wagner et al., 1990, 1999) for native and naturalized flowering plants. Some names have been updated to reflect more recent taxonomic or nomenclatural changes as presented in Imada (2012).

Figure 3. Locations of water quality stations (WQS) (green circles) and avian point-count station (red square) in the Project vicinity.

Table 1. Analytical methods and instruments used for water quality analyses.

Analysis	Method	Reference	Instrument†
Temperature	SM 2550 B	Standard Methods 20th Edition (1998)	YSI ProPlus multi-meter
Conductivity	SM 2510-B	Standard Methods, 20th Edition (1998)	YSI ProPlus multi-meter
pH	SM 4500 H+	Standard Methods 20th Edition (1998)	Hannah pocket pH meter
Dissolved Oxygen	SM 4500-O G	Standard Methods 20th Edition (1998)	YSI ProPlus multi-meter
Turbidity	EPA 180.1 Rev 2.0	USEPA (1993)	HACH 2100Q Turbidimeter
Total Suspended Solids	Method 2540 D	Standard Methods 20th Edition (1998)	Mettler Toledo XS204 balance
Nitrate + Nitrite	EPA 353.2	USEPA (1993)	Lachat Quikchem 8500, FIA
Total Nitrogen	EPA 353.2	USEPA (1993)	Lachat Quikchem 8500, FIA
Total Phosphorus	EPA 365.3	USEPA (1993)	Lachat Quikchem 8500, FIA
Stream Velocity			Swoffer Model

† typical instruments listed, others may have been substituted

Aquatic Biota Survey

The survey for aquatic biota consisted of making visual observations of aquatic organisms while walking in and adjacent to the stream in the Project area and vicinity. Biologists noted relative abundance (e.g., rare, common, abundant) of each species encountered as the survey progressed. Hand nets were used to capture fishes for close inspection and discover more cryptic, bottom-dwelling species. Nomenclature for aquatic species follow *Hawai'i's Native and Exotic Freshwater Animals* (Yamamoto and Tagawa, 2000). A review of biological records from previous surveys within the watershed is included in the species list developed for the Project survey.

Avian Survey

AECOS biologists conducted an avian survey of the Project area on May 9 during the morning hours when birds are most active. A single point-count station was

selected in the Project area between Maunawili Road and the confluence of Maunawili and Olomana streams (see Fig. 3, above). Weather conditions were ideal for avian observations, with no rain, light wind, and minimal sound interference from traffic or stream flow. All birds observed and/or heard during an 8-minute period were identified to species and counted. Additional avian species observed in the Project area beyond the point-count period were noted as incidental observations. Biologists continually surveyed for waterbirds while on-site.

Avian phylogenetic order and nomenclature used in this report follow the *Hawaiian Island Birds Checklist* (VanderWerf et al., 2018), which is based on the *Checklist of North and Middle America Birds* by American Ornithological Society (AOS; Chesser et al., 2018). Hawaiian common names are provided for indigenous and endemic species.

Mammalian Survey

AECOS biologists compiled a list of terrestrial mammal species observed in the Project area. Visual observations of tracks, scat, and other sign indicating mammals using the area were noted. Mammalian scientific names follow *Mammal Species of the World* (Wilson and Reeder, 2005).

Federal Jurisdictional Waters

Federal jurisdiction extends to the OHWM in the stream channel. The Clean Water Rule lists the following physical characteristics as indicators of the OHWM: clear and natural line impressed on the banks, shelving, changes in the character of the soil, destruction of terrestrial vegetation, litter, debris, and other appropriate means that consider the characteristics of the surrounding area.

On May 9, 2019, *AECOS* scientists marked OHWM in the field with paired-flags on each bank. ControlPoint Surveying Inc. surveyors recorded the geospatial locations of flagging on the same date. Photographs and OHWM delineation datasheets are used to document the character of the environment at each paired-flag channel cross-section within the Project area.

Results

Water Quality Results

Results from stream discharge calculations and *in situ* water quality measurements are provided in Table 2. Laboratory analytical results for total suspended solids (TSS), turbidity, and nutrients are provided in Table 3.

Table 2. Results for *in situ* water quality measurements on May 9, 2019 in Maunawili Stream.

Station	Time (hh:mm)	Discharge (cfs)	Temp. (°C)	Conductivity (µmhos/cm)	pH (SU)	Dissolved Oxygen (mg/l)	Dissolved Oxygen (% sat.)
Upstream	0951	0.61	22.7	170	6.62	9.35	109
Impact	0937	0.61	22.2	169	7.10	9.58	110
Downstream	0918	3.56	22.2	170	6.62	9.40	108

Table 3. Results for turbidity, suspended solids, and nutrients concentrations from samples collected on May 9, 2019 in Maunawili Stream.

Station	Turbidity (ntu)	TSS (mg/l)	Ammonia (µg N/l)	Nitrate+ Nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
Upstream	3.4	2.92	15	26	126	44
Impact	3.6	2.85	13	31	88	44
Downstream	3.6	2.96	17	31	110	47

Stream discharge increased markedly between the two upper-most stations and the downstream station (0.61 to 3.56 cfs) located below the confluence with Olomana Stream, whereas water temperature and conductivity values were quite similar. DO values showed little variation. A decrease in pH downstream may be related to the change from concrete-lined channel streambed at the

bridge to natural streambed below the bridge and to mixing with Olomana Stream water.

Particulates (turbidity and TSS) values were relatively constant between stations (Table 3) and demonstrated no spatial trends. No spatial trends were apparent for nitrogen and phosphorus moieties.

Botanical Results

Downstream of Maunawili Stream Bridge, Maunawili and Olomana stream channels are deeply shaded beneath a dense tree canopy. The riparian zone is occupied with a crowded understory of herbaceous plants. Upstream of the bridge, a hardened segment of Maunawili Stream channel supports hydrophytic plants which grow in areas of accumulated sediment along the banks, as well as a fair number of plants rooted in weep holes and cracks in the concrete banks. Trees rooted in adjacent residences overhang the left side of the channel. Typical ruderal plants grow on the verge of Maunawili Road.

A listing of all vascular plants observed in the survey area is presented as Table 4. Entries are arranged alphabetically under family name and include scientific name, common name, status of the species (i.e., native or non-native; see key at end of table), and a qualitative abundance value. The vascular flora of the survey area comprises a mix of alien and native species of flowering trees, shrubs, grasses, and forbs, totaling 64 taxa. Only native (indigenous or endemic) plants typically have resource value or are of concern in assessing impacts of a project. Other plants may have either cultural or landscape value. Two species (3%)—*Hibiscus tiliaceus* and *Cyperus polystachyos*—are natives; another six (9%) are early Polynesian introductions (so-called "canoe plants").

Table 4. Checklist of plants found in the survey area of Maunawili Stream.

Family *Species*	Common name	Status	Abundance	Notes
FERNS AND FERN ALIES				
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F. M. Jarrett ex C. V. Morton	swordfern	Nat	R	<1>
POLYPODIACEAE				
Phymatosorus grossus (Langsd. & Fishch.) Brownlie	*laua'e*	Nat	O	<1>

Table 4 (continued).

Family *Species*	Common name	Status	Abundance	Notes
PTERIDACEAE				
Adiantum raddianum C. Presl.	maidenhair fern	Nat	O	<1>
THELYPTERIDACEAE				
Christella dentata (Forssk.) Brownsey & Jermy	*pai'i'ihā*	Nat	C	<1>
FLOWERING PLANTS DICOTYLEDONES				
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat		<1>
ANACARDIACEAE				
Mangifera indica L.	*manakō,* mango	Nat	R	<1>
APOCYNACEAE				
Cascabela thevetia (L.) Lippold	be-still tree	Nat	O	<2>
ARALIACEAE				
Schefflera actinophylla (Endl.) Harms	octopus tree	Nat	R	<1>
ASTERACEAE (COMPOSITAE)				
Ageratum houstonianum Mill.	*maile hohono*	Nat	R	<1>
Sphagneticola trilobata (L.)	wedelia	Nat	O	<1>
Youngia japonica (L.) DC	Oriental hawksbeard	Nat	R	<1>
BEGONIACEAE				
Begonia hirtella Link	*pīkonia*	Nat	R	<1>
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip tree	Nat	O	<1>
CECROPIACEAE				
Cecropia obtusifolia Bertol.	guarumo	Nat	R	<1>
CONVOLVULACEAE				
Ipomoea triloba L.	little bell	Nat	O	<2>
CUCURBITACEAE				
Coccinia grandis (L.) Voigt	scarlet-fruited gourd	Nat	O	<1>
EUPHORBIACEAE				
Aleurites moluccana (L.) Wild.	*kukui*	**Pol**	O	<1>
Euphorbia hirta L.	garden spurge	Nat	O	<1>

Table 4 (continued)

Family / *Species*	Common name	Status	Abundance	Notes
FABACEAE				
Caesalpinia decapetala (Roth) Alston	wait-a-bit	Nat	O	<1>
Falcataria moluccana (Miq.) Barneby & Grimes	---	Nat	C	<1>
Lablab purpureus (L.) Sweet	hyacinth bean, *pāpapa*	?Nat	R	<1>
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	O,C	<1,2>
Mimosa pudica L.	sensitive plant	Nat	R	<1>
LAURACEAE				
Persea americana Mill.	avocado	Nat	O	<1>
MELASTOMATACEAE				
Clidemia hirta (L.) D. Don	Koster's curse	Nat	C	<1>
Melastoma candidum D. Don	--	Nat	O	<1>
MALVACEAE				
Hibiscus tiliaceus L.	*hau*	**?Ind**	R	<1>
MYRTACEAE				
Psidium cattleianum Sabine	strawberry guava, *waiawī*	Nat	R	<1>
Psidium guajava L.	common guava, *kuawa*	Nat	O	<1>
Syzygium malaccense (L.) Merr. & Perry	mountain apple, *'ōhia'a 'ai*	**Pol**	R	<1>
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false *alena*	Nat	R	<2>
OCHNACEAE				
Ochna thomasiana Engler & Gilg	Mickey Mouse plant	Nat	R	<1>
ONAGRACEAE				
Ludwigia octovalvis (Jacq.) Raven	*kāmole*, primrose willow	**?Pol**	O	<1>
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat	O	<2>
RUBIACEAE				
Coffea arabica L.	Arabian coffee (saplings)	Nat	O	<1>
Paederia foetida L.	*maile pilau*	Nat	O	<1>
Spermacoce assurgens Ruiz & Pav.	buttonweed	Nat	R	<1>

Table 4 (continued)

Family / *Species*	Common name	Status	Abundance	Notes
ULMACEAE				
Trema orientalis (L.) Blume	gunpowder tree	Nat	O	<2>
URTICACEAE				
Pilea microphylla (L.) Liebm.	artillery plant	Nat	O	<1>
VERBENACEAE				
Citharexylum caudatum L.	fiddlewood	Nat	A	<1>
Clerodendrum chinense (Osbeck) Mabb.	*pikake hohono*	Nat	C	<1,2>
Stachytarpheta jamaicensis (L.) Vahl	Jamaica vervain	Nat	R	<2>
FLOWERING PLANTS *MONOCOTYLEDONES*				
ARACEAE				
Alocasia macrorrhizos (L.) G. Don	*'ape*	**Pol**	O	<1>
Epipremnum pinnatum (L.) Engl.	pothos	Nat	A	<1>
Monstera deliciosa Liebm.	Swiss-cheese plant	Nat	C	<1>
ARECACEAE				
Cocos nucifera L.	*niu*, coconut	**Pol**	O	<1>
Livistona chinensis (Jacq.) R. Br. Ex Mart.	Chinese fan palm	Nat	R	<1>
LILIACEAE				
Asparagus plumosus J.G. Baker	asparagus-fern	Nat	R	<1>
COMMELINACEAE				
Commelina diffusa N. L. Burm.	*honohono*	**?Pol**	O	<1>
CYPERACEAE				
Cyperus gracilis R. Br.	McCoy grass	Nat	O	<1>
Cyperus involucratus Rottb.	*'ahu'awa haole*, umbrella sedge	Nat	C	<1>
Cyperus polystachyos Rottb.	---	**Ind**	O	<1>
Kyllinga brevifolia Rottb.	*kili'o'opu*	Nat	R	<1>
Kyllinga nemoralis (J. R. Forster & G. Forster) Dandy ex Hutchinson & Dalziel	*kili'o'opu*	Nat	O	<1>
HELICONIACEAE				
Heliconia bihai (L.) L.	---	Nat	C	<1>
POACEAE				
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	R	<2>

Table 4 (continued)

Family *Species*	Common name	Status	Abundance	Notes
POACEAE (continued)				
Coix lacryma-jobi L.	Job's tears, pū'ohe'ohe	Nat	R	<1>
Eleusine indica (L.) Gaertn.	wiregrass	Nat	O	<2>
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	O	<2>
Megathyrsus maximus (Jacq.) B.K. Simnon & W.L. Jacobs	Guinea grass	Nat	C	<1,2>
Oplismenus hirtellus (L.) P. Beauv.	basketgrass, hohono kukui	Nat	C	<1>
Paspalum dilatatum Poir	Dallis grass	Nat	R	<1>
Setaria palmifolia (J. König) Stapf	palmgrass	Nat	C	<1>
Sorghum halepense (L.) Pers.	Johnson grass	Nat	O	<1>

Legend to Table 4

STATUS = distributional status for the Hawaiian Islands:
- **Ind** = indigenous; native to Hawai'i, but not unique to the Hawaiian Islands.
- **Pol** = Early Polynesian introduction; canoe plant.
- Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of the Cook Expedition in 1778, and well-established outside of cultivation.
- **?** = status is uncertain.

ABUNDANCE = occurrence ratings for plant species:
- R – Rare — seen in only one or perhaps two 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.

NOTES (location):
- <1> – Within riparian zone of Maunawili Stream.
- <2> – Along roadside verge.

Aquatic Biota Results

A list of aquatic animals observed in Maunawili Stream is presented in Table 5, drawn from species observed by *AECOS* in the May 2019 survey, as well as previous HDLNR-DAR surveys within the watershed (Parham et. al, 2008) and *AECOS* (2017). Qualitative abundances are provided only for species observed by *AECOS* in the May 2019 survey.

Table 5. List of aquatic species from Kawainui Watershed and Maunawili Stream.

PHYLUM, CLASS, ORDER, FAMILY *Species*	Common name	Abundance	Status	ID Code
	INVERTEBRATES			
MOLLUSCA, BIVALVIA				
VENERIDA				
CYRENIDAE				
Corbicula fluminea Müller	Asiatic flume clam	U	Nat	1,2
MOLLUSCA, GASTROPODA*				
PHYSIDAE				
indet.	pond snail	---	Nat	2
PLANORBIDAE				
Ferrissia californica Rowell	limpet	---	Nat	2
AMPULLARIIDAE				
Pomacea canaliculata Lamarck	channeled applesnail	R	Nat	1,2
indet.	applesnail	---	Nat	2
THIARIDAE				
Melanoides tuberculatus Müller	red-rimmed melania	O	Nat	1,2,3
Tarebia granifera Lamarck	quilted melania	---	Nat	2
ARTHROPODA, INSECTA				
DIPTERA				
CHIRONOMIDAE				
Telmatogeton sp.	midge	---	Ind	2
ODONATA				
COENAGRIONIDAE				
Ischnura posita Hagen	fragile forktail	R	Nat	1
Ischnura ramburii Selys	Rambur's forktail	---	Nat	2
Megalagrion hawaiiense McLachlan		---	**End**	2
Megalagrion nigrohamatum nigrolineatum Blackburn	blackline Hawaiian damselfly	---	**End**	2
Megalagrion oceanicum McLachlan	Oceanic Hawaiian damselfly	---	**End**	2
LIBELLULIDAE				
Orthenis ferruginea Fabricius	roseate skimmer	R	Nat	1
ARTHROPODA, MALACOSTRACA				

Table 5 (continued).

PHYLUM, CLASS, ORDER, FAMILY *Species*	Common name	Abundance	Status	ID Code
DECAPODA				
PORTUNIDAE				
Thalamita crenata Tien	mangrove swimming crab	---	Ind	2
ATYIDAE				
Atyoida bisulcata Randall	Hawaiian mountain shrimp, *ʻōpae kalaʻole*	---	**End**	2
Neocaridina denticulata sinensis De Haan	Taiwan blue shrimp	A	Nat	1,3
CAMBARIDAE				
Procambarus clarkii Girard	Louisiana crawfish	R	Nat	1,2,3
PALAEMONIDAE				
Macrobrachium grandimanus Randall	Hawaiian river shrimp, *ʻōpae ʻoehaʻa*	---	**End**	2
Macrobrachium lar Fabricius	Pacific prawn	U	Nat	1, 2
VERTEBRATES				
CHORDATA, ACTINOPTERYGII				
SILURIFORMES				
CALLICHTHYIDAE				
Corydoras aeneus Gill	bronze corydoras	A	Nat	1,3
CLARIIDAE				
Clarias fuscus Scopoli	Chinese catfish	---	Nat	2,3
LORICARIIDAE				
Ancistrus cf. *temminckii*	bristlenose catfish	C	Nat	1,2,3
Hypostomus cf. *watwata* Hancock	armored catfish	---	Nat	3
CYPRINIFORMES				
CYPRINIDAE				
Cyprinus carpio Linnaeus	common carp	---	Nat	2
CICHLIFORMES				
CICHLIDAE				
Hemichromis elongatus Peters	banded jeweled cichlid	C	Nat	1,2,3
Tilapia sp.	unid. tilapia	R	Nat	1,2

Table 5 (continued).

PHYLUM, CLASS, ORDER, FAMILY *Species*	Common name	Abundance	Status	ID Code
GOBIIFORMES				
GOBIIDAE				
Awaous stamineus Eydoux & Souleyet	*ʻoʻopu nākea*	---	**End**	2
Sicyopterus stimpsoni Gill	*ʻoʻopu nōpili*	---	**End**	2
Stenogobius hawaiiensis Watson	*ʻoʻopu naniha*	---	**End**	2
ELEOTRIDAE				
Eleotris sandwicensis Vaillant & Sauvage	*ʻoʻopu akupa*	---	**End**	2
CYPRINODONTIFORMES				
POECILIIDAE				
Gambusia affinis Baird and Girard	mosquitofish	A	Nat	1,2,3
Poecilia sp. hybrid complex		A	Nat	1,2,3
Poecilia reticulata	guppy	A	Nat	1,2,3
Xiphophorus helleri Heckel	green swordtail	U	Nat	1,2,3
CHORDATA, AMPHIBIA, ANURA				
BUFONIDAE				
Rhinella marina Linnaeus	cane toad	A	Nat	1,2

Legend to Table 5

Abundance categories:
- R – Rare – only one or two individuals observed.
- O – Occasional – seen irregularly in small numbers.
- C – Common – observed everywhere, although generally not in large numbers.
- A – Abundant – observed in large numbers and widely distributed in survey area.

Status categories:
- **End** – Endemic – species native only to Hawaiʻi.
- **Ind** – Indigenous – species native to Hawaiʻi and native elsewhere.
- Nat – Naturalized – species introduced to Hawaiʻi intentionally or accidentally.

ID Codes:
- 1 – Observed in Project area on May 9, 2019.
- 2 – Reported as occurring in the Kawainui Watershed by Parham et al. (2008).
- 3 – Reported by *AECOS* in nearby Makawao Stream at Royal Hawaiian Golf Course in Maunawili on December 13, 2012 (AECOS, 2013).

The stream segment *mauka* of Maunawili Stream Bridge is a shallow concrete-lined channel. Biodiversity in this segment is limited to schools of poeciliids in the channel and Taiwan blue shrimp (*Neocaridina denticulata sinensis*), a non-native shrimp, on the undersides of riparian vegetation and leaf litter on the stream margins.

Downstream from the bridge, Maunawili Stream drops into a series of pools and straight short runs before reaching a confluence with Olomana Stream. In this segment, Maunawili Stream has a natural bed lined with boulders, as well as high, steep earthen banks. The stream is nearly completely shaded under a canopy of broadleaf trees and several downed trees lie across the stream. Biodiversity in the pools below Maunawili Stream bridge is higher compared to the channelized segment upstream. Schools of bronze corydoras (*Corydoras aeneus*) occupy these pools. Bristlenose catfish (*Ancistrus* cf. *temminckii*), banded jeweled cichlid (*Hemichromis elongatus*), and several common poeciliid species are present. Several Pacific prawn (*Macrobrachium lar*) and the claw of an American crawfish (*Procambarus clarkii*) were observed in the downstream segment.

All species observed during the survey are naturalized, non-native species in Hawaiian streams. No native stream fauna were observed during our aquatic survey. Native fauna listed in Table 5 represent observations from previous surveys in other parts of the watershed.

Avian Results

The avian survey of the Project area recorded a total of 40 individual birds of 13 species (Table 6) from a single point-count station. Five additional species were noted. No native indigenous bird species were observed, although some bird droppings seen along Maunawili Stream likely indicate use of the area by indigenous Black-crowned Night-Heron (*Nycticorax nycticorax*) or *ʻaukuʻu*.

Mammalian Results

Domestic dog (*Canis lupis familiaris*) was observed with pedestrians on Maunawili Road throughout the survey period. Feral pig (*Sus scrofa*) wallows were observed near Olomana Stream in the vicinity of Maunawili Stream Bridge. No other mammalian species were detected during the survey.

Table 6. Avian species detected on May 9, 2019 survey of Maunawili Stream Force Main Crossing No. 1.

ORDER FAMILY *Species*	**Common Name**	**Status**	**No. of Individuals**
GALLIFORMES			
PHASIANIDAE			
Gallus gallus	Domestic Chicken	ND	1
COLUMBIFORMES			
COLUMBIDAE			
Streptopelia chinensis	Spotted Dove	NN	1
Geopelia striata	Zebra Dove	NN	5
PELECANIFORMES			
ARDEIDAE			
Bubulcus ibis	Cattle Egret	NN	-
Nycticorax nycticorax	Black-crowned Night-Heron	I	-*
PASSERIFORMES			
PYCNONOTIDAE			
Pycnonotus cafer	Red-vented Bulbul	NN	3
Pycnonotus jocosus	Red-whiskered Bulbul	NN	5
ZOSTEROPIDAE			
Zosterops japonicus	Japanese White-eye	NN	8
CETTIIDAE			
Horornis diphone	Japanese Bush-Warbler	NN	1
Leiothrix lutea	Red-billed Leiothrix	NN	4
MUSCICAPIDAE			
Copsychus malabaricus	White-rumped Shama	NN	2
STURNIDAE			
Acridotheres tristis	Common Myna	NN	-
CARDINALIDAE			
Cardinalis cardinalis	Northern Cardinal	NN	-
THRAUPIDAE			
Paroaria coronata	Red-crested Cardinal	NN	2
FRINGILLIDAE			
Haemorhous mexicanus	House Finch	NN	4
PASSERIDAE			
Passer domesticus	House Sparrow	NN	2
ESTRILDIDAE			
Estrilda astrild	Common Waxbill	NN	-

[1] Species observed outside of count station; incidental observation.
* Only sign (scat, tracks, nest, etc.) of species observed.

Table 6 (continued).

Legend to Table 6.

Status – **I** = Indigenous
NN = Naturalized, non-native species (introduced).
ND = Naturalized, domestic

Federal Jurisdictional Waters

Within the Project area, Maunawili Stream has physical indicators of flow (i.e., bed and banks and OHWM) and, therefore, is considered to be a jurisdictional tributary to a traditional navigable waters (TNW). In the Project area (immediately downstream of Maunawilli Stream Bridge), Maunawili Stream is approximately 10 m (33 ft) wide and 10 cm (4 in) deep. The stream channel is fairly incised and stream flow is eroding the steep banks. Trees established below the OHWM have exposed roots and shelving is common along both banks. Sediment sorting, another physical indicator of flow, is evident; rounded boulders, cobbles, and silt on the stream bed form cobble bars in the channel. Burrows of the bristlenose catfish (*Ancistris* cf. *teminckii*), an introduced loricariid catfish, are abundant in the stream banks above and below the waterline, but below the OHWM (Figure 4).

Figure 4. Some fish burrows in Mauanawili Stream are located above the water line but below the OHWM.

Hydrophytes, such as umbrella sedge (*Cyperus involucratus*), primrose willow (*Ludwigia octovalvis*), and *honohono* (*Commelina diffusa*), are the most common plants below the OHWM. Terrestrial vegetation, such as palmgrass (*Setaria palmifolia*), basketgrass (*Oplismeus hirtellus*), *kukui* (*Aleurites moluccana*), Mickey Mouse plant (*Ochna thomasiana*), gunpowder tree (*Trema orientalis*), pothos (*Epipremnum pinnatum*), albizia (*Falcataria moluccana*), and heliconia (*Heliconia bihai*) grow on the stream banks above the OHWM.

Attachment A includes OHWM delineation sheets for the Project area. Photographs taken to document the OHWM delineation process are included in Attachment B. Geospatial survey results from ControlPoint surveyors include OHWM and the proposed Project activities, and are provided as a map in Attachment C.

Assessment and Discussion

Water Quality Assessment

Maunawili Stream is classified as Class 2 "freshwater, flowing waters" in the Hawai'i water quality standards (HDOH, 2014). Beneficial uses of Class 2 waters are designated as follows:

> "The objective of class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation on and in these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new treated sewage discharges shall be permitted within estuaries".

Specific water quality criteria have been promulgated that, if met, are designed to allow the water bodies to achieve designated beneficial uses. Wet season (November 1 through April 30) and dry season (May 1 through October 31) criteria for freshwater streams are presented in Table 6 (HDOH, 2014).

Not all of the water quality measurements made in our survey can be compared directly with the state water quality criteria to establish compliance with these standards because such a comparison requires representative geometric mean values, calculated from a minimum of three sampling events at each station in the stream for turbidity, TSS, and nutrients. On the other hand, selected physical

parameters, temperature, pH, conductivity, and DO saturation levels, can be compared with state criteria.

Table 6. State of Hawai'i water quality criteria for streams for wet (Nov. 1-Apr. 30) and dry (May 1-Oct. 31) seasons from HAR §11-54-05.2(b) (HDOH, 2014).

Parameter	Total Nitrogen (µg N/l)	Nitrate + Nitrite (µg N/l)	Total Phosphorus (µg P/l)	Turbidity (NTU)	Total Suspended Solids (mg/l)
Geometric mean not to exceed given value (dry season)	180.0	30.0	30.0	2.0	10.0
(wet season)	*250.0*	*70.0*	*50.0*	*5.0*	*20.0*
Not to exceed more than 10% of the time (dry season)	380.0	90.0	60.0	5.5	30.0
(wet season)	*520.0*	*180.0*	*100.0*	*15.0*	*50.0*
Not to exceed more than 2% of the time (dry season)	600.0	170.0	80.0	10.0	55.0
(wet season)	*800.0*	*300.0*	*150.0*	*25.0*	*80.0*

- pH – shall not deviate more than 0.5 units from ambient and not be lower than 5.5 nor higher than 8.0
- Dissolved oxygen – not less than 80% saturation
- Temperature – shall not vary more than 1 °C from ambient
- Conductivity – not more than 300 micromhos/cm

Maunawili Stream discharge estimate (0.61 cfs) in the Project area on May 9, 2019 is compared with the historic distribution of field measurements made in Maunawili Stream at Maunawili Road Bridge on an irregular basis between 1956 and 1990 at USGS Station 16249200; (USGS, 2019; Figure 5). Only 0.10 inches of rain were recorded in the Maunawili area (Rain Gauge STVH1) during the five days preceding this sampling event (NOAA-NWS, 2019); thus base flow conditions prevailed as indicated in Fig. 5 and represent typical, non-runoff conditions.

Temperature, pH, conductivity, and DO saturation levels were all within state criteria at the time of sampling. Concentrations for all nutrients, except Kjeldahl nitrogen, were typical of higher elevation reaches of Hawai'i streams during base flow conditions.

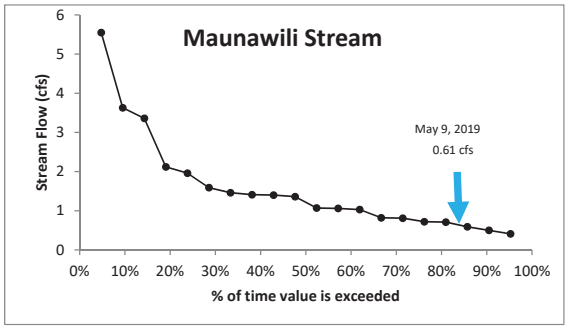

Figure 5. Maunawili Stream flow patterns at Maunawili Road Bridge (USGS 2019).

Project work to repair the force main crossing can be completed with minimum impacts to stream water quality and without negative impacts to long-term water quality if proper BMPs are implemented.

- Repair activities must be restricted to one-half of the stream at a time. This will allow amphidromous animals to use the stream during repair operations as a migratory pathway and maintain stream flow through the reach.
- Cofferdams constructed of sand bags interwoven with thick plastic sheeting to minimize leakage should be employed around in-water work areas. Cofferdams should be surrounded on in-water sides by an anchored silt curtain to prevent discharge of work-related sediments to downstream waters.
- Filter socks should be placed along the lower edge of stream banks in work areas to prevent movement of eroded material into downstream waters.

Botanical Resources

Botanical resources of interest or potential concern from a conservation perspective are native endangered, threatened, or rare species, valuable landscape plants, or exceptional trees. No plants proposed or listed as endangered or threatened under the federal Endangered Species Act of 1973 (ESA) as amended, or the State of Hawai'i endangered species statute, Hawai'i Revised Statutes (HRS) 195D (USFWS, nd. a; HDLNR, 1998) were observed. For

plants, state listing follows the federal listing. No trees in the Project area are listed by the City and County of Honolulu, Exceptional Trees program (CCH, 2017).

Aquatic Biological Resources

No aquatic species protected by state or federal endangered species statutes (HDLNR, 2015; USFWS, nd. a) were observed in Maunawili Stream at the Project area during the course of the aquatic survey on May 9, 2019. However, some species previously reported from Maunawili Stream and Kawainui Watershed (Parham et. al, 2008) are protected. The crimson damselfly (*Megalagrion leptodemas*), blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*), and Oceanic Hawaiian damselfly (*M. oceanicum*) are listed as endangered on state and federal endangered species lists (HDLNR, 2015; USFWS, 2012; USFWS, nd. a; USFWS, nd. b), and reported in the middle to upper reaches of Kawainui Watershed (Parham et. al. 2008). *M. leptodemas* breeds in slow reaches of streams and seep-fed pools. *M. nigrohamatum nigrolineatum* occurs in slow sections or pools along mid-reach and headwater sections of upland streams and seep-fed pools. *M. oceanicum* is found in swiftly flowing sections of streams, usually amid rocks and gravel in stream riffles. Naiads can forage out of the stream on wet moss on rocks (USFWS, 2012; Polhemus and Asquith, 1996). The aforementioned *Megalagrion* species are considered to be vulnerable to extinction and are on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Odonata Specialist Group, 1996). Introduced predatory fish and crustaceans are major threats to the species. USFWS advises that BMPs for work in aquatic environments be incorporated into the project plan to minimize the degradation of water quality and impacts to biological resources (for BMPS, see Water Quality Assessment, above).

ʻOʻopu nākea (*Awaous stamineus*), *ʻoʻopu naniha* (*Stenogobius hawaiiensis*), *ʻoʻopu nōpili* (*Sicyopterus stimpsoni*) and *ʻoʻopu akupa* (*Eleotris sandwicensis*) are native gobies previously reported from Maunawili Stream and Kawainui Watershed (AECOS, 2017; Parham et. al. 2008), but were not observed during the present survey in the Project area. Hawaiʻi Department of Land and Natural Resources (HDLNR) administrative rules regulate fisheries in the state, including the taking of *ʻoʻopu* (HDLNR, 1989). *ʻŌpae ʻoehaʻa* (*Macrobrachium grandimanus*) and *ʻōpae kalaole* (*Atyoida bisulcata*) are native crustaceans that have also been reported from the watershed (Parham et al., 2008), but were not observed during the recent survey of the Project area.

Many Hawaiian endemic and indigenous freshwater fish and crustaceans have an amphidromous life cycle: eggs are laid in freshwater stream reaches, and hatched larvae drift downstream and out into the ocean where they develop for a time before migrating back into freshwater streams to grow to maturity (Ford

and Kinzie, 1982; Kinzie, 1988). Project activities must not impede this amphidromous cycle. Maintaining good water quality in the stream should be a priority.

- Downstream and upstream migration pathways should be maintained.
- New structures should not include drains or grates that may entrain drifting larvae, nor overhanging culverts that may obstruct upstream movement of recruiting juveniles.

Avian Resources

The avian assemblage surveyed at the Project area is fairly consistent with the lowland wet forest and urban environment found there, although waterbirds were notably absent from the modified stream channel in the Project area. All birds observed during the survey period are non-native species naturalized to Hawaiʻi. Most abundant were Japanese White-eye (*Zosterops japonicus*), Zebra Dove (*Geopelia striata*), and Red-whiskered Bulbul (*Pycnonotus jocosus*).

While not observed, Mallard (*Anas platyrynchos*), Hawaiian Duck-Mallard hybrid, and Black-crowned Night Heron are waterbird species that could be expected to utilize waterways in the Project area, and are quite common on Oʻahu. The Oʻahu population of Hawaiian Duck has interbred extensively with the non-native feral Mallard (*Anas platyrynchos*), such that Hawaiian Duck-Mallard hybrid of the two species are predominantly observed and are difficult to distinguish from pure *koloa* (Uyehara et al., 2007). Hawaiian Duck-Mallard hybrid are not protected.

No endangered Hawaiian waterbirds were observed during the survey: On Oʻahu, these consist of the Hawaiian Duck or *koloa* (*Anas wyvilliana;* see above), Hawaiian Common Gallinule (*Gallinula galeata sandvicensis*) or *ʻalae ʻula*, Hawaiian Coot (*Fulica alai*) or *ʻalae keʻokeʻo*, and Hawaiin Stilt or *aeʻo* (*Himantopus mexicanus knudseni*).

Optimal habitats for endangered waterbird species are not present in the Project area. However, suitable habitat for endangered waterbirds may be found downstream of the Project in Kawainui Marsh, and potentially along water features at the nearby Royal Hawaiian Golf Course. USFWS recommends that if water resources are located within or adjacent to a project site, incorporate the applicable best management practices (BMPs) regarding work in aquatic environments into the project design (USFWS, nd. b):

- If an endangered waterbird is observed in the Project area, cease work until the animal leaves the Project area voluntarily.

- If a nest is found, establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.

Critical habitat for endangered O'ahu 'Elepaio (*Chasiempis ibidis*) occurs less than a mile from the Project (USFWS, nd. a, see Figure 6), along the upper ridges and valleys of Ko'olau Mountain. A population of O'ahu 'Elepaio was reported from Maunawili in 1975 (344 individuals), but no individuals were detected in subsequent surveys from the 1990s, or 2012 (VanderWerf et al., 2013; VanderWerf et al., 2001). Ko'olau populations of O'ahu 'Elepaio are typically observed from an elevational range of 150 to 550 m (500 to 1,800 ft; Pyle and Pyle, 2017), while the Project elevation is around 23 m (75 ft). Given the relatively low elevation of the Project, endangered O'ahu 'Elepaio are unlikely to utilize the Project area or immediate vicinity. However, some USFWS endangered forest bird recommendations may apply for Project activities (USFWS, nd. b):

- Avoid increasing mosquito populations by creating stagnant water habitat.

Protected seabirds may overfly the Project area, and have some potential to utilize cliff habitat in upper Maunawili Valley. Seabird species of concern include protected Wedge-tailed Shearwater or *'ua'u kani* (*Ardenna pacifica*), threatened Newell's Shearwater or *'a'o* (*Puffinus newelli*), endangered Hawaiian Petrel or *'ua'u* (*Pterodroma sandwichensis*), and endangered Band-rumped Storm-Petrel or *'akē'akē (Oceanodroma castro)*. USFWS advises that Hawaiian seabirds may traverse projects during the breeding, nesting, and fledging seasons (March 1 to December 15). Night lights can disorient seabirds, resulting in their potential downing and harm from collision with objects and/or predation by dogs and cats if downed (Reed et al., 1985; Telfer et al., 1987):

- If the Project will result in additional night-time lighting sources for night-time construction, then risk of incidentally downing nocturnally-flying seabirds will increase. To avoid or minimize potential Project impacts to seabirds, USFWS recommend the following applicable measures: fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary; install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area; and avoid night-time construction during the seabird fledging period from

September 15 through December 15 (USFWS, nd. b). All external lighting structures should be fully "dark sky compliant" (HDLNR-DOFAW, 2016).

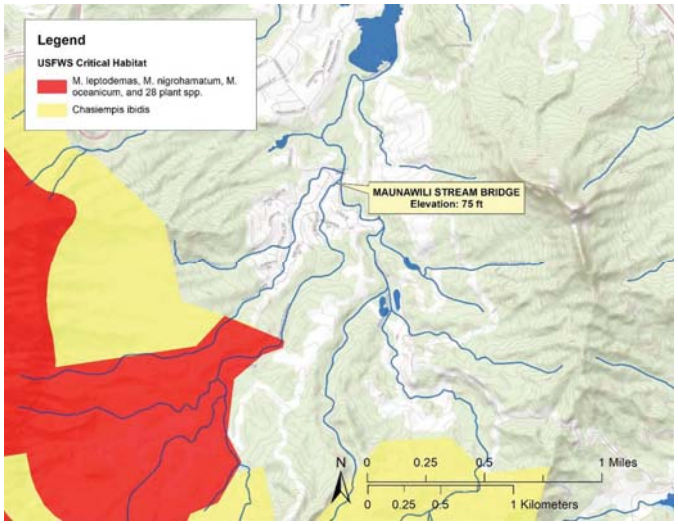

Figure 6. Federally-designated Critical Habitat near the Maunawili Stream Bridge Project site.

White Tern (*Gygis alba*), or *manu o Kū*, is another indigenous seabird listed as threatened under the State of Hawai'i endangered species statute HRS 195D (HDLNR, 2015). White Tern occurs on O'ahu (USFWS, 2005), with the majority of the population found in the Honolulu area. White Tern was not observed (or expected to occur) in the Project area and Project activities are not anticipated to have an impact on this species.

Mammalian Resources

Mammals detected during the survey are not native to Hawai'i and offer little value from an ecological perspective. The Hawaiian hoary bat is the only

Endangered Species Act (ESA)-listed terrestrial mammal in Hawai'i, with a potentially widespread, ubiquitous distribution on islands throughout the state. Potential Hawaiian hoary bat roosts (trees over 4.6 m [15 ft]) are abundant in the riparian forest in the Project area. USFWS provides general BMP recommendations for areas with bat roosting habitat (USFWS nd. b):

- To avoid potential deleterious impacts to roosting bats with pups, it is recommended that no woody vegetation taller than 4.6 m (15 ft) be removed during the bat pupping season between June 1 and September 15 (USFWS, 1998). The use of barbed wire to top fence lines may entangle flying bats and must be avoided (Zimpfer and Bonaccorso, 2010).

The Hawaiian Hoary Bat is known to forage for insects along waterways (USFWS, 1998), such as those found in the Project along Maunawili and Olomana streams. Because Hawaiian Hoary Bat is a noted habitat generalist that forages in multiple locations over a wide geographic home range (Bonaccorso, 2010), and the proposed Project activities along Maunawili Stream are not expected to reduce stream forage habitat, deleterious impacts to Hawaiian Hoary Bat are not anticipated so long as appropriate aforementioned BMPs are followed.

Jurisdictional Waters

Maunawili Stream is jurisdictional under federal law up to the OHWM. Any work below the OHWM may require a permit from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. Provided that design and construction plans comply with the general and regional conditions, USACE is likely to verify this Project under Nationwide Permit (NWP) 12 for utility line activities.

Critical Habitat

Federally delineated Critical Habitat is not present in the Project area of Maunawilli Stream Bridge (USFWS 2019; See Figure 6). Thus, the Project as currently proposed, will not impinge on federally designated Critical Habitat. No equivalent habitat designation exists under state law.

Critical Habitat for three native damselflies, O'ahu 'Elepaio, and several endemic plant species begin less than one mile *mauka* (upslope) from Maunawili Stream Bridge. Despite this lateral proximity, Critical Habitat and the Project area are separated by a distinct elevational buffer: Maunawili Stream bridge is located around 23 m (75 ft) ASL, while critical habitat begins around 91 m (300 ft) ASL

and extends upward to include the ridges and peaks of the Ko'oalu Mountain. The nearest peak, Konahuanui, reaches approximately 960 m (3150 ft) in height. Deleterious impacts to Critical Habitat and federally-protected species upslope of the Project are not anticipated, so long as appropriate aforementioned BMPs are followed.

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Attachment A

Ordinary High Water Mark Delineation Datasheets – Maunawili Stream

OHWM Delineation Cover Sheet

Project: Maunawili Estates Ww Pump Sta. Force Main Crossing No. 1 Repair **Date:** 9 May 2019

Location: Maunawili, O'ahu **Investigators:** Susan Burr and Bryson Luke, *AECOS*

Project Description:

The purpose of the project is to repair the 8-inch ductile iron pipe wastewater force main at the Maunawili Stream Crossing No. 1.

Describe the river or stream's condition (disturbances, in-stream structures, etc.):
Maunawili Stream is the largest of eight named streams and numerous unnamed tributaries that drain Maunawili Valley between Olomana Ridge and the Ko'olau Range. Maunawili Stream is a perennial stream that discharges into Kawainui Marsh, which drains into Oneawa Canal, which has a coastal outlet into the Pacific Ocean at the north end of Kailua Bay. Maunawili Stream is channelized and hardened upstream of the force main crossing and Maunawili Road Bridge, but has a natural bed and un-hardened banks downstream of the crossing.

Maunawili Stream is listed in the Hawai'i stream assessment, a listing of perennial streams (HCPSU, 1990), and Kawainui Watershed is assigned code number 32013 in Hawai'i watershed atlas (Parham et al., 2008).

Off-site Information

Remotely sensed image(s) acquired? **Yes** **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:
Figure 1 (Google Earth, 2015)

Hydrologic/hydraulic information acquired? **Yes** **No** [If yes, attach information to datasheet(s) and describe below.] U.S. Geological Survey (USGS) operated a stream gauge station in Makawao Stream (also called Olomana Stream; No. 16254000) from 1912-1916 and from 1958-present (USGS, 2019). Makawao Stream and Maunawili Stream have similarly sized watersheds; the confluence of Makawao Stream and Maunawili Stream is just downstream from the Project area. A review of the period of record for the gauge station indicates the peak yearly streamflow for the time period was 6,000 cubic feet per second (cfs). The average daily discharge is 4.91 cfs.

The 2019 May through September dry season started out relatively wet for O'ahu (NOAA-NWS, 2019). The National Weather Service Mauanwili rain gage (MAUH1), located approximately 1.3 km (0.8 mi) upslope from the Project area at 127 m (417 ft) ASL, records an average annual rainfall of 1859 mm (73 in; Giambelluca et al., 2013). May 2019 rainfall was 4.86 inches, 82% of average and 2019 rainfall through May 31 was 31.47 inches, 87% of average (NOAA-NWS, 2019).

List and describe any other supporting information received/acquired:

Giambelluca, T. W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013: Online Rainfall Atlas of Hawai'i. *Bull. Amer. Meteor. Soc.* 94: 313-316, doi: 10.1175/BAMS-D-11-00228.1. Online at URL: http://rainfall.geography.hawaii.edu/; last accessed on July 3, 2019.

Hawaii Cooperative Park Service Unit. 1990. Hawaii stream assessment. A preliminary appraisal of Hawaii's stream resources. Prep. for State of Hawaii, Commission on Water Resource Management. National Park Service, Hawaii Cooperative Park Service Unit, Rept. No. R84: 294 pp.

National Oceanic and Atmospheric Administration – National Weather Service Forecast Office, Honolulu, HI (NOAA-NWS). 2019. Hydrology in Hawaii. Available online at URL: http://www.prh.noaa.gov/hnl/hydro/pages/ hydrology.php; last accessed July 3, 2019.

Parham, J. E., G. R. Higashi, E. K. Lapp, D. G. K. Kuamo'o, R. T. Nishimoto, S. Hau, J. M. Fitzsimmons, D. A. Polhemus and W. S. Devick. 2008. Atlas of Hawaiian Watersheds and their Aquatic Resources. Island of O'ahu. Bishop Museum and Division of Aquatic Resources. 614 pp.

U.S. Geological Survey (USGS). 2019. National Water Information System: Web Interface, USGS 16254000 Makawao Str nr Kailua, Oahu, HI. Available online at URL: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=16254000; last accessed July 3, 2019.

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

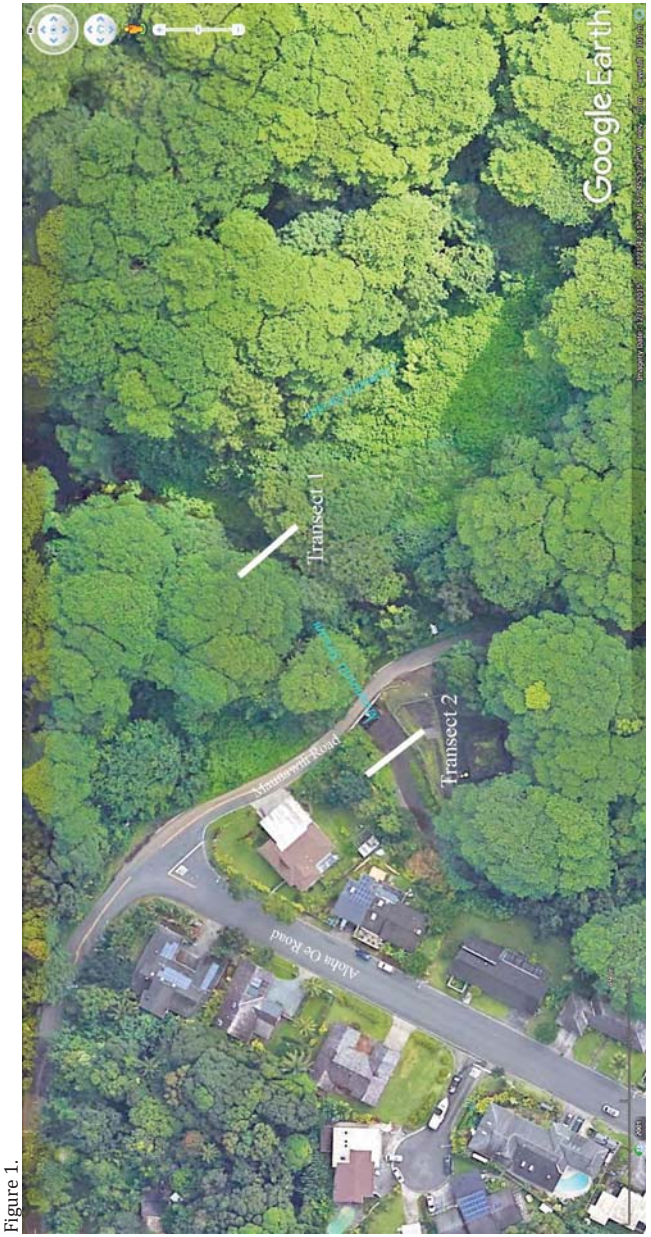
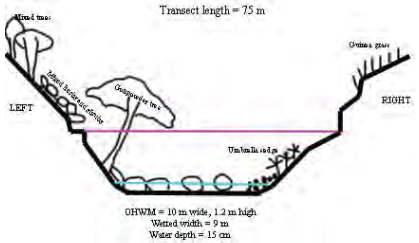


Figure 1.

Datasheet # 1 **OHWM Delineation Datasheet** Page 3 of 4

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ■ Sharp (> 60°) | ■ Moderate (30–60°) | ■ Gentle (< 30°) | ■ None

Notes/Description: Break in slope at OHWM is less than 20°.

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	85	0	0	5	10	Y
Below OHWM	10	0	0	15	75	N

Notes/Description: Stream bed consists primarily of boulders and rounded cobbles, including a cobble bar along the right side of the channel. Soil horizons are developed above the OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	75	15	10	0
Below OHWM	10	0	20	70

Notes/Description:

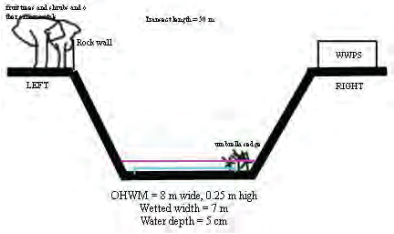
Guinea grass, palmgrass, and bamboo grass are rooted on the banks above the OHWM. Below the OHWM, umbrella sedge is the only herbaceous plant present. A gunpowder tree rooted below the OHWM has exposed roots and is leaning into the stream.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation.

Shelving and a break in bank slope are obvious physical indicators of flow in this segment of Maunawili Stream. Sediment sorting (including cobble bars) is a good indicator of OHWM. Several trees (e.g., gunpowder, coconut, albizia) are rooted below the OHWM, but roots are exposed and the base of the trees are being undercut by stream flow. Vegetation wrack lines are apparent and broken concrete slabs from the force main crossing are scattered throughout the stream segment.

Datasheet # 2 **OHWM Delineation Datasheet** Page 4 of 4

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: Sharp (> 60°) | Moderate (30–60°) | Gentle (< 30°) | None

Notes/Description: OHWM is approximately 0.25 m up from the channel bottom on the sloping hardened banks.

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	0	0	0	00	N
Below OHWM	10	0	0	0	0	N

Notes/Description: Maunawili Stream is confined to a hardened concrete channel. Some clay/silt has accumulated on the concrete channel bottom.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	10	90
Below OHWM	0	0	5	95

Notes/Description:

Maunawili Stream is confined to a hardened concrete channel. Clay/silt deposited by stream flow has accumulated along the edges of the concrete channel and supports patches of dense umbrella sedge (FACW) plants.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation.

Destruction of terrestrial vegetation, deposited sediment, and sediment staining and are the physical indicators we used most often to identify jurisdictional limits.

Attachment B

Ordinary High Water Mark
Photo Log –
Maunawili Stream

Flag 1 is located on Maunawili Stream just upstream of confluence with Olomana Stream.

Flag 1 Upstream

Flag 1 Downstream

Flag 1 Left

Flag 1 Right

Flag 2 is located on Maunawili Stream downstream of force main crossing no. 1 and Maunawili Stream Bridge.

Flag 2 Upstream

Flag 2 Downstream

Flag 2 Left

Flag 2 Right

Flag 3 is located in a pool on Maunawili Stream just downstream of force main crossing no. 1 and Maunawili Stream Bridge.

Flag 3 Upstream

Flag 3 Downstream

Flag 3 Left

Flag 3 Right

Flag 4 is located in the concrete channel of Maunawili Stream upstream of Maunawili Stream Bridge.

Flag 4 Upstream

Flag 4 Downstream

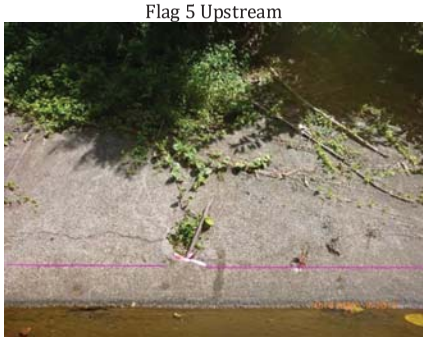
Flag 4 Left

Flag 4 Right

Flag 5 is located in the concrete channel of Maunawili Stream upstream of Maunawili Stream Bridge.

Flag 5 Upstream

Flag 5 Downstream



Flag 5 Left

Flag 5 Right

Attachment C

Ordinary High Water Mark Delineation Map – Maunawili Stream

TMK: 4-2-67: 28

TMK: 4-2-67: 02

TMK: 4-2-67: 01

TMK: 4-2-08: 05

TMK: 4-2-08: 01

EASEMENT 10, FOR STREAM PURPOSES, 45-FT. WIDE

EASEMENT 11, FOR SEWER PURPOSES (10-FT. WIDE)

MAUNAWILI STREAM

20-FT. ROADWAY SETBACK LINE

20-FT. ROADWAY SETBACK LINE

TRUE NORTH
SCALE: 1 IN = 20 FT

ALOHA OE DRIVE
(CITY)

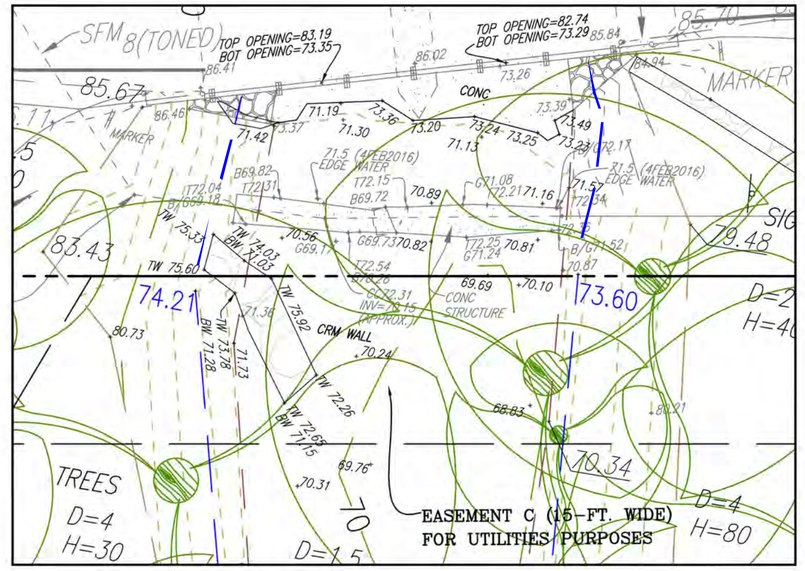
MAUNAWILI ROAD
(CITY)

TO PUUALOHA STREET

EASEMENT A (20-FT. WIDE) FOR ACCESS AND UTILITY PURPOSES

EASEMENT C (15-FT. WIDE) FOR UTILITIES PURPOSES

SEE INSET



SCALE: 1 IN. = 10 FT.

BENCHMARK:
C&C STREET MONUMENT
TOP OF BRASS PIN
ELEV.=85.80 FT., MSL

TOPOGRAPHIC SURVEY MAP
MAUNAWILI ESTATES
FORCE MAIN
AT KAILUA, KOOLAUPOKO, OAHU, HAWAII

TMK: 4-2-67: 28 & 4-2-08: 01 (POR.)

SCALE: 1 in. = 20 ft. JULY 19, 2019

JOB NO. 15211A FIELD BOOK : 3537: 71

DRN: SN-M FLD: NI

CONTROLPOINT SURVEYING, INC.
615 Piikoi St. Suite 700
HONOLULU, HAWAII 96814

AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAILUA"

— — ORDINARY HIGH WATER MARK (OHWM) DELINEATED BY AECOS MAY 9, 2019 AT 9:00 AM

ABBREVIATIONS:

BOT	BOTTOM	D	DIAMETER OR DRAIN
BW	BOTTOM WALL	H	HEIGHT
CLF	CHAIN LINK FENCE	OHWM	ORDINARY HIGH WATER MARK
CRM	CONCRETE RUBBLE MASONRY (ROCK) WALL	TW	TOP WALL

NOTES:

THIS MAP AND ASSOCIATED CADD FILE IS A TOPOGRAPHIC SURVEY OF THE SUBJECT PARCEL OR PROJECT SITE. THE DEPICTION OF BOUNDARIES AND ENCUMBRANCES AFFECTING THE PROJECT SITE ARE TAKEN FROM LATEST TAX MAPS ONLY. OBTAINING A COPY OF THE CURRENT TITLE REPORT OR DEED FOR AREAS WHERE PROPERTY AND ENCUMBRANCE ISSUES ARE CRITICAL IS RECOMMENDED PRIOR TO ANY DESIGN AND CONSTRUCTION WORK.

UNDERGROUND UTILITY LINES AND/OR STRUCTURES, IF SHOWN, ARE PROVIDED BASED ON INFORMATION FROM PLANS/MAPS PREPARED BY OTHERS, AND NEED TO BE REVIEWED BY PUBLIC UTILITY AGENCIES OR ASSOCIATED FACILITIES.

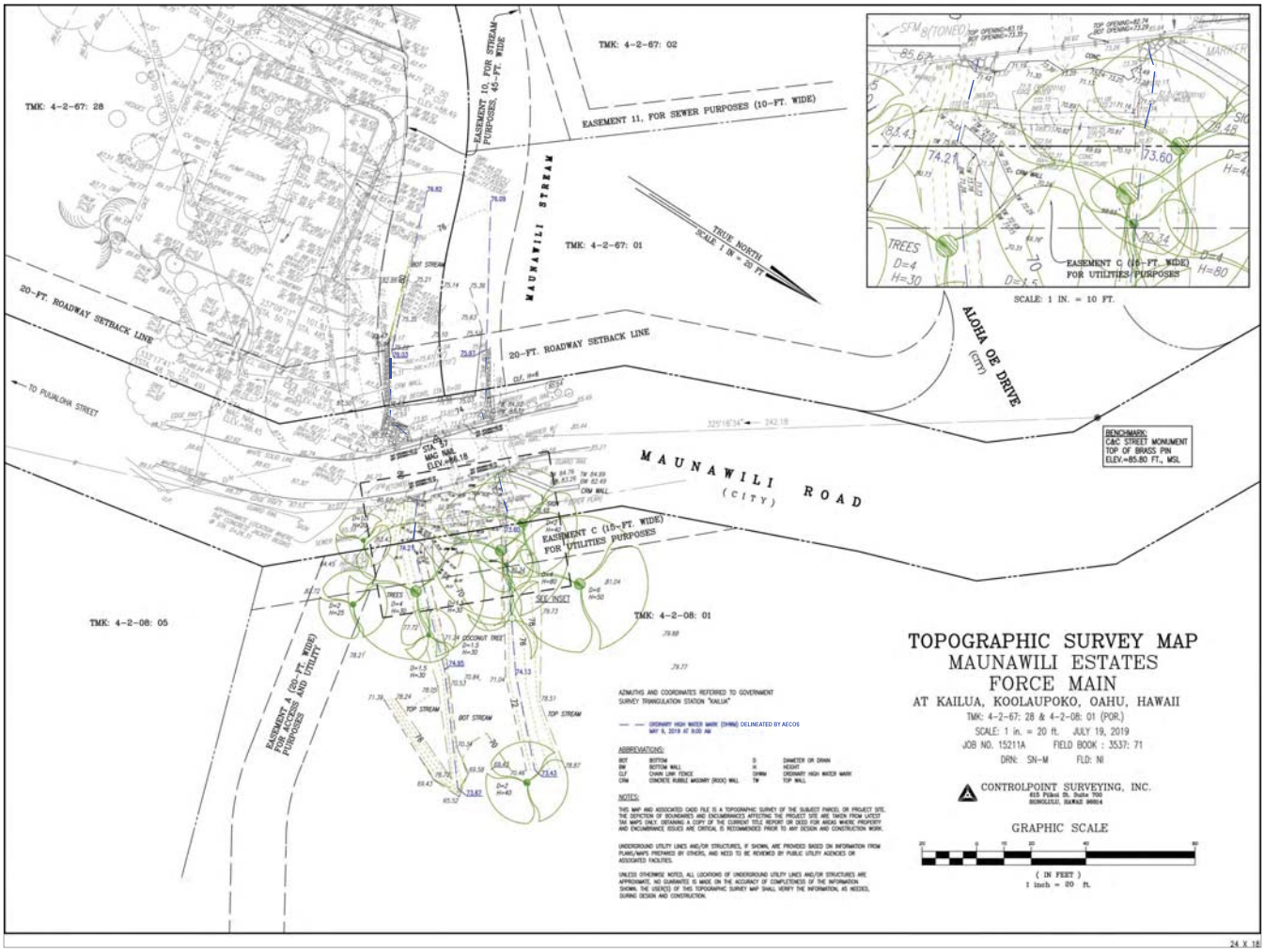
UNLESS OTHERWISE NOTED, ALL LOCATIONS OF UNDERGROUND UTILITY LINES AND/OR STRUCTURES ARE APPROXIMATE. NO GUARANTEE IS MADE ON THE ACCURACY OF COMPLETENESS OF THE INFORMATION SHOWN. THE USER(S) OF THIS TOPOGRAPHIC SURVEY MAP SHALL VERIFY THE INFORMATION, AS NEEDED, DURING DESIGN AND CONSTRUCTION.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

24 X 18


TMK: 4-2-67: 28
TMK: 4-2-67: 02
EASEMENT 10, FOR STREAM PURPOSES, 45-FT. WIDE
EASEMENT 11, FOR SEWER PURPOSES (10-FT. WIDE)
MAUNAWILI STREAM
TMK: 4-2-67: 01
TRUE NORTH
SCALE 1 IN = 40 FT
20-FT. ROADWAY SETBACK LINE
20-FT. ROADWAY SETBACK LINE
TO PUULOLOA STREET
ALOHA OE DRIVE
(CITY)
MAUNAWILI ROAD
(CITY)
STA. 57
MAG NAIL
ELEV.=86.18
EASEMENT C (15-FT. WIDE)
FOR UTILITIES PURPOSES
SEE INSET
TMK: 4-2-08: 01
TMK: 4-2-08: 05
EASEMENT A (20-FT. WIDE)
FOR ACCESS AND UTILITY
PURPOSES
TOP STREAM
BOT STREAM
TREES
COCONUT TREE
CRW WALL
EASEMENT C (15-FT. WIDE)
FOR UTILITIES/PURPOSES
SCALE: 1 IN. = 10 FT.
BENCHMARK:
C&C STREET MONUMENT
TOP OF BRASS PIN
ELEV.=85.80 FT., MSL
AZIMUTHS AND COORDINATES REFERRED TO GOVERNMENT
SURVEY TRIANGULATION STATION "KAILUA"
ORDINARY HIGH WATER MARK (OHWM) DELINEATED BY AECOS
MAY 9, 2019 AT 8:00 AM
ABBREVIATIONS:
BOT BOTTOM
BW BOTTOM WALL
CLF CHAIN LINK FENCE
CRW CONCRETE RUBBLE MASONRY (ROCK) WALL
D DIAMETER OR DRAIN
H HEIGHT
OHWM ORDINARY HIGH WATER MARK
TW TOP WALL
NOTES:
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TOPOGRAPHIC SURVEY MAP
MAUNAWILI ESTATES
FORCE MAIN
AT KAILUA, KOOLAUPOKO, OAHU, HAWAII
TMK: 4-2-67: 28 & 4-2-08: 01 (POR.)
SCALE: 1 in. = 20 ft. JULY 19, 2019
JOB NO. 15211A FIELD BOOK : 3537: 71
DRN: SN-M FLD: NI
CONTROLPOINT SURVEYING, INC.
415 Pilani St. Suite 700
HONOLULU, HAWAII 96814
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

24 X 18

APPENDIX C

Reconnaissance Level Survey

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
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

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

April 4, 2018

IN REPLY REFER TO:
LOG NO: 2018.00502
DOC NO: 1804TGM04
Architecture

Lori M.K. Kahikina, Director
Department of Environmental Services,
Division of Wastewater Engineering and Construction,
City & County of Honolulu
650 S. King Street, 14th Floor
Honolulu, HI 96813

Dear Ms. Kahikina:

SUBJECT: HRS Chapter 6E-8 Historic Preservation Review
Maunawili Estates Wastewater Pump Station Force Main Crossing – Repair
1275 Maunawili Road, Kailua, HI 96734
Kailua Ahupua'a, Ko'olaupoko Moku, Island of O'ahu
TMK: (1) 4-2-008:001

On March 23, 2018, the State Historic Preservation Division (SHPD) accepted the Reconnaissance Level Survey (RLS) for the Maunawili Bridge #3 (LOG NO: 2018.00502; DOC NO: 1803TGM16).

The SIHP number for the site is:

- 50-80-15-08211

Please contact Ms. Tanya Gumapac-McGuire, Architectural Historian, at (808) 692-8022 or at Tanya.Gumapac-Mcguire@hawaii.gov regarding architectural resources or this letter.

Mahalo,

Alan Downer

Alan Downer, PhD.
Deputy State Historic Preservation Officer
Administrator, State Historic Preservation Division

cc: Mr. Clifford Kanda, Project Engineer, Department of Design and Construction, ckanda@honolulu.gov
Wei Chen, Project manager, Fukunaga & Associates, Inc., wchen@fukunagaengineers.com
Alison Chiu, Fung Associates, Inc., Alison@funghawaii.com

State Historic Preservation Division
HRS 6E Submittal Form

Per §6E, Hawai'i Revised Statutes, if the Project requires review by the State Historic Preservation Division (SHPD), please review and fill out this form and submit all requested information to SHPD. Submittals will not be reviewed until this form and documentation are **submitted electronically** to:

dlnr.intake.shpd@hawaii.gov

If you are unable to submit electronically, please contact SHPD at (808) 692-8015. Mahalo.

The submission date of this form is:

1. APPLICANT (select one)

○ Property Owner ◉ Government Agency

2. LEAD AGENCY (select one)

○ Planning Department ◉ Department of Public Works ○ Other.

Specify Other: City and County of Honolulu, Department of Design and Construction

Type of Permit Applied For: USACE Section 404 Permit

3. APPLICANT CONTACT

3.1) Name: Clifford Kanda 3.2) Title: Project Engineer

3.3) Street Address: 650 South King Street, 14th Floor

3.4) County: Honolulu 3.5) State: HI 3.6) Zip Code: 96813

3.7) Phone: 808-768-8753 3.8) Email: ckanda@honolulu.gov

4. PROJECT DATA

4.1) Permit Number (if applicable):

4.2) TMK [e.g. (3) 1-2-003:004]: adjacent to (1) 4-2-008:001 and (1) 4-2-067:001

4.3) Street Address: 1275 Maunawili Road (Maunawili Estates WWPS)

4.4) County: Honolulu 4.5) State: Hawaii 4.6) Zip Code: 96734

4.7) Total Property Acreage: <1 acre

4.8) Project Area (acreage, square feet): <1 acre

4.9) List any previous SHPD correspondence (LOG Number & DOC Number, if applicable):

LOG NO. 2016.02851 DOC NO. 1704GC08

5. PROJECT INFORMATION

5.1) Does the Project involve a Historic Property? A Historic Property is any building, structure, object, district, area, or site, including heiau and underwater site, which is over 50 years old (*HRS §6E-2*).

⊙ Yes ○ No

5.2) Is the Property listed on the Hawai'i Register of Historic Places? To check: http://dlnr.hawaii.gov/shpd/

○ Yes ⊙ No ○ I don't know

5.3) Is the Property listed on the National Register of Historic Places? To check: http://dlnr.hawaii.gov/shpd/

○ Yes ⊙ No ○ I don't know

5.4) Detailed Project Description and Scope of Work:

Please see attached consultation letter.

5.5) Description of **previous** ground disturbance (e.g. previous grading and grubbing):

Please see attached consultation letter.

5.6) Description of **proposed** ground disturbance (e.g. # of trenches, Length x Width x Depth):

Please see attached consultation letter.

5.7) Is the Project receiving federal funding? (*36 CFR 800.16y*)

○ Yes ⊙ No ○ I don't know

5.8) Is the Project located on land owned by a federal agency? (*36 CFR 800.16y*)

○ Yes ⊙ No ○ I don't know

5.9) Will this Project require a permit from a federal agency? (*36 CFR 800.16y*)

⊙ Yes ○ No ○ I don't know

If the answer is 'Yes' for any of the questions 5.7 - 5.9, then the Project may also be subject to compliance with Section 106 of the National Historic Preservation Act (NHPA).

6. PROJECT SUBMITTALS

6.1) Please submit a copy of the Tax Map Key (TMK) map

6.2) Please submit a copy of the property map showing the project area and indicate if the project area is smaller than the property area.

6.3) Please submit a permit set of drawings. A permit set is a set of drawings prepared and signed by a licensed architect or engineer and is at least 65% complete.

6.4) Are you submitting a survey?

⊙ Yes ○ No

Specify Survey: RLS

6.5) Did SHPD request the survey?

⊙ Yes ○ No ○ I don't know

If 'Yes', then please provide the date, SHPD LOG NO, and DOC NO:

LOG NO. 2016.02851 DOC NO. 1704GC08

6.6) **SURVEY REVIEW FEES**. Fee for Review of Reports and Plans (§§13-275-4 and 284-4). A filing fee will be charged for all reports and plans submitted to our office for review. Please go to:

http://dlnr.hawaii.gov/shpd/about/branches/archaeology/filing-fee-schedule/

A check payable to the Hawaii Historic Preservation Special Fund should accompany all reports or plans submitted.

6.7) Please submit color photos/images of the Historic Property (any building, structure, object, district, area, or site, including heiau and underwater site) that will be affected by the Project.

The following are the minimum number and type of color photographs required:

Quantity	Description
1-2	Street view(s) of the resource and surrounding area
1-2	Over view of exterior work area
1	exterior photo of the North elevation (if applicable)
1	exterior photo of the South elevation (if applicable)
1	exterior photo of the East elevation (if applicable)
1	exterior photo of the West elevation (if applicable)
1-2	interior photos(s) of areas affected (if applicable)

CHECKLIST

☑ **SHPD FORM 6E** (this form)
Completed and submitted to dlnr.intake.shpd@hawaii.gov

☑ **PROJECT SUBMITTALS** (any requested documentation for items 6.1 - 6.6 of this form)
Requested documentation has been submitted to dlnr.intake.shpd@hawaii.gov

☑ **Filing Fee Form**
If answer is 'Yes' to any of the Questions 6.4-6.6 Complete and submit the filing fee form

DAVID Y. IGE
GOVERNOR OF
HAWAII

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

ROBERT K. MASUDA
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AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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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

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

HRS 6E Submittal Filing Fees

All submittals must have the appropriate filing fee in accordance with HAR §13-275-4 or HAR §13-284-4.
All contact fields below must be complete and accurate.

Landowner: City and County of Honolulu
(if privately-owned historic property on Hawaii Register, HRS §6E-10)

Agency: City and County of Honolulu, Department of Environmental Services
Contact Name: Clifford Kanda, Project Engineer
Mailing Address: 650 South King Street, 14th Floor, Honolulu, HI 96813
Phone: 808-768-8753 Email: ckanda@honolulu.gov

Title of Report/Plan: Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 RLS

Ahupua'a Kailua District Koolaupoko Island Oahu
TMK(s) Adjacent to (1) 4-2-008:001

Contract Firm: Fung Associates, Inc.
(firm who completed the work on behalf of the agency)
Contact Name: Alison Chiu
Phone: 808-941-3000 Email: alison@funghawaii.com

_____ Check if Report/Plan is a re-submittal (no fee)
_____ Check if Field Inspection Report requested by SHPD (no fee)

_____ $0 Archaeological Monitoring Report, no resources reported
_____ $25 Archaeological Monitoring Plan
_____ $25 Burial Disinterment Report
_____ $25 Request from Agency for Determination Letter per HAR §13-275
_____ $50 Archaeological Assessment (AIS with negative findings)
_____ $50 Osteological Analysis Report
_____ $100 Archaeological Monitoring Report, resources reported
_____ $150 Archaeological Inventory Survey Plan, Archaeological Data Recovery Plan, or Preservation Plan
_____ $250 Burial Treatment Plan (BTP)
_X_ $450 Archaeological, Architectural, or Ethnographic Survey Report
_____ $450 Archaeological Data Recovery Report
_____ Fee Total: Make check payable to "Hawaii Historic Preservation Special Fund"

For Office Use Only:

Date Received:	Payment Method: Cash	Amount $
Log No.:	Check No.	Amount $
Receipt Issued:	Money Order	Amount $

rev. 9/26/2017

AGENCY LETTERHEAD

Dr. Alan Downer, Administrator
State Historic Preservation Division
601 Kamokila Blvd., #555
Kapolei, Hawai`i 96707

DATE:

SUBJECT: Hawaii Revised Statutes, Chapter 6E-8 & Section 106 of the National Historic Preservation Act of 1966 (NHPA), Review of Proposed Projects
Maunawili Wastewater Pump Stations, Force Mains, and Sewer Improvements
TMK: Adjacent to (1) 4-2-008:001
Kailua Ahupuaa, Koolaupoko District
Kailua, Oahu

In response to: D2016.02851/L1704GC08

Dear Dr. Downer:

On behalf of the City & County of Honolulu, Department of Environmental Services (ENV) and project engineers Fukunaga & Associates, Inc., we are submitting the following project for your review.

Consultation was initiated with SHPD in early 2017 as part of Hawaii Revised Statutes Chapter 343, Environmental Review. On April 19, 2017, SHPD requested continued consultation with a site visit and a Reconnaissance Level Survey (RLS) to identify potential historic properties within the project area pursuant to Hawaii Administrative Rule §13-275-5 [LOG NO. 2016.02851, DOC NO. 1704GC08]. The site visit was conducted with members of the SHPD Archaeology and Architecture Branches on July 18, 2017.

We offer the following architectural RLS documentation for review and acceptance. In addition, we request your department's concurrence with our proposed determination.

I. GENERAL INFORMATION

A. **Agency Contact:** Lori M.K. Kahikina, Director
Attn: Clifford Kanda, Project Engineer
City and County of Honolulu
Department of Environmental Services,
Wastewater Engineering & Construction Division
Collection System Engineering Branch, Section A
650 South King Street, 14th Floor
Honolulu, HI 96813
(t): (808) 768-8753
(e): ckanda@honolulu.gov

B. **Prime Contact:** Wei Chen, Project Manager
Fukunaga & Associates, Inc.
1375 Kapiolani Boulevard, Suite 1530
Honolulu, HI 96819
(t): (808) 944-1821
(e): wchen@fukunagaengineers.com

C. **Additional Contacts:** Alison Chiu
Fung Associates, Inc.

1833 Kalakaua Avenue, Suite 1008
Honolulu, HI 96815
(t): (808) 941-3000
(e): Alison@funghawaii.com

D. **Project Name(s):** Maunawili Estates Wastewater Pump Station Force Main Crossing No.1 Repair at Maunawili Stream, Kailua

E. **Project Street Address:** 1275 Maunawili Road (Maunawili Estates WWPS) Kailua, Hawaii 96734

F. **TMK:** Adjacent to (1) 4-2-008:001

G. **Area of Potential Effect:** A 1200 s.f. (60ft x 20ft) area immediately northeast of Maunawili Stream Bridge #3. All work will take place within the stream and is therefore subject to federal permits and Section 106 requirements. (Please see attached map).

H. **Project Descriptions:** Per as-built plans, the existing 8-inch ductile iron pipe force main reinforced concrete jacket (RCJ) was buried under the stream bed and rip rap, and protected from above by a cement rubble masonry (CRM) layer. The CRM layer has been washed away, and the wing walls at the downstream side of the bridge are missing. The original stream bed has eroded away, and a hole has developed under the RCJ that allows the stream to flow under instead of over the RCJ during normal flow. If this erosion continues, more of the wastewater force main section will be exposed and unsupported. The force main now delivers about 0.1 million gallons wastewater flow daily and up to 1 mgd (million gallons per day) flow rate at peak when it rains. The structural failure of the undermined and unprotected force main will cause thousands to millions of gallons of wastewater spill into Maunawili Stream.

The repair of the Maunawili Estates Wastewater Pump Station 8-inch ductile iron pipe wastewater force main at the Maunawili Stream crossing consists of restoration of the heavily eroded stream banks and stream bed, and construction of a new CRM layer. A new reinforced concrete jacket will not be constructed. No alterations or work are proposed for Maunawili Bridge #3.

II. IDENTIFICATION OF HISTORIC PLACES

A. Initial consultation for architectural resources within the APE was conducted in a letter from SHPD dated April 19, 2017, in which a Reconnaissance Level Survey (RLS) of Maunawili Bridge #3 was requested. A site visit was performed by Fung Associates, Inc. on July 18, 2017, and the RLS was completed in January 2018. The bridge and its surroundings have been altered since initial construction, so the bridge is not eligible for listing on the Hawaii or National Registers of Historic Places. A more detailed analysis of the bridge's integrity is included within the RLS, a copy of which is enclosed with this letter.

B. Initial consultation for archaeological resources within the APE was conducted on-site with Garnet Clark and Stephanie Hacker on July 18, 2017. Pursuant to that discussion, the Archaeological Branch determined no further documentation was needed for the project.

III. EFFECT ASSESSMENT

A. Due to the nature of this project, we believe SHPD will be able to determine "no historic properties affected" and "no adverse effect" for this force main repair project, and we request your concurrence.

AGENCY LETTERHEAD

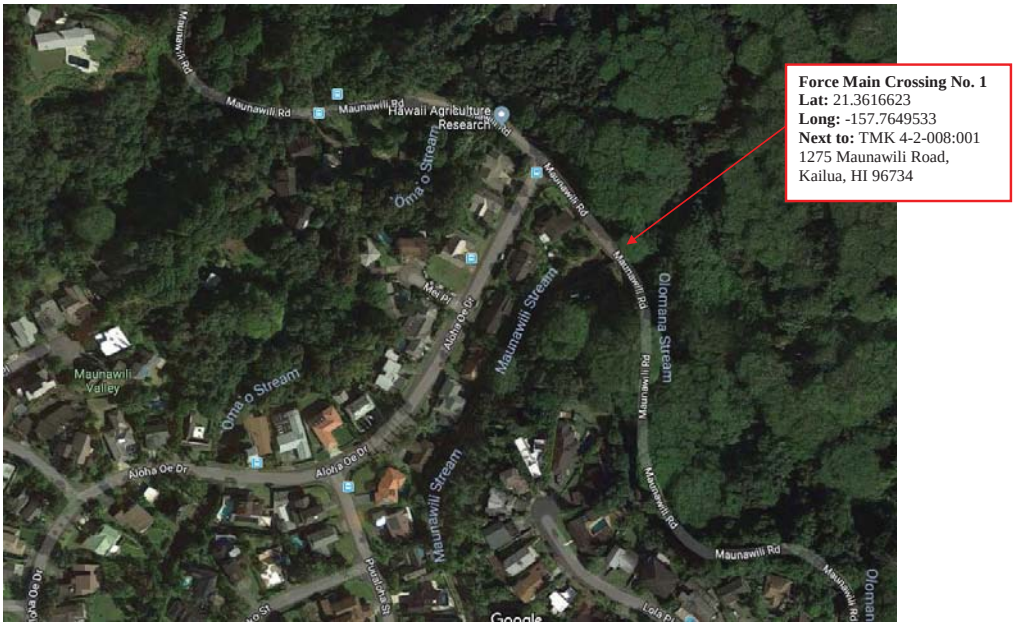
Thank you very much for your consideration. Please feel free to call Mr. Clifford Kanda at (808) 768-8753 should you or your staff have any questions. We look forward to working with SHPD on these needed improvements.

Aloha,

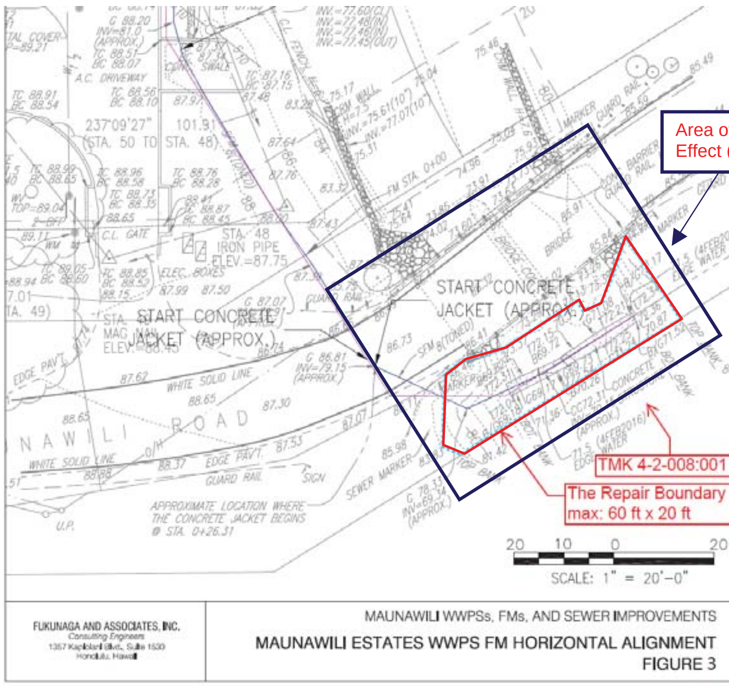
City and County of Honolulu

Aerial Photograph:
Aerial Photograph *(Google Maps, 2018)*

Aerial Photograph:
Aerial Photograph *(Google Maps, 2018)*



Aerial Photograph:
Fukunaga and Associates, Inc.



Maunawili Wastewater Pump Stations
Force Mains, and Sewer Improvements

Maunawili Bridge #3

2013 Statewide Bridge Inventory, Oahu Bridge Matrix (excerpt):
Fung Associates, Inc. (2013)

Oahu County Bridge Matrix

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawaii Register	Eligibility Status*	Character Defining Feature (Significance)	Page No.
003380001200001	Lai Road Bridge No. 3-Pukele Stream	Pukele Stream	Lai Road	1935	Concrete Slab	Metal Thrie Beam	No	Not Eligible	This bridge does not have distinctive engineering or architectural features that depart from standard bridge design. The bridge is on a private road and not publicly accessible but maintained by the City.	n/a
003261001200001	Laimi Road Bridge-Nuuanu Stream	Nuuanu Stream	Laimi Road	1920	Concrete Girder	Concrete Solid Panel with Cap	No	Eligible	• Associated with early developements in concrete bridge construction in Hawaii • Good example of 1920's reinforced concrete bridge • Associated with historic Nuuanu residential development	4-368
003949001100001	Leokane Street Triple Box Culvert-Waipahu Stream	Waipahu Stream	Leokane Street	1965	Concrete Box Culvert	Concrete and Metal	No	Program Comments	This is a typical post-war culvert and falls under Program Comments.	n/a
003950001100001	Leonui Street Triple Box Culvert-Waipahu Stream	Waipahu Stream	Leonui Street	1965	Concrete Box Culvert	Concrete and Metal	No	Program Comments	This is a typical post-war culvert and falls under Program Comments.	n/a
003262001200001	Liholiho Street Box Culvert-Makiki Stream	Makiki Stream	Liholiho Street	1977	Concrete Box Culvert	Concrete and Metal Decorative	No	Not Eligible	This culvert has lost integrity due to the complete reconstruction of the original 1937 culvert in 1977. It is also scheduled for rehabilitation in fall of 2013. The concrete rubble masonry channel is a potentially eligible historic resource.	n/a
003083371400092	Lowrey Avenue Bridge-Manoa Stream	Manoa Stream	Lowrey Avenue	1953	Concrete Tee Beam	Concrete Open Decorative	No	Program Comments	This is a typical post-war bridge and falls under Program Comments. This bridge replaced an earlier wood bridge and was part of the Manoa Stream Flood Control Project.	n/a
003484001100001	Luluku Road Triple Box Culvert-Kaneohe Stream	Kaneohe Stream	Luluku Road	1962	Concrete Box Culvert	Metal Horizontal	No	Program Comments	This is a typical post-war culvert and falls under Program Comments.	n/a
003083381400047	Lusitana Street Bridge-Pauoa Stream	Pauoa Stream	Lusitana Street	1932	Concrete Tee Beam	Concrete Open Arched	No	Eligible	• Associated with early developements in concrete bridge construction in Hawaii • Good example of 1930's reinforced concrete bridge	4-371
003806001100001	Maaloa Street Bridge-Ulehawa Channel U-3	Ulehawa Channel U-3	Maaloa Street	1964	Concrete Slab	Concrete Open Horizontal	No	Program Comments	This is a typical post-war bridge and falls under Program Comments.	n/a
003402001100001	Makakalo Street 4-Cell Box Culvert-Drainage Ditch	Drainage Ditch	Makakalo Street	1955	Concrete Box Culvert	No Parapet/Railing	No	Program Comments	This is a typical post-war culvert and falls under Program Comments.	n/a
003226001200001	Makiki Street Bridge-Makiki Stream	Makiki Stream	Makiki Street	1912	Closed Spandrel Arch	Metal Horizontal	No	High Preservation Value	• Arch bridges are an uncommon bridge type • Associated with early developements in concrete bridge construction in Hawaii • Good example of 1910's closed spandrel arch bridge	4-374
003340001200001	Malia Street Bridge No. 1-Waialae Nui Stream	Waialae Nui Stream	Malia Street	1961	Concrete Slab	Concrete Solid Decorative	No	Eligible	• Associated with early developements in concrete bridge construction in Hawaii • Good example of 1960's reinforced concrete bridge	4-377
003807001100001	Maliona Street Box Culvert-Channel M-4	Maili Channel M-4	Maliona Street	1967	Concrete Box Culvert	Concrete and Metal	No	Program Comments	This is a typical post-war culvert and falls under Program Comments.	n/a
003444001100001	Maunawili Road Bridge No. 2-Kamakalepo Stream	Kamakalepo Stream	Maunawili Road	1966	Concrete Slab	Metal Thrie Beam	No	Program Comments	This is a typical post-war bridge and falls under Program Comments.	n/a
003437001100001	Maunawili Road Bridge No. 3-Maunawili Stream	Maunawili Stream	Maunawili Road	2009	Concrete Slab	Concrete and Metal	No	Not Eligible**	This bridge has lost integrity due to the complete replacement of the original 1937 bridge in 2009. The concrete rubble masonry abutments are a potentially eligible historic resource.	n/a

Photographs:
Maunawili Bridge #3 Setting, note channelized stream

Photographs:
View of force main crossing from Maunawili Stream Bridge #3

Photographs:

Overview of Maunawili Stream Bridge #3

Photographs:

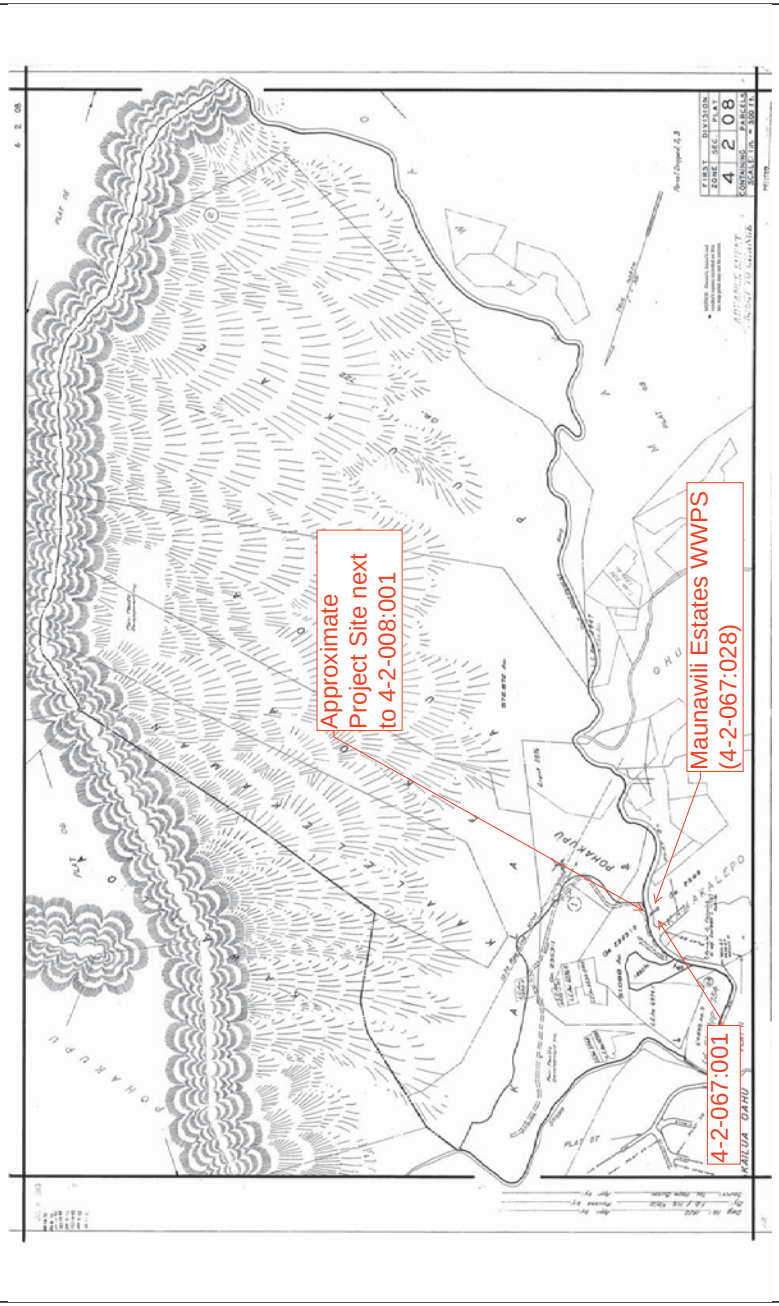
Underside and central pier of Maunawili Stream Bridge #3

Photographs:

Northwest wing wall of Maunawili Bridge #3

Photographs:

Southwest end-cap (later addition)



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

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

April 19, 2017

IN REPLY REFER TO:
Doc No. 2016. 02851
Log No. 1704GC08
Archaeology, Architecture

Clifford Kanda, PE, Project Manager
Department of Design and Construction
City and County of Honolulu
650 S. King Street, 14th Floor
Honolulu, HI 96813
ckanda@honolulu.gov

Dear Mr. Kanda:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Request for Exemption from Hawaii Revised Statues Chapter 343, Environmental Review
Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1
Repair at Maunawili Stream
Kailua Ahupua'a, Ko'olaupoko District, Island of O'ahu
TMK: (1) 4-2-008:025 por. and 026 por.

Thank you for the opportunity to comment on the City and County of Honolulu (CCH), Department of Design and Construction's (DDCs) proposed project for repair of the Maunawili Estates Wastewater Pump Station Force Main Crossing No. 1 at Maunawili Stream, Maunawili Road Bridge No. 3. This project involves a 60 ft. by 20 ft. area within TMK: (1) 4-2-008:001 [comprised of 5.08 acres] and TMK: (1) 4-2-008:005 [comprised of 572.87 acres]. The SHPD received this submittal on December 7, 2016.

The DDC indicates that an existing 8-inch force main encased by a reinforced concrete jacket (RCJ) is buried under the Maunawili Stream bed and is protected above by a CRM layer. Currently, the force main now delivers about 0.1 million gallons of wastewater flow daily, and the wing walls of the CRM downstream of the Maunawili Road Bridge No. 3 are missing. The original stream bed has eroded and a pocket has developed under the RCJ. During normal flow, this pocket allows stream flow under the RCJ instead of over the RCJ, exposing the wastewater force main. Further deterioration will undermine the force main, and leaving it unprotected will cause a wastewater spill into Maunawili Stream. DDC indicates that the repair of the 8-inch force main will involve (1) restoration of the stream banks and stream bed; (2) construction of new reinforced concrete jacket; and (3) construction of new CRM layer.

A review of SHPD records indicates that numerous archaeological studies have been conducted within Maunawili Valley and several significant historic properties have been documented. However, these sites are in upper Maunawili Valley and within the Royal Hawaiian Golf Club facility. SHPD records also indicate that no archaeological inventory survey has been conducted within the proposed project area. In addition, pursuant to Hawaii Revised Statutes (HRS), Chapter 6E-2, the Maunawili Road Bridge No. 3 (Bridge No. 437) meets the criteria of a historic property, and pursuant to Hawaii Administrative Rules (HAR) Chapter 13-275-6, the Maunawili Road Bridge No. 3 is assessed as significant under Criterion "c" (distinctive characteristic of a type, period or method of construction).

Based on the information provided, SHPD is **unable to make a determination**. Please provide the following:

- Architectural Historic Resource Inventory Form – Reconnaissance Level, to be completed and submitted by an architectural historian meeting the Secretary of Interior standards and qualifications. The forms can be found on the SHPD website at http://dlnr.hawaii.gov/shpd/review-compliance/forms/.

- A site visit by the Archaeology Branch to determine if any historic properties are within the proposed project area along the Maunawili Stream bank.

Please contact Ms. Jessica Puff at (808) 692-8023 or at Jessica.L.Puff@hawaii.gov for any concerns regarding architectural resources. Please contact Garnet Clark at (808) 692-8024 or at Garnet.K.Clark@hawaii.gov to arrange the site visit. Please contact me at Susan.A.Lebo@hawaii.gov for any questions or concerns regarding archaeological resources or this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief

cc: Wei Chen, Fukunaga & Associates, Inc. (wchen@fukunageengineers.com)

MAUNAWILI ESTATES WASTEWATER PUMP STATION FORCE MAIN CROSSING NO. 1 RECONNAISSANCE LEVEL SURVEY

Contents

Statement of Project Objectives

This architectural reconnaissance level survey (RLS) was undertaken as a result of Hawaii Revised Statutes Chapter 6E-8 communications between the Hawaii State Historic Preservation Division (SHPD) and the City and County Department of Environmental Services. The survey involves a single structure, the Maunawili Road Bridge No. 3 – Maunawili Stream, which is located within the force main repair project boundary. The objective of the survey is to ascertain whether the structure is historically significant.

Methodology

The survey followed a methodology that included performing background research, visiting the project location, and writing this RLS report. The survey was limited to an examination of the bridge and its immediate surroundings, which encompass less than one acre.

Prior to the start of any fieldwork, background research was undertaken. The preliminary background research involved an examination of pertinent materials provided by the client. SHPD records disclosed the bridge was neither listed in the Hawaii or National Registers of Historic Places, nor included in the Statewide Inventory of Historic Places.

Alison Chiu and Tonia Moy, both of whom meet the Secretary of the Interior's Professional Qualification Standards as an architectural historian or historic architect, conducted a field survey on July 18, 2017. Notes and photographs were taken in the field, and 100% of the survey area was investigated.

Following the site survey, additional research was undertaken. This included a review of existing reports, maps and drawings. Following the gathering of information, this report was prepared, reviewed, and finalized, and an RLS form was completed.

Boundary Explanation and Justification

The survey boundary is limited to the Maunawili Bridge #3 structure because it is the only historic architectural resource within the force main project area.

DESCRIPTION

Maunawilli Stream Bridge #3 is located within Maunawili Valley on the island of Oahu's windward (northeast) side. Maunawili sits at the base of the Koolau Mountain range, in between the Olomana and Aniani Nui Ridges. Several streams run through the valley, which is lush with vegetation. Two subdivisions with a total of seven bridges are located in the valley.

The 1937 bridge was designed by George K. Dawson of the City and County of Honolulu's Department of Public Works and is located at the northern end of the Maunawili neighborhood. The bridge is 41' long, 13'6" wide and 12'9" tall. The double span concrete span bridge carries Maunawili Road over the channelized Maunawili Stream.

A concrete slab, concrete rubble masonry abutments and a single poured in place concrete pier support the bridge superstructure. Toe walls stabilize upstream and downstream ends of the slab, and the trapezoidal pier has battered walls to act as a cut water. Wing walls are concrete rubble masonry.

The bridge is a single lane wide with a poured in place concrete deck and parapet walls. The original metal pipe rails were replaced with standard metal guardrails, which rise above the parapet walls. Solid concrete parapets were added at either end of the bridge during the guardrail replacement. Vegetation is currently growing out of the bridge deck.

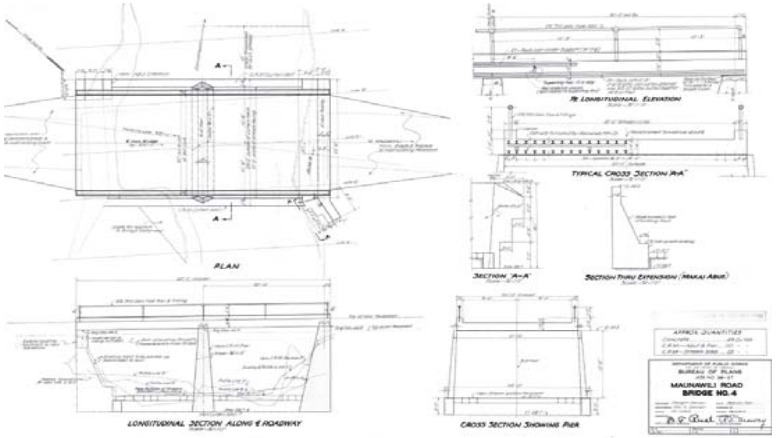


FIGURE 1: ORIGINAL 1937 BRIDGE PLANS, COURTESY OF THE CITY AND COUNTY OF HONOLULU.

HISTORIC OVERVIEW

Starting in the 11th or 12th centuries, people began living and farming in Maunawili. The valley's residents used its numerous springs and streams to feed lo'i and fishponds. Over the next several centuries at least three heiau were constructed, and the area became a retreat for Hawaiian royalty.

After the Great Mahele in 1848, land was purchased within Maunawili Valley, including Japanese and Chinese farmers. In 1869 Major Edward Boyd bought several acres within the valley and operated Maunawili Ranch. Boyd was close to the royal family and hosted Queen Liliuokalani and King David Kalakaua on several occasions. Boyd sold his property in 1893 to William G. Irwin, who wanted to use the valley's water for his Waimanalo Sugar Plantation. With the land no longer used for ranching, the majority of the valley was used to grow rice, fruit and crop trees throughout the late nineteenth and early twentieth centuries. Maunawili Valley remained agricultural until the late 1960s when two subdivisions were constructed in the makai end of the valley. Maunawili Stream was channelized at the same time as the subdivisions were constructed.

Today's Maunawili Road was part of a trail system that linked windward Oahu with the rest of the island. The trail through the valley provided a path from the Nuuanu Pali Trail to Waimanalo. During the 19th century, the old Pali Trail and windward trail system were improved to accommodate agricultural development in the area. An 1881 map by C.J. Lyons shows that Maunawili Road was an improved dirt road; in subsequent maps dating from 1894, 1902, and 1928 show the road in roughly the same footprint. By the turn of the 20th century, Kalanianaole Highway had been constructed, diverting traffic makai of Maunawili Road.

FIGURE 2: 1936 USGS MAP, COURTESY OF THE UNIVERSITY OF HAWAII AT MANOA.

Maunawili Bridge #3 replaced an older crossing in 1937. Remnants of the old bridge abutments can still be seen downstream, or northeast, of the existing bridge. The new concrete slab bridge was designed by George K. Dawson of the City and County of Honolulu's Department of Public Works, probably as a Depression Era public works project. Interestingly, old rails furnished by Waimanalo Plantation were used to reinforce the concrete bridge deck. In 2009 the bridge deck and rails were completely replaced. New guardrails were installed on and adjacent to the bridge, and concrete parapets were added at the ends of the bridge.

DATA SUMMARY

One historic resource was found within the survey area. The 1937 double span, concrete slab bridge was altered in 2009; the deck and guardrails and abutment were replaced, and parapets were added at either end of the bridge. Due to the alterations, the bridge has lost its historic integrity and is not eligible for listing on the Hawaii and National Registers of Historic Places.

RECOMMENDATIONS

The RLS found Maunawili Bridge #3 not eligible for listing on historic register. Consequently, no further research or recordation is recommended for this project.

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DATA SHEETS (RLS FORM)

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

FOR SHPD USE ONLY: **Site #** Click here to enter text. **TMK #** Click here to enter text.

I. GENERAL INFORMATION

Common / Present Name: Maunawili Road Bridge No. 3
Historic Name: Maunawili Road Bridge No. 3
Property Owner: State of Hawaii
Address: Maunawili Road over Maunawili Stream
City/ Town/ Location: Maunawili, HI
County: Honolulu
TMK [(X)-X-X-XXX:XXX)]: N/A, adjacent to (1) 4-2-008:001, (1) 4-2-067:001, (1) 4-2-067:028
Subdivision/Neighborhood: Maunawili
Latitude: -157.764997
Longitude: 21.361644
Parcel Number: NA
Historic District: NA
Original Use: Bridge/Transportation
Current Use: Bridge/Transportation
Architect/ Builder (if known): George K. Dawson (Engineer)
Date of Construction (if known): 1937

II. Photograph of Resource

Prepared By: Alison Chiu Consulting Firm: Fung Associates, Inc.
Address: 1833 Kalakaua Avenue #1008, Honolulu, HI 96815
Telephone Number: (808) 941-3000 Email: projects@funghawaii.com Date: 1-10-18

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

FOR SHPD USE ONLY: **Site #** Click here to enter text. **TMK #** Click here to enter text.

III. CONDITION ASSESSMENT

Category (select all that apply):
- ☐Building(s)
  - ☐Residential ☐Commercial ☐Educational ☐Public/Civic ☐Religious
- ☒Structure(s)
- ☐Object(s)
- ☐Site(s)/Landscape(s)
- ☐Archaeology or potential for archaeology (Please provide a description of the potential for archaeology within VI. Description of Resource Features below.)

Condition:
- ☐Excellent
- ☒Good
- ☐Fair

Eligibility (select all that apply):
- ☐National Register of Historic Places
- ☐State Register of Historic Places
  - ☒Not Eligible
  - ☐Eligible
  - ☐Listed
  - ☐Contributing to Historic District:
    Name of District: Click here to enter text.
  - ☐Unknown

Criteria of Significance (select all that apply)
- ☐A: Associated with Events
- ☐B: Associated with Significant Person(s)
- ☐C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)
- ☐D: Have yielded or may be likely to yield information important to history or prehistory.

FOR SHPD USE ONLY: **Site #**Click here to enter text. **TMK #** Click here to enter text.

IV. MAP

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

FOR SHPD USE ONLY: **Site #**Click here to enter text. **TMK #** Click here to enter text.

V. DESCRIPTION

Materials (please check those materials that are visible):

Height:
- ☐Stories: Click here to enter text.
- ☐Below Ground
- ☒N/A
- ☐Other: Click here to enter text.

Exterior Walls (siding):

☐Aluminum Siding	☐Metal	☐Plywood
☐Asbestos	☐Shingles-Asphalt	☐OSB
☐Brick	☐Shingles-Wood	☐Fiberboard
☐Ceramic	☐Stone	☐Fiber Cement
☒Concrete	☐Stucco	☐Vinyl Siding
☐Horizontal Wood Siding	☐Vertical Wood Siding	☐Other:
☐Log	☐Engineered Siding	Click here to enter text.

Roof:

☐Asphalt, shingle	☐Slate	☐Wood Shingle
☐Asphalt, roll	☐Built Up	☒None
☐Metal	☐Ceramic Tile	
☐Other: Click here to enter text.		

Foundation:

☐Brick	☐Concrete Slab	☒Stone
☐Concrete Block	☒Poured Concrete	☐Raised/Pile
☐Other: Click here to enter text.		

Structural Support:

☐Baled Hay	☐Frame-wood	☐Puddled Clay
☐Concrete Block	☐Frame-metal/steel	☐Rammed Earth
☐Concrete Framed	☐Brick-load bearing	☐Sod
☒Concrete Poured	☐Stone-load bearing	
☐Other: Click here to enter text.		

Windows:

☐Double Hung Sash	☐Jalousie	☐Stained Glass
☐Single Hung Sash	☐Glass Block	☐Replacement
☐Casement	☒None/Unknown	☐Aluminum
☐Fixed	☐Ribbon	☐Vinyl
☐Other: Click here to enter text.		

Lanai(s)

☐Arcade	☐Recessed	☐Wrap-around
☐Balcony	☐Stoop	☐Verandah
☐Porte-Cochere	☐Portico	☒None
☐Other: Click here to enter text.		

Chimney

☐Brick	☐Stuccoed Masonry	☐Stove Pipe
☐Concrete	☐Stone	☐Siding
☒None	☐Other: Click here to enter text.	

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X. Continuation Sheet

Please use this sheet those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

View southwest from Maunawili Bridge #3. Note channelized Maunawili Stream and new guardrail. July, 2017.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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View of west, or upstream, side of bridge. July, 2017.

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View of bridge deck looking southeast, up Maunawili Road. July, 2017.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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View of guardrails and parapets added in 2009. July, 2017.

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A view of underside of Maunawili Bridge #3. Detail of the bridge deck, pier and abutment. July, 2017.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

FOR SHPD USE ONLY: **Site #**Click here to enter text. **TMK #** Click here to enter text.

View of northwest bridge wing walls. July, 2017.

FOR SHPD USE ONLY:	Site #Click here to enter text.	TMK # Click here to enter text.

View of force main to be repaired. July, 2017.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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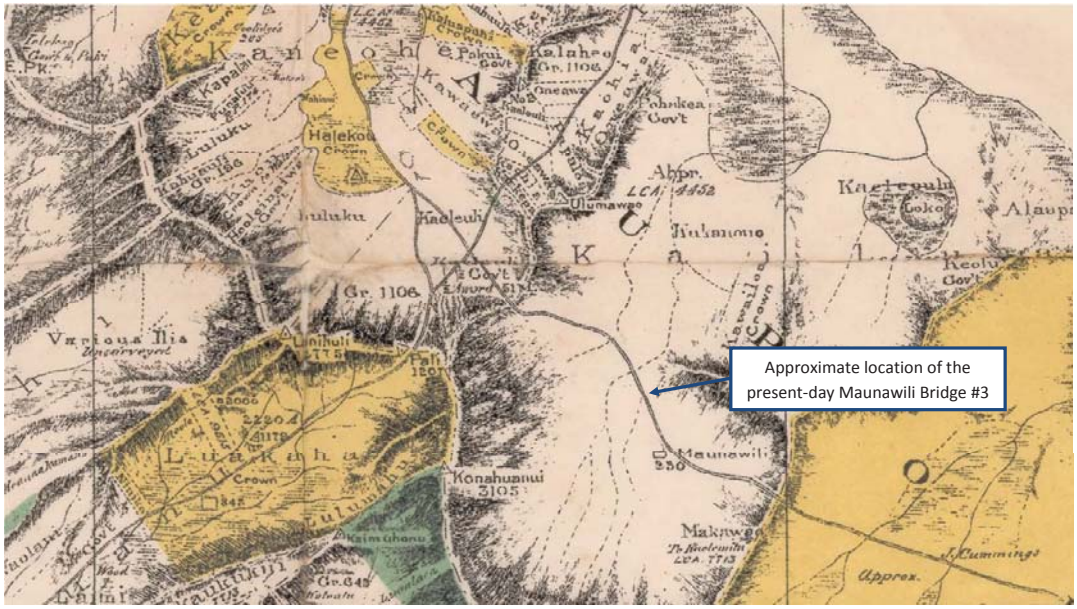
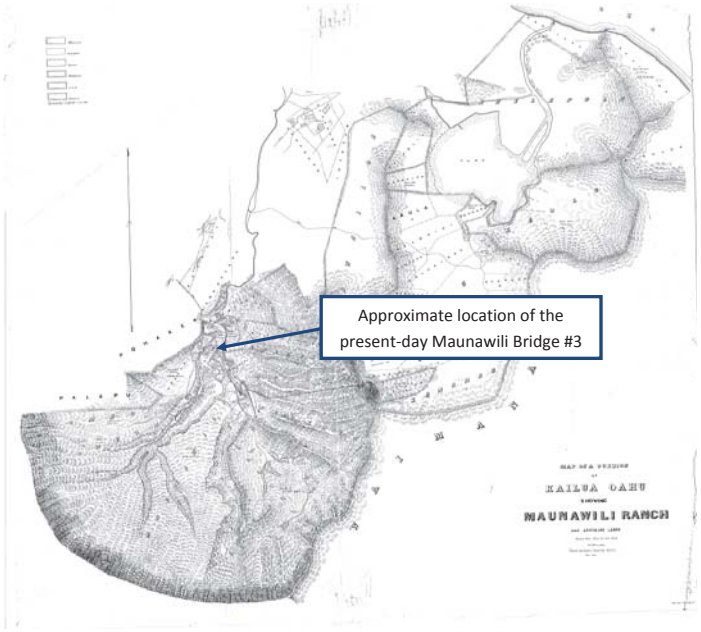
View of old abutments (northeast) side of the existing bridge. July, 2017. Note the abutments are not within the project area or APE and will not be affected by the project.



Map of Oahu, 1881, Lyons and Covington (Hawaiian Government Survey). Courtesy of the University of Hawaii at Manoa.



Map of Maunawili Ranch, 1894, W.A. Wall (Hawaiian Government Survey). Courtesy of AVA Konohiki.

FOR SHPD USE ONLY: **Site #**Click here to enter text. **TMK #** Click here to enter text.

Map of Oahu, 1902, W.A. Wall (Hawaii Territory Survey). Courtesy of the University of Hawaii at Manoa.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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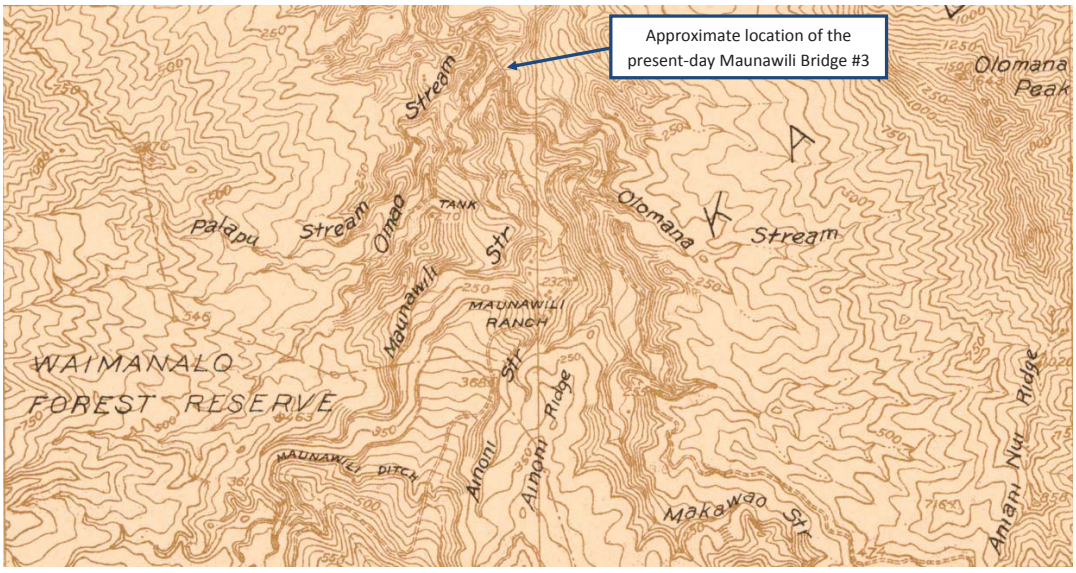

Map of Oahu, Mokapu, 1928 (United States Geological Survey). Courtesy of the University of Hawaii at Manoa.

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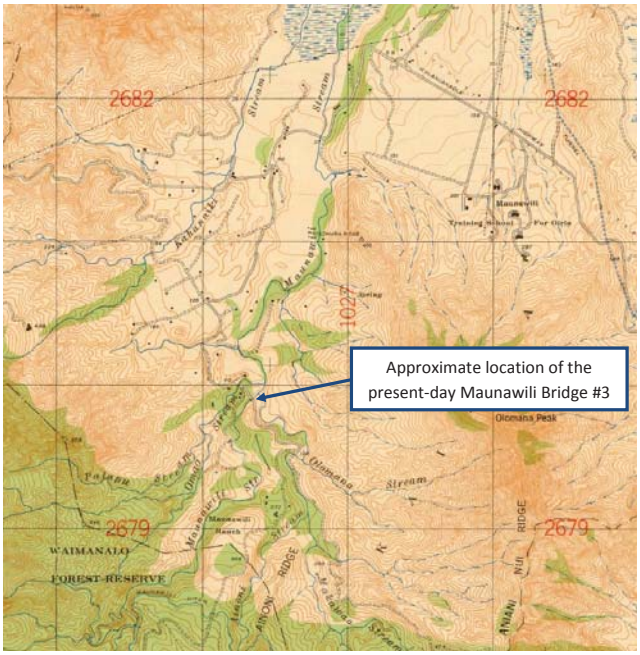

Map of Oahu, Mokapu, 1936 (United States War Department). Courtesy of the University of Hawaii at Manoa.

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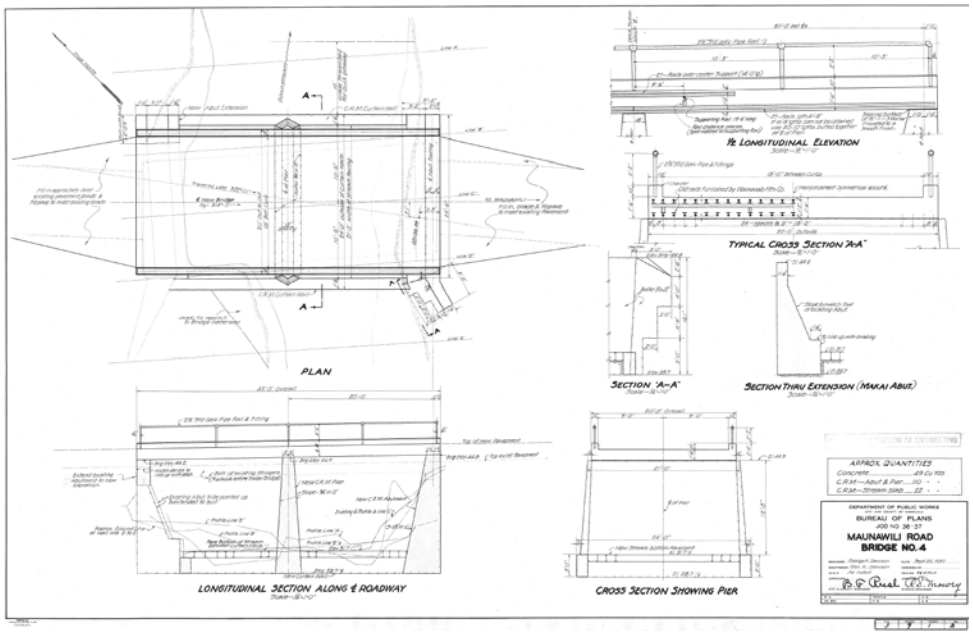

1937 Plans for Maunawili Road Bridge No. 3 (City and County of Honolulu, Department of Public Works). Note that the bridge name has changed from Maunawili Road Bridge No. 4 to Maunawili Bridge No. 3 since the plans were drawn in 1937.