

# WASTEWATER MANAGEMENT DIVISION

## DEPARTMENT OF PUBLIC WORKS

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DEREK S.K. KAWAKAMI, MAYOR  
REIKO MATSUYAMA, MANAGING DIRECTOR

September 18, 2023

Mary Alice Evans, Director  
Office of Planning and Sustainable Development  
Environmental Review Program  
State of Hawai'i  
235 South Beretania Street, Room 702  
Honolulu, Hawai'i 96813

Subject: Chapter 343, Hawai'i Revised Statutes and Title 11, Chapter 200.1, Hawai'i Administrative Rules Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the Wailua Wastewater Treatment Plant (WWTP) and Effluent Disposal Improvements  
Līhu'e District, Kaua'i, Hawai'i

Dear Ms. Evans,

The County of Kaua'i Department of Public Works Wastewater Management Division (WMD) hereby transmits the DEA-AFONSI for the Wailua Wastewater Treatment Plant (WWTP) and Effluent Disposal Improvements, Līhu'e District, Kaua'i, Hawai'i. We respectfully request publication in the next available edition of the Environmental Notice. In addition to this letter, we have also submitted the electronic version of the Environmental Review Program Publication Form and a searchable PDF-formatted copy of the DEA-AFONSI through the online submission platform.

If you have any questions, please call Mr. Donald Fujimoto, WMD Division Chief at 808 241-4083.

Sincerely,

*Donald Fujimoto*

Donald Fujimoto  
Division Chief  
County of Kaua'i  
Department of Public Works  
Wastewater Management Division (WMD)

cc (via email): Stephen Esaki, Associate Civil Engineer, Kennedy Jenks  
John Hagihara, Principal, HHF Planners

**From:** [webmaster@hawaii.gov](mailto:webmaster@hawaii.gov)  
**To:** [DBEDT OPSD Environmental Review Program](#)  
**Subject:** New online submission for The Environmental Notice  
**Date:** Monday, September 18, 2023 9:57:52 AM

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**Action Name**

Wailua Wastewater Treatment Plant And Effluent Disposal Improvements

**Type of Document/Determination**

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

**HRS §343-5(a) Trigger(s)**

- (1) Propose the use of state or county lands or the use of state or county funds

**Judicial district**

Līhu‘e, Kaua‘i

**Tax Map Key(s) (TMK(s))**

(4) 3-9-006:019; (4) 3-9-006:027; (4) 3-9-006:999; (4) 3-9-002:032; (4) 3-9-002:004

**Action type**

Agency

**Other required permits and approvals**

Building and Construction Permits Community Noise Permit and/or Noise Variance Endangered Species Act Compliance Grading, Grubbing, and Stockpiling Permits Hawai‘i Environmental Policy Act Compliance Magnuson-Stevens Fishery Conservation and Management Act Compliance National Environmental Policy Act National Historic Preservation Act Compliance National Pollutant Discharge Elimination System Permit Recycled Water Permit Special Management Area Major Permit U.S. Army Corps of Engineers, Nationwide Permit Zoning Permit

**Proposing/determining agency**

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[Map It](#)

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Yes

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[Map It](#)

**Action summary**

The County of Kauai Department of Public Works is proposing to construct improvements to the Wailua Wastewater Treatment Plant (WWTP) and its effluent disposal system including: improvements to existing WWTP processes; rehabilitation of the existing recycled water force main that connects the WWTP to the irrigation holding pond at the Wailua Municipal Golf Course; and upgrades to the existing ocean outfall diffusers to prevent them from being covered by sand. The Wailua WWTP is located at 4460 Nalu Road approximately 2,000 feet south of the Wailua River and adjacent to Lydgate Beach Park. The recycled water force main is approximately 4,600 feet in length. From the WWTP, the force main follows County-owned rights of way along Nalu Road, Leho Drive, and Nehe Road before entering the golf course property. The ocean outfall is located in a notch in the reef approximately 670 feet from shore in waters approximately 30 feet deep.

**Reasons supporting determination**

HRS 343 significance criteria is discussed in Chapter 9: ANTICIPATED DETERMINATION AND FINDINGS of the Draft EA.

**Attached documents (signed agency letter & EA/EIS)**

- [COK-DEA-letter-OPSD-ERP-part-1-signed.pdf](#)
- [Draft-EA\\_Wailua-WWTP-and-Effluent-Disposal-Improvements\\_September-2023.pdf](#)

**Action location map**

- [WailuaWWTP\\_APE.zip](#)

**Authorized individual**

John Hagihara

**Authorization**

- The above named authorized individual hereby certifies that he/she has the authority to make this

submission.



Draft Environmental Assessment  
**WAILUA WASTEWATER TREATMENT PLANT  
AND EFFLUENT DISPOSAL IMPROVEMENTS**



**SEPTEMBER 2023**

Prepared For  
**County of Kaua'i**

Prepared By



**HHF PLANNERS**  
*places for people*

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**ACRONYMS AND ABBREVIATIONS**

AAQS ambient air quality standards  
 ALISH Agricultural Lands of Importance in the State of Hawai'i  
 BMPs best management practices  
 CDP Census Designated Place  
 CEQ Council on Environmental Quality  
 CFR Code of Federal Regulations  
 CIA cultural impact assessment  
 CO carbon monoxide  
 County County of Kaua'i  
 CWA Clean Water Act  
 CWB Clean Water Branch  
 CWRM State of Hawai'i Commission on Water Resources Management  
 CZM Coastal Zone Management  
 CZMA Coastal Zone Management Act  
 dBA A-weighted decibels  
 DOH Hawai'i State Department of Health  
 DPW Department of Public Works  
 EA Environmental Assessment  
 EFH Essential fish habitat  
 EIS Environmental Impact Statement  
 ESA Endangered Species Act  
 F Fahrenheit  
 FEMA Federal Emergency Management Agency  
 FIRM Flood Insurance Rate Map  
 FONSI Finding of No Significant Impact  
 H<sub>2</sub>S hydrogen sulfide  
 HAR Hawai'i Administrative Rules  
 HRS Hawai'i Revised Statutes  
 LCA Land Commission award  
 LSB Land Study Bureau  
 mgd million gallons per day  
 mg/L milligrams per liter  
 MSL mean sea level  
 NAAQS National ambient air quality standards

NEPA National Environmental Policy Act  
 NHPA National Historic Preservation Act  
 NO<sub>2</sub> nitrogen dioxide  
 NOAA National Oceanic and Atmospheric Administration  
 NPDES National Pollutant Discharge Elimination System  
 NRCS Natural Resources Conservation Service  
 O<sub>3</sub> ozone  
 Pb lead  
 PM<sub>2.5</sub> fine particulate matter, 2.5 microns (size) or smaller  
 PM<sub>10</sub> particulate matter, 10 microns (size) or smaller  
 PSI pounds per square inch  
 PVC polyvinyl chloride  
 R-2 R-2 quality recycled water  
 ROW right(s)-of-way  
 SDWA Safe Drinking Water Act  
 SHPO State Historic Preservation Officer  
 SIHP State Inventory of Historic Places  
 SLR sea level rise  
 SMA Special Management Area  
 SO<sub>2</sub> sulfur dioxide  
 TMK Tax Map Key  
 USC United States Code  
 USEPA United States Environmental Protection Agency  
 USFWS United States Fish and Wildlife Service  
 ZOM Zone of mixing

## 1. INTRODUCTION

The Wailua Wastewater Treatment Plant (WWTP) is located at 4460 Nalu Road on 2.033 acres (Tax Map Key [TMK]: (4) 3-9-006:019) of County-owned land. The treatment plant provides secondary treatment and disinfection to produce R-2 quality effluent for reuse. The plant was originally constructed in 1964 and receives wastewater from the Kapa'a, Papaloa, Waipouli and Wailua areas. The plant was originally designed to treat an average flow of 0.5 million gallons per day (MGD). The plant has undergone four phases of expansion and construction, with the most recent in 1992. The current WWTP has a rated treatment design capacity of 1.5 MGD.

The Wailua Municipal Golf Course is located at 3-5350 Kuhio Highway, south of the WWTP. It is situated on four separate TMKs parcels ((4) 3-9-002: parcels 4, 5 and 6 and (4) 3-9-005: parcel 1) comprising an area of 243.73 acres. The Wailua Municipal Golf Course has been using R-2 effluent from the WWTP for golf course irrigation since 1976 as its primary source of irrigation water. Excess treated effluent is currently discharged to an existing permitted ocean outfall connected to the WWTP (National Pollutant Discharge Elimination System [NPDES] Permit Number: HI 0020257). General precautions for all uses of recycled water are explained in the Hawai'i Department of Health's Guidelines for the Treatment and Use of Recycled Water (May 15, 2002). The use of R-2 effluent for golf course irrigation is acceptable for golf course landscapes where an adequate buffer exists between the areas being sprayed and the adjacent residential or publicly accessible area. The irrigation practices at the Wailua Municipal Golf Course will meet the buffer requirement and irrigate during periods only when the public is not present.

Typically, during non-rainy months (April to September), treated effluent is discharged from the WWTP through the existing ocean outfall from Tuesday morning to Thursday morning (about three days of flow per week). The outfall requires flushing for approximately three days a week to prevent clogging of the ocean outfall diffusers from migrating sand driven by the ocean currents. In order to divert effluent to the outfall, the WWTP disinfection operation is adjusted to meet ocean outfall disposal lower chlorine residual requirements. During the rainy season (October through February), the Wailua Municipal Golf Course requires less water and R-2 flows are routed predominantly to the ocean outfall. In 2017, approximately 60 percent of the total flows were discharged to the ocean. The remaining 40 percent of the plant effluent was used to irrigate the Wailua Municipal Golf Course.

In the past, the outfalls diffusers have been covered over completely with sand. When this occurs, the Wailua WWTP is unable to use the ocean outfall and relies solely on the Wailua Golf Course irrigation for the proper disposal of the treated effluent. The outfall is located in a notch in the reef approximately 670 feet from shore in waters approximately 30 feet deep (22.037° N, 159.3342° W). The end of the outfall has six 4-inch diffusers where the excess R-2 recycled water or periodic R-3 recycled water is discharged.

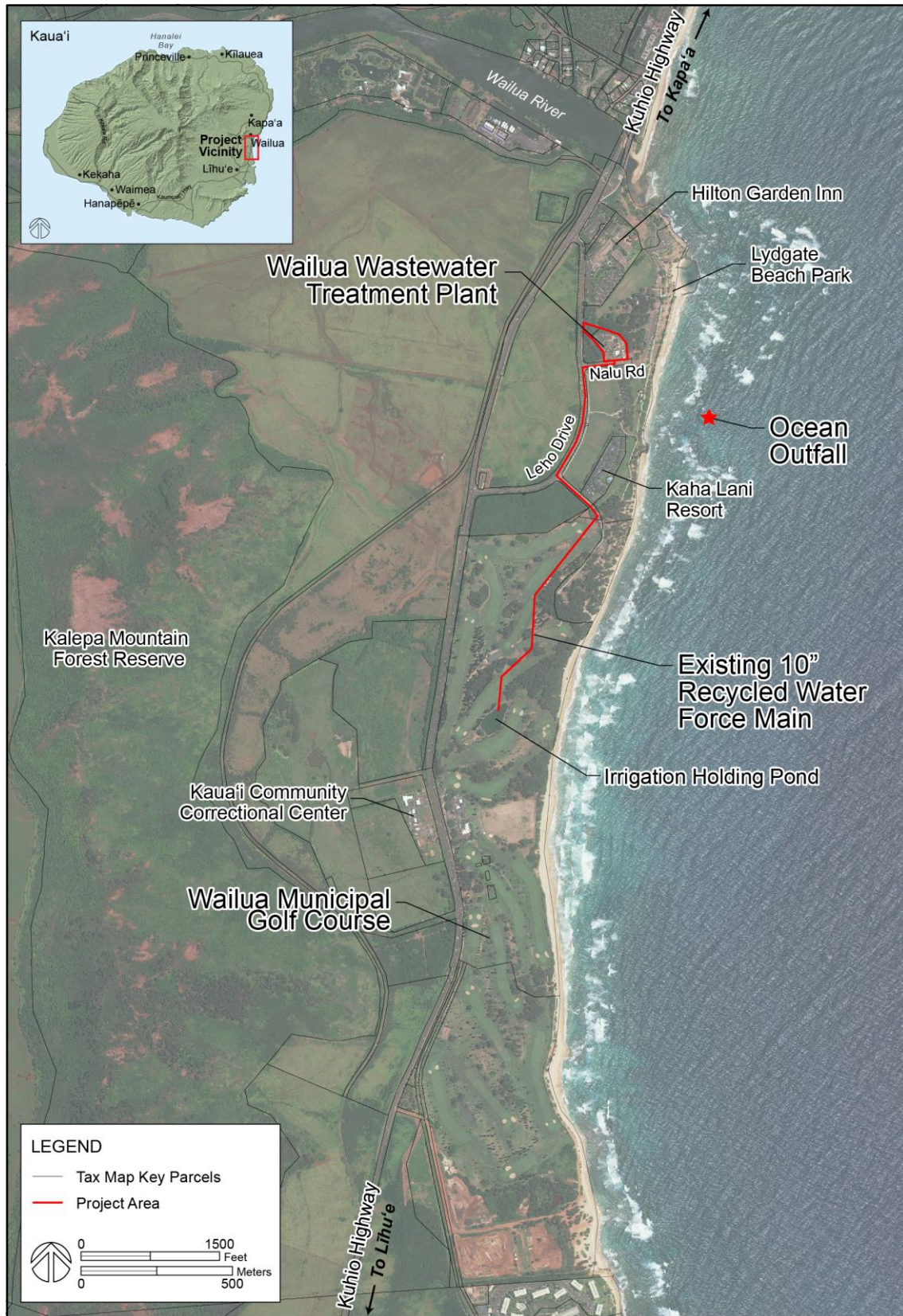


Figure 1-1: Regional Location Map

## 1.1 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) is prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) §4321 et seq.) as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations (CFR) Parts 1500-1508), as well as Chapter 343, Hawai'i Revised Statutes (HRS), as amended, and Title 11, Chapter 200.1, Hawai'i Administrative Rules (HAR) which sets forth the state's requirements for preparing environmental assessments.

The proposed project is planned to receive funding from both the United States Environmental Protection Agency (USEPA) and the County of Kaua'i (County). In addition, the majority of the project area is owned by the County. Compliance with NEPA is required because the project proposes to use federal funds provided through the USEPA Clean Water State Revolving Fund (CWSRF). The Hawai'i State Department of Health (DOH) must conduct an environmental review of projects funded under the CWSRF using the USEPA approved State Environmental Review Process (SERP). In addition, the State must comply with the Federal cross-cutting authorities set forth 40 CFR § 35.3145. An environmental review is defined by HRS Chapter 343 and HAR Chapter 11-200. Where there are differences between the Hawai'i Statutes/Rules and the applicable USEPA statutes and regulations, the Project must comply with USEPA statutes and regulations in order to qualify for the State CWSRF Program's loan.

This EA analyzes the potential environmental and socioeconomic consequences of the Proposed Action and reasonable alternatives. The intent of the EA is to provide sufficient analysis for determining whether the Proposed Action requires preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) pursuant to both NEPA and Chapter 343, HRS.

## 1.2 PROJECT SUMMARY

|                         |   |
|-------------------------|---|
| <b>Proposed Action:</b> | Wailua Wastewater Treatment Plant Process, Disinfection, and Electrical Improvements and Wailua Wastewater Treatment Plant Effluent Disposal Improvements                                   |
| <b>Location:</b>        | Līhu'e District, Kaua'i, Hawai'i<br><br>Wailua Wastewater Treatment Plant<br>4460 Nalu Road<br>Wailua, HI 96746<br><br>Wailua Municipal Golf Course<br>3-5350 Kuhio Hwy<br>Wailua, HI 96766 |
| <b>Proposing Agency</b> | County of Kaua'i<br>Department of Public Works<br>Wastewater Management Division<br>4444 Rice Street, Suite 275<br>Līhu'e, HI 96766   |

|   |   |
|---|---|
| <b>Responsible Entity (NEPA)</b>                        | State of Hawai'i Department of Health<br>Kinau Hale<br>1250 Punchbowl Street<br>Honolulu, Hawai'i 96813   |
| <b>Federal Funding Agency</b>                           | United States Environmental Protection Agency   |
| <b>Landowner/<br/>Tax Map Key Number</b>                | <b>Wailua WWTP/County of Kaua'i</b><br>(4) 3-9-006:019 (2.03 acres)<br>(4) 3-9-006:027 (1.53 acres)<br><br><b>Rights of Way (Nalu Road, Leho Drive, and Nehe Road)</b><br>(4) 3-9-006: 999 (16.82 acres)<br><br><b>Wailua Municipal Golf Course/County of Kaua'i</b><br>(4) 3-9-002:032 (0.06 acres)<br><br><b>Wailua Municipal Golf Course/State of Hawai'i</b><br>(4) 3-9-002:004 (136.18 acres)  |
| <b>Chapter 343, Hawai'i Revised Statutes "Trigger:"</b> | Use of State and County lands and funds   |
| <b>Existing Use:</b>                                    | Wailua Wastewater Treatment Plant and Wailua Municipal Golf Course  |
| <b>Land Use Designations:</b>                           | <b>State Land Use District:</b> Urban<br><b>County of Kaua'i General Plan District:</b> Līhu'e<br><b>County of Kaua'i General Plan Designation:</b><br><b>Wailua WWTP:</b> Agricultural<br><b>Rights of Way:</b> Agricultural<br><b>Wailua Municipal Golf Course:</b> Golf Course<br><b>Special Management Area:</b> Within SMA boundary  |
| <b>Flood Zone Designation:</b>                          | The Wailua Wastewater Treatment Plant is located within Zone X, an area of minimal flood hazard (Flood Insurance Rate Map Panel 1500020212F).<br><br>Portions of the Wailua Municipal Golf are located within special flood hazard areas within the 1% chance annual (or 100-year) flood plain (Zones A and VE) . However, the area to be impacted by the recycled water force main (Project Area B) is located within Zone X, an area of minimal flood hazard (Flood Insurance Rate Map Panel 1500020214F).  |
| <b>Permits and Approvals Required:</b>                  | Building and Construction Permits<br>Community Noise Permit and/or Noise Variance<br>Endangered Species Act Compliance<br>Grading, Grubbing, and Stockpiling Permits<br>Hawai'i Environmental Policy Act Compliance<br>Magnuson-Stevens Fishery Conservation and Management Act Compliance<br>National Environmental Policy Act<br>National Historic Preservation Act Compliance<br>National Pollutant Discharge Elimination System Permit<br>Recycled Water Permit<br>Special Management Area Major Permit<br>U.S. Army Corps of Engineers, Nationwide Permit<br>Zoning Permit |

|                                  |  |
|----------------------------------|--|
| <b>Agency Contact:</b>           | Donald Fujimoto, Division Chief<br>Department of Public Works<br>Wastewater Management Division<br>4444 Rice Street, Suite 295<br>Līhu‘e, HI 96766   |
| <b>Consultant Contact:</b>       | John Hagihara, Senior Associate<br>HHF Planners<br>733 Bishop Street, Suite 2590<br>Honolulu, HI 96813<br>Phone: 457-3174; E-mail: jhagihara@hhf.com |
| <b>Anticipated Determination</b> | Finding of No Significant Impact   |

### 1.3 REGULATORY OVERVIEW

This EA has been prepared based upon federal and state laws, statutes, regulations, and policies that are pertinent to the implementation of the proposed action, including the following:

- NEPA (42 USC sections 4321 et seq), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508)
- Clean Air Act (42 USC section 7401 et seq.)
- Clean Water Act (33 USC section 1251 et seq.)
- Coastal Zone Management Act (CZMA) (16 USC section 1451 et seq.)
- National Historic Preservation Act (NHPA) (as amended) (54 USC section 306108 et seq.)
- Endangered Species Act (ESA) (16 USC section 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. section 1801 et seq)
- Migratory Bird Treaty Act (16 USC sections 703-712)
- Executive Order 11988, Floodplain Management
- Executive Order 11990, Protection of Wetlands
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Chapter 343, HRS, and Title 11, Chapter 200.1 HAR

A description of the Proposed Action’s consistency with the relevant laws, policies and regulations, and regulatory agencies responsible for their implementation, is presented in Chapter 5.

### 1.3.1 Required Permits and approvals.

Table 1-1 lists the federal, state and county permits and approvals that may be required for the Proposed Action. DOH has delegated authority from the U.S. Environmental Protection Agency (USEPA) to ensure compliance with NEPA and other related federal laws and authorities required under 24 CFR 58.5 and 58.6.

**Table 1-1 Required Permits and Approvals**

| <b>Permit/Approval/Consultation</b>   | <b>Agency</b>   |
|---|---|
| <b>Federal</b>  |   |
| NEPA Finding of No Significant Impact (FONSI) or Notice of Intent to prepare Environmental Impact Statement | U.S. Environmental Protection Agency (delegated to the State of Hawai'i Department of Health)   |
| Section 106, National Historic Preservation Act consultation  | State Historic Preservation Officer   |
| Section 7, Endangered Species Act consultation  | U.S. Fish and Wildlife  |
| Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat Assessment                 | National Oceanic and Atmospheric Administration, National Marine Fisheries                      |
| <b>State of Hawai'i</b>   |   |
| CWA, Section 402, National Pollutant Discharge Elimination System Permit                                    | State of Hawai'i Department of Health, Clean Water Branch                                       |
| Community Noise Permit or Variance  | State of Hawai'i Department of Health, Indoor and Radiological Health Branch                    |
| Recycled Water Permit   | State of Hawai'i Department of Health, Wastewater Branch  |
| <b>County of Kaua'i</b>   |   |
| Chapter 343, Hawai'i Revised Statutes Environmental Review and Determination                                | County of Kaua'i, Department of Public Works, Wastewater Management Division (proposing agency) |
| Special Management Area Major Permit  | County of Kaua'i, Planning Department, Regulatory Permit Division                               |
| Construction Plan Approval  | County of Kaua'i, Department of Public Works  |
| Building and Construction Permits   | County of Kaua'i, Department of Public Works, Building Division                                 |
| Grading, Grubbing, and Stockpiling Permits  | County of Kaua'i, Department of Public Works, Engineering Division                              |
| Zoning Permit   | County of Kaua'i, Planning Department, Regulatory Permit Division                               |



## 2. PROJECT DESCRIPTION AND ALTERNATIVES

### 2.1 PROJECT LOCATION

The Proposed Action is located near the coast on the east side of Kaua'i to the south of Wailua Town. The project is within in the ahupua'a of Wailua and the traditional moku of Puna. The Proposed Action includes improvements at the existing Wailua Wastewater Treatment Plant, upgrades to the ocean outfall diffusers, and the rehabilitation of an existing R-2 recycled water force main that runs between the WWTP and the Wailua Municipal Golf Course irrigation holding pond. For the purposes of this EA, the following three project areas have been identified (Figure 2-1).

#### 2.1.1 Project Area A: Wailua WWTP

The Wailua WWTP is located at 4460 Nalu Road approximately 2,000 feet south of the Wailua River and adjacent to Lydgate Beach Park. Project Area A includes the existing 2.033-acre WWTP property (TMK: (4) 3-9-006-019) as well as a portion of the adjacent County-owned property (TMK: (4) 3-9-006-027). The WWTP site is bounded to the north and east by Lydgate Beach Park, to the south by Nalu Road, and to the West by Leho Drive.

#### 2.1.2 Project Area B: Recycled Water Force Main Rehabilitation

Project Area B encompasses an existing underground R-2 recycled water force main that runs between the Wailua WWTP and the irrigation holding pond at the Wailua Municipal Golf Course between holes 15 and 16. The force main is approximately 4,600 feet in length. From the WWTP, the force main follows County-owned rights of way along Nalu Road, Leho Drive, and Nehe Road (TMK: (4) 3-9-006-999). The force main enters the golf course from Nehe Drive via a small (0.06-acre) County-owned property (TMK: (4) 3-9-002-032) at northwest boundary of the golf course. The force main then continues through the State-owned and County-lease golf course property (TMK: (4) 3-9-002-004) to the irrigation holding pond located within.

#### 2.1.3 Project Area C: Wailua WWTP Ocean Outfall Diffusers

The ocean outfall is located in a notch in the reef approximately 670 feet from shore in waters approximately 30 feet deep (22.037° N, 159.3342° W). The end of the outfall has six 4-inch diffusers where the excess R-2 recycled water or periodic R-3 recycled water is discharged.



Figure 2-1: Project Location Map

**Table 2-1 TMK Parcel Information**

| <b>TMK Parcel</b>   | <b>Owner</b>     | <b>Parcel Size (acreage)</b> |
|---|------------------|------------------------------|
| <b>Wailua Wastewater Treatment Plant</b>                    |                  |                              |
| (4) 3-9-006:019   | County of Kaua'i | 2.03 acres                   |
| (4) 3-9-006:027   | County of Kaua'i | 1.53 acres                   |
| <b>Rights of Way (Nalu Road, Leho Drive, and Nehe Road)</b> |                  |                              |
| (4) 3-9-006: 999  | County of Kaua'i | 16.82 acres                  |
| <b>Waiula Municipal Golf Course</b>                         |                  |                              |
| (4) 3-9-002:032   | County of Kaua'i | 0.06 acres                   |
| (4) 3-9-002:004   | State of Hawai'i | 136.18 acres                 |

## 2.2 PURPOSE AND NEED FOR ACTION

The purpose of the project is to improve and enhance the reliability and resiliency of the existing WWTP processes. The project is needed to ensure the WWTP meets its National Pollutant Discharge Elimination System (NPDES) permit effluent water quality requirements. In addition, the project will reduce the likelihood of the ocean outfall diffusers being clogged with sand.

Maintaining the integrity of the outfall diffusers is critical to the operation of the WWTP. Should the diffusers get clogged by sand, the WWTP's only alternative for effluent disposal would be to convey effluent to the irrigation holding pond at the Wailua Municipal Golf Course. In some cases, typically during high precipitation events, the WWTP is not able to treat effluent to R-2 recycled water quality standards<sup>1</sup>. If one of these events were to occur while the diffusers were clogged by sand, the WWTP would be forced to convey R-3 effluent to the golf course to prevent a spill from occurring at the WWTP and Lydgate Park.

If R-3 quality effluent is discharged to the lined irrigation holding pond, then the golf course will not be able to use its irrigation system as it is not permitted for R-3 irrigation. If the lined storage pond is filled and overflows, the R-3 effluent spill would flow to an adjacent unlined pond and would potentially result in the closure of the Wailua Municipal Golf Course and potential DOH fines.

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<sup>1</sup> DOH identifies the following three categories of recycled water:

"R-1" means recycled water where the wastewater has undergone oxidation, filtration and disinfection. R-1 is considered the highest grade of recycled water.

"R-2" means recycled water where the wastewater has undergone oxidation and disinfection.

"R-3" means recycled water where the wastewater has undergone oxidation only. R-3 is considered the lowest grade of recycled water.

## 2.3 OVERVIEW OF ALTERNATIVES

Alternatives were identified and considered during the planning process to select the Proposed Action. Alternatives that were initially considered and eliminated from further consideration based on their feasibility and practicability of implementation or lack of alignment with the project purpose and need are described in Section 2.3.1. The discussion of probable impacts associated with the No Action Alternative (described in Section 2.3.2) and the Proposed Action (described in Section 2.3.3) are presented in the following chapters.

### 2.3.1 Alternatives Considered But Eliminated From Further Evaluation

#### ***Expanded Effluent Reuse and Disposal***

Several alternative locations were considered for expanded reuse and/or disposal of treated effluent from the Wailua WWTP. These alternatives included the construction of a new backup effluent disposal basin directly mauka of the Wailua WWTP (between the WWTP and Leho Drive), expansion of the existing irrigation overflow basin near the 16<sup>th</sup> Hole, and installation of a new irrigation system at the Wailua Municipal Golf Course driving range (not previously irrigated). The proposed disposal basin mauka of the WWTP and the expanded overflow basin near the 16<sup>th</sup> Hole of the golf course was disallowed by Department of Health Wastewater Branch as not meeting the criteria for Soil Aquifer Treatment. The expanded effluent reuse areas at the Wailua Golf Course Driving Range were determined to be infeasible due to the potential presence of Native Hawaiian burials, *iwi kupuna*. For those reasons, expanded effluent reuse and disposal was eliminated from further evaluation.

#### ***Full Replacement of the Recycled Water Force Main***

Full-scale replacement of the R-2 recycled water force main was considered as an alternative to rehabilitation. However, replacement would require the excavation of the existing force main along its entire 4,600-foot length. Additionally, the cost of full-scale replacement was estimated to have a higher cost than rehabilitation. For those reasons, replacement of the R-2 recycled water force main was eliminated from further evaluation.

### 2.3.2 No Action

The No Action Alternative would result in no change to the Wailua WWTP treatment processes. The Wailua WWTP processes would continue to age and potentially fall into disrepair. The recycled water force main would not be rehabilitated and existing irrigation with R-2 effluent would continue at the Wailua Municipal Golf Course. There would be no change to the ocean outfall diffusers and they would continue to be vulnerable to being covered with sand. Although the No Action Alternative would not meet the purpose and need for action, it was carried forward for analysis in this EA as a requirement of NEPA to provide a baseline for analysis of the environmental consequences.

### **2.3.3 Proposed Action**

The Proposed Action includes improvements to the existing WWTP processes, rehabilitation of the recycled water force main, and improvements to the ocean outfall diffusers.

#### **2.3.3.1 Wailua WWTP Improvements**

Project Area A is the WWTP, which encompasses approximately 2.43 acres (0.98 hectares) including the entire TMK (4) 3-9-006-019, a portion of the adjacent parcel TMK (4) 3-9-006:027 (por), and a portion of the Nalu Drive right of way (TMK [4] 3-9-006: 999 [por.]). A range of improvements are being proposed to maintain and upgrade existing plant processes. These project elements will improve the secondary treatment and provide a more reliable and robust WWTP.

Planned WWTP process improvements (Project Area A) include modifications to the aeration basins, clarifiers, filter bay, and chlorine contact tank; installation of a second effluent filter and an on-site hypochlorite generation system; replacement of the effluent pumps; electrical upgrades; and site work to include trenching, grading, and the construction of new site access roads. Planned WWTP process improvements also include the construction of a new headworks and primary filters, re-purposing of existing equalization basins for additional secondary treatment, and modifications to the solids handling processes including new solids thickening and solids storage that will support trucking thickened solids to the Lihu'e WWTP for biosolids stabilization in-lieu of disposal at the Kekaha Landfill.

#### **2.3.3.2 Recycled Water Force Main Rehabilitation**

It is intended that the golf course will continue to be irrigated by R-2 recycled water. There is an existing 10-inch asbestos cement force main which conveys R-2 effluent from the WWTP to an existing lined irrigation holding pond near the 16<sup>th</sup> hole of the Wailua Municipal Golf Course (Project Area B). The force main was constructed in 1976 and is nearing the end of its design life. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe sliplining, which will limit the amount of excavation required. Instead of digging up and replacing the entire force main, trenchless methods will allow excavation to be primarily limited to bends or corners in the force main. At these locations, launching/receiving pits would be excavated to provide access to the line for the rehabilitation equipment. The locations of the launching and receiving pits are shown in Figures 2-2 to 2-4. Additional excavation may be required for the installation and/or reconnection of air release valves in the rehabilitated force main.

The rehabilitated force main will continue to connect the Wailua WWTP to the Wailua Municipal Golf Course irrigation holding pond. The irrigation holding pond is able to store approximately 1.9 million gallons of effluent. From the holding pond, the effluent is pumped to the golf course irrigation system. The irrigation system is automatically controlled by an irrigation control computer system at the clubhouse or can be manually operated by golf course staff

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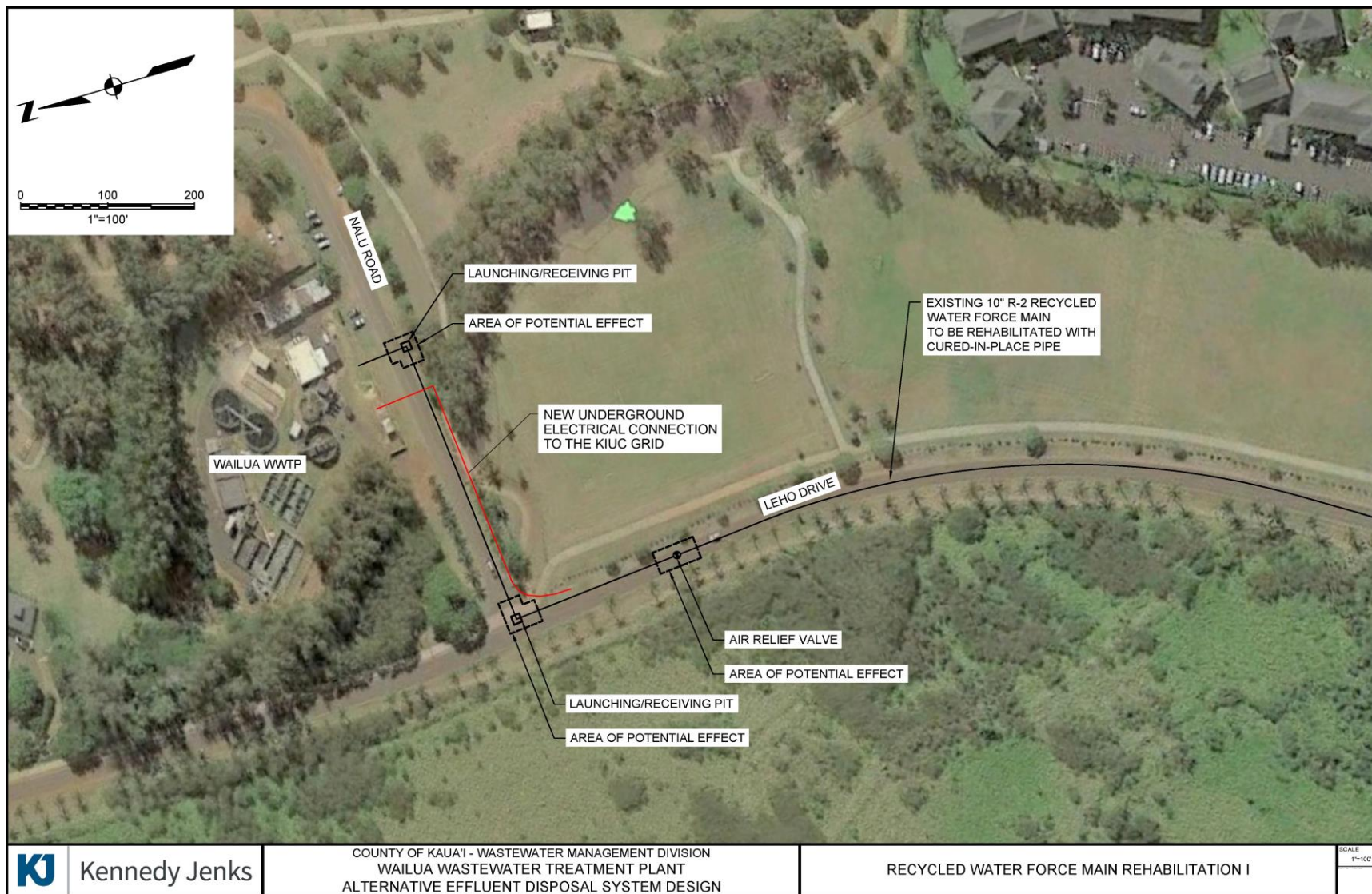


Figure 2-2: Recycled Water Force Main Rehabilitation Along Nalu Road and Leho Drive

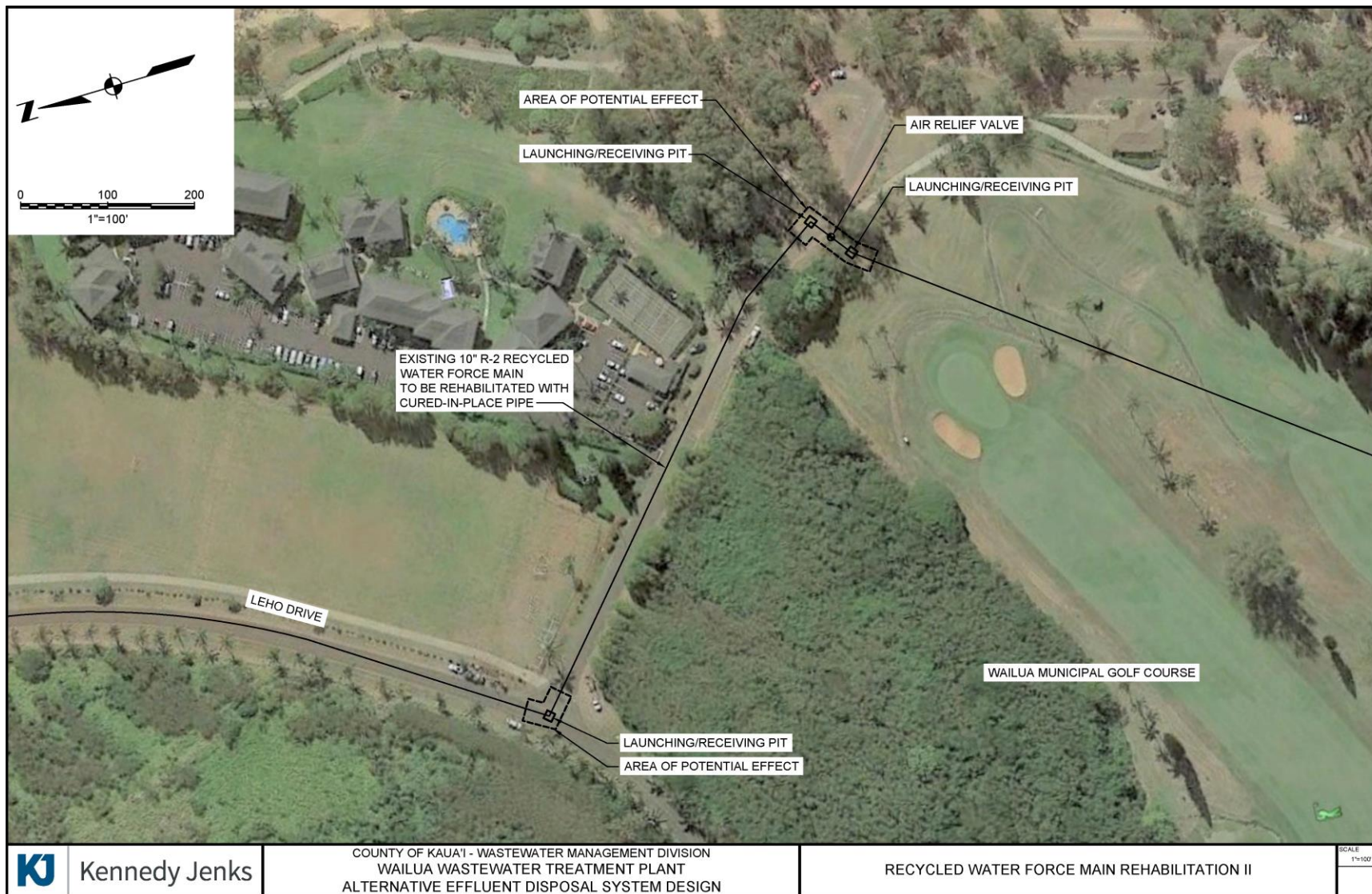


Figure 2-3: Recycled Water Force Main Rehabilitation Along Leho Drive and Nehe Road





Figure 2-4: Recycled Water Force Main Rehabilitation at the Wailua Municipal Golf Course

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### 2.3.3.3 Ocean Outfall

The existing ocean outfall consists of six (6) 4-inch diffusers that are evenly spaced along the crown of the 15-inch reinforced concrete pipe outfall. The outfall is located approximately 670 feet from the shoreline at a depth of 30 feet. In its current configuration, three (3) of the existing diffusers are blind flanged closed while three (3) are in use. Photographs of the outfall diffusers from an inspection in April 2021 are shown in Figure 2-5.

The Proposed Action includes the modification of the existing ocean outfall, involving the addition of rubber spool diffuser risers attached to flanged ends of the existing outfall diffusers. The diffuser risers are preliminarily estimated to be 2 feet high, but their height may be adjusted during the final project design. This action will increase the height off the bottom of the diffuser outlets, reducing the likelihood of sand covering the outlets. All equipment and materials will be transported to the Project site by a work vessel, which will be anchored near the outfall. The anchor locations will be verified by divers to be free of living coral. The dive team will access the diffusers, remove debris from the flange faces of the three open diffusers, and attach the rubber spool pipe risers. Only hand tools will be used during the installation process.



Figure 2-5: Existing Wailua WWTP Ocean Outfall Diffusers

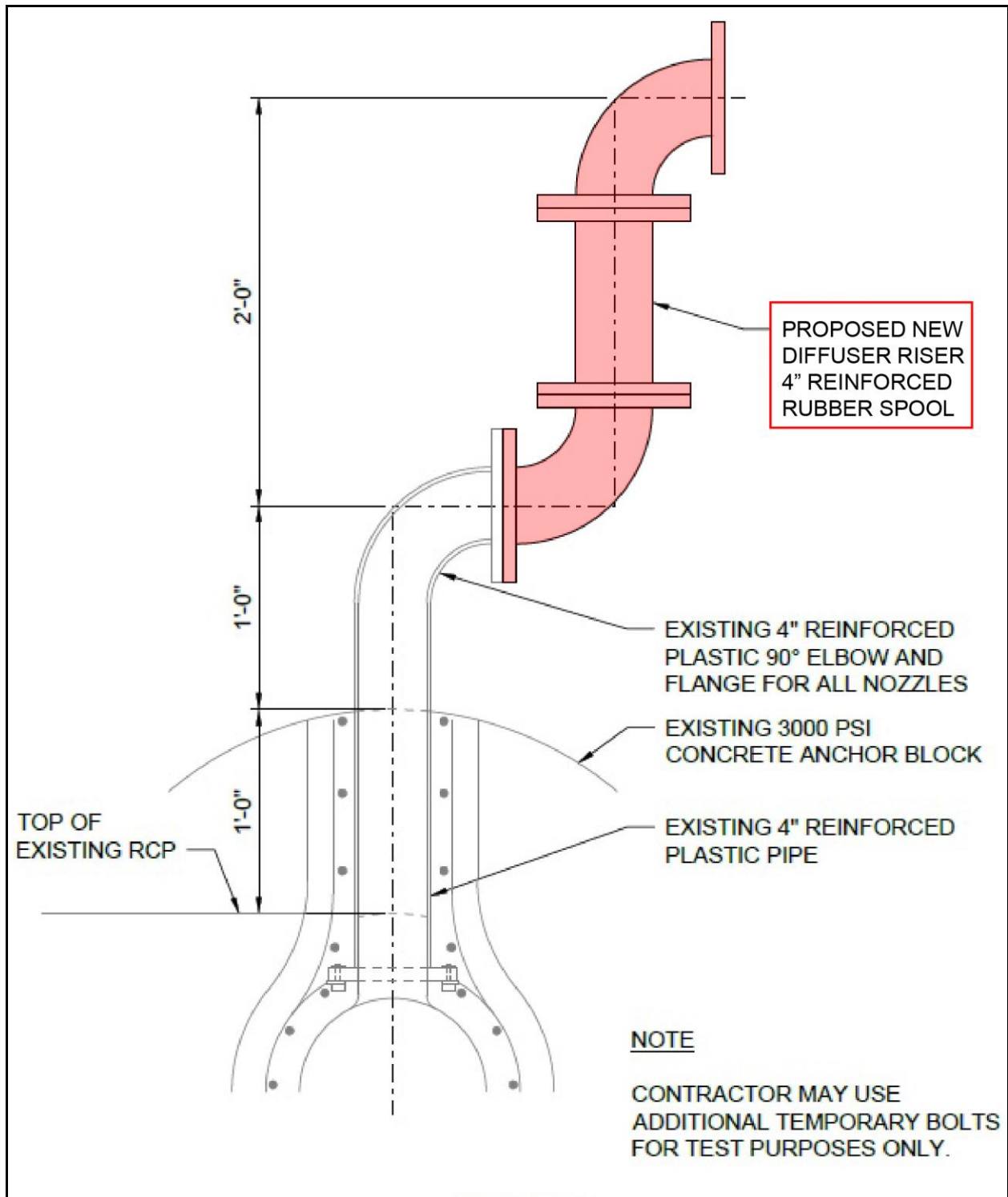


Figure 2-6: Typical Proposed New Diffuser Riser

### 3. NATURAL AND PHYSICAL ENVIRONMENT

#### 3.1 CLIMATE

##### **3.1.1 Existing Conditions**

Located at the northern edge of the tropics, the Hawaiian Islands enjoy a moderate climate with almost continual trade winds. Generally, the islands' climate has little day-to-day and month-to-month variability. Situated on the eastern, windward side of the island of Kaua'i adjacent to the coast, the project area is known to be sunny and dry with relatively low rainfall. Historical data from the Lihue Plantation 1065 recording station shows monthly temperatures range from a low of 70 degrees Fahrenheit (°F) in January-February to a high of 77°F in August. Total annual rainfall averages about 47 inches per year. The historic monthly average rainfall varies from a low of roughly 2.4 inches during the summer (June) to a high of 6.7 inches during winter (November) (Giambelluca et al., 2014).

Trade winds flowing from the northeast to the southwest are the prominent air circulation feature across Hawai'i. The trade winds in the project area typically range from 15 to 25 miles per hour (mph), with gusts upwards of 35 mph. In general, trade winds are present between 80% to 95% of the time between May and September and become less consistent between October through April. Climate change has impacted the trade winds causing an overall decrease in the number of trade wind days, from 291 days in 1973 to 210 in 2009. The trade winds have also shifted to a more easterly direction (Garza et al. 2012). Extremely high winds occur only occasionally and then only as a result of a major storm, which mostly occur during the winter season and may yield high winds from any direction.

##### **3.1.2 Potential Impacts and Mitigation**

###### **3.1.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the climate in association with the study area.

###### **3.1.2.2 Proposed Action Alternative**

The Proposed Action would have no effect on immediate climate conditions and no mitigation is required. The larger relationship of the Proposed Action to global climate change and sea level rise is discussed in Section 3.5.5. One of the primary goals of the proposed WWTP improvements is to increase the resilience of the utility in the face of global climate change.

#### 3.2 TOPOGRAPHY AND SOILS

##### **3.2.1 Existing Conditions**

The project site extends for approximately 4,500 feet along the east coastal plain of Kaua'i. The terrain is gently sloping from mauka to makai or west to east with ground elevations ranging from roughly 40 to 10 feet above mean sea level (MSL).

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) classifies the soils within the project area. Project Area A is underlain by Koloa stony silty clay with 15 to 25 percent slopes

(KvD), Lihue silty clay with 0 to 8 percent slopes (LhB), and Mokuleia fine sandy loam (Mr). Project Area B is underlain by Lihue silty clay with zero to eight percent slopes (LhB), Mokuleia fine sandy loam (Mr), and dune lands (DL). The coastal plain on the windward side of Kaua'i also features sand dunes, hills of loose calcareous sand material drifted and piled by the wind. The sand dunes in the vicinity of Project Area B have been modified and anchored with the development of the golf course.

### **3.2.2 Potential Impacts and Mitigation**

#### **3.2.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline topography and soils throughout the project area. Therefore, no impacts to topography and soils would occur with implementation of the No Action Alternative.

#### **3.2.2.2 Proposed Action Alternative**

**Project Area A:** Implementation of the proposed action at the WWTP would result in ground disturbance for the demolition and removal of existing structures, preparation for new construction, and installation and upgrade of subsurface infrastructure. Soils would be disturbed for the demolition and removal of an abandoned chlorine tank to make way for the new construction and WWTP access road. Grading would be required for the construction of new structures along the southern edge of the parcel. Excavation and trenching would also be needed for the new WWTP access road. To support the access road, a retaining wall is proposed for the southwest corner of the property. Trenching would be done throughout the WWTP parcel to add new utilities and piping and to upgrade existing utilities and piping.

Construction period BMPs would be implemented to avoid and reduce erosion and subsequent offsite transport of sediment from these changes to the site's topography. Soils that are unsuitable for building foundations would be excavated and replaced with non-expansive granular fill material. During the operational period, this alternative is not expected to include ground disturbance or changes to soil conditions.

**Project Area B:** Ground disturbance associated with the rehabilitation of the existing 10" R-2 Recycled Water Force Main would be minimized through the use of trenchless methods such as cured-in-place pipe or pipe slip lining. The trenchless executed within Launching/Receiving Pits, located at intervals along the approximately 4,600-foot force main (Figures 2-2 through 2-4). Excavation of the Launching/Receiving Pits will be required; the pits are typically 4-5 feet in depth though they could be up to 10-foot deep if there are subsurface obstructions. Additional excavation may be required for the installation of air release valves. The soils excavated from the pits will be stored in proximity and used to backfill the same pits.

The implementation of trenchless technology would reduce the impact of disturbing soils along the entire force main. In addition, soils along the trench line were disturbed during the initial placement of the 10" water main in the 1970s. There will be no impact to soils or topography during operations of the recycled water force main.

Trenching along and across Nalu Road would be required to connect the WWTP to the electrical grid.

**Project Area C:** The ocean outfall is located approximately 670 feet offshore at a depth of 30 feet and would not impact terrestrial soils or topography.

Therefore, implementation of this alternative would not result in significant impacts to topography and soils.

### 3.3 WATER RESOURCES

#### 3.3.1 Surface Waters

##### 3.3.1.1 Existing Conditions

The project area is located between two watersheds, Wailua and Kawailoa. The Wailua River watershed is a very large watershed at 52.6 square miles which extends from the highest mountains of Kaua'i, Wai'ale'ale (elevation 5,226 ft), to the ocean at the Wailua River mouth, just north of the project area (Parham et al. 2008). This watershed drains fifteen streams and hosts numerous native and introduced aquatic species. Kawailoa watershed is 1.6 square miles and is classified as DAR cluster code 5, meaning the watershed is of medium size, steep in the upper watershed and has a small embayment. This watershed holds Kawailoa Stream, a perennial stream 2.7 miles in length that drains off of the southern part of Kalepa Ridge, the mountain ridge to the west of the project area (Parham et al. 2008). A spring-fed wetland is located just west of Kuhio Highway, outside the project area. This is a 118-acre freshwater emergent wetland located near the Kaua'i Community Correctional Center. The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (2023) defines these wetlands as mostly a Palustrine Emergent Persistent Temporary Flooded wetland (PEM1A classification code).

In the northern half of the Wailua Municipal Golf Course, there are four freshwater ponds. Three of these ponds serve as water features along the golf course and are not located within the recycled water force main alignment (Project Area B). The remaining pond is known as the Irrigation Holding Pond and it is the terminus of the recycled water force main. Since 1976 it has been receiving R-2 effluent from the nearby WWTP for purposes of irrigating the golf course. The Irrigation Holding Pond is lined and has the capacity of approximately 1.9 million gallons (Figure 3-1).



**Figure 3-1: Irrigation Holding Pond**

### ***3.3.1.2 Potential Impacts and Mitigation***

#### ***3.3.1.2.1 No Action Alternative***

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the surface waters within the project area. Therefore, no impacts to surface waters would occur with implementation of the No Action Alternative.

#### ***3.3.1.2.2 Proposed Action Alternative***

There are no natural surface waters within the Proposed Action project areas. The manmade irrigation holding pond is the terminus of the recycled water force main, and is therefore located within Project Area B. The irrigation holding pond would be drained during the rehabilitation of the recycled water force main and refilled following completion. Construction activities would comply with BMPs for sedimentation and erosion control to ensure stormwater runoff would not impact nearby surface waters. Therefore, no impacts to surface waters are expected.



### **3.3.2 Groundwater**

#### **3.3.2.1 Existing Conditions**

The groundwater beneath the project area is associated with the southern Lihue Basin, a broad (approximately 42 square miles) topographic depression on the eastern side of Kaua'i flanked by the Makaleha Mountains to the north, the Haupu Ridge to the south and steep cliffs of the Waimea Canyon Basalt to the west and open to the east. It is filled by lava flows linked to the Koloa Volcanics and Waimea Canyon Basalts events. The Lihue Basins' regional hydraulic conductivities of the Koloa Volcanics and the dike-intruded Waimea Canyon Basalt produce a thick freshwater lens which provides baseflow to streams that cross the basin, such as the Wailua River (Element Environmental, 2019).

The underlying Koloa Volcanics and dike-intruded Waimea Canyon Basalts have lower permeabilities than most areas of ground-water development in Hawai'i and result in steeper head gradients and a higher proportion of groundwater discharging to streams than to the ocean (Element Environmental, 2019). More than 60% of the ground water discharging from the aquifer in the southern Lihue Basin seeps to streams with the remainder seeping directly to the ocean (Izuka and Gingerich, 1998).

#### **3.3.2.2 Potential Impacts and Mitigation**

##### **3.3.2.2.1 No Action Alternative**

The No Action Alternative would not impact existing groundwater resources since no construction activities would occur and current conditions would remain unchanged. Therefore, no impacts to groundwater would occur with implementation of the No Action Alternative.

##### **3.3.2.2.2 Proposed Action Alternative**

The Proposed Action would include the construction of some new impervious surfaces at the Wailua WWTP (i.e., new site access roads). However, the extent of these new impervious surfaces would be limited and runoff would be directed to adjacent vegetated areas for percolation. Therefore, no impacts to groundwater would occur with implementation of the Proposed Action.

### **3.3.3 Marine Waters**

#### **3.3.3.1 Existing Conditions**

HAR §11-54 defines the State standards for particular parameters in Hawai'i waters and is comprised of both narrative and numerical criteria. State waters are classified as either inland waters or marine waters. HAR §11-54-3 (c) defines classifications for marine waters. The marine waters in and around Wailua are classified as open coastal waters "Class A." According to HAR §11-54-3 (c), "It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters." No new sewage discharges will be permitted within embayments with the exception of:

- A. Acceptable non-contact thermal and drydock or marine railway discharges in identified harbors.

- B. Storm water discharges associated with industrial activities which meet, at the minimum, the basic water quality criteria applicable to all waters as specified in section 11-54-4, and all applicable requirements specified in the chapter 11-55, titled “Water Pollution Control”
- C. Discharges covered by a NPDES general permit, approved by the U.S. Environmental Protection Agency and issued by the Department in accordance with 40 C.F.R. section 122.28 and all applicable requirements specified in chapter 11-55, titled “Water Pollution Control”

To comply with CWA Section 402, the Wailua WWTP currently has a National Pollutant Discharge Elimination System (NPDES) permit (No. HI0020257) from DOH to discharge treated wastewater to the Pacific Ocean through Outfall Serial No. 001. The permit sets forth effluent limitations, monitoring requirements, and other conditions that the WWTP must adhere to through the permit period.

The ocean outfall is located southeast of the Wailua WWTP approximately 670 feet from the shoreline and in 30 feet of water (Figure 2-1). Effluent is conveyed through a 15-inch-diameter reinforced concrete pipe which leads to a 90-foot-long outfall diffuser with six 4-inch-diameter ports. During the dry season (April-Oct), plant operators typically divert most of the R-2 treated effluent to the golf course. During the wet season, most of the effluent including off-spec effluent on rainy-day events, is conveyed to the permitted ocean outfall. In 2017, for example, approximately 60 percent of the effluent was discharged to the ocean while the remaining 40 percent was sent as R-2 irrigation water to the golf course (County of Kaua’i, Wastewater Management Division 2018:1).

The NPDES permit requires three types of water monitoring programs be conducted: Shoreline Monitoring, Offshore Water Quality Monitoring, and Bottom Biological Communities Monitoring.

#### Shoreline Monitoring

During shoreline monitoring, the ocean water is tested for enterococci bacteria and technicians make visual observations of the water and ocean and weather conditions. Shoreline monitoring sets the protocol for assessing recreational health for marine coastal waters. Bacterial evaluations using enterococci inform decisions about whether public health is being protected while participating in ocean water contact activities. The presence of enterococci in sufficient numbers indicates the potential for human infectious diseases as defined in the Clean Water Act §502(23). In Hawai’i, the public must be notified when the enterococci concentrations in any given sample are at or above 130 colony forming units (CFUs)/100 mL of water (Hawai’i State Department of Health, Clean Water Branch 2018:12). Three shoreline stations located adjacent to and south of the ocean outfall are tested approximately five times per month. Results are included in the monthly Discharge Monitoring Reports (DMR) of the Wailua WWTP. The results indicate that in general, levels of enterococci bacteria are below 10 MPN/100 mL (most probable number per 100 milliliters; laboratories and agencies worldwide use both MPN and CFU interchangeably). The highest level of enterococci (50 MPN/100 mL), recorded on November 14, 2017, coincided with a period of heavy rains and brown waters. Other results higher than 10 MPN/100 mL also correlated with high precipitation events. The County of Kaua’i concluded that higher levels of enterococci do not appear to correlate with either effluent enterococci levels or chlorine residuals in WWTP effluent. Rather, they can be attributed to high rain events and increased flow of the Wailua

River, which discharges into the ocean near the ocean outfall and location of shoreline monitoring (County of Kaua'i, Wastewater Management Division 2018:1).

### Offshore Water Quality Monitoring

The goal of the water quality program is to protect coastal and marine waters. The offshore water quality monitoring monitors for the following parameters: Total Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite Nitrogen, Total Phosphorus, Chlorophyll a, Turbidity, pH, Dissolved Oxygen (DO), Temperature and Salinity. Grab samples are collected at one meter below water surface, two meters above the ocean floor, and a mid-depth sample. For the parameters pH, DO, Temperature and Salinity, a continuous depth profile data presentation is required.

There are six monitoring locations for the offshore water quality monitoring effort: four defined by the four corners of the zone of mixing (ZOM), a fifth adjacent to the outfall diffuser and the sixth is a control station located south of and remote from the ZOM boundary. The ZOM is an area where wastewater effluent from a point source discharge is mixed, usually by natural means, with cleaner receiving waters. In the mixing zone, the level of toxic pollutants is allowed to be higher than the acceptable concentration for the general water body. In this case, the ZOM is in proximity to the ocean outfall.

The 2017 Zone of Mixing Dilution Analysis modeled dilution rates and compared them with observed measurements. The principal finding was that the effluent dilution in the receiving waters was exceptionally high (Brown and Caldwell, 2017).

### Biological Communities Monitoring

The County conducted benthic monitoring surveys over a 20-year period from 1997 to 2016. The results of the surveys indicate that there are not any significant impacts to the marine biological environment resulting from the discharge of effluent from the Wailua WWTP due to the following reasons (Dollar, 2017):

1. The natural rigor of the area from water movement (currents and wave impact) and sediment scour and deposition prevents the establishment of benthic communities
2. The discharged effluent is entrained in a freshwater plume that rises and is rapidly dispersed by wave and current action with minimal or no contact with the ocean floor.
3. Fish communities have generally been similar or higher at one of the stations closest to the diffusers compared to other survey sites, suggesting that some effects of the discharge might be considered as positive, rather than negative.

### **3.3.3.2 Potential Impacts and Mitigation**

#### **3.3.2.2.1 No Action Alternative**

The No Action Alternative would not impact the existing use of the Wailua WWTP ocean outfall. Therefore, no impacts to marine waters would occur with implementation of the No Action Alternative.

### **3.3.2.2 Proposed Action Alternative**

The Proposed Action would not change the typical disposal of effluent from the Wailua WWTP. The WWTP would continue to operate in compliance with the NPDES permit that allows treated effluent to be discharged at the existing ocean outfall, and therefore, no change to marine water quality is expected.

The proposed improvements to the ocean outfall diffusers would involve minor construction work in marine waters to install the new diffuser risers. The ocean outfall is located in navigable waters approximately 670 from shore at an elevation of 30 feet below MSL. Therefore, the Proposed Action is subject to the CWA Section 404 under the jurisdiction of the U.S. Army Corps of Engineers (USACE). As such, Kaua'i County has obtained a USACE Nationwide Permit for the proposed improvements to the ocean outfall (Appendix D). The installation work would be conducted in compliance with the BMPs established in the USACE Nationwide Permit (Appendix D) to prevent the discharge or accidental spillage of pollutants, solid waste debris, and other objectionable wastes in surface waters.

Therefore, the Proposed Action would have less than significant impacts on marine waters.

## **3.4 NATURAL HAZARDS**

### **3.4.1 Earthquake Hazards**

Earthquakes can cause extensive property damage and endanger lives, with earthquake-related injuries resulting from collapsing buildings and bridges, fire from broken gas and power lines, flooding from ruptured water and drainage systems, landslides and debris falls ([fema.gov/earthquake/why-earthquakes-occur](https://www.fema.gov/earthquake/why-earthquakes-occur)). In Hawai'i, earthquakes are mainly associated with volcanic activity resulting from magma movement beneath the earth's surface and have been historically concentrated around Hawai'i Island where volcanic activity is highest.

#### **3.4.1.1 Existing Conditions**

Earthquake hazard maps produced by the U.S. Geological Services Earthquake Hazards Program are used as planning tools in designing buildings, bridges, highways and utilities to withstand shaking associated with earthquake events (Hawai'i Emergency Management Agency 2018). The Seismic Hazard Maps indicate that all islands across the state have low levels of seismic hazard, except for Hawai'i Island which has intermediate levels of seismic hazard.

#### **3.4.1.2 Potential Impacts and Mitigation**

##### **3.4.1.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the potential for earthquakes. Therefore, the No Action Alternative would have no impact on earthquake hazard risks.

### **3.4.1.2.2 Proposed Action Alternative**

Kaua'i is at low risk for earthquake hazards and therefore the threat of impacts associated with earthquake hazards is low for the Proposed Action. Because Kaua'i is at low risk for seismic activity, there is little danger that existing or new construction of WWTP structures (Project Area A), underground force mains (Project Area B), or the ocean outfall (Project Area C ) could be damaged or pose a threat to employees or the public. Therefore, the Proposed Action would have no impact on earthquake hazard risks.

### **3.4.2 Tsunami Hazards**

A tsunami is a series of large, long ocean waves generated by an underwater disturbance such as an earthquake, landslide or volcanic eruption. Tsunamis strike with devastating force and quickly flood all low-lying coastal areas, threatening all life and property along or near the coastline. In general, areas less than 25 feet above sea level and within a mile of the shoreline are at greatest risk of tsunami inundation. While drowning is the most common cause of death associated with tsunamis, hazards associated with tsunamis include flooding, contamination of drinking water and fires from gas lines or ruptured tanks (Hawai'i Emergency Management Agency 2018).

#### **3.4.2.1 Existing Conditions**

The entire project area is within the tsunami evacuation zone (Figure 3-2) and is subject to tsunami threat. The Tsunami Evacuation Zone Maps identify three zones: a tsunami evacuation zone where most of Kaua'i's tsunami warning events will occur; an extreme tsunami evacuation zone for very large (magnitude 9+) earthquake and tsunami; and a safe zone that provides guidance for the minimum safe evacuation distance. The nearest safe zone is located between Leho Drive and Kuhio Highway.

The County of Kaua'i has produced its most recent update of the *Kaua'i Multi-Hazard Mitigation and Resilience Plan* in May 2021. The plan lists the Wailua Wastewater Treatment Plant as a critical government facility and a critical water infrastructure.

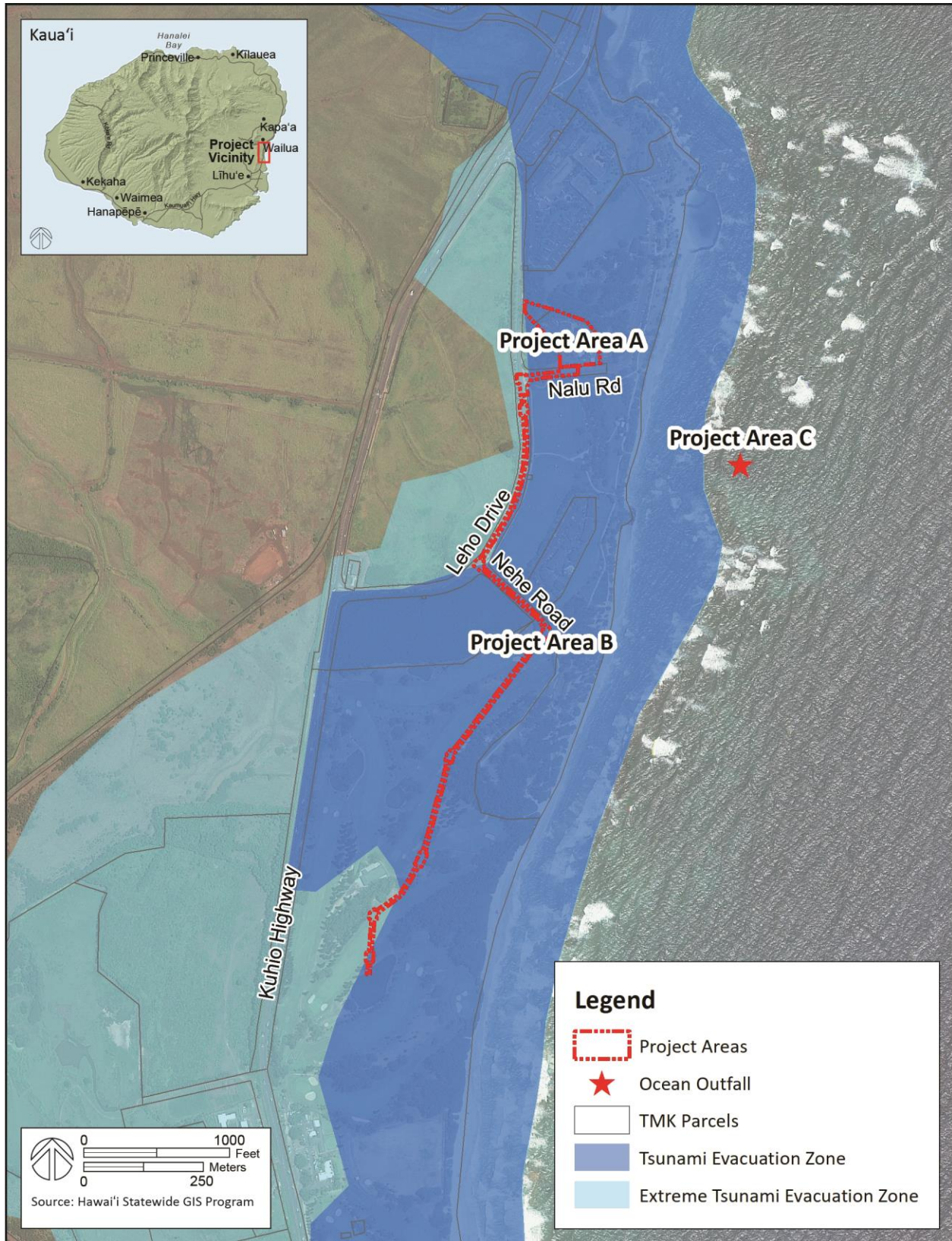


Figure 3-2: Tsunami Evacuation Zones

### **3.4.2.2 Potential Impacts and Mitigation**

#### **3.4.2.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the Wailua WWTP or the recycled water force main. Therefore, the No Action Alternative would have no impact on tsunami hazard risk.

#### **3.4.2.2.2 Proposed Action Alternative**

Under the Proposed Action, the Wailua WWTP and the recycled water force main would continue to be located within the tsunami evacuation zone. The Proposed Action would include rehabilitation of existing facilities and construction of some new improvements at the WWTP. Relocation of the Wailua WWTP was determined to be infeasible at this time, so the proposed improvements would modernize and improve WWTP processes. Since the WWTP and recycled water force main would remain in the same location, the Proposed Action would not increase the risk of the potential tsunami impacts to the facility.

Therefore, implementation of the Proposed Action is expected to have less than significant impacts to tsunami hazard risk.

### **3.4.3 Hurricane Hazards**

A hurricane is a tropical cyclone with maximum sustained winds of 74 miles per hour or higher. Major hazards associated with hurricanes are excessive rainfall and inland flooding, strong winds, storm surge and shoreline erosion, and tidal and coastal flooding. Hawai'i experienced the destructive force of a hurricane when Hurricane Iniki struck the island of Kaua'i in 1992 with sustained winds of 130 mph and caused \$2.3 billion in property damage (Businger 1998). Since the beginning of hurricane tracking in the 1950s, Hawai'i has been impacted by one damaging hurricane per decade.

#### **3.4.3.1 Existing Conditions**

According to the *2015 Hawai'i Catastrophic Hurricane Plan/FEMA Region IX Hawai'i Catastrophic Annex*, a hurricane of any size and duration may pose a threat to the infrastructure, environment and economy and impact the daily lives of residents, primarily because of Hawai'i's geographic isolation and dependency on imported goods, and the concentration of developments along coastal shores (Hawai'i Emergency Management Agency 2018). The most recent *AIR Tropical Cyclone Model for Hawai'i* (2013) assumes equal risk across all the Hawaiian Islands. In addition, climate change and global warming have begun to impact hurricane frequency and intensity in the Central Pacific. National Oceanic and Atmospheric (NOAA) studies indicate that tropical cyclone intensity will increase as the planet warms causing higher coastal inundation levels, increased rainfall rates, magnified wind speeds, and a higher proportion of Category 4 and 5 hurricanes.

### **3.4.3.2 Potential Impacts and Mitigation**

#### **3.4.3.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the potential for hurricanes. Therefore, implementation of the No Action Alternative would have no impact on hurricane risk or vulnerability.

#### **3.4.3.2.2 Proposed Action Alternative**

With climate change, there is an increased hurricane risk to the entire island, including the study area. The study area's proximity to the coast makes it especially prone to hurricane hazards such as storm surge, coastal erosion, and coastal flooding. Nevertheless, the WWTP and the recycled water force main would remain in the same location, so the Proposed Action would not increase their vulnerability to hurricane impacts. Instead, the improvements to the WWTP (Project Area A) and the ocean outfall (Project Area C) would help to modernize WWTP processes and make the WWTP more resilient to natural hazards such as future hurricanes by reducing the vulnerability of the ocean outfall diffusers to being covered by sand.

Therefore, implementation of the Proposed Action would have a minor beneficial impact on the resilience of the WWTP to hurricane risks.

### **3.4.4 Flood Hazards**

#### **3.4.4.1 Existing Conditions**

The Federal Emergency Management Agency (FEMA) classifies flood hazard zones as part of the Flood Insurance Program for the City and County of Honolulu. As shown in Figure 3-3, the Flood Insurance Rate Maps (FIRM), Map Panel Number 1500020212F effective date of November 26, 2010 places the WWTP, Leho Drive, and a portion of the golf course (Project Areas A, B, and C) in an area of low to moderate flood risk. The X value indicates minimal risk areas outside the 1-percent and 0.2 percent annual chance floodplains. To the south within the golf course, some of Project Area C and all of D (a portion of the irrigation holding pond and the driving range) are within the VE zone, which is defined as coastal areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action (Map Panel Number 1500020214F effective date of November 26, 2010).



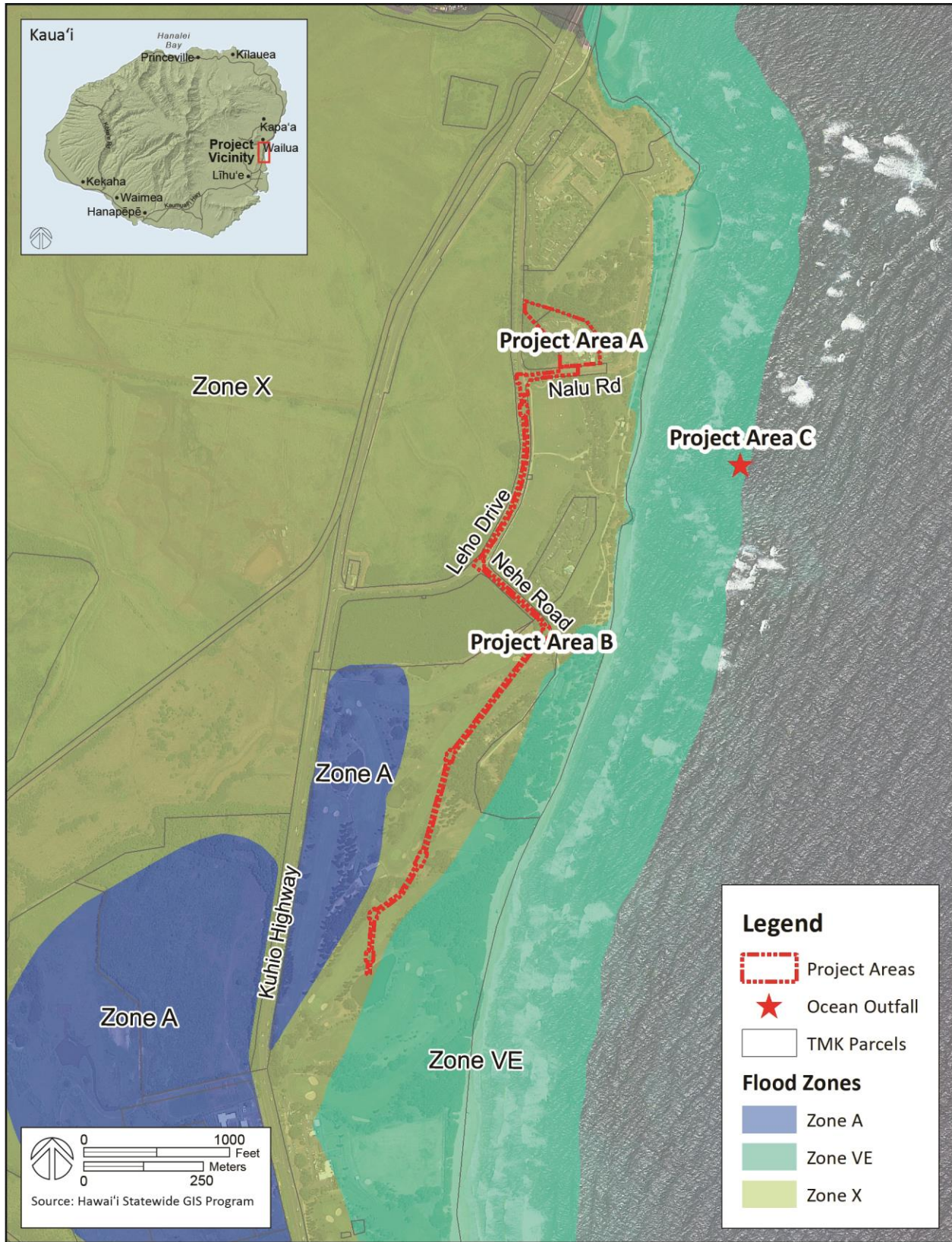


Figure 3-3: Flood Zones

### **3.4.4.2 Potential Impacts and Mitigation**

#### **3.4.4.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the potential for flooding. Therefore, implementation of the No Action Alternative would have no impact on flood hazards.

#### **3.4.4.2.2 Proposed Action Alternative**

According to the FEMA FIRM maps, the risk for flooding in the project area is located in flood zone X, an area of minimal flooding hazard. Therefore, the project area is not located within a floodplain, and the requirements of Executive Order 11988 (Floodplain Management) do not apply. However, climate change and sea level rise can cause increased flash flooding, storm intensification, coastal flooding, storm surges and resultant coastal erosion, and inundation caused by elevated groundwater tables (University of Hawai'i at Mānoa Sea Grant College Program, 2014). Despite these potential hazards, the Proposed Action (construction and operations) would not impact flooding frequency or severity. Both the WWTP (Project Area A) and the recycled water force main (Project Area B) would continue as existing uses and would not increase the facilities vulnerability to flooding. Improvements to the WWTP will improved operating processes and make the ocean outfall more resilient by reducing the potential of the outfall diffusers being covered by sand. This will allow the plant to better handle periodic flood events and avoid spillage.

### **3.4.5 Climate Change and Sea Level Rise**

Climate change is a long-term shift in patterns of temperature, precipitation, humidity, wind and seasons. Scientific data show that earth's climate has been warming and is mostly attributable to rising levels of carbon dioxide and other "greenhouse gases" generated by human activity. These changes are already impacting Hawai'i and the Pacific Islands through rising sea levels, increasing ocean acidity, changing rainfall patterns, decreasing stream flows, and changing wind and wave patterns.

#### **3.4.5.1 Climate Change Projections and Sea Level Rise Modeling**

In 2014, the Kaua'i County Planning Department requested a technical study on Climate Change and Coastal Hazards of Kaua'i with the intent of addressing climate change and sea level rise in its General Plan update. The report addresses different factors of climate change that can impact coastal hazards on Kaua'i. Erosion, an important factor linked to coastal hazards, has been documented as impacting the majority of beaches on Kaua'i. On the islands' north and east coasts (project area location), exposed to the northeast trade wind swell, 78% of beaches are undergoing chronic erosion. Chronic erosion is made worse by episodic or seasonal erosion associated with high waves and storms. Sea level on Kaua'i has already risen about six inches over the past century. Extreme water levels will occur when climate change-generated sea level rise combines with seasonal high tides, interannual and interdecadal sea-level variations, and surge associated with storms and tsunamis. As sea level rises, the water table also rises leading to a break of the land surface creating and expanding wetlands, changing drainage patterns, saturating the soil, and causing increased flooding.

According to a report prepared in 2017 intended to provide a statewide assessment of Hawaii's vulnerability to sea level rise (SLR), sea level is rising at increasing rates due to global warming of the atmosphere and oceans and melting of glaciers and ice sheets (Hawaii's Climate Change Mitigation and Adaptation Commission, 2017). The report presents results of modeling studies conducted to determine the potential future exposure of the main Hawaiian Islands to coastal hazards for four future sea level rise scenarios: 0.5 feet, 1.1 feet, 2.0 feet, and 3.2 feet. These scenarios relate to global SLR predictions based on GHG emissions continuing at current levels of increase, and which published scenarios suggest could occur between 2060 and 2100. The 2017 Hawaii's Climate Change Mitigation and Adaptation Commission report uses 3.2 feet to SLR to depict hazards that may occur in the mid to latter half of this century.

### **3.4.5.2 Potential Impacts and Mitigation**

#### **3.4.5.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to risks to the WWTP associated with climate change and sea level rise. Therefore, no impacts would occur with the implementation of the No Action Alternative.

#### **3.4.5.2.2 Proposed Action Alternative**

The SLR modeling indicates that the Project Areas A (WWTP) and B (recycled water force main) are located outside of the 3.2-foot SLR exposure area with the exception of a small area where the recycled water force main intersects the exposure area connecting the ocean to the small water features along the Wailua Municipal Golf Course (Figure 3-4). However, according to the Kaua'i Climate Change and Coastal Hazards Assessment (2014), as part of critical water infrastructure on the island, the Wailua WWTP should be assessed individually for vulnerability, particularly because it has a low risk tolerance.

The Proposed Action would improve existing processes at the WWTP and improve the resilience of the WWTP to potential impacts from heavy rainfall events by reducing the vulnerability of the ocean outfall diffusers being covered with sand.

Therefore, implementation of the Proposed Action is not expected to have significant impacts risks associated with climate change or sea level rise.

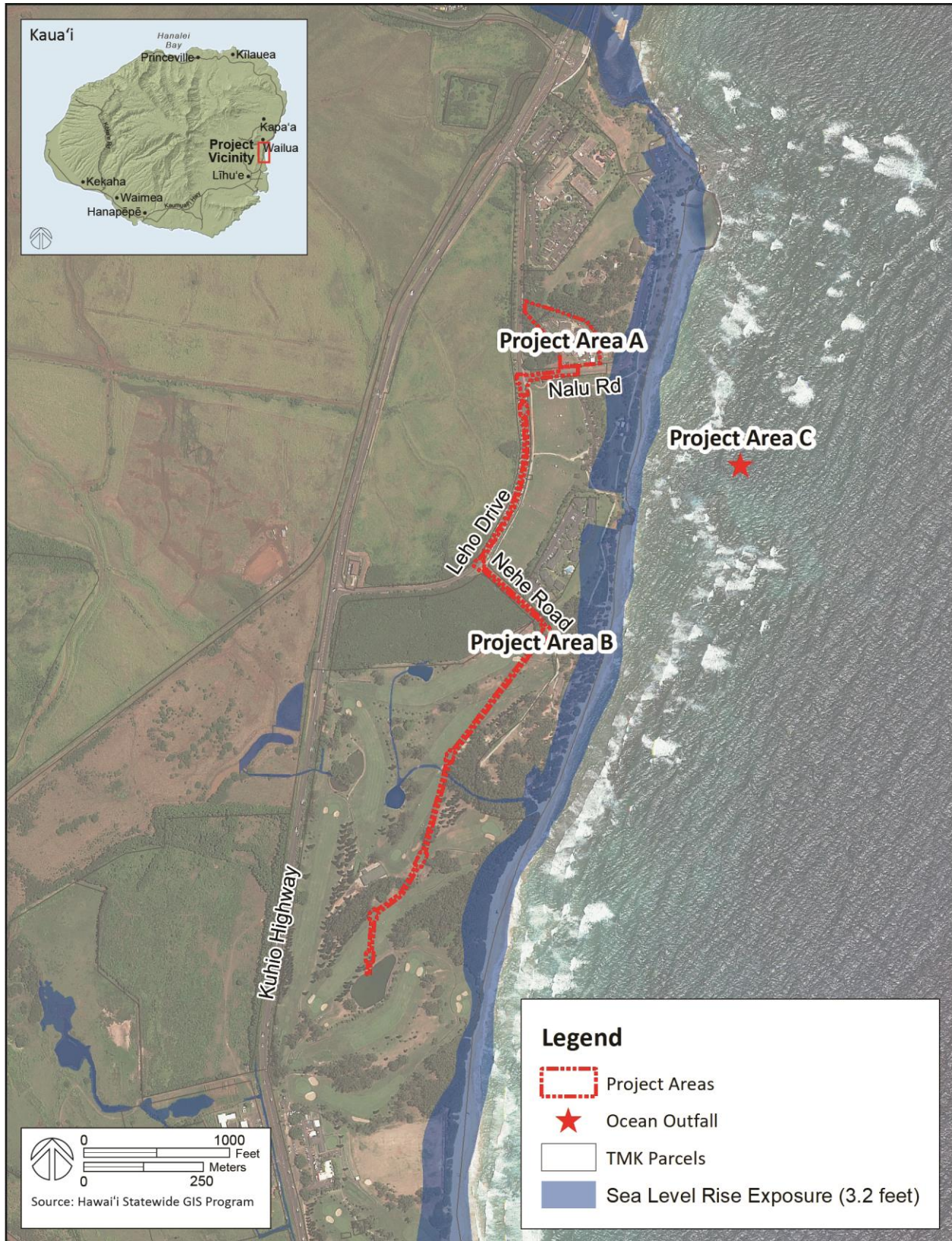


Figure 3-4: Sea Level Rise Exposure

## 3.5 TERRESTRIAL BIOLOGICAL RESOURCES

### 3.5.1 Terrestrial Vegetation

#### 3.5.1.1 Existing Conditions

A botanical survey of the proposed project area was conducted to inventory the flora and provide a general description of the existing vegetation, search for threatened and endangered species and species of concern and provide recommendations regarding potential impacts to the plant resources in regards to the proposed project (AECOS, 2019).

A pedestrian transect was created to view all vascular plants growing within the distinct parts of the project area. Project Area A, a 1.6-acre undeveloped area adjacent the existing WWTP, is comprised of a mixture of scrub and tall grass. There are regularly maintained grass verges along Leho Drive and Nalu Road. The recycled water force main follows the existing roadways and adjacent maintained grass verges along Leho Drive, Nalu Road, and Nehe Road before entering the Wailua Municipal Golf Course. The golf course is primarily a maintained lawn covered by close-cropped Bermuda grass (*Cynodon dactylon*). Other typical species along the golf course include ironwood trees (*Casuarina equisetifolia*) and coconut palms (*Cocos nucifera*).

#### 3.5.1.2 Potential Impacts and Mitigation

##### 3.5.1.2.1 No Action Alternative

Under the No Action Alternative the Proposed Action would not occur and there would be no change to terrestrial vegetation. Therefore, no impacts to terrestrial vegetation would occur with implementation of the No Action Alternative.

##### 3.5.1.2.2 Proposed Action Alternative

Under the Proposed Action, vegetation removal will be confined to existing landscaped areas and areas of invasive vegetation. For Project Area A, a cluster of ironwood trees, haole koa, and Guinea grass will be cleared just northwest of the existing WWTP wall to make way for the proposed new headworks and access road. Landscaping will replace the invasive vegetation during operations at the WWTP. In Project Areas B, short-clipped invasive grasses and golf course turf will be impacted during the rehabilitation of the recycled water force main. No threatened or endangered plants were identified during the survey and no critical plant habitat is designated within the Project Area. Therefore, no significant impact to terrestrial vegetation would occur with implementation of the Proposed Action.

## 3.5.2 TERRESTRIAL WILDLIFE

### 3.5.2.1 Existing Conditions

Special-status species, for the purposes of this assessment, are those species listed as threatened or endangered under the Endangered Species Act (ESA) and species afforded special protection under the Migratory Bird Treaty Act (MBTA).

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the U.S. Fish and Wildlife Services (USFWS) to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat.

Birds, both migratory and most native-resident bird species, are protected under the MBTA. Under the MBTA, it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation.

Avian and terrestrial mammalian surveys were conducted for the proposed project to determine the presence of any avian and terrestrial mammalian species currently listed, or proposed for listing under the federal or State of Hawai'i endangered species statutes within or adjacent to the project area (AECOS 2019).

#### **3.5.2.1.1. Avian Survey**

Four avian point count stations were established covering the project area. A single eight-minute avian point-count was made at each of the count stations, conducted in the morning hours. Field observations were made with binoculars and by listening to vocalizations. In addition, the general vicinity was searched for species and habitats.

The findings of the avian survey are consistent with the location of the sites, the habitats found there, and their current usage. Little difference exists in avian assemblages present on each site, and all the species recorded can be expected to occur at any of the sites on a temporal or seasonal basis. A total of 216 birds representing 13 species and 12 families were recorded during the avian survey. The most common species identified were the chicken (*Gallus* sp.), the common Myna (*Acridotheres tristis*), and the house finch (*Haemorhous mexicanus*) and together, these species accounted for 59% of all birds recorded during the survey.

In addition, four black-necked stilts (*Himantopus mexicanus knudseni*) were identified in the irrigation holding pond. The black-necked stilt is an endemic species listed as endangered under both Federal and State of Hawai'i endangered species statutes. Although not recorded during this survey, several other endangered water birds have been identified on the golf course in recent surveys including the Nēnē (*Branta sandvicensis*), the Hawaiian Coot (*Fulica alai*), the Common Moorhen (*Gallinula galeata sandvicensis*), and Hawaiian Duck (*Anas wyvilliana*).

#### **3.5.2.1.2 Mammalian Survey**

The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. Three terrestrial mammalian species were detected within the project areas including the domestic dog (*Canis lupus familiaris*), house cat (*Felix catus*) and pig (*Sus scrofa*). Although no rodents were recorded during the survey, it is likely that one or more of the four established Muridae found on Kaua'i—European house mouse (*Mus musculus domesticus*), roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*)---use resources

found within the project area on a seasonal basis. These human commensal species are drawn to areas of human habitation and activity. All introduced rodents are deleterious to native fauna.

No mammalian species currently proposed for listing or listed under either the federal or State of Hawai'i endangered species statutes were recorded on this site (State of Hawai'i Department of Land and Natural Resources 1998; USFWS 2016). The findings are consistent with the current habitat present along the survey corridor and the developed nature of the project area.

The one endangered mammal known to exist on Kaua'i, the Hawaiian hoary bat, 'ōpe'ape'a (*Lasiurus cinereus semotus*), was not recorded during the survey. However, the Hawaiian hoary bat is widely distributed in the low to mid-elevation areas on the island, and these bats have been documented in areas with dense vegetation.

### **3.5.2.2 Potential Impacts and Mitigation**

#### **3.5.2.2.1 No Action Alternative**

Under the No Action Alternative the Proposed Action would not occur and there would be no change to terrestrial wildlife or habitat. Therefore, no impacts to terrestrial wildlife would occur with implementation of the No Action Alternative.

#### **3.5.2.2.2 Proposed Action Alternative**

The Proposed Action would take place in previously developed areas and would have limited impacts to terrestrial wildlife through the implementation of standard construction best management practices. Specific considerations and BMPs for protected species are discussed below.

#### **Hawaiian Hoary Bat**

Though no Hawaiian hoary bats were identified during the biological survey for this project, the endangered species is widely distributed in the lowland areas on Kaua'i, particularly in areas of dense vegetation. AECOS determined that minimal suitable habitat occurs within Project Area A (WWTP). Construction activities could have short-term, temporary impacts to bats during clearing and grubbing phases. The proposed action does call for clearing an area NW of the existing WWTP footprint. The trimming or removal of foliage and/or trees within the construction areas may temporarily displace individual bats, which may use the vegetation as a roosting location. Potential adverse effects from such disturbances can be avoided or minimized by not clearing woody vegetation taller than 15 feet between June 1 and September 15, the pupping season. Considering the area of proposed vegetation clearing is not prime bat habitat, the area of clearing is relatively small and BMPs are clear, the Proposed Action is not anticipated to have negative effects on the Hawaiian hoary bat population.

#### **Hawaiian Waterbirds**

The only protected waterbird species recorded during the avian survey was the Hawaiian Stilt, which is listed as an endangered species under both federal and state of Hawai'i endangered species statutes. This species was observed utilizing the irrigation holding pond. The irrigation holding pond would be drained during the rehabilitation of the recycled water force main, and stilts and other waterbirds would be expected to relocate to other nearby ponds or water features. The irrigation pond is not the primary

foraging or breeding habitat for the Hawaiian Stilt and there are alternate sites both on the golf course and near the golf course that can provide suitable habitat for the stilt. There are two additional ponds at the golf course and there are wetlands nearby, to the west and south of the golf course. There will be no long-term impact to the pond itself and construction activities will be temporary; thus the Hawaiian Stilt will not be impacted for the long term.

Although not recorded during the survey for this project, other endangered waterbirds known to frequent the Wailua Golf Course include the Hawaiian Coot, the Common Moorhen, and the Hawaiian Goose (Nēnē). The habitat that characterizes the golf course is not considered appropriate for the Coot and the Moorhen. The Nēnē uses the golf course for grazing and browsing. In the short-term, construction activities may impact the Nēnē who are foraging on the golf course. However, there is ample room at the golf course and many alternate sites where Nēnē can graze. There is not expected to be any long-term impacts to any of the listed waterbirds.

### ***Hawaiian Seabirds***

Though no seabirds were recorded during the survey for this project, the endangered Hawaiian Petrel, the Band-rumped Storm Petrel and the threatened Newell's Shearwater have been recorded over-flying the general project area between April and November. The main concern with these seabirds is that night lights can cause nocturnally flying seabirds to become disoriented during the nesting season leading to predation or death. The two main circumstances in which outdoor lighting could pose a threat to seabirds are: a) during construction, if it is deemed expedient or necessary to conduct night-time construction activities; b) following build-out, the potential use of streetlights or other exterior lighting during the seabird fledgling season which runs from September 15 through December 15. If night-time construction activity or equipment maintenance is considered necessary during construction, all lights should be dark-sky compliant and flood/work lights should be placed on poles high enough to allow lights to point directly to the ground. If exterior lights or streetlights are installed in conjunction with the project (for example at Project Area A [WWTP]), lights should be dark-sky compliant. If such mitigation is taken, the proposed actions are not expected to result in deleterious impacts to protected seabirds.

### ***Critical Habitat***

There is no federally delineated Critical Habitat for any avian or mammalian species at the project area. Thus, modifications of habitat on the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

### ***Endangered Species Act Consultation***

DOH initiated informal consultation with USFWS Pacific Islands Office under Section 7 of the ESA for the Proposed Action's potential impacts to ESA-listed species (Appendix A). As part of the consultation, DOH identified measures to avoid and/or minimize impacts to ESA-listed species (Table 3-1). With the implementation of the avoidance and minimization measures, USFWS concurred that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian hoary bat, the Hawaiian seabirds, the Hawaiian waterbirds, and the Hawaiian goose.

Therefore, implementation of the Proposed Action would not result in significant impacts to terrestrial wildlife.



**Table 3-1 Avoidance and Minimization Measures for ESA-listed Species**

***Hawaiian Hoary Bat***

1. Woody plants greater than 15 ft. tall will not be cleared between June 1 and September 15, the period in which bats are potentially at risk from vegetation clearing.
2. Barbed wire will not be utilized for fencing.

***Hawaiian Seabirds***

1. All outdoor lights will be fully shielded so the bulb can only be seen from below bulb height and only used when necessary.
2. Automatic motion sensor switches and controls will be installed on all outdoor lights or lights will be turned off when human activity is not occurring in the lighted area.
3. Nighttime construction will be avoided during the seabird fledging period, September 15 through December 15. If nighttime construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights will be shielded.

***Hawaiian Waterbirds***

1. A qualified biological monitor will conduct Hawaiian waterbird and nest surveys at the proposed project site prior to project activities, and after any subsequent delay in activities of three or more days.
2. Any documented nests or broods within the project vicinity will be reported to the U.S. Fish and Wildlife Service (Service) within 48 hours.
3. A 100-foot buffer will be established and maintained around all active nests and /or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
4. If a listed Hawaiian waterbird is observed within the project site, or flies into the site while activities are occurring, the biological monitor will halt all activities within 100 feet of the individual(s). Work will not resume until the Hawaiian waterbird(s) leave the area on their own accord.
5. A report will be submitted to the Service within 30 days of the project being completed. The report will include the results of Hawaiian waterbird surveys, the location and outcome of documented nests, and any other relevant information.
6. Predator trapping will occur at least 30 meters from any known nest site. Live traps will have a shade to reduce heat stress and will be checked daily when open. A metal mesh barrier/hurdle or box will be placed in front or over live traps to reduce any non-target species catch. A24 traps will be mounted high enough to be out of reach for non-target species.

***Hawaiian Goose***

1. The qualified biological monitor will conduct a survey for the Hawaiian goose prior to the initiative of any work, or after any subsequent delay in work of three or more days. The same protocol for the Hawaiian waterbirds will be conducted for the Hawaiian goose.
2. If a nest is discovered, work will cease, and the Service will be contacted for further guidance.
3. Predator trapping will occur at least 30 meters from any known nest site. Live traps will have a shade to reduce heat stress and will be checked daily when open. A metal mesh barrier/hurdle or box will be placed in front or over live traps to reduce any non-target species catch. A24 traps will be mounted high enough to be out of reach for non-target species.

### 3.6 MARINE BIOLOGICAL RESOURCES

The shore in the Project area is a sand beach, grading onto a gently sloped limestone reef platform. Bisecting the limestone platform are numerous sand-filled channels or grooves oriented perpendicular to the shoreline. Owing to the northeast facing orientation of the shore, the area is directly impacted by Tradewind-generated seas. In addition, refracting long period swells from the south and north also generate breaking surf on the nearshore reef platform. As a result, the nearshore area is generally under more-or-less constant impact from waves (MRC, 2012).

Marine Research Consultants Inc. conducted biological monitoring for the receiving waters of the Wailua WWTP outfall (2017). Observations of the diffusers indicate that there is no evidence of deposition of effluent material on the reef surface. The high degree of water motion, created by seaward-flowing rip current that has been a consistent feature of the area during all surveys to date, rapidly dilutes and disperses the effluent.

While the effluent discharge cannot be unequivocally be eliminated as a factor in the lack of benthos, particularly corals, in the vicinity of the diffusers, other environmental factors must also be considered. The primary factor appears to be a seaward-flowing rip current of high turbid water and suspended sediment that continually flows offshore through the gap in the reef where the diffusers are located. As most of the reef flat is very shallow, one of the only avenues of seaward return from the surf zone is through the channel occupied by the outfall. The turbid water in the rip is likely a result of the resuspension of particulate material (sand) and the inner surf zone. There have been no visual indications during previous surveys of any disease or pathological abnormalities with any of the biota or fish in the area of the discharge.

#### **3.6.1 Essential Fish Habitat**

AECOS conducted an analysis of Essential Fish Habitat (EFH) for the marine waters off the project area in 2022 (AECOS 2022). The complete report can be found in Appendix A. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). The project vicinity is located within the boundaries of the Hawai'i Archipelago Fishery Ecosystem Plan (FEP; WPRFMC, 2009a). This place-based FEP uses an ecosystem-based approach with "geographically defined ecosystem plans containing identical fishery regulations." The FEP identifies and categorizes Management Unit Species (MUS) based on the managed fisheries and incorporates all of the management provisions of the former Fishery Management Plans with updates. Waters off the Wailua WWTP are designated as EFH (including water column and all bottom areas) for coral reef ecosystem, bottomfish, pelagic, and crustacean MUS. According to the EFH designations in the Hawai'i FEP, the Project vicinity is absent of EFH for precious corals, deep-water shrimp, and seamount ground fish.

The Hawai'i and Pelagic FEPs further identify ecologically valuable subsections of EFH for the above MUS as "habitat areas of particular concern" (HAPC). These HAPCs are based on the importance of the ecological functions provided, the sensitivity to human or development-induced environmental degradation or stress, and rarity. There are no HAPC within, adjacent to, or near the Project area.

### **3.6.2 Endangered Species Act**

There were no coral colonies observed along the diffusers during site visits (Marine Research Consultants Inc., 2017). Turf algae and coral were present at the outer margins of the area during the site visits and has been documented as part of the NOAA maps for the area. The outfall channel is dominated by uncolonized sandy substrate.

No Green Sea Turtles, Hawksbill Sea Turtles, Humpback Whales, or Hawaiian Monk Seals were observed during any of the previous site visits to the outfall. However, sand beaches like the one mauka of the outfall are an important element for sea turtle and monk seal habitats. The project site is within Hawaiian Monk Seal critical habitat, but is not within the Humpback Whale Sanctuary.

### **3.6.2 Potential Impacts and Mitigation**

#### **3.6.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to marine species or essential fish habitat. Therefore, no impacts to marine biological resources would occur with implementation of the No Action Alternative.

#### **3.6.2.2 Proposed Action Alternative**

The Proposed Action would include minor in-water construction work to install the ocean outfall diffuser risers. All equipment and materials will be transported to the project site by the work vessel. The work vessel would place its anchor at in the vicinity of the outfall. The anchor locations would be verified by divers to be in a location free of coral prior to setting anchors during operations. The dive team would access the diffusers, remove debris from the flange faces of the three open diffusers, and attach the new modifications to the flange faces.

It is anticipated that the fishes that occur in the Project vicinity will actively avoid direct impacts from Project activities. Some impairment of ability of EFH managed species to find prey items could occur, but this effect should be temporary and spatially limited to the immediate vicinity of the modification activities. The modified structures will maintain fish habitat and foraging resources in the Project area.

Direct impacts to marine resources by Project activities are anticipated to be minimal. No coral resources occur on the outfall diffusers that would be impacted from the modifications. Any biological assemblages residing on and around the existing outfall diffusers are not anticipated to be compromised.

Potential indirect impacts to coral reef ecosystems from construction activity of the Project may occur from degradation of water quality. Project construction may temporarily increase the amount of suspended sediment in the water column, although disturbance of the bottom is expected to be minimal. Impacts to water quality associated with Project activities will be short-term and temporary and can be minimized using appropriate construction BMPs.

The installation and operation of the outfall diffuser risers are unlikely to reduce the quantity and quality of EFH in the nearshore environment. Effects to EFH area will be minimal because: 1) the

impact at the site is low intensity, 2) marine resources at the outfall diffuser site are limited, with no sensitive or vulnerable (e.g. coral) resources present, and 3) the modification work will occur over a short time period.

DOH initiated consultation with NOAA National Marine Fisheries (NMFS) regarding potential adverse effects to essential fish habitat from the Proposed Action. DOH determined and NOAA NMFS concurred that the Proposed Action would result in minimal effects to EFH in the project area.

Consultation on potential effects to ESA-listed species was conducted as part of the USACE Nationwide permitting process under the Standard Local Operating Procedures for Endangered Species in the Central and Western Pacific Region (PAC-SLOPES). USACE and NOAA issued a notification and verification form that the is not likely to adversely affect endangered or threatened under the ESA and NMFS jurisdiction or to destroy or adversely modify designated critical habitat.

Therefore, implementation of the Proposed Action would not result in significant impacts to marine biological resources.

## 4. HUMAN ENVIRONMENT

This chapter analyzes the following resources in detail: existing and surrounding land use, air quality, noise, historic and archaeological resources, visual environment, and hazardous and regulated materials.

Impacts to the following resource areas were negligible or nonexistent, therefore, they were not analyzed in detail:

**Socioeconomic Factors:** The Proposed Action would not contribute to changes in socioeconomic conditions (i.e., population, housing, or community character) on Kauai. There would be no change in the number of personnel assigned to operate the Wailua WWTP or the Wailua Municipal Golf Course, and there would be no change to the overall wastewater treatment capacity of the Wailua WWTP. The Proposed Action would include construction period expenditures, but this spending would have a negligible effect on overall socioeconomic conditions.

**Environmental Justice:** The Proposed Action and the surrounding area of Wailua is located within Census Blockgroup 150070404013. Compared to State of Hawaii averages, this Blockgroup is in the 45<sup>th</sup> percentile for people of color and the 40<sup>th</sup> percentile for low-income populations. (EJ Screen Community Report, 2022). Additionally, the Proposed Action would improve and rehabilitate processes and facilities at the existing WWTP, recycled water force main, and ocean outfall diffusers. It would not introduce new major facilities or uses. Therefore, the Proposed Action would not result in disproportionately high and adverse human health or environmental effects on low-income or minority communities.

**Infrastructure and Utilities:** The Proposed Action wouldn't significantly change the demand for potable water, electricity, telecommunications, drainage, or solid waste disposal services. The proposed WWTP improvements would include process improvements at the Wailua WWTP, but the capacity of the facility would remain unchanged. Additionally, the recycled water force main rehabilitation would extend the existing practice of conveying R-2 recycled water from the Wailua WWTP to the Wailua Municipal Golf Course for irrigation.

**Transportation and Roadways:** During the construction period, rehabilitation of the recycled water force main (Project Area B) would take place within existing rights of way and would have minor, temporary impacts on vehicular traffic along Nalu Road, Leho Drive, and Nehe Road. Impacts would be minimized through the implementation of standard BMPs including construction traffic control plans. The Proposed Action wouldn't change the overall traffic patterns or create additional trips within the project area during the operational period.

**Public Services:** Implementation of the Proposed Action would not increase demand for public services like schools, fire department services, police services, or emergency services.

## 4.1 EXISTING AND SURROUNDING LAND USE

### 4.1.1 Existing Conditions

The project area, which consists of land at the existing WWTP, a wastewater line alignment on Leho Drive and Nehe Road extending into the Wailua Municipal Golf Course, and two separate sites within the golf course, stretches along approximately one mile of Kaua'i's eastern coast. From a regional perspective, WWTP and Wailua Municipal Golf Course are situated between the towns of Wailua and Hanamā'ulu on Kaua'i's east side. Kaua'i's capital, Līhu'e, is approximately 4.9 miles southwest of the project area. This part of Kaua'i is often referred to as the Coconut Coast, a popular slogan for attracting visitors. Although used primarily for resort use, there are only three modest resorts along a 2.7-mile stretch of shoreline. The nearest residential communities are located in Hanamā'ulu (approximately 3.3 miles to the southwest) and Wailua (0.5-1.0 miles to the northwest).

The surrounding area is predominately rural and lightly developed for resort and recreational uses. Kūhiō Highway is the main north-south thoroughfare that provides access to Wailua Wastewater Treatment Plant, Lydgate Beach Park, and the Wailua Municipal Golf Course. Secondary two-lane connector roads, such as Leho Drive, Nalu Road, and Nehe Road, offer vehicular access to destination points along the coast. A north-south mountain range, Kalepa Ridge (highest elevation 709' above MSL) parallels Kūhiō Highway on its mauka side. Lands between Kūhiō Highway and Kalepa Ridge are former sugar cane lands and are generally open grasslands now used for intermittent small-scale cattle grazing. It is surrounded by a spring-fed wetland. The makai or east side of Kūhiō Highway is dominated by the 232-acre Wailua Municipal Golf Course, resorts, parks and recreational areas.

The Wailua WWTP is bordered by east and the north, east, and south (across Nalu Road) by Lydgate Beach Park. Kamalani Playground is located in Lydgate Beach Park, approximately 200 feet north of the WWTP. The Hilton Garden Resort is located approximately 300 feet north of the WWTP. To the west, the WWTP is bordered by a County-owned undeveloped parcel, a portion of which will be used for the proposed WWTP improvements, then by Leho Drive. Across Leho Drive from the WWTP there is a large undeveloped parcel owned by the Department of Hawaiian Homelands (DHHL).

The proposed rehabilitation of the existing 10-inch force main runs from the Wailua WWTP west Nalu Road, Leho Drive, and Nehe Road before entering the Wailua Municipal Golf Course. Existing land uses adjacent to the force main include Lydgate Park and Kaha Lani Resort.

The Wailua Municipal Golf Course is bordered to the west by Kuhio Highway. Kaua'i Community Correctional Center (KCCC) is located mauka of Kuhio Highway, just across the entrance to the golf course. The golf course is bordered to the north by an undeveloped, forested parcel owned by DHHL. A portion of Lydgate Beach Park, including the public camping sites and the Kamalani Bridge Playground, is located between the golf course and the ocean along golf courses northeastern boundary. A sandy beach and the ocean form the remaining eastern boundary of the golf course.

## **4.1.2 Potential Impacts and Mitigation**

### **4.1.2.1 No Action Alternative**

The No Action Alternative would not impact existing or surrounding land uses since no construction activities would occur and there would be no change in existing conditions. Therefore, there would be no impact to existing or surrounding land use from implementation of the No Action Alternative.

### **4.1.2.2 Proposed Action**

The Proposed Action would have no impact on the existing land uses at the Wailua WWTP or the Wailua Municipal Golf Course. No new land uses or changes to existing uses or land use patterns would be introduced by the Proposed Action. Neighboring properties immediately adjacent to the project area may experience typical short-term, construction related impacts such as traffic, noise and dust, which would be minimized through the use of standard construction BMPs. Therefore, there would be no impact to existing or surrounding land use from implementation of the Proposed Action.

## **4.2 AIR QUALITY**

### **4.2.1 Existing Conditions**

Ambient air quality pertains to the purity of the general outdoor atmosphere, external to buildings, to which the general public has access. Ambient concentrations of air pollution are regulated by both National and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 CFR, while State of Hawai'i AAQS are defined in Chapter 11-59 HAR . National and state AAQS have been established for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), ozone (O<sub>3</sub>), and concentrations of airborne particulate matter (less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>)). In addition, the state has also established a standard for hydrogen sulfide (H<sub>2</sub>S).

The two types of national standards are primary and secondary standards. Primary standards define limits to protect public health with an "adequate margin of safety," including the health of sensitive populations such as asthmatics, children and the elderly. Secondary standards define limits to protect public welfare from "any known or anticipated adverse effects of a pollutant," which includes protection against decreased visibility, diminished comfort levels, and damage to animals, crops, vegetation and the man-made environment. State AAQS, which are designed "to protect public health and welfare and to prevent the significant deterioration of air quality," are generally more stringent than national standards.

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The State DOH collects data on selected gaseous and particulate air pollutants from a statewide network of monitoring stations. There is currently one air quality monitoring station on Kaua'i and it is considered a special purpose monitoring station for monitoring cruise ships. The Niupalu monitoring station is located near Nāwiliwili Harbor and is the closest monitoring station to the project area (roughly 6.5 miles southwest of the project). Based on the *State of Hawai'i Annual Summary Air Quality Data* prepared by the Department of Health Clean Air Branch, the Niupalu monitoring station recorded criteria pollutant levels that were below both state and federal AAQS standards for the years 2016-2018. Excluding exceedances due to the volcano on Hawai'i Island, the State of Hawai'i was in attainment of all NAAQS in 2016 (State Department of Health 2016).

Wastewater treatment plants can be a source of nuisance odors to the surrounding community if not properly designed and/or operated. Typically, nuisance odors are most commonly associated with anaerobic (without oxygen) conditions at the headworks (the facility where raw sewage enters the WWTP), and with residual solids processing. Hydrogen sulfide is the primary source of the nuisance odor.

At the WWTP itself, air quality is primarily a problem during times when winds shift to the south and adjacent beach park users are exposed to odors coming from the plant. Present air quality at the project area is mostly affected by air pollutants from vehicular and natural sources.

#### **4.2.2 Potential Impacts and Mitigation**

##### **4.2.2.1 No Action Alternative**

The No Action Alternative would not affect air quality since no construction activities would occur and there would be no change in existing operations of the Wailua WWTP. Therefore, there would be no impact to air quality from the implementation of the No Action Alternative.

##### **4.2.2.2 Proposed Action Alternative**

The Proposed Action would not introduce any new air emissions sources or modify existing stationary sources to affect long-term air quality. Short-term, temporary air emissions such as fugitive dust and exhaust emissions from construction equipment would be generated during the construction period. These potential impacts would be minor and short-lived. The contractor would be required to employ BMPs to minimize particulate emissions during construction. All construction activities would comply with the provisions of HAR 11-60.1-33 (Fugitive Dust). Because the State of Hawai'i is in attainment of the NAAQS, the Proposed Action is not subject to the Clean Air Act's General Conformity Rule.

To combat the long-term effects of the primary odorous compound hydrogen sulfide, the Wailua WWTP will utilize an odor control system.

Therefore, implementation of the Proposed Action would have a minor, beneficial impact on air quality in the vicinity of the Wailua WWTP.

#### **4.3 NOISE**



### **4.3.1 Existing Conditions**

Noise levels in the vicinity of the project area are typical of low-density resort area. Consistent with the character of the surrounding recreational and resort use, the predominant noise sources in the project area include vehicular traffic from Nalu Road and Leho Drive, nearby recreational noises from Lydgate Beach Park and Wailua Municipal Golf Course, and noises from the operations of the existing Wailua Wastewater Treatment Plant.

Noise sensitive receptors in the vicinity of the project area include the cottages associated with the Hilton Garden Inn located approximately 300 feet north of the WWTP and the Kaha Lani Resort located approximately 150 feet north of the proposed force main rehabilitation along Nehe Road. Other land uses adjacent to and near the project area is mostly dedicated to day-time recreational use (i.e., Lydgate Beach Park and the Wailua Municipal Golf Course).

Various local and federal agencies have established guidelines and standards for assessing environmental noise impacts and have set noise limits as a function of land use. The State of Hawai'i's Community Noise Control Rule (HAR §11-46) identifies three classes of zoning districts and specifies maximum permissible sound levels due to stationary noise sources. Noise related to construction activities is also regulated. For Class A zoning districts—the equivalent to lands zoned residential, public space and open space—the maximum permissible sound levels are 55 A-weighted decibels (dBa) for daytime (7 a.m. to 10 p.m.) and 45 dBa for nighttime (10 p.m. to 7 a.m.). Noise sources above the permissible sound levels are required to obtain a permit prior to the related activities.

### **4.3.2 Potential Impacts and Mitigation**

#### ***4.3.2.1 No Action Alternative***

The No Action Alternative would not affect noise levels or noise generating sources since no construction activities would occur and there would be no change in existing conditions. Therefore, implementation of the No Action Alternative would have no impact on the noise environment.

#### ***4.3.2.2 Proposed Action Alternative***

The Proposed Action would not introduce any new major noise sources or modify existing noise levels to affect the long-term noise environment. The operations and use of the WWTP and the effluent disposal system is not a major source of noise. Short-term, temporary noise impacts would occur during the construction phase. The dominant sources of noise during construction would be from site preparation activities requiring the use of earth-moving and material-handling equipment, such as backhoes, compactors, pavers and trucks. The noise level of typical construction equipment is estimated to range between 75-95 dBA at a distance of 50 feet (EPA 1971), although actual noise levels produced would relate to the methods employed during each stage of the construction.

Compliance with the State of Hawai'i, Department of Health (DOH) standards for allowable noise levels (Chapter 11-46 HAR Community Noise Control) would help to minimize construction-related noise impacts. The use of appropriate measures, such as scheduling activities during specific times of the day (i.e., no nighttime work near noise-sensitive uses), installing mufflers on construction equipment and vehicles with exhaust systems and installing noise barriers, would further minimize

potential noise impacts to noise sensitive receptors near the project areas. Therefore, implementation of the Proposed Action would have a less than significant impact on the noise environment.

#### 4.4 HISTORIC AND ARCHAEOLOGICAL RESOURCES

##### 4.4.1 Existing Conditions

An Archaeological Literature Review was prepared by Pacific Consulting Services, Inc. to determine the land-use history of the project area and to identify any historic or archaeological resources within the APE. The findings of the study are summarized in this section and in Section 4.4.2. The study is included in Appendix C.

The project area is located in the ahupua'a of Wailua in the traditional moku (district) of Puna. In ancient times, Wailua was one of two royal centers on Kaua'i, the other being Waimea, on the west side of the island. Wailua was chosen by the ali'i for its fertile soil, fresh water, rich marine resources, safe canoe landings, and good surf. The large numbers of heiau (Hawaiian ritual site or temple) and other cultural sites at Wailua confirm the traditional importance of this area. The area was a social and political center of the kingdom of Kaua'i by AD 1300-1350. Wailua is translated as "two waters," possibly referring to the North and South Forks of Wailua River. The ahupua'a is also thought to be named after the high chief Wailuanuiaho'āno, who was born in 'Ewa, O'ahu, the son of La'akona and the 'Ewa family by Ka-ho'ano-o-Kalani.

##### ***Legendary Traditions of Wailua***

A survey of traditional mythological literature indicates that Wailua is prominently associated with many famous legendary and historical figures including Maui, Kawelo, Pikoikaala, Laieikawai, Mō'ikeha, La'amaikahiki, and Ka'ililauokekoa (Bushnell et al. 2004: 36). Wailua was prominent in that it was the site of many "firsts." The first kalo and 'uala on Kaua'i were said to be planted by Mō'ikeha in Wailua. Mō'ikeha's hānai (foster) son, La'amaikahiki, brought the first temple drum to the islands and placed it at the heiau of Holoholoku at Wailua. Here also were introduced the first hau trees on Kaua'i at Hihiakalahau along the Wailua River below Poliahu Heiau, and the first coconut tree in the islands at Molohua, north of the river mouth.

##### ***Wailua in the Māhele***

The ahupua'a of Wailua was claimed and awarded to Kamehameha III during the Māhele. Deborah Kapule Kekaiha'akūlou (known as Kapule), former wife of Kaumuali'i, and her son Iosia Kaumuali'i claimed most of the makai lands in Wailua. Subsequently, fifty-one parcels totaling approximately 75 acres were awarded to twenty-seven individual claimants in Wailua. All the parcels were within approximately a mile of the shore. Two Land Commission Awards (LCAs) were granted north of Project Area A, near the mouth of Wailua River and Hauola place of refuge, approximately 1,097 feet (335m) north of the existing Wailua Wastewater Treatment Facility.

##### ***Wailua in 1840***

The U.S. Exploring Expedition visited Wailua in October 1840. At the time, Kapule was living at Wailua, having moved there in 1835. The following is a description of Wailua at the time of the expedition:

The country on this route was uninteresting, until they reached Wailua, the residence of Deborah, a chief woman of the islands, readily known as such from her enormous size, and the cast of her countenance. She has a person living with her called Oliva Chapin, who speaks English, and has learned how to extort money. Deborah has about forty men in her district; but they were absent, being employed in the mountains cutting timber to pay the tax to the king.

Near Deborah's residence are extensive fishponds belonging to her [located at today's Coco Palms on the north side of Wailua River], which have been made with great labour: they are of different degrees of saltiness. The fish are taken from the sea when young and put into the saltiest pond; as they grow larger, they are removed into one less salty, and are finally fattened in fresh water. While our gentlemen were there, Deborah received young fish in payment of the poll-tax, which were immediately transferred to her ponds.

Wailua (two waters) was formerly a place of some importance. It is situated on a small stream of the same name, in a barren, sandy spot.

Deborah furnished them with a double canoe, to carry them up the river to visit the falls. Taking the western branch, they ascended it for two and a half miles.

There are many good taro patches and sugar plantations on its banks. They landed in what appeared to have been an old crater, in front of a basin, with high perpendicular bank. The low grounds along the river are extremely fertile, producing bread-fruit, sugar-cane, oranges, etc. The latter, however, are suffering from the blight, and some of the trees were covered with a black smut, produced by a species of aphid.

In ascending, an insulated black rock is passed, known as the "Muu," which has been detached from a high rocky bluff that is remarkable for the dikes visible in it (Wilkes 1845:68).

Kapule stayed at Wailua until 1850 when she returned to Waimea.

### ***Rice and Sugar Cane Plantations***

By the 1870s, the taro planted in alluvial terraces along the Wailua River had been largely replaced with rice, while the uplands were used for cattle grazing and sugar cane cultivation. Handy, who did much of his fieldwork in the first decades of the 20<sup>th</sup> century describes Wailua:

Along the lower 2 miles of Wailua River, above the sandy coastal plain, are many broad, open, level areas, formerly terraces, now mostly sugar. Opaekaa Stream, which flows into tidewater Wailua River, watered many terraces both above and below the falls. The large area of terraces below the falls is now planted mostly in rice, a few of the upper terraces being used for sweet potatoes, while the uppermost are pasture (Handy 1940:67-68).

The Lihue Plantation, originally formed in 1849, leased 30,000 acres at Wailua in 1878. A 1939 map shows the Wailua Field 5 partially extending into the project area (Project Area B along Leho Drive).

### ***Lydgate Beach Park and Wailua Golf Course***

Reverend John Mortimer Lydgate was a plantation manager and surveyor for the Hawaiian Kingdom and later for the Territory of Hawai'i. In 1921, he petitioned the territorial governor to set aside land for a public park. Land was granted along the sunny eastern coast in an area that was useless for the cultivation of sugar cane. Just the previous year, the Ahukini Terminal & Railway Company built a railroad from Ahukini to Anahola to haul sugarcane, workers, and freight. The railroad traversed the new Lydgate Park parcel. The railroad was dismantled following the transition from railroad hauling to truck hauling around 1957. Today, a bike path uses a portion of the former railroad alignment.

The south portion of Lydgate Park became the Wailua Golf Course starting in 1920. In the 1960s, the course was expanded by 9 holes becoming an 18-hole golf course. Also during the 1960s, Kaha Lani and Hilton Garden Inn (formerly the Wailua Resort) were constructed. Lydgate Park was added to the Wailua River State Park in 1962. In 1992, the park was subdivided whereby 4.8 acres containing Hikinalā Heiau was retained by the State's Wailua River Park and the remaining 45.5 acres was transferred to the City and County of Kaua'i (Vernon and Clark, 2020:18).

### **Archaeological Sites in the Vicinity of the Project Area**

#### ***Wailua Complex of Heiau***

There are several historic sites located near the mouth of the Wailua River that are part of a larger complex of heiau and historic sites, the Wailua Complex of Heiau (Site 50-30-80-502). The sites within the Wailua Complex of Heiau include the following: Hikinaakalā and Hau'ola, Pae Ki'i Māhū o Wailua, Malae Heiau, Holoholoku Heiau, Pōhaku Ho'ohānau and Pōhaku Piko, Poliahu Heiau, and the Bellstone. Of these sites, three are near the project area: Malae Heiau, Hikinaakalā Heiau and Pae Ki'i Māhū o Wailua petroglyphs. The Wailua Complex of Heiau was designated a National Historic Landmark in 1962.

#### ***Hikinaakalā Heiau***

Hikinaakalā Heiau, SIHP Site 50-30-08-105, is located south of the Wailua River mouth. Translated as "rising of the sun," the heiau overlooks Wailua Bay and faces the rising sun. The rectangular enclosure encompasses one acre of land on the northern edge of Lydgate Beach Park. The walls were originally 6 feet high and up to 11 feet wide on the southern side. In the late 1800s and early 1900s, rocks were removed during the construction of nearby roadbeds. Further destruction occurred between 1907, when the first description of the heiau was made, and 1930. Today, all that remains are a parallel row of large, upright boulders that formed the foundation of the original massive walls.

Hikinaakalā is associated with the ruling chief of Kaua'i, Wailuanuiahoano, who lived during the 14<sup>th</sup> century. Little is known about the function of this heiau; however, it is associated with a row of wooden ki'i (statues) that were placed outside of the walled enclosure facing the river—and served as guardians of the site. This heiau is situated 1,100 feet north of the Wailua WWTP.

#### ***Pae Ki'i Māhū o Wailua***

Ka Pae Ki'i Māhū, SIHP Site 50-30-08-105a, are a cluster of eight petroglyph boulders (ki'i pōhaku) within a series of 61 boulders located at the mouth of the Wailua River and just north of Hikinaakalā Heiau. The boulders are a fine-grained grey-blue basalt and are only visible sporadically, when sands

shift at the river mouth and it is low tide. The meaning behind the human, fish, and geometric images is not known. This site is located approximately 1,600 feet north of the Wailua WWTP.

### ***Malae Heiau***

Malae Heiau (also known Malaeha'akoa, Malaea and Makaukiu), SIHP Site 50-30-08-105, is located south of the Wailua River and adjacent to and west of Kūhiō Highway. This heiau is situated on a high point with a commanding view of the river, its companion heiau (Poliahu) on the north side of the river at 200 ft elevation, and Hikinaakalā Heiau at the river mouth. It is the largest remaining heiau on Kaua'i encompassing almost two acres. The original walls were 8-10 feet high and 8 feet wide with a 6-foot-wide interior ledge that may have been used for seating. The corners of the heiau were buttressed with 13-foot-high walls. Archaeological records indicate an early period of construction, before 1200 AD. The heiau construction is attributed to the Menehune. Following the overthrow of the kapu system, Debora Kapule converted the heiau to a cattle pen. This heiau is situated approximately 1,400 feet northwest of the Wailua WWTP.

### ***Hau'ola***

Hau'ola was the traditional name given to this part of Wailua Beach. In addition, this name was used to designate a pu'uhonua, place of refuge, at the north end of Hikinaakalā Heiau. In ancient times, it was the kapu, the sacred law, that regulated all facets of life. The kapu was dictated by the ali'i nui (high chief) and their kahuna (priests). Anyone who violated the kapu could be put to death. The pu'uhonua was a place that kapu breakers could seek refuge and forgiveness. The pu'uhonua is also a place where people could escape punishment and find safety during times of war. The boundaries of the pu'uhonua may have changed over time, at one time including much of the ahupua'a of Wailua.

### ***Lithic Scatters***

After a 1990 sugarcane harvest adjacent to Malae Heiau, an artifact scatter was exposed. A surface collection was carried out, which yielded adze preforms, flakes, and cores around the exterior of the heiau wall. This artifact scatter was designated SIHP Site 50-30-08-00104A. Kikuchi (1987) had also conducted a study of adze fragments from the heiau area recovered after a sugarcane harvest in 1973 (Drennan 2008:22).

Site 50-30-08-5013 consists of a pre-Contact surface lithic scatter with four loci and one outlier located approximately 157 ft west of Malae Heiau. Locus A and Locus B are near the current project area. At Locus A, 111 artifacts were recorded. Locus B was located 656 feet south of Malae Heiau. This site may be associated with Malae Heiau and the Wailua Heiau Complex.

### ***Human Burials***

Site 50-30-08-103 encompasses approximately 100 human burials within the sand dunes of coastal Wailua, south of the Wailua River. This area is traditionally known as Walio (or Alio) (Bushnell et al. 2004:57, 100). Many of the burials have been found in separate occasions and were assigned different site numbers. The following instances of burial discovery have been documented within Site 50-30-80-103: 13 human burials and disarticulated human skeletal remains encountered in the 1970s at Wailua Golf Course (designated Sites 50-30-08-542, -546, -819) [Cox 1977]; one burial encountered at Wailua

Golf Course in the early 1990s (designated Site 50-30-08-9357) [Beardsley 1994]; remains of eight individuals from a disturbed or secondary deposit at Wailua Golf Course (designated Site 50-30-08-1980); 44 human burials and 42 instances of disarticulated human skeletal remains encountered at Wailua Golf Course (Fager and Spear 2000); and two human burials and two instances of isolated human skeletal remains found at Lydgate Park (Morawski and Dega 2003). These burials date to the pre-Contact and early Historic Period. However, it has been mentioned by Stanley B. Porteus (1962) that some of the burials may not be Hawaiian. Porteus reported that “about 2,000 Polynesians, mostly Gilbert Islanders” immigrated to the island for work in the late 19<sup>th</sup> century (Kuykendall 1967:127). “Those that did not die returned home---the rest were buried in the sand dunes alongside what is now the golf course near Kapaa, Kauai [Wailua Golf Course]” (Porteus 1962:159).

Also documented under Site 50-30-08-103 is Site 50-30-08-356. This site is a subsurface cultural layer (with traditional artifacts) and three fire pit features. One of the fire pit features yielded a date range of A.D. 1440 to 1670 (Fager and Spear 2000).

### ***Historic Agricultural Feature***

Site 50-30-08-5013 is a historic agricultural water transportation system comprising five features and three sub-features. These features represent a sample of the approximately 100 features the site is believed to comprise. Only Feature 5 is near the current project area, described as follows:

Feature 5 was a ditch that descends in elevation from 226 to 81 feet above mean sea level and is 1,280 meters in length and 3.0 meters wide. The ditch was curvilinear and was oriented northwest-southeast (136°/316°). The feature was U-shaped and was excavated along the base contour of the northeast side of Kālepa Ridge [Drennan 2008:35].

### ***Wailua Complex of Heiau***

Though written over 30 years ago, the nomination form for the National Historic Landmark is still relevant and succinctly summarizes the significance of this complex of heiau at Wailua:

The Wailua NHL is significant under National Register criteria A, B, C and D. In size, quality, setting, historic association and information potential, it is one of the most important archaeological site complexes in the Hawaiian Islands with components spanning all phases of Hawaiian culture. Wailua was the principal residence as well as administrative and religious center of Kauai’s paramount chief (ali’i nui) for most of the year. The traditional name of this area is Wailuanui-hoano or “great, sacred Wailua”; it was imbued with mana and kapu and as such it became an important center for the formation of the highest ranking ali’i marital alliances. Wailua was set aside for the exclusive use of the chief, his court and priests. In this context Wailua was comparable to other localities in the Islands such as Waipi’o and Kahalu’u, Hawai’i or Kualoa, Oahu where ali’i resided, young chiefs were raised and trained and numerous heiau were constructed. Further, the temple platforms within the Landmark are testimony to the impressive degree of religious, political and economic power that had evolved on Kauai by European contact in 1778.

Most of the heiau and sacred sites in the NHL complex are associated with legends, rulers, and events that played an important role in Hawaiian culture and are of traditional significance to contemporary Hawaiians of native descent... (Dunbar 1988).

#### **4.4.2 Potential Impacts and Mitigation**

##### **4.3.2.1 No Action Alternative**

The No Action Alternative would not affect historic or archaeological resources since no construction activities would occur and there would be no change in existing conditions. Therefore, implementation of the No Action Alternative would have no impact on historic and archaeological resources.

##### **4.4.2.2 Proposed Action Alternative**

Several archaeological sites were previously identified at or near the project area. Malae Heiau (SIHP Site 00104) and Hikinaakalā Heiau (SIHP Site 00105), part of the Wailua Complex of Heiaus NHL, are located over 1,000 feet north of Project Area A, and would not be affected by the proposed action. SIHP Site 05012, a historic period ditch associated with Lihue Plantation, is located approximately 630 feet west of Project Area A and approximately 370 feet west of Project Area B and would not be affected by the proposed action. At the Wailua Municipal Golf Course, Project Area B is within or partially within the boundaries of SIHP Site 00103, which comprises at least 100 human burials documented within the coastal sand dunes south of the Wailua River.

Of the two project areas, only Project Area A includes existing structures that are greater than 50 years old and could be considered historic. Project Area A encompasses the WWTP and involves a range of improvements to maintain and upgrade existing plant processes. There are six structures located at the WWTP that are greater than 50 years old. Four of these structures (the rapid bloc basins, the sludge drying beds, the breakroom building, and the control building) would remain in place, and would not be affected by the proposed improvements. Two of these structures (the abandoned chlorine contact basin and the boundary wall) would be demolished to make room for the proposed improvements. However, neither of these structures is eligible for listing on the NRHP. Therefore, no effects to historic structures are expected at the WWTP.

Of the two project area locales, archaeological sites, including human burials, are more likely to be encountered at Project Area B where coral dune sands are present. Based on underlying soils and the land use history gleaned from a historical map of Lihue Planation, there is low potential for encountering historic properties at Project Area A; nonetheless, the lack of archaeological research directly associated with the WWTP indicates that the subsurface cultural context is unknown. The rehabilitation of the existing recycled water force main (Project Area B) would be conducted in coral dune sands. Therefore, it would have the potential to impact subsurface archaeological sites.

DOH has initiated NHPA Section 106 consultation with SHPD regarding the Proposed Action. The recommended effect determination for Project Areas A and B is, "effect with proposed mitigation commitments." The recommended mitigation for work in Project Area B (which is within SIHP Site 00103) is archaeological monitoring, while the recommended commitment for Project Area A is archaeological monitoring for identification purposes; both efforts to be guided by an SHPD-approved

Archaeological Monitoring Plan (AMP). The AMP will establish protocols for the recording and mitigation of subsurface cultural deposits in accordance with HAR §13-279-4. Should *iwi kupuna* be inadvertently discovered during ground disturbing activities, all work in the immediate vicinity of the find will immediately cease and the protocols established in HAR §13-300-40 will be implemented. DOH is awaiting SHPD regarding their proposed determination.

Therefore, implementation of the Proposed Action would result in less than significant impacts to historic and archaeological resources.

## 4.5 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) was prepared by Pacific Consulting Services, Inc.(2023) to comply with the State of Hawai'i's environmental review process under Chapter 343 HRS and HAR Section 11-200.1 rules for the environmental impact assessment process which require project proponents to assess proposed actions for their potential impacts to cultural properties, practices, and beliefs. The findings of the study are summarized in this section and in Section 4.5.2. The CIA is presented in Appendix D.

### 4.5.1 Existing Conditions

Work conducted for this CIA included archival map and document research, a review of previous archaeological investigations conducted near the project area locales, as well as an effort to collect cultural information through community consultation. All work was carried out in accordance with HRS Chapter 6E, HAR Title 13 Subtitle 13, Chapter 275, and HRS 343. Background research indicates that Project Area A was formerly adjacent to, and likely at least partially within, a former sugarcane field of the Lihue Planation. Prior to the sugar production era, two LCAs were present to the north of Project Area A, south of the Wailua River. Records indicate these LCAs consisted of house lots. Project Area B is situated on the coastal sand dune, which is the location of SIHP Site 00103, a traditional Hawaiian burial area.

### 4.5.2 Potential Impacts and Mitigation

#### 4.5.2.1 No Action Alternative

The No Action Alternative would not impact cultural resources within or adjacent to the project area since no construction activities would occur and there would be no change in existing conditions.

#### 4.5.2.2 Proposed Action Alternative

A further analytical framework for addressing the preservation and protection of cultural practices specific to Native Hawaiian communities resulted from a 2000 Hawaii Supreme Court ruling (in *Ka Pa'akai O Ka'Aina vs Land Use Commission*. 94 Hawaii 31 (2001)). In its decision, the court established a three-part analytical approach to identify, assess impacts, and mitigate impacts to traditional and customary native Hawaiian rights associated with a proposed action. The three-part analysis, based primarily on archival research due to the lack of response during the consultation effort, is summarized below:



- 1) The identity and scope of valued cultural, historical, or natural resources, including the extent to which traditional and customary native Hawaiian rights are exercised.
  - a) One historic property (SIHP 00103) with multiple human remains and a cultural deposit is present within the proposed area.
- 2) The extent to which those resources—including traditional and customary native Hawaiian rights—will be affected or impaired by the proposed action.
  - a) The proposed project includes ground disturbing work within Site SIHP 00103, which includes human burials and subsurface cultural deposits. Although most of the ground disturbance will be within previously disturbed areas, there is the possibility that additional human remains and subsurface cultural deposits will be inadvertently discovered during the project.
- 3) The feasible action, if any, to be taken by the agency to reasonably protect native Hawaiian rights if they are found to exist:
  - a) The agency has taken two actions to reasonably protect native Hawaiian rights.
    - i) The project has undergone a series of redesign efforts to eliminate, reduce, or minimize ground disturbance in previously undisturbed areas (e.g., rehabilitating the force main via sliplining as opposed to full scale replacement, and eliminating all work at the Wailua Driving range).
    - ii) The project will require archaeological monitoring during ground disturbance to ensure that any identified historic properties (including inadvertently discovered human remains) are treated in accordance with HAR 13-13-279 and HAR 13-13-300.

Therefore, implementation of the Proposed Action would result in less than significant impacts to cultural resources.

## 4.6 VISUAL ENVIRONMENT

### 4.6.1 Existing Conditions

The mile-long project area is characterized as a lightly developed resort area surrounded by recreational uses. Lands mauka of the three-lane Kuhio Highway are undeveloped and comprise of abandoned sugar cane lands. Lands makai of Kuhio Highway are characterized by undulating sand dunes with intermittent resorts/condominiums and recreational areas. The Wailua Municipal Golf Course comprises the bulk of the makai lands—encompassing approximately 200 acres. It is an 18-hole golf course, originally designed in 1930 and expanded in 1962. North of the golf course are two modest-sized resort condominiums and playing fields, picnic and playground areas, a bike path, and beach park. The large amount of undeveloped land and open space with low vegetation and ocean views evokes a rural character.

## **4.6.2 Potential Impacts and Mitigation**

### **4.6.2.1 No Action Alternative**

The No Action Alternative would not affect views in and around the project areas since no construction activities would occur and there would be no change in existing conditions. Therefore, implementation of the No Action Alternative would have no impact on the visual environment.

### **4.6.2.2 Proposed Action Alternative**

The Proposed Action would consist of rehabilitation, improvements to existing uses. During the construction period, the presence of construction equipment would affect the visual environment, but the impacts would be temporary. Long-term, operational period impacts to the visual environment would include vegetation clearing and new construction at Project Area A (Wailua WWTP), especially in the northwest corner of the site. A portion of the existing vegetated area along Leho Drive would be cleared to make way for the new access road. Therefore, this access road and general views into the WWTP would become visible from Leho Drive. Additionally, the existing site screening wall along Nalo Road would be demolished and replaced. These changes would result in minor impacts to views in and around the project area, but the general character of the Wailua WWTP would remain similar to its existing condition and there would be no impact to existing significant views along the shoreline. The recycled water force main would be located underground so there would be no impact to the visual environment after construction is complete. The ocean outfall diffusers risers would be located approximately 30 feet below sea level and 670 feet offshore so there would be no impact to the visual environment.

Therefore, the implementation of the Proposed Action would not result in significant impacts to the visual environment.

## **4.7 HAZARDOUS AND REGULATED MATERIALS AND WASTE**

### **4.7.1 Existing Conditions**

The Resource Conservation and Recovery Act (RCRA) created the framework for hazardous and non-hazardous waste management programs in the United States. Materials regulated by RCRA are identified as “solid wastes.” Only materials that meet the definition of solid waste under RCRA can be classified as hazardous wastes. Domestic sewage and mixtures of domestic sewage that pass through a sewer system to a publicly owned treatment works for treatment are excluded from the definition of solid waste under 40 CFR section 261.4 (a)(1).

Review of two EPA web-based applications, NEPAassist [epa.gov/nepa/nepassist](http://epa.gov/nepa/nepassist) and EPA Cleanups in My Community [epa.gov/cleanups/cleanups-my-community](http://epa.gov/cleanups/cleanups-my-community), was conducted to locate any sites of concern near the project area that have hazardous materials, contamination, toxic chemicals, gases or radioactive substances near the project area. The NEPAassist review compiles information from EPA databases, including the EPA’s Superfund List (Comprehensive Environmental Response, Compensation and Liability Information System) National Priorities List, hazardous waste sites

contained in the Resource Conservation and Recovery Act Information, stationary sources of air pollution, Toxic Release Inventory, Brownfields, radiation facilities, and water discharge permits issued under the National Pollutant Discharge Elimination System program. The EPA Cleanups in My Community review provides progress profiles of sites where pollution is being or has been cleaned up, including Superfund, RCRA Corrective Action, Brownfields, emergency responses, incidents of national significance, and federal facilities monitored by the EPA. NEPAassist identified two inactive NPDES permitted sites, Lydgate Pond (NPDES HIF006281) located 900 feet northeast of the Wailua WWTP and Kaumuali'i Highway Guardrail (NPDES HIF000704) located 1,134 feet northwest of the Wailua WWTP. No sites that have hazardous materials, contamination, toxic chemicals, gases or radioactive substances were identified near the project area under the EPA Cleanups in My Community review.

#### **4.7.2 Potential Impacts and Mitigation**

##### **4.7.2.1 No Action Alternative**

The No Action Alternative would not affect hazardous and regulated materials and wastes since no construction activities would occur and there would be no change in existing conditions. Therefore, implementation of the No Action Alternative would have no impact on the hazardous and regulated materials and wastes.

##### **4.7.2.2 Proposed Action Alternative**

There are no known environmental cleanup sites in the vicinity of the Proposed Action project area. During the construction process for the Wailua WWTP improvements, the construction contractor would be responsible for implementing BMPs to avoid or minimize potential leaks or spills from construction equipment (i.e., oil, diesel, etc.).

Regulated chemicals, including chlorine are currently stored at the Wailua WWTP for use in the wastewater treatment processes. These hazardous materials would continue to be handled and stored in compliance with all applicable rules, standards, and regulations. However, the proposed WWTP improvements would include the installation of an on-site hypochlorite generating station that would generate hypochlorite using salt, water, and power. Once the system is operational, it would reduce the need to transport hypochlorite and chlorine to the Wailua WWTP. Therefore, the implementation of the Proposed Action would have a minor beneficial impact on hazardous and regulated materials and wastes.

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## 5. CONFORMANCE WITH EXISTING PLANS, POLICIES, AND LAND USE CONTROLS

This chapter discusses the proposed project's conformance with relevant state and county land use plans, policies and controls. State plans and policies include the State Land Use District regulations, Hawai'i State Plan (HRS Chapter 266), the State Environmental Policy (HRS Chapter 344), and the State Coastal Zone Management program. County-level plans and policies include the Kaua'i General Plan, Lihue Community Plan, Special Management Area (HRS Chapter 205A) and zoning.

### 5.1 STATE OF HAWAII

#### 5.1.1 State Land Use

Pursuant to HRS Chapter 205, all lands in the State of Hawai'i are classified into one of four major land use districts by the State Land Use Commission. The four land use districts are the Urban, Rural, Agricultural and Conservation Districts. Permitted uses within the State Land Use Districts are prescribed under Chapter 205, HRS and the State Land Use Commission's Administrative Rules (HAR Title 13, Chapter 13).

**Discussion:** Figure 5-1 shows the State land use district boundaries in relation to the project site. Project Area A and a portion of Project Area B, including the Wailua WWTP and the water line from Nalu Road to Nehe Road are on properties designated within the State Urban District, which is defined to include "lands characterized by 'city-like' concentrations of people, structures, streets, urban level of services and other related land uses" (HAR §15-15-18 (1)). Permitted uses within the Urban District are regulated by the ordinances and land use controls of the respective county, which in this case is Kaua'i County. The Wailua WWTP (Project Area A) and the recycled water force main (Project Area B) are both permitted uses under Kaua'i County land use regulations.

A portion of Project Area B (i.e., Wailua Municipal Golf Course) is within lands designated as the State Agricultural District. Golf courses and golf-related activities approved by the respective county before July 1, 2005 are allowed in the Agricultural District.

The Proposed Action would maintain existing land uses within the project area. It is consistent with the intent of the State Land Use Districts prescribed under Chapter 205, HRS, and does not require any action or approval from the State Land Use Commission to amend the existing land use designation.

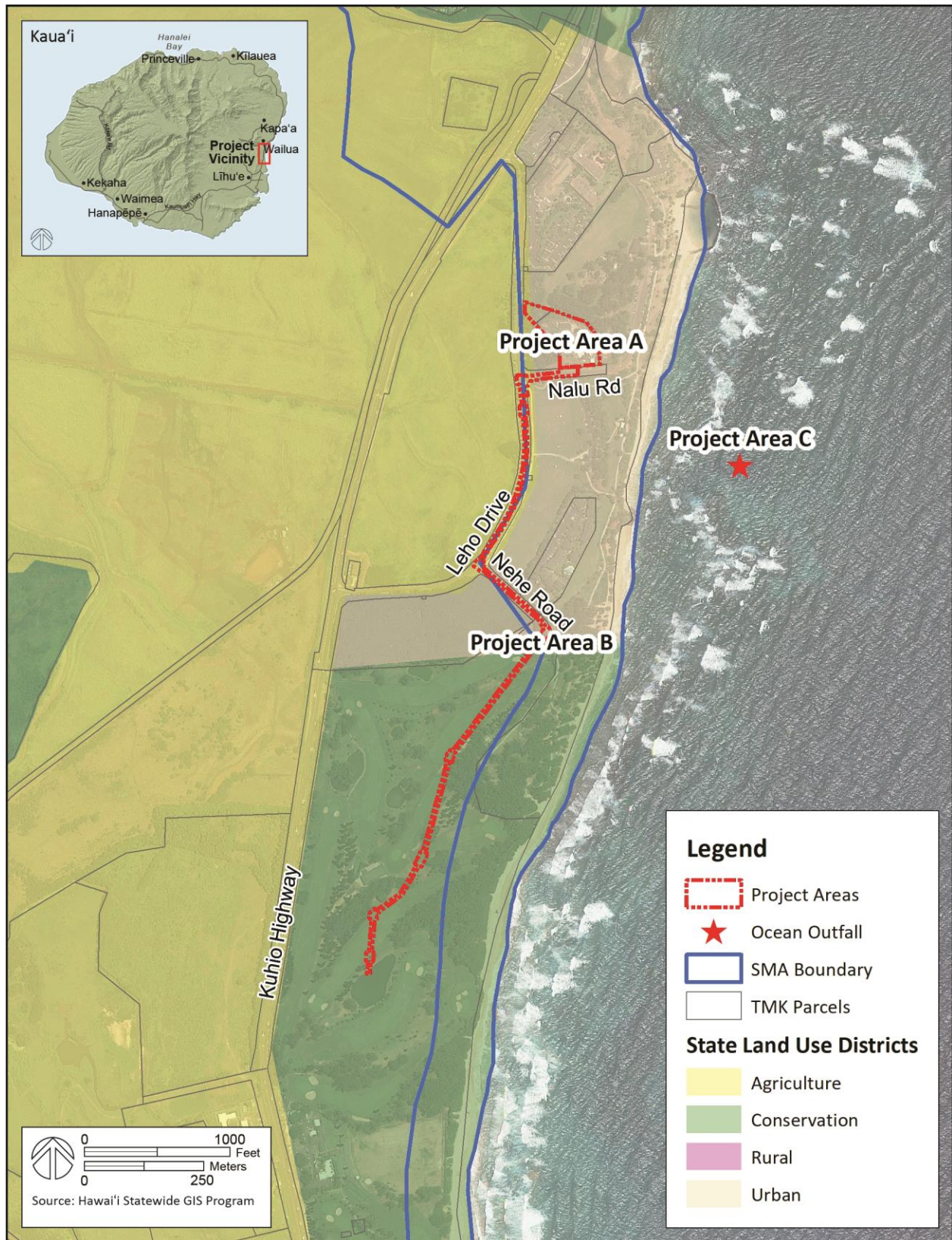


Figure 5-1 State Land Use Districts and the Special Management Area

### 5.1.2 Hawai'i State Plan, HRS Chapter 266

The Hawai'i State Plan (HRS Chapter 226, as amended) is a long-range comprehensive plan that establishes the overall theme, goals, objectives, policies, and priority guidelines for statewide planning. The Plan provides a framework for determining priorities, allocating public resources, and improving coordination between State and county plans, policies, programs, projects, and regulatory activities.

The Hawai'i State Plan is divided into three parts:

- *Part I, Overall Theme, Goals, Objectives, and Policies.* Part I focus on general topic areas including population, economy, physical environment, facility systems, and socio-cultural advancement.
- *Part II, Planning Coordination and Implementation.* Part II establishes a statewide planning system to coordinate major state and county activities and to implement the overall theme, goals, objectives, policies, and priority guidelines. These are implemented through State Functional Plans.
- *Part III, Priority Guidelines.* This part of the State Plan establishes overall priority guidelines to address areas of statewide concern.

**Discussion:** Review and analysis of HRS Chapter 226 indicates that the Proposed Action is consistent with the State Plan policies listed below. The Proposed Action includes process improvements at the WWTP, rehabilitation of the recycled water force main that supplies irrigation water to the Wailua Municipal Golf Course, and improvements to the ocean outfall diffusers. These improvements will increase the resilience of the Wailua WWTP, while also prolonging the beneficial practice of conveying recycled water to the golf course for reuse (i.e., irrigation). The Proposed Action would not impact the existing visual character along the shoreline, obstruct existing viewplanes to or along the shoreline, or affect existing public access to ocean resources. Construction activities will comply with all applicable laws and regulations to ensure that the physical environment is not adversely impacted.

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

- (b)(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.*
- (b)(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.*

*§226-11 Objectives and policies for facility systems—solid and liquid wastes.*

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

*226-16 Objective and policies for facility systems—water.*

- (b)(1) Coordinate development of land use activities with existing and potential water supply.*
- (b)(3) Reclaim and encourage the productive use of runoff water and waste water discharges.*
- (b)(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.*

*§226-20 Objectives and policies for socio-cultural advancement—health.*

*(b)(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.*

*§226-103 Economic priority guidelines—water use and development*

*(e)(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.*

*(e)(2) Encourage the improvement of irrigation technology and promote the use of non-potable water for agricultural and landscaping purposes. Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.*

### **5.1.3 Hawai'i Coastal Zone Management Program**

The objectives and policies of the Hawai'i CZM Program are described in HRS Chapter 205A-2, Part I. The objectives of the program are intended to promote the protection and maintenance of valuable coastal resources. All lands in the state and the area extending seaward from the shoreline are classified as valuable coastal resources within the State's CZM area.

Part II of HRS Chapter 205A contains the general objectives and policies upon which all counties, including the County of Kaua'i, have established special management areas (SMA). The project site is within the boundaries of the County's SMA, which requires compliance with the provisions of the county SMA rules (Special Management Area Rules and Regulations of the County of Kaua'i) discussed in Section 5.2.4.

The following discussion assesses the project's conformance with the objectives and policies of the Hawai'i Coastal Zone Management Act (HRS Chapter 205A-22).

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

**Discussion:** The Proposed Action will not affect existing public access to coastal recreational resources except for temporary construction activities along Nalu Road. The majority of the activities associated with the Proposed Action will not impact public access to Lydgate Regional Park. Public access to coastal resources is primarily via Nalu and Nehe Roads. The only activity that could temporarily affect public access to Lydgate Beach is during the replacement of the recycled water force main and electrical system improvements that traverse Nalu Road.

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

**Discussion:** See discussion for Objective #1.

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

**Discussion:** The Proposed Action would improve wastewater treatment processes at the Wailua WWTP, and would make the WWTP more resilient by reducing the vulnerability of the outfall diffusers from being covered with sand. The WWTP would continue to be operated in compliance with the NPDES permit and the associated monitoring requirements to minimize adverse effects upon special management area resources.

*(4) Alterations to existing land forms and vegetation, except crops, and construction or structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and*



*minimum danger of floods, wind damage, storm surge, landslides, erosion, siltation, or failure in the event of earthquake.*

**Discussion:** The Proposed Action would not significantly alter existing landforms or vegetation, and new construction would be limited to areas within or adjacent to the existing WWTP site. Therefore, there would be minimal or no adverse effects on water resources and scenic and recreational amenities.

*(5) Economic Uses*

*(A) Provide public or private facilities and improvements important to the State's economy in suitable locations.*

**Discussion:** The Wailua WWTP is a critical public facility and its wastewater treatment services are important for the economic vitality of Kaua'i. The Proposed Action would maintain and improve processes at the WWTP.

*(6) Coastal Hazards*

*(A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.*

**Discussion:** The WWTP would continue to be located within a tsunami evacuation zone, but it is not located within a flood zone or within the 3.2-foot scenario of sea level rise exposure. The purpose of the project is to improve WWTP processes and to reduce the vulnerability of the ocean outfall diffusers from being covered in sand. If the diffusers become covered with sand during an extreme rainfall event, the WWTP would be at risk of a backup or overflow. Therefore, the Proposed Action is an important step in reducing potential ancillary hazards from flooding.

*(7) Managing Development*

*(A) Improve the development and review process, communication and public participation in the management of coastal resources and hazards.*

*(8) Public Participation*

*(A) Stimulate public information, education and participation in coastal management.*

**Discussion:** The EA review process provides opportunity for public input at various stages, including the pre-assessment consultation process and a Draft EA 30-day public comment period during which the public has an opportunity to provide their input on the project. Early consultation with applicable government agencies and organizations was conducted as part of the preparation for this Draft EA (see Chapter 6 for consulted agencies and organizations). Additionally, the SMA Major permit process will require a public hearing.

*(9) Beach Protection*

*(A) Protect beaches for public use and recreation.*

**Discussion:** The Proposed Action would impact public use or recreation at nearby beaches.

*(10) Marine Resources*

*(A) Promote the protection, use and development of marine and coastal resources to assure their sustainability.*

**Discussion:** Appropriate best management practices will be used during the installation of the ocean outfall diffuser risers, to avoid or minimize potential effects on the marine environment. The WWTP would continue to be operated in compliance with the NPDES permit and the associated monitoring requirements to minimize adverse effects upon marine resources.

#### 5.1.4 Department of Hawaiian Homelands

The Department of Hawaiian Homelands (DHHL) owns approximately 526 acres in Wailua, mauka of the Wailua WWTP. Of these 526 acres, 474 acres are mauka of Kūhiō Highway while 52 acres are makai of the highway.

##### *Kauaʻi Island Plan (2004)*

DHHL published a Kauaʻi Island Plan in 2004 to guide overall land use and development of its Kauaʻi lands for the next 20 years. For its Wailua lands, DHHL proposes several different land uses including residential homesteads, agriculture homesteads, general agriculture, special districts, and commercial use. The Kauaʻi Island Plan designates three priority areas focused on residential development: Wailua, Hanapēpē, and Anahola/Kamalomaloʻo. The priority areas reflect DHHL's focus on developing large master-planned communities that provide the maximum number of houses to its beneficiaries in the shortest time and at the least cost.

The Kauaʻi Island Plan outlines the opportunities and constraints for the Wailua lands. The opportunities include the terrain is conducive to development, Wailua is ideally situated between two major population and employment centers, the lands are excellent agricultural lands, and the capacity of the Wailua WWTP is sufficient to support a major residential development. Some of the constraints include the need for new water sources, the wetlands near KCCC are undevelopable, the location of the Kapaʻa Bypass Route may interfere with development plans, and finally addressing the odors from the Wailua WWTP.

The 2004 plan for the Wailua lands calls for 651 residential lots and 50 kūpuna housing units on 216 acres of the mauka parcel. This area would also include 15 acres of parks and a school, and 35 2-acre lots on 99 acres of land for subsistence agriculture. The makai parcel would comprise commercial and community uses including a new DHHL Kauaʻi District Office, and commercial uses that would cater to residents and visitors, generate income for DHHL, and provide jobs for DHHL beneficiaries. Special district corridors would buffer Kūhiō Highway, Malae Heiau, and an irrigation ditch located along the western boundary of the mauka parcel.

##### *Wailua Regional Plan (2009)*

In 2009, DHHL published the *Wailua Regional Plan* to address land use development factors, outline issues and opportunities, and identify the region's top priority projects for implementation in the short term. DHHL details its plan for residential development mauka of Kūhiō Highway saying it is seeking a developer willing to provide a minimum of 200 single-family detached residences and over-sizing the infrastructure to accommodate up to 600 residences. In return, DHHL will offset the lease rent for the 50.6-acre makai parcel that the developer can use to construct a timeshare/resort or other commercial venture.

DHHL is not subject to county and state land use zoning. They plan to designate the makai parcel Resort (RR-20) for planning and permitting purposes. A maximum density of 800 units is being considered for the site. DHHL is also considering commercial uses for the site under the County of Kauaʻi's General Commercial district zoning (CG).

DHHL hopes to tie their development into the County's wastewater system at Wailua. The projected wastewater flow from the DHHL Wailua development is approximately 0.26 mgd. This will have a significant impact on the Wailua WWTP. The current capacity of the plant is 1.5 mgd and upgrades to the plant will be required to accommodate wastewater increases from the proposed Wailua

development. The far term expansion of the WWTP to a 2.0 mgd capacity will provide sufficient capacity to accommodate the Wailua flow. If there is a change in policy regarding individual wastewater systems (IWS) in the region, plans may need to be modified and a new Kapa'a WWTP may need to be constructed.

#### *DHHL Kaua'i Regional Update (2019)*

In an update for implementation of various DHHL plans and programs for the island of Kaua'i, DHHL reported that of all the priority projects proposed for the Wailua development, the one project that has been completed is the capping and casing of Well #1, the primary potable water source for the development. Regarding plans for the wastewater treatment, DHHL reports that it continues to coordinate with the County of Kaua'i on potential relocation and expansion of the Wailua WWTP

**Discussion:** The Proposed Action is generally consistent with DHHL Plans for the Wailua area. The project would not increase the capacity of the Wailua WWTP, but the County will continue to coordinate with DHHL on future improvements and/or relocation. The Proposed Action will improve processes at the WWTP and reduce the vulnerability of the outfall diffusers. Additionally, the Proposed Action includes the implementation of an odor control system to address odor concerns associated with the WWTP.

## **5.2 COUNTY OF KAUA'I**

### **5.2.1 General Plan**

Chapter 46 of HRS grants counties the power to regulate land development through zoning based on a general plan. The *General Plan for the County of Kaua'i* was first adopted in 1971 and was subsequently amended in 1984 and 2000. More recently, a revised plan was researched and developed from 2014-2017 and adopted in February 2018.

The Plan is a comprehensive statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of Kaua'i, including broad policy statements that facilitate the attainment of the Plan's objectives. It identifies actions for the following ten sectors: Watershed; Housing; Land Transportation; Critical Infrastructure; Shared Spaces; Economy; Heritage Resources; Energy Sustainability & Climate Change Mitigation; Public Safety & Hazards Resiliency; and, Opportunity & Health for All.

**Discussion:** The Proposed Action is consistent with the Policy #5: Make Strategic Investments in Infrastructure. Recognizing the County's limited budget and resources, the General Plan calls for strategic investments in infrastructure as a means to maintain services and direct growth to areas most suitable for development. The Wailua WWTP is an existing WWTP and its continued operation is critical to supporting the community of East Kaua'i. Additionally, the Proposed Action is consistent with the actions identified for Sector IV.2: Wastewater, Septic Systems, and Cesspools. The Proposed Action would improve processes at the WWTP to ensure safe, efficient, and cost effective operations, it would support the reuse of recycled water by rehabilitating the recycled water force main that services the Wailua Municipal Golf Course irrigation holding pond, and the project would utilize Clean Water State Revolving Fund Program funds for financing the project.

### 5.2.2 Līhu'e Community Plan

The County of Kaua'i provides a conceptual framework for implementing the objectives and policies of the General Plan on a regional basis. Six geographical DP and Sustainable Communities Plan (SCP) areas have been established on Kaua'i, including the Līhu'e region where the project site is located. The six community-oriented plans articulate the long-range future vision and policies for regional land use, and establish policies and guidelines for land use, public facilities and infrastructure improvements over a 20-year period.

The Līhu'e Development Plan was first adopted by Ordinance 335 in 1976, and most recently revised in 2015 with the adoption of Ordinance No. 989. The Līhu'e Community Plan encompasses Kaua'i's (southeastern) or windward side, extending from north of Wailua River to Hā'upu Ridge. In carrying out the purposes of the General Plan, Līhu'e District is expected to experience the largest growth of all Kaua'i's districts over the 25-year planning horizon.

**Discussion:** Figure 5-2 shows the SCP's Urban Land Use Map in relation to the project site. As shown on the SCP Land Use Map, the project site is within areas designated for Agriculture (i.e., Wailua WWTP) and Parks and Recreation (i.e., Wailua Municipal Golf Course). The Proposed Action would continue existing uses at these sites and is therefore consistent with the designated land uses.

### 5.2.3 County of Kaua'i Zoning

The County of Kaua'i Code (Ordinance No. 935, Bill No. 2433, Draft 2) regulates land use in accordance with adopted land use policies, including the General Plan and Development Plans. The Zoning Ordinance describes the various zoning districts, the uses allowed within each zoning district, and the applicable development standards for each district. Zoning designations are shown on the zoning maps for the county.

**Discussion:** Project Area A (the WWTP) and the portions of Project Area B (recycled water force main) along Nalu Road, Leho Drive, and Nehe Road are within the Open District. The Wailua Municipal Golf Course does not have a designated zoning district. Per the County of Kaua'i Comprehensive Zoning Ordinance Table of Uses (Table 8-2.4). Utility installations require a use permit in Open Districts. Therefore, the Proposed Action would be required to obtain a zoning permit from the County Planning Department. The Proposed Action include a minor increase in the development footprint of the Wailua WWTP, but it would maintain the existing use of the site. Therefore, the Proposed Action is expected to be consistent with the requirements and standards of the Open Zoning District.

#### 5.2.4 Special Management Area

The Hawai'i CZM Program embodied in HRS Chapter 205A contains the general objectives and policies upon which all counties within the state have structured specific legislation for the SMA. The intent of the SMA is to ensure adequate access to publicly owned areas; to mitigate adverse effects to water resources, and scenic and recreational amenities; to minimize vulnerability to coastal hazards; and to preserve historic and archaeological resources. The City and County of Honolulu, similar to other counties in Hawai'i, has adopted: (1) boundaries which identify the SMA; and (2) rules and regulations which are consistent with HRS Chapter 205A that control development within the SMA (ROH Chapter 25). Development within the SMA is subject to the regulations and procedures contained in ROH Chapter 25.

**Discussion:** Figure 5-1 shows the SMA boundary in relation to the project site. The project site is located within the SMA. Consultation with Planning Department staff indicates that an SMA Major Permit would be required for the Proposed Action.

#### 5.2.5 Shoreline Setbacks

Pursuant to HRS Chapter 205A, the County of Kaua'i has established standards and procedures that "generally prohibit within the shoreline area any construction or activity which may adversely affect beach processes, public access along the shoreline, or shoreline open space" (ROH Chapter 23). The shoreline area regulated by the County Planning Department encompasses the land between the certified shoreline and the shoreline setback line.

**Discussion:** The County DPW coordinated with the County Planning Department regarding the applicability of shoreline setback ordinance. The County Planning Department determined that the Proposed Action is exempted from the shoreline setbacks requirements per Sec. 8-1.4 (e) of the shoreline ordinance.

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## 6. CONFORMANCE WITH FEDERAL PLANS AND POLICIES

The proposed project is planned to receive funding from both the County of Kauai and the Clean Water State Revolving Fund (CWSRF). DOH is required to conduct environmental review of projects funded under the CWSRF. The funding portion from the CWSRF constitutes a federal action that requires the project to comply with federal cross-cutting authorities set forth in 40 CFR §35.3145.

**Table 6-1 Compliance with Federal Cross-Cutting Authorities**

| No. | Environmental Authority   | Responsible Agency                                | Applicability   |
|-----|---|---|---|
| 1   | Archaeological and Historical Preservation Act of 1974 (16 U.S.C. § 469a-1) | State Historic Preservation Division (SHPD)       | In-process. The project is engaged in NHPA Section 106 consultation with SHPD. DOH has sent SHPD a consultation letter proposing a determination of “no adverse effect.” SHPD is reviewing the proposed determination (see Appendix C).   |
| 2   | Bald and Golden Eagle Protection Act (16 U.S.C § 668-668c)                  | U. S. Department of the Interior                  | Not applicable. Bald and Golden Eagles do not exist in Hawai‘i.   |
| 3   | Clean Air Act (42 U.S.C. § 7401)  | State Department of Health (DOH) Clean Air Branch | Complies. The Draft EA will be provided to the DOH for review and comment. See Section 4.2 for an analysis of the Proposed Actions potential impacts to air quality.  |
| 4   | Coastal Barrier Resources Act (16 U.S.C. § 3501)                            | State Coastal Zone Management Agency              | Not applicable. The Proposed Action is not located on a coastal barrier island.   |
| 5   | Coastal Zone Management Act (16 U.S.C. § 1451)                              | State Coastal Zone Management Agency              | Complies. Pursuant to Chapter 205A-2, HRS, the Proposed Action is within the Coastal Zone Management Area, which encompasses all lands of the State. Some parts of the Proposed Action are located within the Special Management Area (SMA) and, as such, a SMA Use permit is required. |
| 6   | Endangered Species Act (16 U.S.C. § 1531)                                   | U.S. Fish and Wildlife Service (USFWS)            | Complies. ESA Section 7 consultation was completed with USFWS (Appendix A).   |
| 7   | Environmental Justice (Executive Order 12898)                               | U.S. Environmental Protection Agency (EPA)        | Complies. The Proposed Action would not result in disproportionately high and adverse human health or environmental effects on low-income or minority communities (see discussion on page 4-1).   |
| 8   | Farmland Protection Policy Act (7 U.S.C. § 4201)                            | Natural Resources Conservation Service            | Not applicable. The Proposed Action would not include the conversion of farmland to non-agricultural uses.  |

|    |   |  |   |
|----|---|--|---|
| 9  | Fish and Wildlife Coordination Act (16 U.S.C. § 661)  | USFWS                                      | Complies. The Draft EA will be provided to USFWS for review and comment.  |
| 10 | Floodplain Management (Executive Order 11988, as amended by Executive Orders 12148 and 13690)     | Federal Emergency Management Agency (FEMA) | Not Applicable. The Proposed Action is not located within a floodplain.   |
| 11 | Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.)              | National Marine Fisheries Service (NMFS)   | Complies. EFH consultation was completed with NMFS (Appendix B).  |
| 12 | Marine Mammal Protection Act (16 U.S.C. § 703 et seq.)  | NMFS                                       | Complies. The Proposed Action would not involve taking of marine mammal species. Avoidance and minimization measures are outlined in  |
| 13 | Migratory Bird Treaty Act (16 U.S.C. § 703 et seq.)   | USFWS                                      | Complies. MBTA compliance addressed in ESA Section 7 consultation with USFWS (Appendix A).  |
| 14 | National Historic Preservation Act (54 U.S.C. § 300101 et seq.)                                   | SHPD                                       | In process. The project is engaged in NHPA Section 106 consultation with SHPD. DOH has sent SHPD a consultation letter proposing a determination of “no adverse effect.” SHPD is reviewing the proposed determination (see Appendix C). |
| 15 | Protection of Wetlands (Executive Order 11990 [1977], as amended by Executive Order 12608 [1997]) | U.S. Army Corps of Engineers (USACE)       | Not applicable. The Proposed Action would not impact wetlands.  |
| 16 | Rivers and Harbors Act (33 U.S.C. § 403)  | USACE                                      | Complies. Kaua’i County obtained a USACE Nationwide Permit for the proposed improvements to the ocean outfall (Appendix D).   |
| 17 | Safe Drinking Water Act (42 U.S.C. § 300f)  | DOH Safe Drinking Water Branch             | Complies. The proposed project will not affect a sole source aquifer. The Draft EA will be provided to the DOH-SDWB for review and comment.   |
| 18 | Wild and Scenic Rivers Act (16 U.S.C. § 1271)   | National Park Service                      | Not applicable. There are no Wild or Scenic Rivers in the State of Hawai’i.   |



## 7. SUMMARY OF OTHER IMPACTS

### 7.1 CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (HAR Section 11-200.1-2). Secondary impacts or indirect effects are defined as “effects which are caused by the action and are later in time or farther removed in distance, but still reasonably foreseeable. [It] may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (HAR Section 11-200.1-2).

The analysis of cumulative impacts takes into account future developments planned for the Wailua community. Known developments and infrastructure improvements for this area include the DHHL plans discussed in Chapter 5.2.6. However, since these are long-range plans with no specified timeframe for development, they were not considered contributing factors to the cumulative impact. Additionally, the Proposed Action will simply maintain or improve existing uses, and therefore would not contribute significant additive effects on the surrounding environment. Impacts would be limited to construction-period impacts (such as increased noise levels, dust and air quality impacts, traffic, etc.) which would be short-term and temporary in duration.

### 7.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those that cannot be recovered if the proposed project is implemented. The Proposed Action would irreversibly and irretrievably commit three types of resources: (1) human labor; (2) fuel, oil, and lubricants for construction vehicles and equipment; and (3) energy and resources used to produce the materials and components used in the project (e.g., pipe, construction products, roadway materials). The Proposed Action and the No Action Alternative would require similar resources—electricity, water and manpower—to operate and maintain the systems.

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## 8. AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED

### 8.1 CHAPTER 343, HRS PRE-ASSESSMENT CONSULTATION

An informational letter was sent on March 20, 2020 to the following agencies, organizations and individuals to gather comments on the proposed project during the pre-assessment consultation process to prepare this Draft EA. A total of 13 agencies and organizations provided written comments. The parties who formally responded during the pre-assessment consultation process are identified by an asterisk (\*).

#### Federal

National Oceanic and Atmospheric Administration, National Marine Fisheries Services  
U.S. Army Corps of Engineers  
U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service

#### State of Hawai'i

\* Department of Accounting and General Services  
Department of Business, Economic Development & Tourism, Office of Planning  
\* Department of Hawaiian Home Lands  
\* Department of Health, Environmental Health Administration  
Department of Land and Natural Resources, Land Division  
\* Department of Land and Natural Resources, State Historic Preservation Division  
Department of Land and Natural Resources, Office of Conservation and Coastal Lands  
Department of Transportation  
Office of Hawaiian Affairs  
Office of Environmental Quality Control  
\* University of Hawai'i Sea Grant College Program  
\* University of Hawai'i Water Resources Research Center

#### County of Kaua'i

Department of Public Works  
\* Department of Planning  
Department of Parks and Recreation  
Department of Water  
Kaua'i Fire Department  
Kaua'i Police Department

#### Utility Companies

Kaua'i Island Utility Cooperative  
Hawaiian Telcom  
Charter Communications (Spectrum)

#### Elected Officials

The Honorable Senator Mazie Hirono  
The Honorable Senator Brian Schatz  
The Honorable Representative Tulsi Gabbard  
The Honorable Senator Ronald Kouchi, 8th Senatorial District  
The Honorable James Tokioka, 15th Representative District

The Honorable Mayor Derek S.K. Kawakami, County of Kaua'i  
The Honorable Council Chair Arryl Kaneshiro, County of Kaua'i  
The Honorable Council Vice Chair Ross Kagawa, County of Kaua'i  
The Honorable Councilmember Arthur Brun, County of Kaua'i  
The Honorable Councilmember Mason K. Chock, County of Kaua'i  
The Honorable Councilmember Felicia Cowden, County of Kaua'i  
The Honorable Councilmember Luke A. Evslin, County of Kaua'i  
The Honorable Councilmember KipuKai Kualii, County of Kaua'i

#### Community Organizations and Others

- \* Wailua-Kapa'a Neighborhood Association
- Kaua'i Path
- \* Sierra Club
- \* Historic Hawai'i Foundation
- KAHEA – The Hawai'i Environmental Alliance
- Hilton Garden Inn Kaua'i
- Kaha Lani Resort

## **8.2 NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION**

Consultation letters were sent to the following agencies and organizations as part of the initial NHPA Section 106 consultation process.

#### Agencies

Department of Land and Natural Resources, State Historic Preservation Office  
Department of Land and Natural Resources, Division of State Parks,  
Office of Hawaiian Affairs  
Department of Parks and Recreation, County of Kaua'i  
Kaua'i Historic Preservation Commission, County of Kaua'i  
Public Works Department, County of Kaua'i

#### Native Hawaiian Organizations

Association of Hawaiian Civic Clubs  
Association of Hawaiians for Homestead Lands  
Order of Kamehameha I  
Nā Kuleana o Kānaka 'Ōiwi  
Kaua'i Historical Society  
Kaua'i/Niihau Island Burial Council  
Friends of 'Iolani Palace  
The Mary Kawena Pūku'i Cultural Preservation Society  
Queen Debra Kapule Hawaiian Civic Club  
Ko'olau Foundation  
Na Koa Ikaika Ka Lahui Hawai'i  
Council for Native Hawaiian Advancement  
Na Mookupuna o Wailua  
Native Hawaiian Education Council  
Kanu o ka 'Āina Learning 'Ohana (KALO)  
Aha Moku Council, Kaua'i

**Additional Consulting Parties**

Historic Hawai'i Foundation  
Wailua-Kapa'a Neighborhood Association

**8.3 CULTURAL IMPACT ASSESSMENT CONSULTATION**

In addition to the EA pre-assessment consultation and NHPA Section 106 consultation, the individuals listed below were invited to participate in the cultural impact assessment consultation process. Additionally, a public notice was published in the Office of Hawaiian Affairs newsletter, *Ka Wai Ola*.

**Table 8-1 Individuals Invited to Participate in the Cultural Impact Assessment Consultation**

| <b>Name</b>                  | <b>Affiliation</b>  |
|------------------------------|---|
| Ms. Dawn N. S. Chang         | State Historic Preservation Officer and Chairperson, Department of Land and Natural Resources   |
| Dr. Alan Downer              | Administrator, State Historic Preservation Division; Deputy State Historic Preservation Officer |
| Ms. Annelle Amaral           | President, Association of Hawaiian Civic Clubs  |
| Mr. Gerald Ida               | Chair, Kauai Historic Preservation Commission, County of Kauai                                  |
| Mr. Curt Cottrell            | Administrator, Division of State Parks, Department of Land and Natural Resources                |
| Mr. Dan Ahuna                | OHA, Kaua'i Island Rep  |
| Mr. Dennis Ragsdale          | Advocate General, Order of Kamehameha I   |
| Ms. Donna Kaliko Santos      | Nā Kuleana o Kānaka 'Ōiwi   |
| Kamakana C. Ferreira         | OHA Lead Compliance Specialist  |
| Keith Yap                    | Chair, Kauai/Niihau Island Burial Council   |
| Kiersten Faulkner            | Executive Director, Historic Hawai'i Foundation   |
| Liberta Hussey Albao         | President, Queen Debra Kapule Hawaiian Civic Club   |
| Mililani B. Trask            | Convenor, Na Koa Ikaika Ka Lahui Hawaii   |
| Kūhiō Lewis                  | Executive Director, Council for Native Hawaiian Advancement                                     |
| Mr. Noa Mau-Espirito         | Na Mookupuna o Wailua   |
| Noelani Josselin             | Cultural Practitioner   |
| Patrick T. Porter            | Director, Department of Parks and Recreation, County of Kauai                                   |
| Rayne Regush                 | Chair, Wailua-Kapa'a Neighborhood Association   |
| Taffi Wise                   | Executive Director, Kanu o ka 'Āina Learning 'Ohana (KALO)                                      |
| Billy Kaohelauli'i           | Aha Moku Council Rep, Kaua'i  |
| Vincent Hinano Rodrigues, JD | Branch Chief, History and Culture   |
| Kauanoë Hoomanawanui         | Burial Sites Specialist (Kauai and Niihau)  |
| David Buckley                | SHPD Kauai Lead Archaeologist   |
| Randy Wichman                | Kauai Historical Society  |

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## 9. ANTICIPATED DETERMINATION AND FINDINGS

### 9.1 CHAPTER 343, HRS ANTICIPATED DETERMINATION AND FINDINGS

To determine whether a proposed action may have a significant impact on the environment, the proposing agency needs to consider all phases of the action, the expected primary and secondary consequences, cumulative effect, and the short- and long-term effects. The agency's review and evaluation of the proposed action would result in a determination of either: 1) the action may have a significant effect on the environment, and an Environmental Impact Statement Preparation Notice should be issued, or 2) the action is not likely to have a significant effect and notice of a Finding of No Significant Impact should be issued.

Based on the findings presented in this document, the Proposed Action is not expected to result in a significant impact on the environment. In accordance with Chapter 343, HRS and Section 11-200.1, HAR, it is anticipated that DOH will determine that the proposed project will not have a significant environmental impact and an EIS will not be required. A Finding of No Significant Impact is anticipated.

The anticipated determination was based on review and analysis of the significance criteria specified in Section 11-200.1-13, HAR. An action shall be determined to have a significant effect on the environment if it meets any of the following criteria:

#### **1. Irrevocably commit a natural, cultural, or historic resource**

The Proposed Action would improve and rehabilitate processes and facilities at the existing WWTP, recycled water force main, and ocean outfall diffusers. It would not introduce new major facilities or uses that would irrevocably commit natural, cultural, or historic resources. The USFWS has concurred with the determination that the Proposed Action may effect, but is not likely to effect the Hawaiian hoary bat, the Hawaiian seabirds, the Hawaiian waterbirds, and the Hawaiian goose. The Proposed Action will include avoidance and minimization measures to ensure that potential effects to these species, if any, are discountable. To minimize potential loss or destruction of cultural resources, construction activities would be conducted under an archaeological monitoring plan prepared in concurrence with SHPO and the consulting parties.

#### **2. Curtail the range of beneficial uses of the environment**

The Proposed Action would improve processes at the existing WWTP, rehabilitate the recycled water force main, and improve the resiliency of the ocean outfall diffusers. These are all existing uses and the improvements would not curtail the range of beneficial uses of the environment. No significant adverse impacts to the natural environment would result from the Proposed Action. Construction and operation of the improved facilities would be performed in accordance with applicable State and County regulations, thereby minimizing potential impacts to air and water quality and ambient noise levels.

#### **3. Conflict with the State's environmental policies or long-term environmental goals established by law**

The Proposed Action is consistent with the State's long-term environmental policies and guidelines specified in Chapter 344, HRS.

**4. Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State**

The Proposed Action does not include major new facilities or uses to increase resident or visitor populations, employment patterns, housing demand or community character. The Proposed Action would have a beneficial short-term effect on the economy, due to the temporary increase in construction-related jobs

**5. Have a substantial adverse effect on public health**

The proposed project would not substantially affect public health. The Proposed Action would continue the reuse of R-2 recycled water for irrigation at the Wailua Municipal Golf Course in compliance with applicable State and County regulations.

**6. Involve adverse secondary impacts, such as population changes or effects on public facilities**

No foreseeable changes in land use or intensity of existing use, population or employment levels, or demand for public facilities is anticipated. The Proposed Action is limited in scope to improving processes at the existing WWTP, rehabilitating the recycled water force main, and improving the resiliency of the ocean outfall diffusers. It would not increase the capacity of the WWTP or otherwise effect secondary impacts like population changes or effects on other public facilities.

**7. Involve a substantial degradation of environmental quality**

The environmental quality would not involve substantial changes as a result of the Proposed Action. The use of standard construction BMPs would minimize anticipated construction-related short-term impacts (i.e., noise and air quality). In the long-term, the Proposed Action would improve processes at the existing WWTP, rehabilitate the recycled water force main, and improve the resiliency of the ocean outfall. All of which would benefit environmental quality by reducing the potential for spills at the WWTP.

**8. Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions**

The Proposed Action would not result in any adverse cumulative impacts. It would improve processes at the existing WWTP, but it would not introduce new land uses or increase the capacity of the WWTP. Additionally, no major foreseeable future actions or regional changes have been identified. A discussion of cumulative and secondary impacts is discussed in Section 7.1.

**9. Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat**

Consultation with the USFWS under Section 7(a)(2) of the Endangered Species Act has been completed and the USFWS concurred with the determination that the may affect, but is not likely to adversely affect the Hawaiian hoary bat, the Hawaiian seabirds, the Hawaiian waterbirds, and the Hawaiian goose. The Proposed Action will include avoidance and minimization measures to ensure that potential effects to these species, if any, are discountable.



**10. Have a substantial adverse effect on air or water quality or ambient noise levels**

The proposed project would not substantially affect air or water quality or ambient noise levels. Although temporary, short-term increases such as noise and dust would be experienced during construction, BMPs would be used to minimize impacts.

**11. Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters**

The Proposed Action would maintain the existing location of the WWTP and recycled water force main. The Proposed Action is not located in a floodplain, but it is located within the tsunami evacuation zone. The project area is outside the predicted 3-foot SLR exposure area. There are no known erosion or subsidence problems, or geological hazards in the area.

**12. Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies; or**

The Proposed Action would consist of rehabilitation and improvements to existing uses. It would not have a substantial adverse effect on scenic vistas or viewplanes.

**13. Require substantial energy consumption or emit substantial greenhouse gases.**

The Proposed Action would result in a temporary increase in energy consumption and greenhouse gas emission associated with construction. However, this increase would be limited and is necessary to WWTP processes and the recycled water force main are . Operational energy consumption and greenhouse gas emissions for the improved WWTP and force main are expected to remain the same as existing levels. No new uses or activities that are major users of energy or major producers/sources of greenhouse gases would be introduced.

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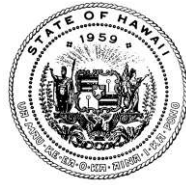
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Endangered Species Act Documentation





**STATE OF HAWAII  
DEPARTMENT OF HEALTH**

P. O. BOX 3378  
HONOLULU, HI 96801-3378

In reply, please refer to:  
File:

October 31, 2022

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Dr. Earl Campbell, Field Supervisor  
U.S. Department of the Interior  
U.S. Fish and Wildlife Service  
Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122  
Honolulu, HI 96850  
Email: [pifwo\\_admin@fws.gov](mailto:pifwo_admin@fws.gov)

Dear Dr. Campbell:

**Subject:** Initiate Informal Consultation Under Section 7 of the Endangered Species Act  
Wailua WWTP NPDES Compliance Improvements  
Clean Water State Revolving Fund (CWSRF) Project No. C150055-10

The U.S. Environmental Protection Agency (EPA) has designated the State of Hawai'i Department of Health (DOH) as its non-federal representative pursuant to 50 CFR Section 402.08 for purposes of initiating the consultation process and preparing a biological assessment, if necessary, under Section 7 of the federal Endangered Species Act (ESA) for certain projects funded under the Clean Water State Revolving Fund (CWSRF) program.

The County of Kaua'i, Department of Public Works, Wastewater Management Division is proposing improvements to the existing Wailua Wastewater Treatment Plant (WWTP) as well as the Wailua Municipal Golf Course. This project plans to use CWSRF program funds.

We are contacting your office to initiate the informal consultation process and determine whether there are any other service trust resources, which may include, but not limited to the Migratory Bird Treaty Act (MBTA), beyond the species and habitats described and discussed in this letter.

**Project Background**

The Wailua WWTP is located at 4460 Nalu Road (TMK: (4) 3-9-006:019) on 2.033 acres of County-owned land (see Attachment A). The WWTP provides tertiary treatment and disinfection to produce R-2 recycled water that is conveyed via an existing 10-inch force main from Wailua WWTP to the Wailua Municipal Golf Course. The Wailua Municipal Golf Course is located at 3-5350 Kūhio Highway (four (4) TMKs: (4) 3-9-002:004, 005, and 006 and (4) 3-9-005:001), south of the WWTP comprising an area of 243.73 acres. The Wailua Municipal Golf Course has been using R-2 recycled water from the WWTP for golf course irrigation since 1976 as its primary source of irrigation water. Excess treated effluent is currently discharged to an existing permitted ocean outfall located to the southeast of the WWTP approximately 700 feet from the shoreline.

### **Project Description**

The proposed project includes improvements to the existing Wailua WWTP and the WWTP's ocean outfall, as well as rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course. Improvements at the WWTP would include, but may not be limited to, modifications to the aeration basins, clarifiers, filter bay, and chlorine contact tank; installation of a second effluent filter and an on-site hypochlorite generation system; replacement of the effluent pumps; electrical upgrades; and site work to include trenching, grading, and the construction of new site access roads. The project area for the proposed improvements would be on the existing Wailua WWTP parcel (TMK: (4) 3-9-006:019) and a portion of the adjacent County-owned parcel (TMK: (4) 3-9-006:027).

The existing ocean outfall modification will consist of extending the diffuser riser pipes at the existing flanges of the three (3) functional outfall diffuser heads located offshore. The extension of the riser pipes will reduce the likelihood of current-driven sand plugging or covering the diffuser heads, increasing the reliability of the existing ocean outfall for effluent disposal. DOH will be consulting with the National Oceanic and Atmospheric Administration - National Marine Fisheries Service regarding potential effects on marine species and/or essential fish habitat.

The proposed improvements also include rehabilitating the existing 10-inch force main that conveys R-2 recycled water from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe sliplining, which will limit the amount of excavation required. Excavation for the force main rehabilitation would be limited to sharp bends or corners in the pipe (see attachment A). The project area for the force main rehabilitation includes the following County-owned parcels and rights of way:

- Nalu Road right of way
- Leho Drive right of way
- Nehe Road right of way
- TMK: (4) 3-9-002:032 – Wailua Municipal Golf Course
- TMK: (4) 3-9-002:004 – Wailua Municipal Golf Course

Previously, the County considered three (3) possible areas for disposal of excess R-2 recycled water that was not needed to irrigate the golf course. These three (3) areas were included in the biological surveys for the project (see Attachment B) and are shown on the project location map (see Attachment A). The County has decided to not pursue any of the three (3) additional disposal areas and they are no longer part of the project.

Biological surveys (see Attachment B) have confirmed the presence of the Hawaiian Stilt (*Himantopus mexicanus knudseni*). It is also expected that four (4) other endemic listed avian species, Hawaiian Duck (*Anas wyvilliana*), Hawaiian Coot (*Fulica alai*), Common Moorhen (*Gallinula galeata sandvicensis*), and Nēnē (*Branta sandvicensis*), use resources within the general project area on a seasonal and/or temporal basis. Additionally, based on a previous consultation for work at the Sewage Pump Station #1 at the Wailua WWTP, the U.S. Fish and Wildlife Service indicated that the following federally listed species may also occur or transit through the vicinity of the proposed project area: endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); endangered Hawaiian petrel (*Pterodroma sandwichensis*), threatened Newell's shearwater (*Puffinus auricularis newelli*), and endangered Hawaii DPS band-rumped storm-petrel (*Oceanodroma castro*) (collectively referred to as Hawaiian seabirds). See Attachment C for avoidance and minimization measures.



Dr. Earl Campbell, Field Supervisor  
October 31, 2022  
Page 3

We respectfully ask your office the following:

1. Are there any other service trust resources, which may include, but are not limited to the MBTA?

Your response within thirty (30) calendar days of receipt of this letter is greatly appreciated. Please address your written response to the following email or mailing address:  
[chane.hayashida@doh.hawaii.gov](mailto:chane.hayashida@doh.hawaii.gov)

Attn: Chane Hayashida  
Department of Health, Wastewater Branch  
2827 Waimano Home Road, Room 207  
Pearl City, HI 96782

Should you have any questions, please contact Chane Hayashida of our Branch at (808) 586-4294.

Sincerely,



SINA PRUDER, P.E., CHIEF  
Wastewater Branch

#### Attachments

JN:sp

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Mr. John Hagihara (via email at [JHagihara@hhf.com](mailto:JHagihara@hhf.com))

Attachment A: Project Location Maps

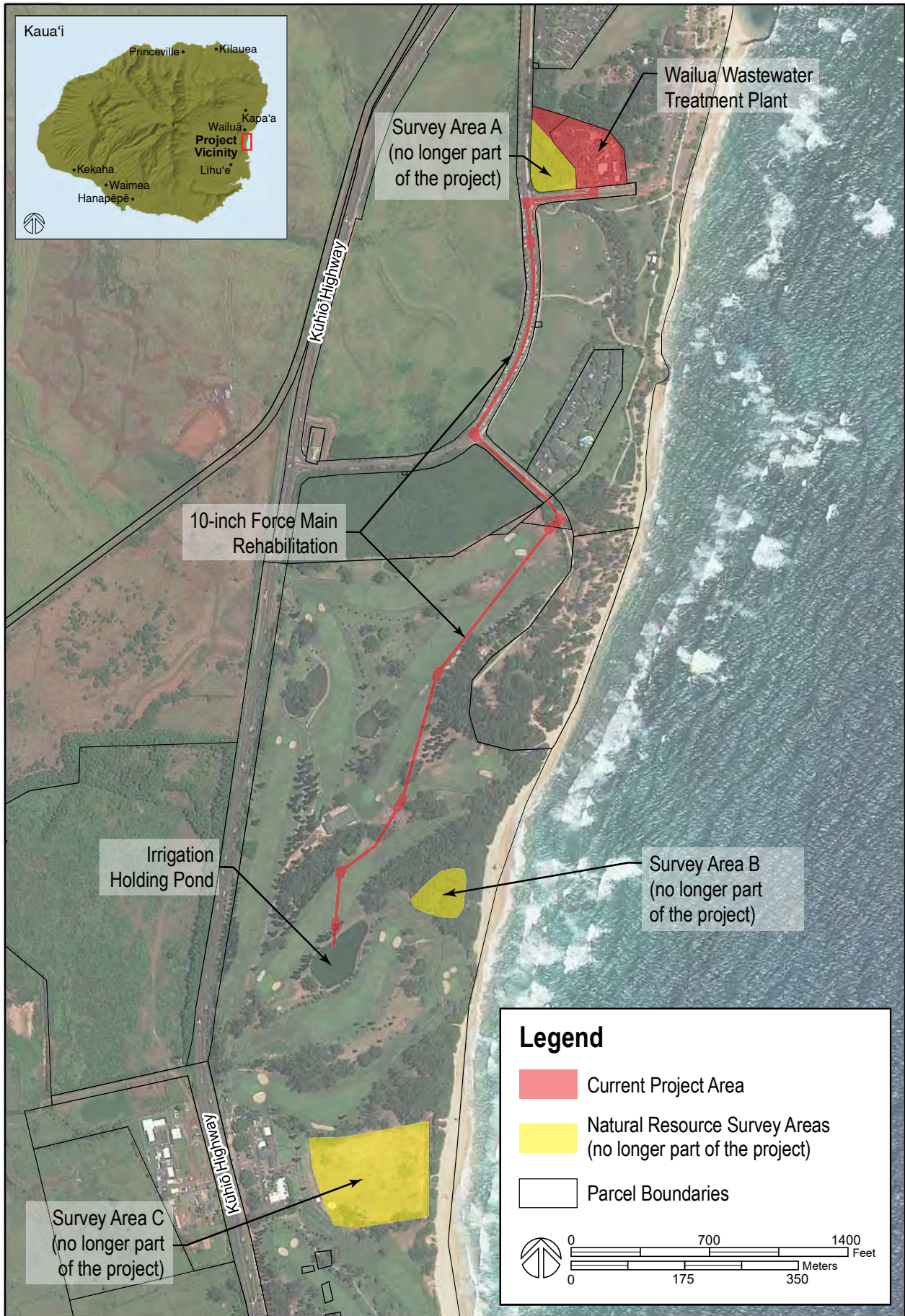


Figure 1: Full Project Area Map

Attachment A: Project Location Maps

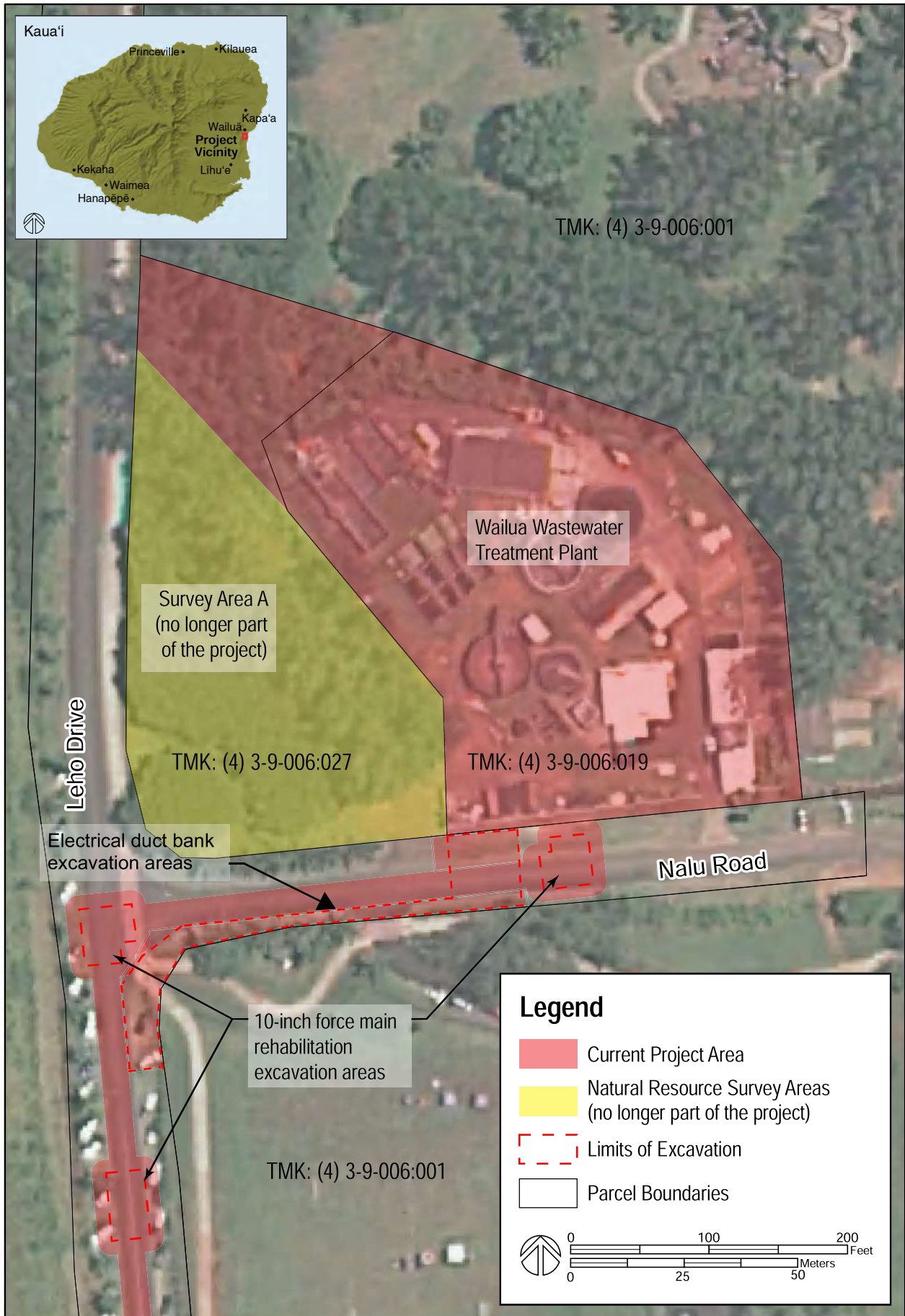


Figure 2: Wailua Wastewater Treatment Plant

### Attachment A: Project Location Maps

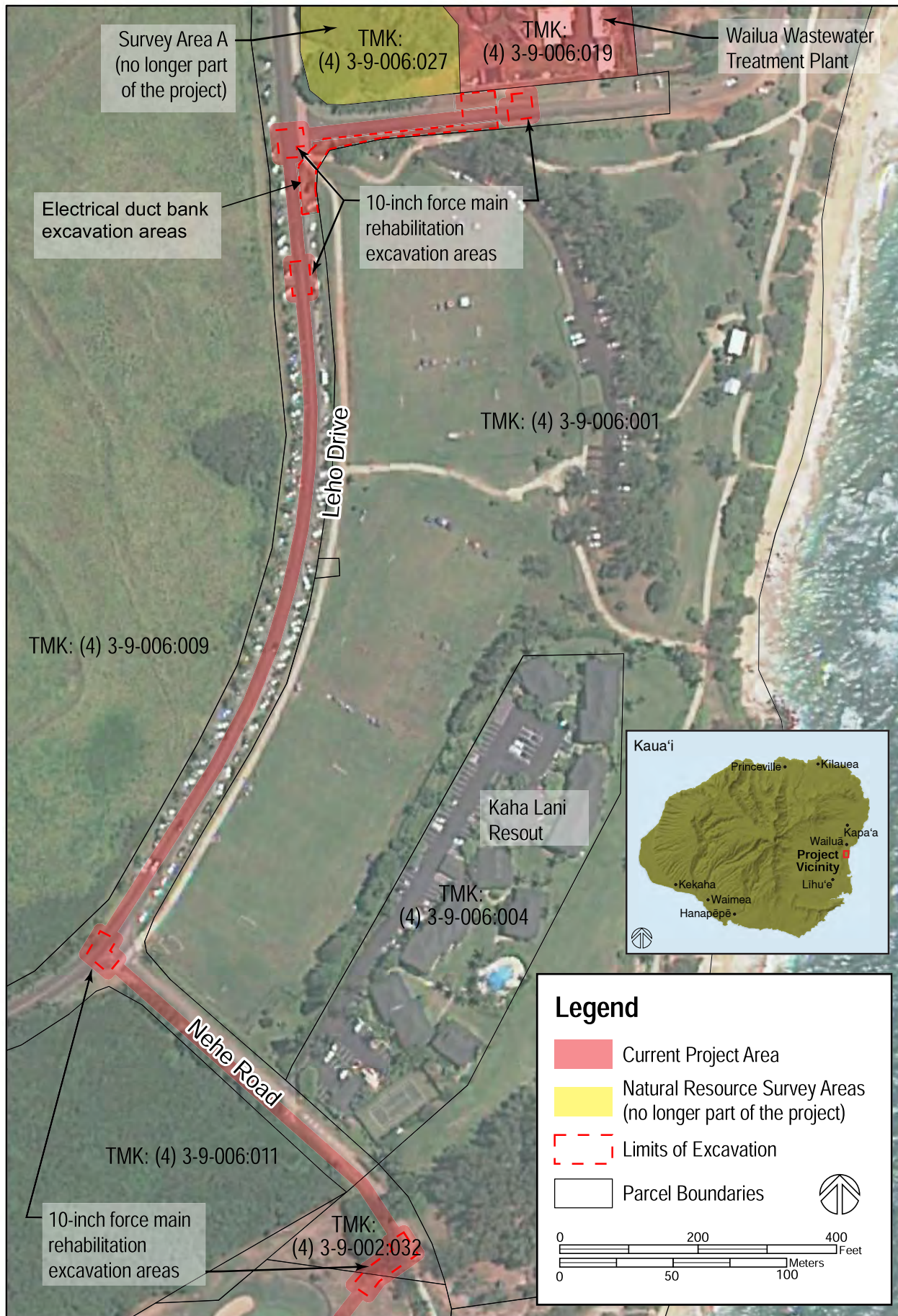


Figure 3: 10-inch Recycled Water Force Main Rehabilitation along Leho Drive and Nehe Road

Attachment A: Project Location Maps

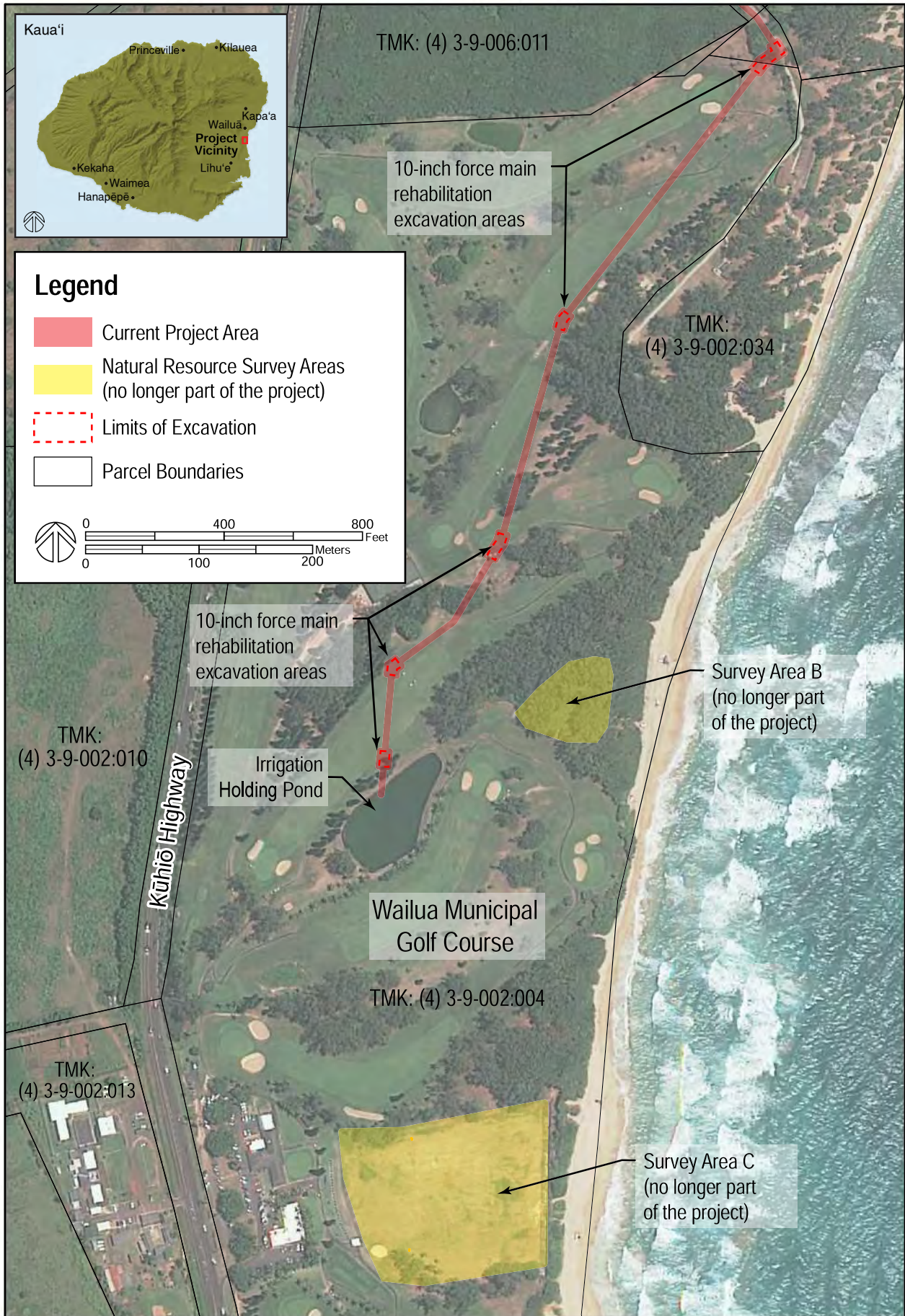


Figure 4: 10-inch Recycled Water Force Main Rehabilitation at the Wailua Municipal Golf Course

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**Natural resources survey for  
proposed excess R-2 irrigation water  
disposal sites, Wailua, Kaua‘i**

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June 17, 2019

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# Natural resources survey for proposed excess R-2 irrigation water disposal sites, Wailua, Kaua‘i

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June 17, 2019

*Draft*

AECOS No. 1575

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## Introduction

The County of Kaua‘i is proposing to utilize alternative effluent disposal sites for the Wailua Waste Water Treatment Plant (WWTP) by discharge of R-2 effluent. The WWTP is located at the corner of Leho Drive and Nalu Road in Wailua, on the east side of the Island of Kaua‘i. Presently, R-2 effluent is sent to the County-owned Wailua Municipal Golf Course south of the WWTP and, since 1976, this water has been the primary source of irrigation water for the golf facility. However, excess effluent beyond that used by the golf course is sent to an offshore ocean outfall, a circumstance typically limited to excessive rainy periods.

Three areas are being contemplated for disposal of R-2 water in excess of that needed to irrigate the golf course. Area “A” is an undeveloped portion of TMK: 3-9-001:027, covering about 1.6 ac (0.65 ha) to the west side (*mauka*) of the existing WWTP, where a 1.5 ac (0.61 ha) portion would be developed into an effluent spreading basin. Area “B” is an “existing infiltration area” part of the Wailua Municipal Golf Course property located to the northeast (*makai*) of a golf course irrigation holding pond and close to hole No. 17. This is an existing depression in sand dunes and not part of the public access areas of the golf course. A gravity overflow discharge pipe from the existing lined irrigation water holding pond (see cover photo) would connect the latter to Site “B”. This location is 0.7 mi (1.1 km) south of the WWTP. A third option is Area “C”, the golf course driving range (TMK: 3-9-002:004 por.) proposed as a

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<sup>1</sup> Rana Productions, Inc., Kailua-Kona.

*Cover photo:* Existing R-2 irrigation water storage pond, Wailua Municipal Golf Course.

"spreading basin" and located directly east (*makai*) of the Wailua Golf Course clubhouse building and 0.9 mi (1.5 km) south of the WWTP. Approximately 5.5 ac (2.23 ha) of the driving range would be used as a "backup effluent disposal site". A low (~ 2-ft high) isolation berm would surround the site on three sides.

## Methods

A survey of each of the three sites proposed for potential development as R-2 effluent disposal areas was undertaken by AECOS biologists on May 15, 2019.

### Botanical Survey

The botanical survey involved a pedestrian "transect" to view all vascular plants growing within each of the three sites. Plant names used herein follow *Manual of the Flowering Plants of Hawai'i* (Wagner, Herbst, & Sohmer, 1990; Wagner & Herbst, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples & Herbst, 2005) for ornamental plants. More recent name changes for plant species follow Imada (2012).

### Avian Survey

A total of four avian count stations were established covering the three sites: two in site "C" (driving range) and one each in sites "A" and "B". A single eight-minute avian point-count was made at each of the count stations, conducted in the morning hours. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. Time not spent at point-count stations was used to search each site and general vicinity for species and habitats not observed during point-counts. Additionally, we looked at the two "pond" features near hole No. 16 for any usage by waterbirds.

Weather conditions were good to excellent, with winds between 5 and 20 kilometers per hour. The avian phylogenetic order and nomenclature used in this report follows the AOS Check-List of North and Middle American Birds 2018 (Chesser et al., 2018).

### Mammalian Survey

The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally



was kept of all terrestrial vertebrate mammalian species detected within the project area. Mammal scientific names follow Wilson and Reeder (2005).

## Results

### Vegetation

The vegetation on each of the three sites surveyed is substantially different in several ways. Site “A” is mostly forested, with portions disturbed by grading and regularly-mowed verges along Leho Drive and Nalu Road. The interior of the site is a mixture of scrub and tall grass (see Figure 2). Site “B” is a depression within an area of sand dunes and forested around the margin, but is otherwise a dense grassland (Figure 3) in the depressed middle part. Site “C” is a driving practice range on the Wailua Municipal Golf Course and a level, close-cropped lawn (Figure 4) surrounded by scattered trees.

### Flora

Although the vegetation is described as very different between sites, the species of plants present are mostly the same, the differences between sites reflecting differences in the relative abundances of the more common species. Table 1 is a listing of all the vascular plants observed in the May 15 survey. Included is the status (native vs. non-native) of each species and a qualitative assessment of abundance for each of the three survey areas.

A total of 51 species of vascular plants is included in Table 1. All but five (90%) of these species are (naturalized or “Nat”) non-native plants. One (2%) is an ornamental (“Orn”) planted at Site “C” and two others are early Polynesian introductions (*ipu* gourd and the coconut tree; “Pol”). Two (4%) are indigenous native plants (“**Ind**”): *pōpolo* (*Solanum americanum*) and ‘*aki’aki* (*Sporobolus virginicus*), the former a common herb and the latter a seashore (dune) grass. Both are rare (seen not more than once or twice during the survey) in an area. The sites differ in the number of plant species present. The largest number of species (40) is found at Site “A”, an undeveloped piece of land adjacent to the Wailua WWTP. Although dominated by a scrub forest of *koa haole* (*Leucaena leucocephala*), the site includes disturbed areas that support a variety of ruderal plants and other areas of larger trees (including a monkeypod planted along the road) and open areas supporting shrubs and dense growth of Guinea grass (*Megathyrsus maximus*).

Table 1. List of vascular plant species observed at three sites proposed for effluent R-2 water disposal.

| Species by Family                                  | Common name               | Status     | Abundance by site |     |     | Notes |
|--|---------------------------|------------|-------------------|-----|-----|-------|
|  |                           |            | "A"               | "B" | "C" |       |
| <i>GYMNOSPERMS</i>                                 |                           |            |                   |     |     |       |
| PINOPSIDA  |                           |            |                   |     |     |       |
| ARAUCARIACEAE                                      |                           |            |                   |     |     |       |
| <i>Araucaria columnaris</i> (G. Forst.) J.D. Hook. | cook-pine                 | Nat        | --                | --  | R   |       |
| <i>FLOWERING PLANTS</i>                            |                           |            |                   |     |     |       |
| DICOTYLEDONE                                       |                           |            |                   |     |     |       |
| ACANTHACEAE  |                           |            |                   |     |     |       |
| <i>Thunbergia fragrans</i> Roxb.                   | sweet clockvine           | Nat        | U                 | --  | --  |       |
| AMARANTHACEAE                                      |                           |            |                   |     |     |       |
| <i>Alternanthera pungens</i> Kunth                 | khaki weed                | Nat        | U                 | --  | --  |       |
| <i>Amaranthus viridis</i> L.                       | slender amaranth          | Nat        | R                 | --  | --  |       |
| ANACARDIACEAE                                      |                           |            |                   |     |     |       |
| <i>Schinus terebinthifolius</i> Raddi              | Christmas berry           | Nat        | U                 | --  | --  |       |
| ASTERACEAE (COMPOSITAE)                            |                           |            |                   |     |     |       |
| <i>Calyptocarpus vialis</i> Less.                  | ---                       | Nat        | Ca                | --  | --  |       |
| <i>Erigeron bellioides</i> DC.                     | fleabane                  | Nat        | R                 | --  | --  |       |
| <i>Parthenium hysterophorus</i> L.                 | false ragweed             | Nat        | Oc                | --  | --  |       |
| <i>Pluchea indica</i> (L.) Less.                   | Indian fleabane           | Nat        | --                | U   | --  |       |
| <i>Pluchea carolinensis</i> (Jacq.) G. Don         | sourbush                  | Nat        | --                | --  | R   |       |
| <i>Pluchea x fosbergii</i> Cooperr. & Galang       | ---                       | Nat        | --                | A   | --  |       |
| <i>Sonchus oleraceus</i> L.                        | sow thistle               | Nat        | R                 | --  | --  |       |
| BORAGINACEAE                                       |                           |            |                   |     |     |       |
| <i>Tournefortia argentea</i> L. fill.              | tree heliotrope           | Nat        | --                | --  | R   |       |
| BRASSICACEAE                                       |                           |            |                   |     |     |       |
| <i>Coronopus didymus</i> (L.) Sm.                  | swinecress                | Nat        | R                 | --  | --  |       |
| CASUARINACEAE                                      |                           |            |                   |     |     |       |
| <i>Casuarina equisetifolia</i> L.                  | ironwood                  | Nat        | A                 | A   | O   |       |
| CLUSIACEAE   |                           |            |                   |     |     |       |
| <i>Clusia rosea</i> Jacq.                          | autograph tree            | Nat        | R                 | --  | --  |       |
| CONVOLVULACEAE                                     |                           |            |                   |     |     |       |
| <i>Ipomoea obscura</i> (L.) Ker-Gawl.              | ---                       | Nat        | U                 | --  | --  |       |
| CUCURBITACEAE                                      |                           |            |                   |     |     |       |
| <i>Lagenaria siceraria</i> (Molina) Stand.         | <i>ipu</i> , bottle gourd | <b>Pol</b> | R                 | --  | --  |       |

Table 1 (continued).

| Species by Family                             | Common name                      | Status     | Abundance by site |     |     | Notes |
|---|----------------------------------|------------|-------------------|-----|-----|-------|
|   |                                  |            | "A"               | "B" | "C" |       |
| <b>EUPHORBIACEAE</b>                          |                                  |            |                   |     |     |       |
| <i>Euphorbia albomarginata</i> Small          | rattlesnake weed                 | Nat        | Ua                | --  | Uo  |       |
| <i>Macaranga tanarius</i> (L.) Müll. Arg.     | ---                              | Nat        | R                 | R   | --  |       |
| <i>Ricinus communis</i> L.                    | castor bean                      | Nat        | U                 | --  | --  |       |
| <b>FABACEAE</b>                               |                                  |            |                   |     |     |       |
| <i>Albizia saman</i> (Jacq.) F. v. Muell.     | monkeypod, rain tree             | Nat        | R                 | --  | --  |       |
| <i>Canavalia cathartica</i> Thours            | <i>maunaloa</i>                  | Nat        | R                 | --  | --  |       |
| <i>Indigofera hendecaphylla</i> Jacq.         | rostrate indigo                  | Nat        | R                 | --  | --  |       |
| <i>Leucaena leucocephala</i> (Lam.) deWit     | <i>koa haole</i>                 | Nat        | AA                | U   | --  |       |
| <b>MALVACEAE</b>                              |                                  |            |                   |     |     |       |
| <i>Abutilon grandifolium</i> (Willd.) Sweet   | hairy abutilon                   | Nat        | U                 | --  | --  |       |
| <i>Malvastrum coromandelianum</i> (L.) Garcke | false mallow                     | Nat        | Oa                | --  | --  |       |
| <b>PHYTOLACCACEAE</b>                         |                                  |            |                   |     |     |       |
| <i>Rivina humilis</i> L.                      | coral berry                      | Nat        | Oa                | AA  | --  |       |
| <b>PLANTAGINACEAE</b>                         |                                  |            |                   |     |     |       |
| <i>Plantago lanceolata</i> L.                 | nrv-lvd plantain                 | Nat        | Uc                | --  | --  |       |
| <b>RUBIACEAE</b>                              |                                  |            |                   |     |     |       |
| <i>Gardenia taitensis</i> A.P. de Candolle    | <i>kiele</i> , Tahitian gardenia | Orn        | --                | --  | R   |       |
| <i>Spermacoce assurgens</i> Ruiz. & Pav.      | buttonweed                       | Nat        | R                 | --  | --  |       |
| <b>SOLANACEAE</b>                             |                                  |            |                   |     |     |       |
| <i>Solanum americanum</i> Mill.               | <i>pōpolo</i>                    | <b>Ind</b> | --                | R   | --  |       |
| <b>VERBENACEAE</b>                            |                                  |            |                   |     |     |       |
| <i>Lantana camara</i> L.                      | lantana                          | Nat        | --                | R   | --  |       |
| <b>FLOWERING PLANTS</b>                       |                                  |            |                   |     |     |       |
| <b>MONOCOTYLEDONE</b>                         |                                  |            |                   |     |     |       |
| <b>ARACEAE</b>                                |                                  |            |                   |     |     |       |
| <i>Alocasia macrorrhizos</i> (L.) G. Don      | 'ape                             | Nat        | R                 | --  | --  |       |
| <i>Epipremnum pinnatum</i> (L.) Engler        | pothos                           | Nat        | Oc                | --  | --  |       |
| <b>ARECACEAE</b>                              |                                  |            |                   |     |     |       |
| <i>Cocos nucifera</i> L.                      | coconut palm                     | Pol        | O                 | R   | U   |       |
| <i>Phoenix dactylifera</i> L.                 | palm, juv.                       | Nat        | R                 | --  | R   | <1>   |
| <b>CYPERACEAE</b>                             |                                  |            |                   |     |     |       |
| <i>Cyperus rotundus</i> L.                    | nut grass                        | Nat        | R                 | --  | U   |       |
| <b>POACEAE (GRAMINEAE)</b>                    |                                  |            |                   |     |     |       |
| <i>Axonopus compressus</i> (Sw.) P. Beauv.    | brd-lvd. carpetgrass             | Nat        | O                 | --  | --  |       |
| <i>Axonopus fisifolius</i> (Raddi) Kuhl.      | nrv-lvd. carpetgrass             | Nat        | A                 | --  | U   |       |
| <i>Bothriochloa pertusa</i> (L.) A. Camus     | pitted beardgrass                | Nat        | O                 | --  | --  |       |
| <i>Chloris barbata</i> (L.) Sw.               | swollen fingergrass              | Nat        | R                 | --  | --  |       |

Table 1 (continued).

| Species by Family  | Common name          | Status     | Abundance by site |     |     | Notes |
|--|----------------------|------------|-------------------|-----|-----|-------|
|  |                      |            | "A"               | "B" | "C" |       |
| POACEAE (continued)  |                      |            |                   |     |     |       |
| <i>Cynodon dactylon</i> (L.) Pers.                             | Bermuda grass        | Nat        | A                 | A   | AA  |       |
| <i>Dactyloctenium aegyptium</i> (L.) Willd.                    | beach wiregrass      | Nat        | U                 | --  | --  |       |
| <i>Eleusine indica</i> (L.) Gaertn.                            | wiregrass            | Nat        | U                 | U   | U   |       |
| <i>Eragrostis pectinacea</i> (Michx.) Nees                     | Carolina lovegrass   | Nat        | U                 | --  | --  |       |
| <i>Megathyrsus maximus</i> (Jacq.) B.K.<br>Simon & W.L. Jacobs | Guinea grass         | Nat        | AA                | Rc  | --  |       |
| <i>Sporobolus indicus</i> (L.) R. Br.                          | West Indian dropseed | Nat        | C                 |     |     |       |
| <i>Sporobolus virginicus</i> (L.) Kunth                        | 'aki'aki             | <b>Ind</b> | --                | --  | R   |       |
| <i>Stenotaphrum secundatum</i> (Walter)<br>Kuntze              | St. Augustine grass  | Nat        | --                | Ra  | --  |       |
| <i>Urochloa mutica</i> (Forssk.) Nguyen                        | California grass     | Nat        | --                | AA  | --  |       |

## Legend to Table 1

Status = distributional status

**Ind** = indigenous; native to Hawai'i, but not unique to the Hawaiian Islands.**Nat** = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.**Orn** = exotic, ornamental or cultivated crop; plant not naturalized (not well-established outside of cultivation, at least at this location).**Pol** = Polynesian introduction; brought to the Hawaiian Islands before 1778.

Abundance = occurrence ratings for plants on property in survey sites

R - Rare - only one or two plants seen.

U - Uncommon - several to a dozen plants observed.

O - Occasional - found regularly, but not abundant anywhere.

C - Common - considered an important part of the vegetation and observed numerous times.

A - Abundant - found in large numbers; may be locally dominant.

AA - Abundant - very abundant and dominant; defining vegetation type.

Lower case letters (as in Oc) offset occurrence ratings (u- several plants; c - many plants; a - abundant in a limited area) in cases where distribution across the survey area may be limited, but individuals seen are more than indicated by the occurrence rating alone.

Notes:

&lt;I&gt; Plant lacking flowers or fruit; identification uncertain.

The other two sites support only 13 to 14 species each, with only 4 species in common. Site "B" is dominated by a margin of ironwood trees (*Casuarina equisetifolia*) and grassland (monotypic stand of California grass or *Urochloa mutica*), the latter grass reflecting the wet conditions that prevailed for a time in the past. Site "C" is a maintained lawn covered by close-cropped Bermuda grass (*Cynodon dactylon*). All of the other species noted are rare or uncommon, except for the ironwoods forming a border around the site.



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Figure 2 (upper). Interior of Site “A” with *koa haole* scrub and dense Guinea grass. A row of ironwood trees (right) separates the vegetated interior from a graded area adjacent to the Wailua WWTP. Figure 3 (lower). Interior basin of Site “B” showing the dominant plants: California grass and, in background, the ironwood trees that border the depression.

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Figure 4. Site “C” is the driving range at Wailua Municipal Golf Course: a well-maintained lawn.

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## Avian Survey Results

A total of 216 individual birds of 13 species, representing 12 separate families, was recorded during station counts (Table 2). One additional species—Black-necked Stilt (*Himantopus mexicanus knudseni*)—was seen within the lined irrigation pond (cover photo). No water was present in the overflow pond nearby (Figure 5). Black-necked Stilt is an endemic species listed as endangered under both federal and State of Hawai‘i endangered species statutes. The remaining 13 avian species recorded during our survey are established alien species.

Avian diversity was low, though in keeping with the location of the survey sites and habitats present there. Three species—Common Myna (*Acridotheres tristis*), feral Chicken (*Gallus* sp.), and House Finch (*Haemorhous mexicanus*)—accounted for 59% of all birds recorded during station counts. The most

Table 2. Avian species detected within the Wailua WWTP Project during point-counts on May 15, 2019.

| Common Name   | Scientific Name               | Status | RA by survey area |       |       |
|---|-------------------------------|--------|-------------------|-------|-------|
|   |                               |        | GC                | "A"   | COM   |
| PHASIANIDAE - Pheasants & Partridges  |                               |        |                   |       |       |
| Phasianinae - Pheasants & Allies  |                               |        |                   |       |       |
| Chicken   | <i>Gallus sp.</i>             | A      | 8.67              | 23.00 | 12.25 |
| COLUMBIFORMES   |                               |        |                   |       |       |
| COLUMBIDAE - Pigeons & Doves  |                               |        |                   |       |       |
| Spotted Dove  | <i>Streptopelia chinensis</i> | A      | -                 | 3.00  | 0.75  |
| Zebra Dove  | <i>Geopelia striata</i>       | A      | 3.33              | 3.00  | 3.25  |
| PELECANIFORMES  |                               |        |                   |       |       |
| ARDEIDAE - Herons, Bitterns & Allies  |                               |        |                   |       |       |
| Cattle Egret  | <i>Bubulcus ibis</i>          | A      | 1.67              | 10.00 | 3.75  |
| PSITTACIFORMES  |                               |        |                   |       |       |
| PSITTACULIDAE - Lories, Lovebirds, and Indomalayan and Papua-Australasian Parrots |                               |        |                   |       |       |
| Rose-ringed Parakeet  | <i>Psittacula krameri</i>     | A      | 0.67              | -     | 0.50  |
| PASSERIFORMES   |                               |        |                   |       |       |
| ZOSTEROPIDAE - White-eyes   |                               |        |                   |       |       |
| Japanese White-eye  | <i>Zosterops japonicus</i>    | A      | 5.67              | 5.00  | 5.50  |
| TURDIDAE - Thrushes   |                               |        |                   |       |       |
| White-rumped Shama  | <i>Copsychus malabaricus</i>  | A      | 1.67              | 3.00  | 2.00  |
| MIMIDAE - Mockingbirds & Thrashers  |                               |        |                   |       |       |
| Northern Mockingbird  | <i>Mimus polyglottos</i>      | A      | 1.33              | 1.00  | 1.25  |

Table 2 (continued).

| Common Name          | Scientific Name              | Status | RA by survey area   |      |       |
|----------------------|------------------------------|--------|---|------|-------|
|                      |                              |        | GC  | "A"  | Comb  |
|                      |                              |        | STURNIDAE - Starlings   |      |       |
| Common Myna          | <i>Acridotheres tristis</i>  | A      | 13.67   | 9.00 | 12.50 |
|                      |                              |        | FRINGILLIDAE - Fringilline and Carduline Finches & Allies<br>Carduelinae - Carduline Finches and Hawaiian Honeycreepers |      |       |
| House Finch          | <i>Haemorhous mexicanus</i>  | A      | 8.00  | 4.00 | 7.00  |
|                      |                              |        | PASSERIDAE - Old World Sparrows   |      |       |
| House Sparrow        | <i>Passer domesticus</i>     | A      | 3.00  | 1.00 | 2.50  |
|                      |                              |        | CARDINALIDAE - Cardinals & Allies   |      |       |
| Northern Cardinal    | <i>Cardinalis cardinalis</i> | A      | 1.33  | 2.00 | 1.50  |
|                      |                              |        | THRAUPIDAE - Tanagers<br>Thraupinae - Core Tanagers   |      |       |
| Red-crested Cardinal | <i>Paroaria coronata</i>     | A      | 1.67  | --   | 1.25  |

Legend to Table 2

Status

A = Alien – Introduced to the Hawaiian Islands by humans

**RA** = Relative abundance - Number of birds detected divided by the number of count stations (*n*)

**GC** = Golf Course relative abundance (3)

**"A"** = Wastewater Treatment Plant site relative abundance (1)

**Comb** = Golf Course and Wastewater Treatment Site combined relative abundance (4)



commonly recorded species was Japanese Common Myna, which accounted for 23% of the total individual birds recorded.



Figure 5. Current overflow “pond” at Hole 16. Irrigation water holding pond is located upslope to the left.

## Mammalian Survey Results

We recorded three terrestrial mammalian species as shown in Table 3, which includes the types of detection recorded for each of these species.

## Discussion

### Botanical Resources

No issues exist for any of the sites with respect to botanical resources. All three sites represent highly disturbed land. No plants of conservation concern are present.

Table 3. Mammalian species detected, Wailua WWTP Surveys, May, 2019.

| Common name                        | Scientific name               | ST | DT            |
|------------------------------------|-------------------------------|----|---------------|
| CARNIVORA- FLESH EATERS            |                               |    |               |
| Canidae - Wolves, Jackals & Allies |                               |    |               |
| Domestic dog                       | <i>Canis lupus familiaris</i> | A  | V, A, Sc, Tr, |
| Felidae- Cats                      |                               |    |               |
| House cat                          | <i>Felis catus</i>            | A  | V, tr         |
| ATRIODACTYLA - Even-Toed Ungulates |                               |    |               |
| SUICIDAE - Old World Swine         |                               |    |               |
| Pig                                | <i>Sus scrofa</i>             | A  | Sc, Tr, Si    |

## Key to table 3

**ST** Status

A Alien – introduced to the Hawaiian Islands by humans

**DT** Detection type

V Visual – an animal seen

A Audio – an animal heard

Sc Scat – an animal detected by fecal droppings

Tr Tracks -an animal detected by the presence of tracks

Si Sign – an animal detected by sign, i.e., tunnels, beds, tree scraping etc.

## Avian Resources

The findings of the avian survey are consistent with the location of the sites, habitats on them, and their current usage. During point-counts, all of the species recorded are well-established alien species. Differences in diversity and population density recorded at each site are shown in Table 2. As can be seen, little difference exists in avian assemblages present on each site, and all of the species detected can be expected to occur at any of the sites on a temporal or seasonal basis.

Four Black-necked Stilts were counted in the lined pond within the golf course. Currently, no other location on any of the three sites surveyed is suitable for usage by this endangered species. Although we did not record Nēnē (*Branta sandvicensis*) during our survey, this endangered species has been recorded on a regular basis on the golf course (David, 2018).

We did not record any indigenous migratory shorebirds during the course of this survey, which was not surprising as these annual wintering species which nest in the high Arctic during the late spring and summer months, usually leave Hawai'i for their trip back to the Arctic in late April or the very early part of May. It is probable that Pacific-Golden Plover (*Pluvialis fulva*), Ruddy Turnstone (*Arenaria interpres*), Sanderling (*Calidris alba*), and Wandering tattler (*Tringa incana*) use resources within the golf course area on a seasonal basis.

Although we did not record any Hawaiian Coot (*Fulica alai*), Common Moorhen (*Gallinula galeata sandvicensis*), or Hawaiian Duck (*Anas wyvilliana*) on the three sites, all three have been recorded on the golf course and are regularly seen in, and close to, the drainage canal fronting Kūhio Highway (David, 2019). No suitable habitat exists in or near site "A" for any of these endangered waterbirds. Whether any of these species have ever been seen within Sites "B" or "C" is unknown; the habitat present on these two sites is not typical of the habitat usually used by these species on Kaua'i.

No seabirds were recorded during the survey. The endangered Hawaiian Petrel (*Pterodroma sandwichensis*) and Band-rumped Storm-Petrel (*Oceanodroma castro*), and the threatened Newell's Shearwater (*Puffinus newelli*), have been recorded over-flying the general project area between April and the end of November each year. The Save Our Shearwaters Program has recovered both species from the Wailua area over the past three decades (Save our Shearwater Program, 2018). The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983, Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered the second most significant cause of mortality in these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds can collide with man-made structures and, if not killed outright, dazed or injured birds become easy targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al. 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003). Additionally, Wedge-tailed Shearwater (*Ardenna pacifica*), a coastal nesting, indigenous seabird, potentially could nest in the coastal dunes east of the golf course. We searched the dune area for signs of seabird activity, and found none. The survey was conducted at the time of the year that this species is nesting on the Island.

## Mammalian Resources

With the exception of the endangered Hawaiian hoary bat or *‘ōpe‘ape‘a* (*Lasiurus cinereus semotus*), all terrestrial mammals currently found on the Island of Kaua‘i are alien species, and most are ubiquitous. We did not record Hawaiian hoary bats overflying the site. However, the Hawaiian hoary bat is widely distributed in the low to mid-elevation areas on the Island, and these bats have been documented in and around almost all areas that still have some dense vegetation (Tomich, 1986; USFWS 1998; David, 2019). No suitable habitat occurs within Site “C” and minimally occurs within site “A”; the habitat within Site “B” potentially provides suitable roost sites.

Although, no rodents were recorded during the course of this survey, it is likely that one or more of the four established Muridae found on Kaua‘i—European house mouse (*Mus musculus domesticus*), roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*)—use resources found within the general area on a seasonal basis. These human commensal species are drawn to areas of human habitation and activity. All of these introduced rodents are deleterious to native faunal species.

## Protected Species

No plant species of any concern with respect to listing under either federal or State of Hawai‘i as threatened or endangered under endangered species statutes (HDLNR, 1998; USFWS, nd) occur on or near the subject sites. Endangered Black-necked Stilts were recorded in the lined pond, and may upon occasion forage or loaf in other locations around the golf course. No mammalian species proposed for listing, or listed as endangered or threatened, were recorded during the course of this survey (HDLNR, 2014; USFWS, nd).

## Jurisdictional Waters

Jurisdictional waters refers to “waters of the U.S.”: wetlands, streams, and tidal waters that come under federal jurisdiction as described in the federal Rivers and Harbors Act (RHA) and Clean Water Act (CWA). No environments that would be regarded as jurisdictional occur at sites “A” or “C”: no streams or wetlands are present and both are entirely “upland” as defined by USACE (1987). Site “B” is a depression between high sand dunes. It would not be unusual for such a depressed area to support an isolated wetland if the invert of the basin reached close to the basal groundwater body. The predominance of

California grass (a “FACW<sup>2</sup>” species; USACE, 2012; Lichvar, et al., 2016) is an indication that such could be the case. However, the grass growing here could as well be the result of a previous recent history of this site being used to receive excess R-2 effluent from the Wailua WWTP (pers. comm., Craig Carney, golf course superintendent). A problem determining wetland status for this depressed area is the nature of the soil. Indications of a wetland require—in addition to the flora indicator established by dominance of a FACW species—demonstrating reducing conditions in the soil resulting from long-term flooding by water. Here, the soil is calcareous material (beach sand) and man-induced flooding has been of water possibly low in dissolved oxygen. We encountered no evidence of standing water during our survey, or evidence of any other wetland indicator plants.

A 2015 rule issued by USACE and USEPA, “The Clean Water Rule” (USACE & 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 three 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 August 16, 2018), 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)<sup>3</sup>. On the basis of proximity—located within 1,500 ft (460 m) of the high tide line—the site “B” depression, if determined to be a wetland, would be jurisdictional (that is, not an isolated wetland). However, the proposed use of this depression as an overflow for irrigation water could be exempt under the final rule (see, for example, GCSAA, 2015). The argument would need to be made that the depression lacked wetland characteristics (either wetland vegetation or soil characteristics) or has an invert several feet above the basal groundwater, and any conditions now present that suggest a wetland here are the result of prior use as an emergency R-2 irrigation water overflow site.

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<sup>2</sup> FACW – Status of a plant species regarded as usually occurring in wetlands, but may as well occur in non-wetlands (Lichvar and Gillich, 2011).

<sup>3</sup> On December 11, 2018 the USEPA and USACE issued a pre-publication draft of a revised definition of waters of the U.S (USACE and USEPA, 2018). This proposed definition will not be applicable until after the public rulemaking process has been completed.

## Critical Habitat

Federally delineated Critical Habitat is not present in the project areas (USFWS, 2012). Thus, the project will not impinge on federally designated Critical Habitat. No equivalent designation exists under state law.

## Recommendations

During the construction phase of the project we recommend the following minimization measures and training be implemented to ensure that construction activities do not result in deleterious impacts to listed faunal species that may be encountered.

- Potential adverse impacts to pupping bats can be avoided or minimized by not clearing woody vegetation taller than 15 ft (4.6 m) within sites “A” and “B” between June 1 and September 15, the period in which bats are potentially at risk from vegetation clearing.
- If night-time construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded and, when large flood/work lights are used, they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.
- If streetlights or exterior facility lighting is installed in conjunction with the project, it is recommended that the lights be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and man-made structures (Reed et al., 1985; Telfer et al., 1987).
- Construction personnel should be given Endangered Species Awareness training to ensure that they are suitably versed in the appropriate behavior and cautions that should be implemented around endangered species, should any enter construction areas.

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## Attachment C

### Avoidance and Minimization Measures

#### **Waterbirds (Hawaiian Stilt [Ae'oi], Hawaiian Duck [koloa], Hawaiian Coot ['alae kea], and Common Moorhen ['alae 'ula]).**

To avoid and minimize potential impacts on waterbirds, the following measures will be incorporated into the project description:

- To discourage waterbird use of the facility, the subsurface-flow-constructed wetland will not have areas of open water; asphalt rather than gravel will be used to provide access around the lagoons; the lagoons will be lined with a high-density polyethylene liner, rather than with substrate that would support vegetation growth; shade balls will be used in the largest lagoon to discourage algal growth, and the lagoons will be bordered by groves rather than bare land.
- The security fence around the perimeter of the treatment and disposal facility will exclude larger non-native mammalian predators.
- In areas where waterbirds are known to be present, the project will post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, the project will incorporate applicable best management practices regarding work in aquatic environments into the project design.
- A biological monitor that is familiar with the species' biology will conduct waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Surveys will be repeated again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
  - The Service will be contacted within 48 hours for further guidance.
  - Will establish and maintain a 100-ft buffer around all active nests and/or broods until the chicks/ducklings have fledged. Will not conduct potentially disruptive activities or habitat alteration within this buffer.
- A biological monitor that is familiar with the species' biology will be present on the project site during all construction or earth-moving activities until the chicks/ducklings fledge to ensure that waterbirds and nests are not adversely impacted.

Dr. Earl Campbell, Field Supervisor  
October 31, 2022

### **Hawaiian Goose (Nēnē)**

To avoid and minimize impacts on the Nēnē, the following measures will be incorporated into the project description:

- Contractor shall be aware that they may encounter Nēnē during the work.
- Contractor shall not approach, feed, or disturb Nēnē.
- If Nēnē is observed loafing or foraging within the project area during the Nēnē breeding season (September through April), a biologist familiar with the nesting behavior of Nēnē shall survey for nests in and around the project area prior to the resumption of any work. The survey shall be repeated after any subsequent delay of work of three or more days (during which the birds may attempt to nest).
- Contractor shall cease all work immediately and contact the U.S. Department of the Interior, Fish and Wildlife Service for further guidance if a nest is discovered within a radius of 150 feet of proposed work, or a previously undiscovered nest is found within said radius after work begins.
- Contractor shall operate vehicles at a maximum of 10 miles per hour within the project property.

### **Hawaiian Hoary Bat**

To avoid and minimize impacts on the endangered Hawaiian hoary bat, the following measures will be incorporated into the project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

### **Hawaiian Petrel, Newell's Shearwater, and Hawaii Distinct Population Segment of the Band-Rumped Storm Petrel (collectively referred to as Hawaiian seabirds)**

To avoid and minimize impacts on the Hawaiian Petrel, Newell's Shearwater, and Hawaii Distinct Population Segment of the Band-Rumped Storm Petrel, the following measures will be incorporated into the project description:

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



# 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:  
2023-0011776-S7-002

November 8, 2022

Ms. Elizabeth Char, M.D.  
Department of Health  
State of Hawai'i  
P.O. Box 3378  
Honolulu, Hawai'i 96801

Subject: Informal Consultation for the Proposed Wailua Wastewater Treatment Plant  
NPDES Compliance Improvements Project, Kaua'i

Dear Ms. Char:

The U.S. Fish and Wildlife Service (Service) Pacific Island Fish and Wildlife Office received your letter dated October 31, 2022, requesting our concurrence with your determination that the proposed Wailua Wastewater Treatment Plant NPDES Compliance Improvements Project, may affect, but is not likely to adversely affect the following federally listed species: the endangered Hawaiian hoary bat ('ōpe'ape'a, *Lasiurus cinereus semotus*); the endangered Hawaiian petrel (ua'u, *Pterodroma sandwichensis*), endangered Hawai'i distinct population segment (DPS) of band-rumped storm-petrel ('ake'ake, *Oceanodroma castro*), and threatened Newell's shearwater ('a'o, *Puffinus auricularis newelli*) (hereafter collectively referred to as Hawaiian seabirds); the endangered Hawaiian duck (koloa, *Anas wyvilliana*), endangered Hawaiian coot ('alae ke'oke'o, *Fulica americana alai*), endangered Hawaiian stilt (ae'o, *Himantopus mexicanus knudseni*), endangered Hawaiian gallinule ('alae 'ula, *Gallinula galeata sandvicensis*) (hereafter collectively referred to as Hawaiian waterbirds); and the threatened Hawaiian goose (nēnē, *Branta sandvicensis*).

The findings and recommendations in this consultation are based on the following: 1) your letter dated October 31, 2022; 2) your biological evaluation; and 3) other information available to us. Our response is in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*).

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## PACIFIC REGION 1

IDAHO, OREGON\*, WASHINGTON,  
AMERICAN SAMOA, GUAM, HAWAI'I, NORTHERN MARIANA ISLANDS

\*PARTIAL

**Project Description**

The County of Kaua‘i, Department of Public Works, Wastewater Management Division is proposing improvements to the existing Wailua Wastewater Treatment Plant (WWTP) as well as the Wailua Municipal Golf Course. This project plans to use the Clean Water State Revolving Program funds. The Wailua WWTP is located at 4460 Nalu Road on 2.033 acres of County-owned land and provides tertiary treatment and disinfection to produce R-2 recycled water that is conveyed via an existing 10-inch force main from Wailua WWTP to the Wailua Municipal Golf Course. The Wailua Municipal Golf Course has been using R-2 recycled water from the WWTP for golf course irrigation since 1976 as its primary source of irrigation water. Excess treated effluent is currently discharged to an existing permitted ocean outfall located to the southeast of the WWTP, approximately 700 feet from the shoreline.

The proposed project includes improvements to the existing Wailua WWTP and the WWTP’s ocean outfall, as well as rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course. Improvements at the WWTP would include, but may not be limited to, modifications to the aeration basins, clarifiers, filter bay, and chlorine contact tank; installation of a second effluent filter and an on-site hypochlorite generation system; replacement of the effluent pumps; electrical upgrades; and site work to include trenching, grading, and the construction of new site access roads. The project area for the proposed improvements would be on the existing Wailua WWTP parcel (TMK: (4) 3-9-006:019) and a portion of the adjacent County-owned parcel (TMK: (4) 3-9-006:027).

The existing ocean outfall modification will consist of extending the diffuser riser pipes at the existing flanges of the three functional outfall diffuser heads located offshore. The extension of the riser pipes will reduce the likelihood of current-driven sand plugging or covering the diffuser heads, increasing the reliability of the existing ocean outfall for effluent disposal. The Department of Health will be consulting with the National Oceanic and Atmospheric Administration-National Marine Fisheries Service regarding potential effects on marine species and/or essential fish habitat.

The proposed improvements also include rehabilitating the existing 10-inch force main that conveys R-2 recycled water from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe sliplining, which will limit the amount of excavation required. Excavation for the force main rehabilitation would be limited to sharp bends or corners in the pipe and includes the following County-owned parcels and right of way:

- Nalu Road right of way
- Leho Drive right of way
- Nehe Road right of way
- TMK: (4) 3-9-002:032 – Wailua Municipal Golf Course
- TMK: (4) 3-9-002:004 – Wailua Municipal Golf Course

**Hawaiian Hoary Bat**

To avoid and minimize potential impacts to the Hawaiian hoary bat the following measures will be implemented:

- Woody plants greater than 15 ft. tall will not be cleared between June 1 and September 15, the period in which bats are potentially at risk from vegetation clearing.
- Barbed wire will not be utilized for fencing.

#### Hawaiian Seabirds

To avoid and minimize potential project impacts to Hawaiian seabirds, the following measures will be implemented:

- All outdoor lights will be fully shielded so the bulb can only be seen from below bulb height and only used when necessary.
- Automatic motion sensor switches and controls will be installed on all outdoor lights or lights will be turned off when human activity is not occurring in the lighted area.
- Nighttime construction will be avoided during the seabird fledging period, September 15 through December 15. If nighttime construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights will be shielded.

#### Hawaiian Waterbirds

Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards. Historically, the most important cause of decline for Hawaiian waterbirds was loss of wetland habitat. Other factors that have contributed to population declines, and which continue to be detrimental, include predation by introduced animals, altered hydrology, alteration of habitat by invasive non-native plants, disease, and possibly environmental contaminants. Currently, predation by introduced animals may be the greatest threat to Hawaiian waterbirds.

To avoid and minimize potential project impacts to Hawaiian waterbirds, the following measures will be implemented:

- A qualified biological monitor will conduct Hawaiian waterbird and nest surveys at the proposed project site prior to project activities, and after any subsequent delay in activities of three or more days.
- Any documented nests or broods within the project vicinity will be reported to the U.S. Fish and Wildlife Service (Service) within 48 hours.
- A 100-foot buffer will be established and maintained around all active nests and /or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
- If a listed Hawaiian waterbird is observed within the project site, or flies into the site while activities are occurring, the biological monitor will halt all activities within 100 feet of the individual(s). Work will not resume until the Hawaiian waterbird(s) leave the area on their own accord.
- A report will be submitted to the Service within 30 days of the project being completed. The report will include the results of Hawaiian waterbird surveys, the location and outcome of documented nests, and any other relevant information.

- Predator trapping will occur at least 30 meters from any known nest site. Live traps will have a shade to reduce heat stress and will be checked daily when open. A metal mesh barrier/hurdle or box will be placed in front or over live traps to reduce any non-target species catch. A24 traps will be mounted high enough to be out of reach for non-target species.

### Hawaiian Goose

Hawaiian geese are found on the islands of Hawaii, Maui, Molokai, and Kauai. They are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

To avoid and minimize potential project impacts to the Hawaiian goose, the following measures will be implemented:

- The qualified biological monitor will conduct a survey for the Hawaiian goose prior to the initiative of any work, or after any subsequent delay in work of three or more days. The same protocol for the Hawaiian waterbirds will be conducted for the Hawaiian goose.
- If a nest is discovered, work will cease, and the Service will be contacted for further guidance.
- Predator trapping will occur at least 30 meters from any known nest site. Live traps will have a shade to reduce heat stress and will be checked daily when open. A metal mesh barrier/hurdle or box will be placed in front or over live traps to reduce any non-target species catch. A24 traps will be mounted high enough to be out of reach for non-target species.

### *Analysis of Effects to Listed Species*

#### Hawaiian Hoary Bats

The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. 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.

By implementing your proposed minimization measures, including not clearing woody plants greater than 15 feet tall between June 1 and September 15 and avoiding using barbed wire for fencing, it is not probable that Hawaiian hoary bats pups would be impacted by tree clearing or bats would be entangled in barbed wire. Because impacts from the proposed project are not probable, impacts are discountable.

#### Hawaiian Seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling



the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

By implementing your proposed minimization measures, including avoiding nighttime construction during the seabird fledging season from September 15 through December 15 and fully shielding and using motion sensor switches on all lights used at night outside of the fledging season, it is not probable that Hawaiian seabirds would be attracted to and possibly become disoriented, resulting in fallout injury or mortality. Because impacts from the proposed project are not probable, impacts are discountable.

#### Hawaiian Waterbirds

Hawaiian waterbirds are known to forage, nest, and/or utilize water features in the vicinity of the proposed project area. By incorporating the above avoidance and minimization measures for Hawaiian waterbirds, crushed eggs or chicks, and adults leaving nests for extended periods or nests failing are not probable, and therefore discountable.

#### Hawaiian Goose

The Hawaiian goose is known to forage, nest, and/or utilize water features in the vicinity of the proposed project area. By incorporating the above avoidance and minimization measures for the Hawaiian goose, crushed eggs or chicks, and adults leaving nests for extended periods or nests failing are not probable, and therefore discountable.

#### *Summary*

Based on the project description along with your proposed avoidance and minimization measures that will be implemented, effects from the actions are discountable. Because impacts from the proposed project are discountable, we concur with your determination that the proposed project may affect, but is not likely to adversely affect the Hawaiian hoary bat, the Hawaiian seabirds, the Hawaiian waterbirds, and the Hawaiian goose.

Re-initiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

- 1) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- 2) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the written concurrence; or,
- 3) If a new species is listed or critical habitat designated that may be affected by the identified action.

We appreciate your efforts to conserve protected species. If you have questions regarding this letter, please contact Charmian Dang, Fish and Wildlife Biologist (phone: 808-792-9400, email:

[Charmian\\_Dang@fws.gov](mailto:Charmian_Dang@fws.gov)). When referring to this project, please include this reference number: 2022-0011776-S7-002.

Sincerely,

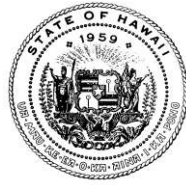
Island Team Manager  
O‘ahu, Kaua‘i, Northwest Hawaiian  
Islands and American Samoa

APPENDIX B

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Essential Fish Habitat Documentation





**STATE OF HAWAII  
DEPARTMENT OF HEALTH**

P. O. BOX 3378  
HONOLULU, HI 96801-3378

In reply, please refer to:  
File:

October 31, 2022

55-10 S7 S7-S305 ltr (initial).docx

Michael Tosatto, Regional Administrator  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Pacific Islands Regional Office  
1845 Wasp Blvd.  
Honolulu, HI 96818  
Email: [piro.info@noaa.gov](mailto:piro.info@noaa.gov)

Dear Mr. Tosatto:

**Subject:** Initiate Informal Consultation Under Section 7 of the Endangered Species Act and Request General Concurrence and Conservation Recommendations Under Section 305(b)(2) of the Magnuson-Stevens Act  
Wailua WWTP NPDES Compliance Improvements  
Clean Water State Revolving Fund (CWSRF) Project No. C150055-10

The U.S. Environmental Protection Agency (EPA) has designated the State of Hawai'i Department of Health (DOH) as its non-federal representative pursuant to

- 50 CFR Section 402.08 for purposes of initiating the consultation process and preparing a biological assessment, if necessary, under Section 7 of the federal Endangered Species Act (ESA) and
- 50 CFR Section 600.920(c) for purposes of initiating the consultation process and preparing an Essential Fish Habitat (EFH) assessment under Section 305(b)(2) of the Magnuson-Stevens Act (MSA)

for certain projects funded under the Clean Water State Revolving Fund (CWSRF) program.

The County of Kaua'i, Department of Public Works, Wastewater Management Division is proposing improvements to the existing Wailua Wastewater Treatment Plant (WWTP) as well as the Wailua Municipal Golf Course. This project plans to use CWSRF program funds.

We are contacting your office to:

- initiate the informal consultation process,
- request concurrence of the proposed determination under Section 305(b)(2) of the Magnuson-Stevens Act (MSA), and
- request conservation recommendations.

**Project Background**

The Wailua WWTP is located at 4460 Nalu Road (TMK: (4) 3-9-006:019) on 2.033 acres of County-owned land (see Attachment A). The WWTP provides tertiary treatment and disinfection to produce R-2 recycled water that is conveyed via an existing 10-inch force main from Wailua WWTP to the Wailua Municipal Golf Course. The Wailua Municipal Golf

Course is located at 3-5350 Kūhio Highway (four (4) TMKs: (4) 3-9-002:004, 005, and 006 and (4) 3-9-005:001), south of the WWTP comprising an area of 243.73 acres. The Wailua Municipal Golf Course has been using R-2 recycled water from the WWTP for golf course irrigation since 1976 as its primary source of irrigation water. Excess treated effluent is currently discharged to an existing permitted ocean outfall located to the southeast of the WWTP approximately 700 feet from the shoreline.

### **Project Description**

The proposed project includes improvements to the existing Wailua WWTP and the WWTP's ocean outfall, as well as rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course. Improvements at the WWTP would include, but may not be limited to, modifications to the aeration basins, clarifiers, filter bay, and chlorine contact tank; installation of a second effluent filter and an on-site hypochlorite generation system; replacement of the effluent pumps; electrical upgrades; and site work to include trenching, grading, and the construction of new site access roads. The project area for the proposed improvements would be on the existing Wailua WWTP parcel (TMK: (4) 3-9-006:019) and a portion of the adjacent County-owned parcel (TMK: (4) 3-9-006:027).

The existing ocean outfall modification will consist of extending the diffuser riser pipes at the existing flanges of the three (3) functional outfall diffuser heads located offshore. The extension of the riser pipes will reduce the likelihood of current-driven sand plugging or covering the diffuser heads, increasing the reliability of the existing ocean outfall for effluent disposal. DOH will be consulting with the National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA Fisheries) regarding potential effects on marine species and/or essential fish habitat.

The proposed improvements also include rehabilitating the existing 10-inch force main that conveys R-2 recycled water from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe sliplining, which will limit the amount of excavation required. Excavation for the force main rehabilitation would be limited to sharp bends or corners in the pipe (see Attachment A). The project area for the force main rehabilitation includes the following County-owned parcels and rights of way:

- Nalu Road right of way
- Leho Drive right of way
- Nehe Road right of way
- TMK: (4) 3-9-002:032 – Wailua Municipal Golf Course
- TMK: (4) 3-9-002:004 – Wailua Municipal Golf Course

### **Essential Fish Habitat Assessment**

In March 2019, the project team engaged in an early pre-consultation meeting with NOAA Fisheries staff, Stuart Goldberg and Anne Chung. After some alterations to the project, a subsequent pre-consultation meeting was held with NOAA Fisheries staff, Anne Chung, in September 2021 to discuss the proposed improvements to the ocean outfall diffusers.

An assessment of impacts of the proposed action to EFH, pursuant to the MSA is provided in the attached EFH assessment (Attachment B). Effects to EFH area will be minimal because:

- 1) the impact at the site is low intensity,

Michael Tosatto, Regional Administrator

October 31, 2022

Page 3

- 2) marine resources at the outfall diffuser site are limited, with no sensitive or vulnerable (e.g., coral) resources present, and
- 3) the modification work will occur over a short time period. The anticipated adverse effects do not have the potential to cause substantial adverse effects to EFH in the nearshore waters off the project.

The DOH requests concurrence from the NOAA Fisheries Habitat Conservation Division (HCD) that the proposed project will result in minimal adverse effects to the EFH project area. Please provide conservation recommendations for the proposed project.

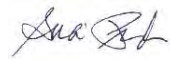
Your response within thirty (30) calendar days of receipt of this letter is greatly appreciated. Please address your written response to the following email or mailing address:

[chane.hayashida@doh.hawaii.gov](mailto:chane.hayashida@doh.hawaii.gov)

Attn: Chane Hayashida  
Department of Health, Wastewater Branch  
2827 Waimano Home Road, Room 207  
Pearl City, HI 96782

Should you have any questions, please contact Chane Hayashida of our Branch at (808) 586-4294.

Sincerely,



SINA PRUDER, P.E., CHIEF  
Wastewater Branch

#### Attachments

JN:sp

c: Mr. Troy Tanigawa (via email at [TTanigawa@kauai.gov](mailto:TTanigawa@kauai.gov))  
Mr. Donn Kakuda (via email at [DKakuda@kauai.gov](mailto:DKakuda@kauai.gov))  
Mr. Stephen Esaki (via email at [StephenEsaki@KennedyJenks.com](mailto:StephenEsaki@KennedyJenks.com))  
Mr. John Hagihara (via email at [JHagihara@hhf.com](mailto:JHagihara@hhf.com))

# Attachment A: Project Location Maps

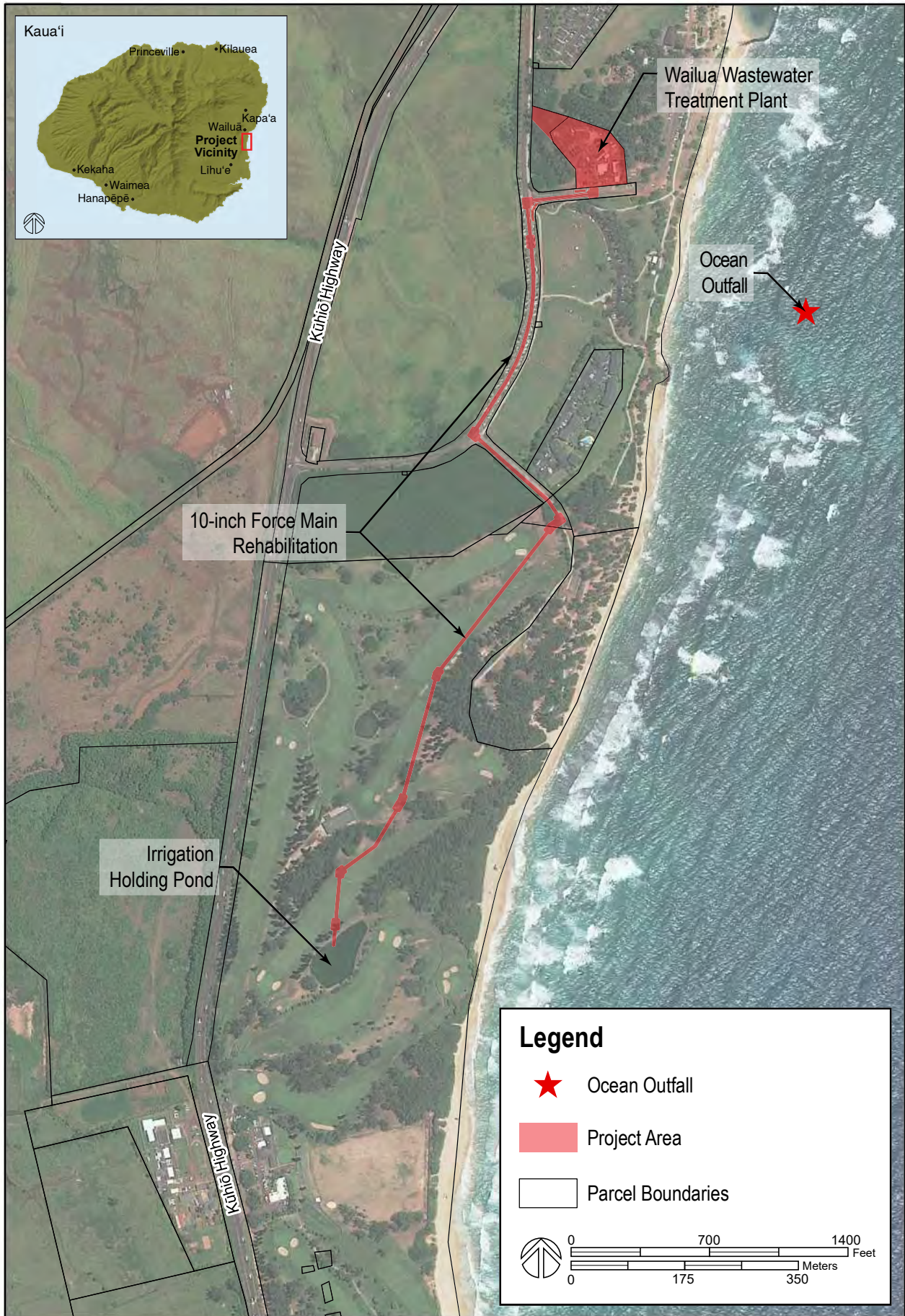


Figure 1: Full Project Area Map



Attachment A: Project Location Maps

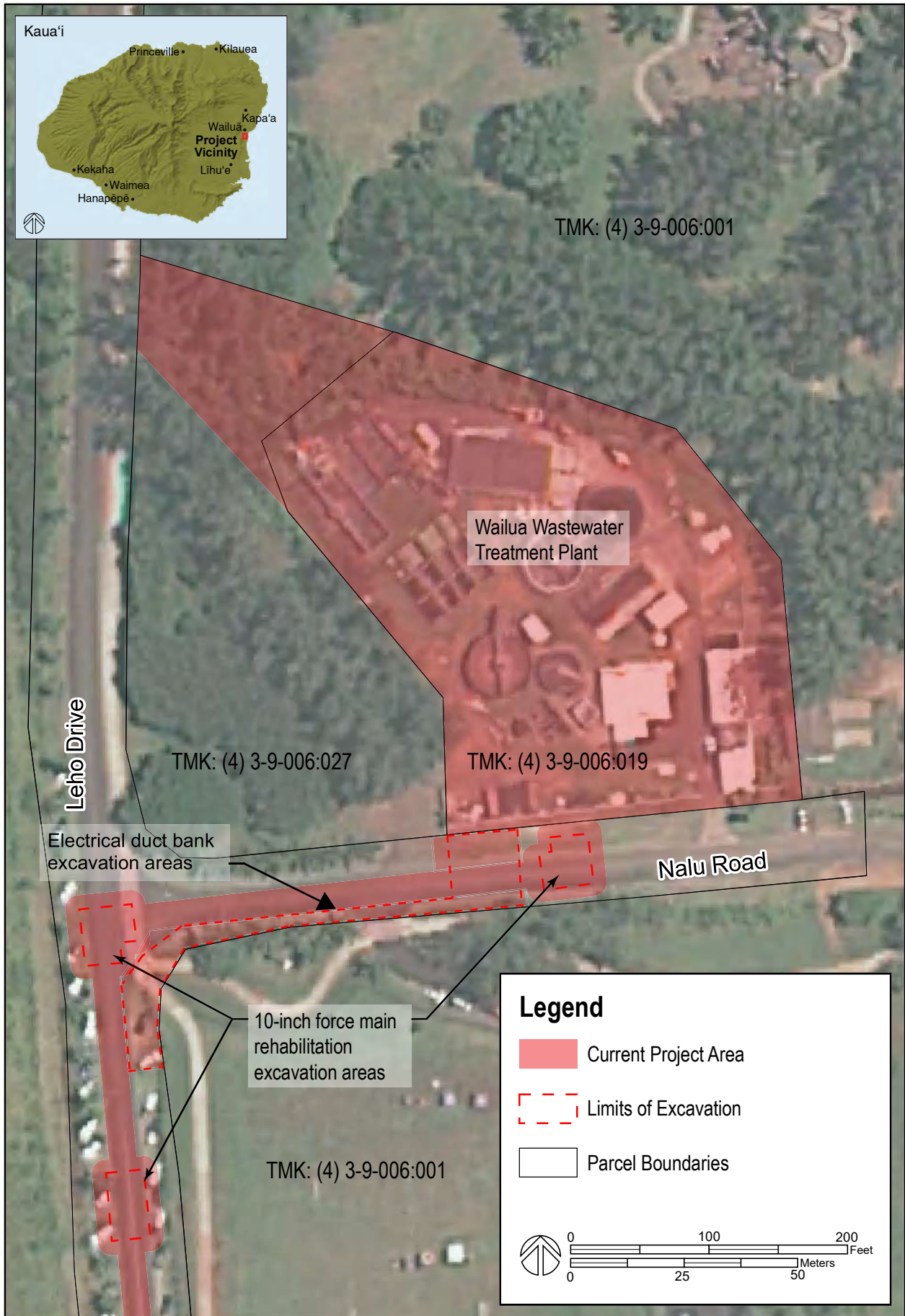


Figure 2: Wailua Wastewater Treatment Plant

Attachment A: Project Location Maps

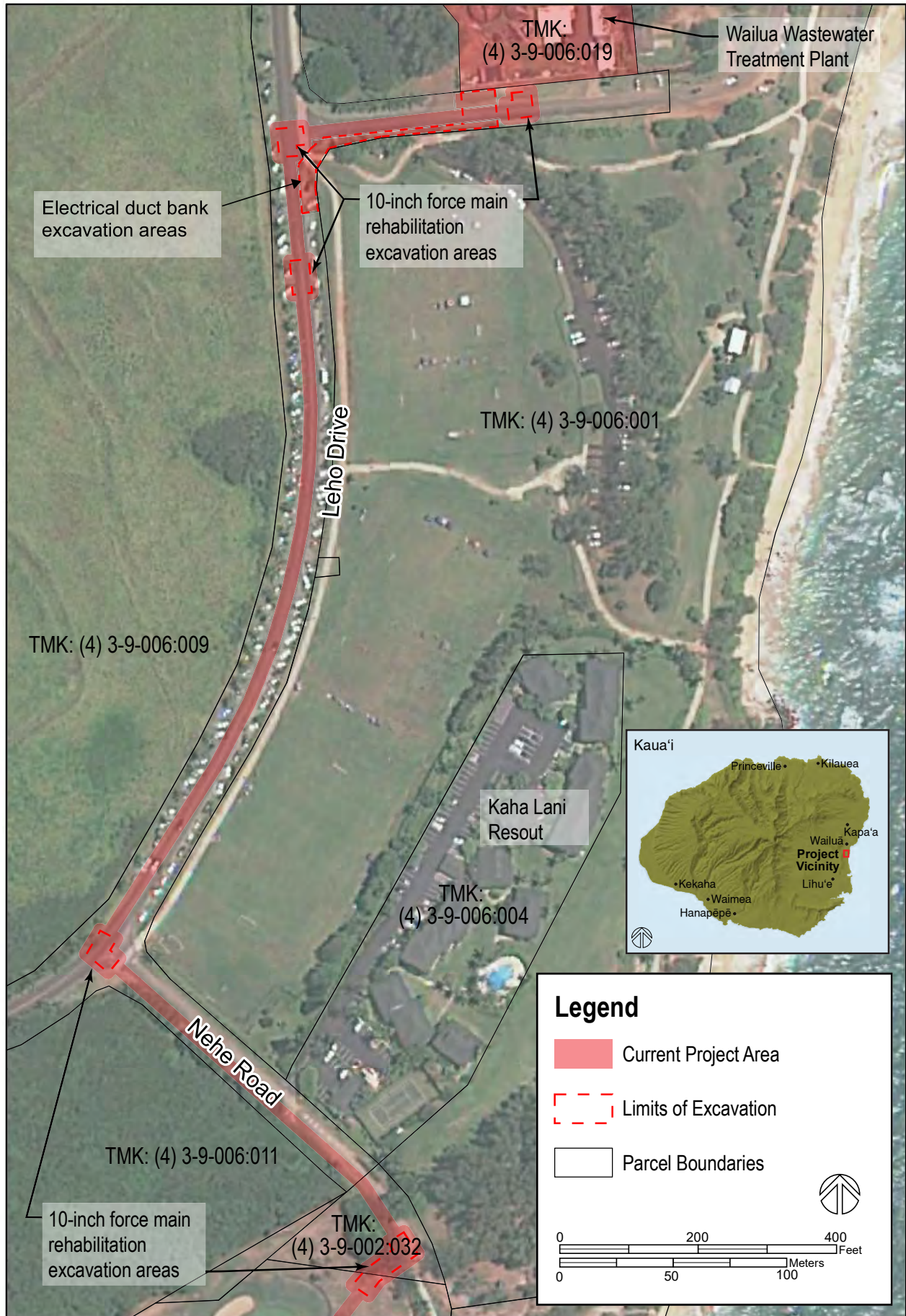


Figure 3: 10-inch Recycled Water Force Main Rehabilitation along Leho Drive and Nehe Road

# Attachment A: Project Location Maps

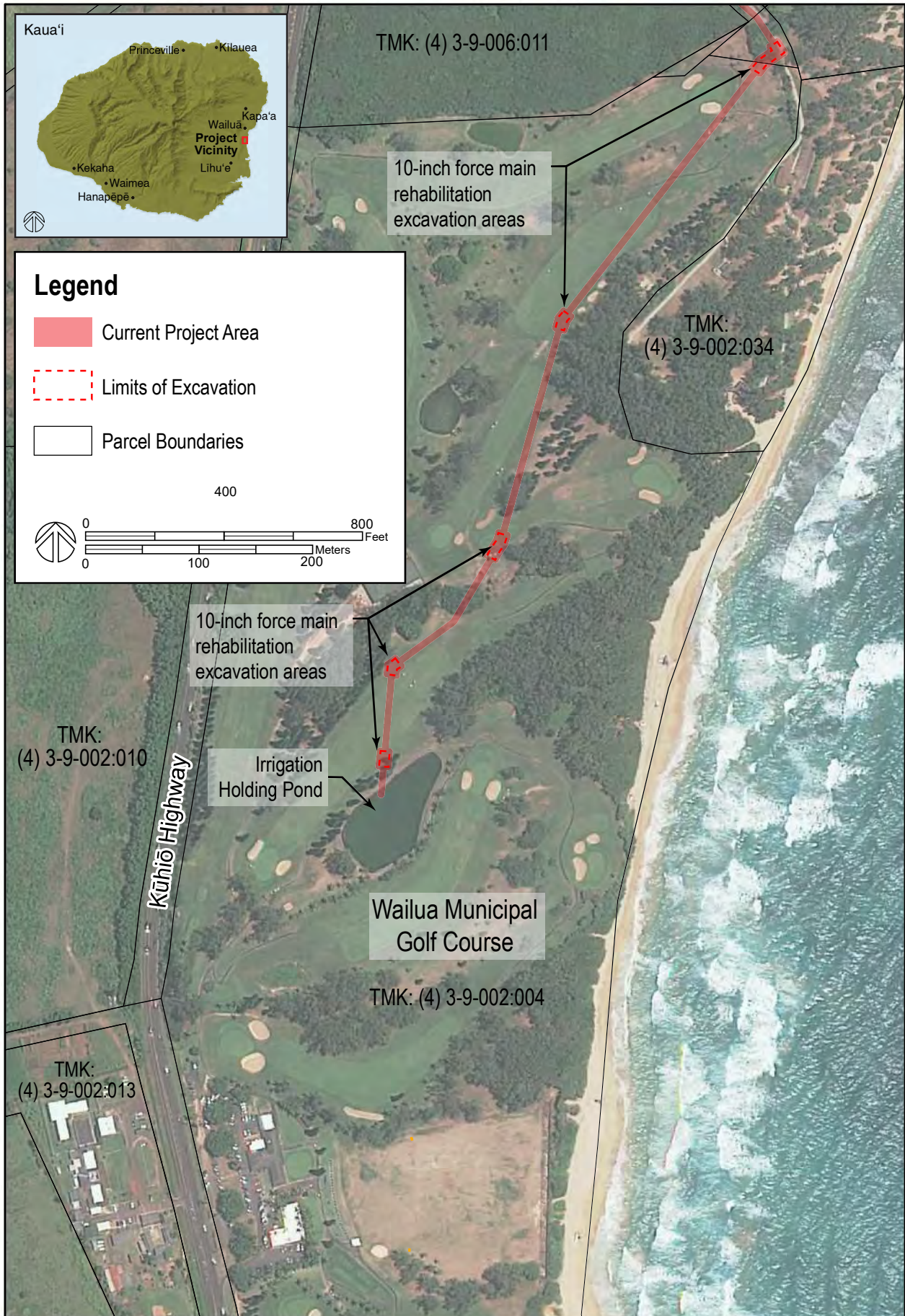


Figure 4: 10-inch Recycled Water Force Main Rehabilitation at the Wailua Municipal Golf Course

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# Essential Fish Habitat (EFH) assessment for the Wailua Wastewater Treatment Plant Wailua, Kaua‘i

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**DRAFT**

AECOS No. 1575C

Stacey Kilarski  
AECOS, Inc.  
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## Introduction

The Wailua Wastewater Treatment Plant (WWTP) on the Island of Kaua‘i produces a treated effluent referred to as R-2 water. This effluent is utilized as the primary source of irrigation water for the County of Kaua‘i (“County”), Wailua Municipal Golf Course (Figure 1), a practice that has been ongoing since 1976 (anon., nd). Excess treated effluent is currently discharged to an existing permitted ocean outfall connected to the WWTP. The Wailua WWTP ocean outfall diffusers were covered by sand during the period of March 2018 through June 2018. Whenever the ocean outfall diffusers become covered with sand, the Wailua WWTP must rely solely on the Wailua Municipal Golf Course for effluent disposal by use or storage of the R-2 water. This places a strain on both the Wailua WWTP and Wailua Municipal Golf Course to safely manage and store the treated effluent in a way that is considered safe for the public. The County plans to modify the existing ocean outfall, involving the addition of rubber spool diffuser risers attached to the existing outfall diffusers (“Project”). AECOS, Inc.

has been tasked with assessing the effects of the proposed Project on essential fish habitat in the vicinity of the ocean diffuser.



**Figure 1. Location of Wailua WWTP and the ocean outfall.**

### Proposed Outfall Modification Design

The proposed outfall modification design includes attaching rubber spool pipe risers to the flanged ends of the existing outfall diffusers. This action will increase the height off the bottom of the diffuser outlets, reducing the likelihood of sand covering the outlets. All equipment and materials will be transported to the Project site by a work vessel, which will be anchored near the outfall. The anchor locations will be verified by divers to be free of living coral. The dive team will access the diffusers, remove debris from the flange faces of the three open diffusers, and attach the rubber spool pipe risers. Only hand tools will be used.

## Essential Fish Habitat Assessment

### Purpose and Background

The purpose of this Essential Fish Habitat (EFH) assessment is to evaluate the effects of the proposed action on EFH as defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This assessment will be used to make a determination of effect for use by the National Oceanic and Atmospheric Administration–National Marine Fisheries Service (NOAA-NMFS) to prepare conservation recommendations as part of the EFH consultation process in accordance with Section 305(b)(2) of the MSA.

### Project Area Existing Environment

The shore in the Project area is a sand beach, grading onto a gently sloped limestone reef platform. Bisecting the limestone platform are numerous sand-filled channels or grooves oriented perpendicular to the shoreline. Owing to the northeast facing orientation of the shore, the area is directly impacted by Tradewind-generated seas. In addition, refracting long period swells from the south and north also generate breaking surf on the nearshore reef platform. As a result, the nearshore area is generally under more-or-less constant impact from waves (MRC, 2012).

Since 1997, monitoring of marine biological assemblages has been conducted to determine impacts of the discharge from the Wailua WWTP outfall (MRC, 2012). Five stations were established in December 1997 in the vicinity of the Wailua WWTP ocean outfall and evaluated on ten occasions, the last survey in 2012. Over the 15-year duration of the monitoring program, coral cover close to the outfall diffuser ports has been sparse. Results for areas at the boundary of the ZOM present a pattern of coral cover increasing and decreasing over time. During the years 1997-1999, coral cover was relatively high, followed by a depression in 2000, an increase in 2002-2006, then a decrease in 2008-2010. Coral cover showed an increase at the 2012 survey. This pattern may reflect wave stresses and associated cycles of coral damage and recovery. This type of pattern of long-term cycles of coverage over 10-15 years has been documented at the Kahe Generating outfall on the Wai'anae coast of the Island of O'ahu (Coles and Brown, 2007).

As discharge from the outfall was intermittent, occurring only following periods of heavy rain between 2002-2006, and coral cover increased during this time, it appears that the discharge had no direct impact on coral community. Motile invertebrates and macroalgae have been scarce at the survey sites adjacent to the

diffuser throughout the course of the monitoring. Results of the benthic monitoring survey over a 15-year period indicate with consistency, that the discharge of effluent from the Wailua WWTP has not had a negative effect on biological assemblages in the area. The following reasons for lack of negative impacts have been offered: 1) the natural rigor of the area from water movement (currents and wave energy) and sediment scour and deposition prevents the establishment of a species rich benthic community; 2) the discharge effluent is entrained in a low salinity plume that rises up from the diffuser port and is rapidly dispersed by wave and current action with minimal or no contact with the benthos; 3) fish abundances have been similar or higher at one of the stations closest to the diffusers compared to the other survey sites, suggesting that some effects of the discharge might be positive (MRC, 2012).

Since 2017, visual inspections of the WWTP ocean diffusers have been conducted to determine the condition of the diffuser structures with respect to burial of sand. Over the course of the surveys, no corals were observed growing on the hard substrate to which the pipe and diffusers are anchored. Furthermore, the physical conditions (e.g. strong currents that suspend sand from the bottom) in the area of the diffusers are not conducive to reef coral settlement and growth (MRC, 2022). Photos of the diffuser ports are presented in Figure 2.

## Essential Fish Habitat in the Project Area

Essential Fish Habitat (EFH) is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). The Magnuson-Stevens Act (MSA) provisions at 50 CFR 600.10 provide further definition for the purpose of interpreting EFH as follows:

*"Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle*

The Project vicinity is located within the boundaries of the Hawai'i Archipelago Fishery Ecosystem Plan (FEP; WPRFMC, 2009a). This place-based FEP uses an ecosystem-based approach with "geographically defined ecosystem plans containing identical fishery regulations." The FEP identifies and categorizes Management Unit Species (MUS) based on the managed fisheries and incorporates all of the management provisions of the former Fishery



**Figure 2. Wailua WWTP ocean outfall diffuser ports (MRC, 2021)**

Management Plans with updates. MUS known to be present in waters around the Hawai'i Archipelago include Bottomfish and Seamount Groundfish MUS (BMUS), Crustaceans MUS (CMUS), Precious Corals MUS (PCMUS), and Coral Reef Ecosystems MUS (CREMUS). Pelagic MUS (PMUS) are managed separately through the Pacific Pelagic FEP. According to the Hawai'i Archipelago and Pacific Pelagic FEPs, the following MUS and life history stages are identified as likely present at, near, or dependent on the Project area:

- BMUS: all life stages for shallow complex, eggs and post-hatch pelagic for intermediate and deep complexes.
- CMUS: all life stages.



- CREMUS: all life stages
- PMUS: all life stages.

Waters and substrate in the Project vicinity are designated as EFH for managed fishery species listed in Table 1.

**Table 1. EFH designated in the Project vicinity.**

| MUS                 | Species Complex  | Designated EFH  |
|---------------------|--|---|
| CREMUS+             | All currently and potentially harvested coral reef taxa    | Water column and all benthic substrate to a depth of 50 fathoms (fm) from the shoreline to the Exclusive Economic Zone (EEZ)  |
| BMUS (all stages)** | Bottomfish Shallow Complex                                 | Eggs and post-hatch pelagic: Water column from the surface to 240-m depth from the shoreline to the EEZ<br>Post-settlement and Subadult/adult: Water column from the surface to 240-m depth from the shoreline to the EEZ |
|                     | Bottomfish Intermediate and Deep complexes                 | Eggs and post-hatch pelagic: Water column from the surface to 400-m depth from the shoreline to the EEZ   |
|                     | Spiny/Slipper Lobster and Kona Crab complexes (all stages) | Eggs and larvae: water column from the surface to 150-m depth, from the shoreline to the EEZ<br>Juveniles and adults: bottom habitat from the shoreline to 100-m depth  |
| PMUS+++             | Temperate/Tropical Species, Sharks and Squid complexes     | Eggs and larvae: water column from the surface to 200-m depth, from the shoreline to the EEZ<br>Juveniles and adults: water column from the surface to 1,000-m depth, from the shoreline to the EEZ                       |

+Western Pacific Regional Fishery Management Council, 2009a.

\*\* Western Pacific Regional Fishery Management Council, 2016.

+++ Western Pacific Regional Fishery Management Council, 2009b.

Waters off the Wailua WWTP are designated as EFH (including water column and all bottom areas) for coral reef ecosystem, bottomfish, pelagic, and crustacean MUS. According to the EFH designations in the Hawai'i FEP, the Project vicinity is absent of EFH for precious corals, deep-water shrimp, and seamount ground fish.

The Hawai'i and Pelagic FEPs further identify ecologically valuable subsections of EFH for the above MUS as "habitat areas of particular concern" (HAPC). These HAPCs are based on the importance of the ecological functions provided, the sensitivity to human or development-induced environmental degradation or stress, and rarity. There are no HAPC within, adjacent to, or near the Project area. In February 2019, NMFS published a final rule to reclassify certain management unit species in the Pacific Islands as ecosystem component species (ECS; NOAA-NMFS, 2019, 84 FR 2767). An ECS means a stock that a Council or the Secretary has determined does not require conservation and management but is identified in an FEP to achieve ecosystem management objectives. The intent is to focus management efforts on species that are in need of conservation and management, and improve efficiency of fishery management in the region. The rule reduces the number of MUS from 173 species or families to 20 in the Hawai'i FEP. The rule also removes the definitions of "Currently Harvested Coral Reef Taxa (CHCRT)" and "Potentially Harvested Coral Reef Taxa (PHCRT)" and revises the definitions of "Ecosystem Component Species" and "Special Permit" throughout. In the current regulations, coral reef MUS are divided into two categories: CHCRT and PHCRT. CHCRT are those species that are harvested commercially in the EEZ and PHCRT are those species that may be potentially harvested in the future. This final rule reclassifies all coral reef MUS as ECS, so the terms CHCRT and PHCRT are unnecessary (NMFS-NOAA, 2019).

### Potential Effects of the Proposed Action on EFH and MUS

It is anticipated that the fishes that occur in the Project vicinity will actively avoid direct impacts from Project activities. Some impairment of ability of EFH managed species to find prey items could occur, but this effect should be temporary and spatially limited to the immediate vicinity of the modification activities. The modified structures will maintain fish habitat and foraging resources in the Project area.

Direct impacts to marine resources by Project activities are anticipated to be minimal. No coral resources occur on the outfall diffusers that would be impacted from the modifications. Any biological assemblages residing on and around the existing outfall diffusers are not anticipated to be compromised.

Potential indirect impacts to coral reef ecosystems from construction activity of the Project may occur from degradation of water quality. Project construction may temporarily increase the amount of suspended sediment in the water column, although disturbance of the bottom is expected to be minimal. Impacts to water quality associated with Project activities will be short-term and

temporary and can be minimized using appropriate construction BMPs, as outlined below.

A best management practices (BMP) plan (Kennedy Jenks, 2022) has been prepared for this Project and includes the following:

- The Contractor shall complete daily inspection of equipment for conditions that could cause spills or leaks; clean equipment prior to operation near the water; properly site storage, refueling, and servicing sites; and implement spill response procedures and stormy weather preparation plans;
- Mooring systems shall be designed to keep the gear off the bottom, by use of a mid-line flow when appropriate, with the intent to eliminate scouring of corals or entanglement of the line on the substrate;
- Any activity related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at conclusion of the day;
- No contamination (trash or debris disposal, alien species introductions, etc.) of marine (reef flats, lagoons, open oceans, etc.) environments adjacent to the project site shall result from project related activities;
- No contamination of the marine environment shall result from the permitted activities. Particular care must be taken to ensure that no petroleum products, trash, or other debris enter near-shore and open ocean waters. When such material is found within the project area, the Contractor, or the designated construction agent, shall collect, and dispose of this material at an approved upland disposal site;
- The work shall be conducted so as to prevent the discharge or accidental spillage of pollutants, solid waste debris, and other objectionable wastes in surface waters;
- All objects lowered to the bottom shall be lowered in a controlled manner. This can be achieved through the use of buoyance controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of descent;
- Equipment, anchor(s), or materials shall not be deployed in areas containing live corals, seagrass beds, or other significant resources;

- Visual surveys for the ESA-listed marine species shall be made prior to the start of work each day, and prior to resumption of work following any break of more than 1/2 hour, to ensure that no protected species are in the area (typically within 50 yards of the proposed work).

## Summary of Short-term and Long-term/Permanent Effects

The extent of temporal impacts to EFH is dependent upon the following factors:

- The intensity of the impact at the specific site being affected;
- The spatial extent of the impact relative to the availability of the habitat type affected;
- The sensitivity/vulnerability of the habitat to the impact;
- The habitat functions that may be altered by the impact (e.g., shelter from predators);
- The timing of the impact relative to when the species or life stage utilizes the habitat;
- The degree to which the adverse impacts are avoided or minimized through BMPs.

Short-term effects result from actions that would cause temporary adverse impact to EFH or associated MUS but are expected to be quickly and substantially restored through natural processes.

## Determination of Effect

The outfall diffuser modifications, as described in the preceding sections, are unlikely to reduce the quantity and quality of EFH in the nearshore environment. Effects to EFH area will be minimal because: 1) the impact at the site is low intensity, 2) marine resources at the outfall diffuser site are limited, with no sensitive or vulnerable (e.g. coral) resources present, and 3) the modification work will occur over a short time period. The anticipated adverse effects do not have the potential to cause substantial adverse effects to EFH in the nearshore waters off the Project.

## References

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- \_\_\_\_\_. 2019. Department of Commerce. Final Rule, Pacific Island Fisheries; Reclassifying Management Unit Species to Ecosystem Component Species. *Federal Register*, 84 (February 8, 2019): 2767-2775.

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- \_\_\_\_\_. 2009a. Fishery Ecosystem Plan for the Hawaii Archipelago. Honolulu, HI: N.P., 2009. Available online at URL: [http://www.wpcouncil.org/fep/WPRFMC%20Hawaii%20FEP%20\(2009-09-21\).pdf](http://www.wpcouncil.org/fep/WPRFMC%20Hawaii%20FEP%20(2009-09-21).pdf).
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- \_\_\_\_\_. 2016. Amendment 4 to the Fishery Ecosystem Plan for the Hawaii Archipelago. Revised Descriptions and Identification of Essential Fish Habitat and Habitat Areas of Particular Concern for Bottomfish and Seamount Groundfish of the Hawaiian Archipelago. Available online at URL: [http://www.fpir.noaa.gov/SFD/pdfs/feps/Hawaii\\_Amendment\\_4.pdf](http://www.fpir.noaa.gov/SFD/pdfs/feps/Hawaii_Amendment_4.pdf).

## Hayashida, Chane

---

**From:** David Delaney - NOAA Federal <david.delaney@noaa.gov>  
**Sent:** Thursday, December 8, 2022 3:25 PM  
**To:** Hayashida, Chane  
**Subject:** Re: [EXTERNAL] Re: ESA Informal Section 7 and MSA Section 305(b)(2) - Wailua WWTP NPDES Compliance Improvements - CWSRF Project No. C150055-10

Hello Chane,

Thank you message and confirming that; it is greatly appreciated. The EFH consultation is now complete.

All the best,  
David

On Thu, Dec 8, 2022 at 3:00 PM Hayashida, Chane <[chane.hayashida@doh.hawaii.gov](mailto:chane.hayashida@doh.hawaii.gov)> wrote:

Hi David,

Thank you very much for your help. I accept all the Conservation Recommendations.

Have a nice day,

Chane

**From:** David Delaney - NOAA Federal <[david.delaney@noaa.gov](mailto:david.delaney@noaa.gov)>  
**Sent:** Tuesday, November 29, 2022 8:27 AM  
**To:** Hayashida, Chane <[chane.hayashida@doh.hawaii.gov](mailto:chane.hayashida@doh.hawaii.gov)>  
**Cc:** Gerry Davis - NOAA Federal <[gerry.davis@noaa.gov](mailto:gerry.davis@noaa.gov)>; Malia Chow - NOAA Federal <[malia.chow@noaa.gov](mailto:malia.chow@noaa.gov)>  
**Subject:** [EXTERNAL] Re: ESA Informal Section 7 and MSA Section 305(b)(2) - Wailua WWTP NPDES Compliance Improvements - CWSRF Project No. C150055-10

Aloha Chane,

The National Marine Fisheries Service, Pacific Islands Regional Office (NMFS), received the State of Hawai'i Department of Health (hereafter, DOH) essential fish habitat (EFH) consultation request and EFH Assessment for the proposed improvements to the existing Wailua Wastewater Treatment Plant (WWTP) as well as the Wailua Municipal Golf Course on October 31, 2022. NMFS determines that the proposed activities may adversely affect EFH. We provide EFH conservation recommendations pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; as described by 50 CFR 600.920). Implementation of these conservation recommendations will ensure that potential adverse effects to EFH are avoided and/or minimized.

## Consultation History

In March 2019, the applicant engaged in an early pre-consultation meeting with NMFS (Drs. S. Goldberg and A. Chung). After some alterations to the project, a subsequent pre-consultation meeting was held with NOAA Fisheries staff, Dr. A. Chung, in September of 2021 to discuss the proposed improvements to the ocean outfall diffusers. On October 31, 2022 the applicant submitted and EFH Assessment (EFHA).

## Project Description

The Wailua WWTP is located at 4460 Nalu Road provides tertiary treatment and disinfection to produce R-2 recycled water that is conveyed via an existing 10-inch force main to the Wailua Municipal Golf Course. The Wailua Municipal Golf Course is located at 3-5350 Kūhio Highway, south of the WWTP. Excess treated effluent is currently discharged to an existing permitted ocean outfall located to the southeast of the WWTP approximately 700 feet from the shoreline. The proposed project includes improvements to the existing Wailua WWTP and the WWTP's ocean outfall, as well as rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course. Improvements at the WWTP would include, but may not be limited to, modifications to the aeration basins, clarifiers, filter bay, and chlorine contact tank; installation of a second effluent filter and an on-site hypochlorite generation system; replacement of the effluent pumps; electrical upgrades; and site work to include trenching, grading, and the construction of new site access roads. The existing ocean outfall modification will consist of extending the diffuser riser pipes at the existing flanges of the three functional outfall diffuser heads located offshore. The extension of the riser pipes will reduce the likelihood of current-driven sand plugging or covering the diffuser heads, increasing the reliability of the existing ocean outfall for effluent disposal. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe sliplining, which will limit the amount of excavation required. The proposed outfall modification design includes attaching rubber spool pipe risers to the flanged ends of the existing outfall diffusers. This action will increase the height off the bottom of the diffuser outlets, reducing the likelihood of sand covering the outlets. All equipment and materials will be transported to the project site by a work vessel, which will be anchored near the outfall. The anchor locations will be verified by divers to be free of living coral. The dive team will access the diffusers, remove debris from the flange faces of the three open diffusers, and attach the rubber spool pipe risers. Only hand tools will be used.

## Essential Fish Habitat

The marine water column from the surface to a depth of 1,000 meters (m) from shoreline to the outer boundary of the EEZ (200 nautical miles), and the seafloor from the shoreline out to a depth of 700 m around each of the Hawaiian Islands, have been designated as EFH. As such, the water column and bottom of the Pacific Ocean along the project sites and the surrounding waters and submerged lands are designated as EFH, and support various life stages for the management unit species (MUS) identified under the Western Pacific Fishery Management Council's Pelagic and Hawai'i Archipelago Fishery Ecosystem Plans. The MUS and life stages found in these waters include: eggs, larvae, juveniles, and adults of Bottomfish MUS; eggs, larvae, juveniles, and adults of Crustacean MUS; and eggs, larvae, juveniles, and adults of Pelagic MUS. Specific types of habitat considered as EFH include coral reef, patch reefs, hard substrate, artificial substrate, seagrass beds, soft substrate, lagoon, estuarine, surge zone, deep-slope terraces and pelagic/open ocean.

### *Baseline Condition*

NOAA Benthic Habitat maps suggest that the geomorphological structure type is rock/boulder and sand and biologically dominated by turf algae (50-90% cover) or uncolonized (Battista *et al.* 2007; see <https://www.pacioos.hawaii.edu/voyager/>).

### *Adverse Effects*

The adverse effects and stressors discussed below are described in Minton (2017). The proposed activities



may result in adverse effects to EFH from physical damage to corals, sedimentation and turbidity, introduction of chemical contaminants (e.g., petroleum), and introduction of invasive species. Physical damage to corals may occur if soil or debris enters the marine environment and contacts corals. Sedimentation, turbidity, and chemical contaminant impacts may occur if loose soil slides into the marine environment, where it may reduce water quality, cover and smother nearby corals and seagrass (Tuttle and Donahue 2020), and reduce physiological function leading to degradation of state and mortality. Invasive species can outcompete native organisms, leading to potential degradation of the condition of habitat forming EFH (e.g., corals and seagrasses).

#### *DOH-proposed Best Management Practices (BMPs)*

The DOH has proposed to implement the BMPs as seen in Kennedy Jenks (2022) to avoid and minimize adverse effects to EFH.

### **Conservation Recommendations**

Pursuant to Section 305(b)(2) (as described by 50 CFR 600.920) of the MSA, we provide the following conservation recommendation that, when implemented, will ensure that potential adverse effects to EFH at the project site are avoided and minimized:

*Conservation Recommendation 1:* Ensure that equipment, anchors, structures, or fill is not be deployed in project areas containing live corals, seagrass beds, or visible benthic organisms. Perform pre-deployment reconnaissance (e.g., divers) to ensure these resources are avoided.

*Conservation Recommendation 2:* Minimize direct impact (direct or indirect contact causing damage) by divers and construction related tools, equipment, and materials with benthic organisms, regardless of size, especially corals and seagrass

*Conservation Recommendation 3:* Ensure that in-water tool and dive gear (e.g., wetsuit, mask, fins, snorkel, BC, regulator, weight belt, booties) is disinfected by one of the following ways: a 1:52 dilution of commercial bleach in freshwater, a 3 percent free chlorine solution, or a manufacturer's recommended disinfectant-strength dilution of a quaternary ammonium compound in "soft" (low concentration of calcium or magnesium ions) freshwater. This will minimize the potential proliferation of invasive species.

*Conservation Recommendation 4:* Small boats that have been deployed in the field should be cleaned and inspected daily for organic material, including any algal fragments or other organisms. Organic material, if found, should be physically removed and disposed of according to the ship's solid-waste disposal protocol or in approved secure holding systems. The internal and external surfaces of vessels should be rinsed daily with freshwater and always rinsed and be allowed to dry before redeployment.

### **Conclusion**

NMFS appreciates your early and continued coordination on this proposed activity. We have provided EFH Conservation Recommendations that will help you avoid and minimize potential adverse effects to EFH due to your proposed activities. Please be advised that regulations Section 305(b)(4)(B) (as described by 50 CFR 600.920) to implement the EFH provisions of the MSA require that Federal activities agencies provide a written response to this letter within 30 days of its receipt; a preliminary response is acceptable if more time is needed. The final response must include a description of measures to be required to avoid, mitigate, or offset the adverse effects of the proposed activities. If the response is inconsistent with our EFH conservation recommendations, an explanation of the reason for not implementing the recommendations must be provided at least 10 days prior to final approval of the activities.

Please contact me with any comments or questions.

Best regards,

David

### References

Battista, T., B. Costa, and S. Anderson. 2007. Shallow-water benthic habitats of the main eight Hawaiian Islands. NOAA Technical Memorandum NOS NCCOS 61, Biogeography Branch. Silver Spring, MD.

Kennedy Jenks. 2022. Outfall Modification Work Plan. Prep. for County of Kaua'i Wastewater Management Division. 30 pp.

Minton D. 2017. Non-fishing effects that may adversely affect essential fish habitat in the Pacific Islands Regional. Prepared for the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands regional office. Contract ab-133f-15-cq-0014.

Tuttle, L.J. and M.J. Donahue. Thresholds for sediment stress on corals: A systematic review and meta-analysis. NOAA Technical Report, September 28, 2020. 75 p. <http://dx.doi.org/10.13140/RG.2.2.35176.70403>

On Mon, Oct 31, 2022 at 1:40 PM Celeste Hanley - NOAA Federal <[celeste.hanley@noaa.gov](mailto:celeste.hanley@noaa.gov)> wrote:

Aloha, Please see the attached message regarding a request to initiate a Section 7 consultation.

----- Forwarded message -----

From: 'Nagato, Jonathan' via \_NMFS PIR Web General Information <[piro.info@noaa.gov](mailto:piro.info@noaa.gov)>

Date: Mon, Oct 31, 2022 at 12:14 PM

Subject: ESA Informal Section 7 and MSA Section 305(b)(2) - Wailua WWTP NPDES Compliance Improvements - CWSRF Project No. C150055-10

To: [piro.info@noaa.gov](mailto:piro.info@noaa.gov) <[piro.info@noaa.gov](mailto:piro.info@noaa.gov)>

Cc: Pruder, Sina L <[sina.pruder@doh.hawaii.gov](mailto:sina.pruder@doh.hawaii.gov)>, Hayashida, Chane <[chane.hayashida@doh.hawaii.gov](mailto:chane.hayashida@doh.hawaii.gov)>, Troy Tanigawa <[ttanigawa@kauai.gov](mailto:ttanigawa@kauai.gov)>, Donn Kakuda <[dkakuda@kauai.gov](mailto:dkakuda@kauai.gov)>, Stephen Esaki <[StephenEsaki@kennedyjenks.com](mailto:StephenEsaki@kennedyjenks.com)>, John Hagihara <[Jhagihara@hhf.com](mailto:Jhagihara@hhf.com)>

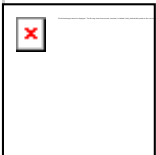
Aloha,

*In effort to reduce paper use and increase efficiency, we are sending letters via email in a pdf format instead of sending paper correspondences via postal mail. Please find our letter attached to this email.*

If you have trouble opening the document, you may need to download the latest version of **Adobe Acrobat Reader DC**.

<https://get.adobe.com/reader/>

Thank you for your understanding and cooperation with our initiative to reduce paper use.



Department of Health, Wastewater Branch

2827 Waimano Home Road

Hale Ola Building, Room 207

Pearl City, Hawaii 96782

Ph. 808-586-4294 Fax: 808-586-4300

Email: [wwb@doh.hawaii.gov](mailto:wwb@doh.hawaii.gov)

--

**Celeste Hanley** (she/her)

*Education and Outreach Specialist, Pacific Islands Regional Office*

NOAA Fisheries | U.S. Department of Commerce

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Mobile: (808) 265-7665

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--

**David Delaney, PhD**

*Fish Biologist, PIRO Habitat Conservation Division*  
NOAA Fisheries | U.S. Department of Commerce  
1845 Wasp Blvd., Building 176, Room 2559  
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--

**David Delaney, PhD** (he/him/his)

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NOAA Fisheries | U.S. Department of Commerce  
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[www.fisheries.noaa.gov](http://www.fisheries.noaa.gov)



APPENDIX C

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National Historic Preservation Act  
and Hawai'i Revised Statutes 6E Documentation



**JOSH GREEN, M.D.**  
GOVERNOR OF HAWAII  
KE KIA'AINA O KA MOKU'AINA 'O HAWAII



**KENNETH S. FINK, MD, MGA, MPH**  
DIRECTOR OF HEALTH  
KA LUNA HO'OKELE

**STATE OF HAWAII**  
**DEPARTMENT OF HEALTH**  
**KA 'OIHANA OLAKINO**  
P. O. BOX 3378  
HONOLULU, HI 96801-3378

In reply, please refer to:  
File:

June 6, 2023

55-10 S106 ltr (prop determ) SHPD.docx

Alan S. Downer, PhD, Administrator  
State of Hawai'i, Department of Land and Natural Resources  
State Historic Preservation Division  
601 Kamokila Boulevard, Rm. 555  
Kapolei, HI 96707  
Submitted via: SHPD HICRIS

Dear Dr. Downer:

Subject: National Historic Preservation Act (NHPA)  
Request for Section 106 Concurrence of Proposed Determination  
Wailua WWTP NPDES Compliance Improvements  
Clean Water State Revolving Fund Project No. C150055-10  
Wailua, Puna District, Island of Kaua'i, Hawai'i  
TMK: (4) 3-9-006:019 and 027 (por.); (4) 3-9-002:004 and 032, and (4) 3-9-006:999  
(Nalu Road, Leho Drive, and Nehe Road)

On behalf of the Environmental Protection Agency (EPA), the State of Hawai'i Department of Health (DOH) requests the State Historic Preservation Officer's (SHPO's) concurrence of the proposed effect determination for the proposed Wailua WWTP NPDES Compliance Improvements project located in Wailua, Puna District, Island of Kaua'i, Hawai'i.

The proposed project may be eligible to utilize federal funding that is administered by the DOH through the Clean Water State Revolving Fund (CWSRF) and will be considered a federal action and undertaking, as defined by Section 106 of the NHPA of 1966 (as amended 2014), Title 54 of the United States Code (54 USC) Section 306108, and Title 36 of the Code of Federal Regulations (36 CFR) Part 800.

The EPA has authorized the DOH to act on behalf of the EPA regarding NHPA Section 106 notification and consultation. This letter is to request Section 106 concurrence of the proposed effects determination from the SHPO and State Historic Preservation Division (SHPD) in accordance with 36 CFR, Section 800.4.

The DOH may provide funding under the CWSRF to the County of Kaua'i, Department of Public Works for the Wailua WWTP NPDES Compliance Improvements project.

A description of the project was provided in the previous correspondence and in Enclosure 1: Project Description. The Area of Potential Effect (APE) for the project was described in the previous correspondence and in Enclosure 2: Area of Potential Effect (APE). The archaeological background was described in the previous correspondence and in Enclosure 3: Archaeological Background. The NHPA Section 106 notice/advertisement and consultations

Alan S. Downer, PhD, Administrator  
June 6, 2023  
Page 2 of 2

with Native Hawaiian Organizations (NHOs), other historically focused organizations, community groups, and interested parties are described in Enclosure 4: Consultations.

Based on the information presented in the enclosures, including a review and inventory of historic properties in the project vicinity and consultation with NHOs, consulting parties, and/or interested persons, the DOH is proposing a “no adverse effect” determination for the subject project.

Should the SHPO and SHPD concur with or object to the proposed “no adverse effect” determination for the Wailua WWTP NPDES Compliance Improvements project, we would appreciate a written response within thirty (30) calendar days of receipt of this letter.

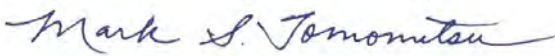
Should the SHPO and SHPD have any comments, we would appreciate a written response within thirty (30) calendar days from receipt of this letter.

Please address your written response via email to [Chane.Hayashida@doh.hawaii.gov](mailto:Chane.Hayashida@doh.hawaii.gov) or via mail to the following address:

Attn: Chane Hayashida  
Department of Health, Wastewater Branch  
2827 Waimano Home Road, Rm. 207  
Pearl City, HI 96782

Should you have any questions, please contact Chane Hayashida at (808) 586-4294.

Sincerely,

for   
SINA PRUDER, P.E., CHIEF  
Wastewater Branch

Enclosures

CH:

c: Troy Tanigawa (via email at [TTanigawa@kauai.gov](mailto:TTanigawa@kauai.gov))  
Donn Kakuda (via email at [DKakuda@kauai.gov](mailto:DKakuda@kauai.gov))  
John Hagihara, HHF Planners (via email at [JHagihara@hhf.com](mailto:JHagihara@hhf.com))  
Stephen Esaki, Kennedy Jenks (via email at [StephenEsaki@kennedyjenks.com](mailto:StephenEsaki@kennedyjenks.com))



## **Enclosure 1: Undertaking Description**

The proposed project includes improvements to the existing Wailua WWTP and the WWTP's ocean outfall and rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course. Improvements at the WWTP (Project Area A) would include, but may not be limited to, modifications to the aeration basins, clarifiers, filter bay, and chlorine contact tank; installation of a second effluent filter and an on-site hypochlorite generation system; replacement of the effluent pumps; electrical upgrades; and site work to include trenching, grading, and the construction of new site access roads. The project area for the proposed improvements would be on the existing Wailua WWTP parcel (TMK: (4) 3-9-006:019) and a portion of the adjacent County-owned parcel (TMK: (4) 3-9-006:027).

The existing ocean outfall modification will occur at the outfall diffuser heads located offshore; no ground disturbance will be required.

The proposed improvements also include rehabilitating the existing 10-inch force main that conveys R-2 recycled water from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course (Project Area B). The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining, limiting the excavation required. Excavation for the force main rehabilitation would be limited to sharp bends or corners in the pipe (*Attachment A*). The project area for the force main rehabilitation includes the following County-owned parcels and rights of way:

## **Enclosure 2: Area of Potential Effect (APE)**

The project APE comprises two locales, designated Project Areas A and B, which are within Wailua Ahupua'a, Puna District, Island of Kaua'i, State of Hawaii. The project APE is located on the east side of Kauai along the coast and has a combined acreage of 5.02 acres (*Attachment A*). Project Area A is the WWTP, which encompasses approximately 2.43 acres including the entire TMK (4) 3-9-006-019, a portion of the adjacent parcel TMK (4) 3-9-006:027 (por), and a portion of the Nalu Drive right of way (TMK [4] 3-9-006: 999 [por.]). Project Area B encompasses 2.79 acres and involves the rehabilitation of an existing 10-inch force main that conveys R-2 effluent from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course. The force main is approximately 4,600 feet long and is within (from north to south: TMKs (4) 3-9-006:019, 3-9-006:027, 3-9-002:032, and 3-9-002:004; and (4) 3-9-006: 999 [Nalu Rd., Leho Dr., and Nehe Rd.]

### **Enclosure 3: Archaeological Background**

Work conducted for this review and assessment included the completion of an Archaeological Literature Review (*Attachment B*), including an archival map and document research and a review of previous archaeological investigations conducted near the four project area locales. Background research indicates that Project Area A was formerly adjacent to, and likely at least partially within, a former sugarcane field of the Lihue Plantation. Prior to the sugar production era, two Land Commission Awards (LCAs) were present to the north of Project Area A, south of the Wailua River. Records indicate these LCAs consisted of house lots. Project Area B is situated on the coastal sand dune, which is the location of State Inventory of Historic Places (SIHP) Site 00103, a traditional Hawaiian burial area.

Of the two project areas, only Project Area A includes existing structures that are greater than 50 years old and could be considered historic. Project Area A encompasses the WWTP and involves a range of improvements to maintain and upgrade existing plant processes. There are six structures located at the WWTP that are greater than 50 years old. Four of these structures (the rapid bloc basins, the sludge drying beds, the breakroom building, and the control building) would remain in place, and would not be affected by the proposed improvements. Two of these structures (the abandoned chlorine contact basin and the boundary wall) would be demolished to make room for the proposed improvements. However, neither of these structures is considered eligible for listing on the National Register for Historic Places. Therefore, no effects on historic structures are expected at the WWTP.

Of the two project area locales, archaeological sites, including human burials, are more likely to be encountered at Project Area B where coral dune sands are present. Based on underlying soils (see Figure 5 in *Attachment B*) and the land use history gleaned from a historical map of Lihue Plantation (see Figure 7 in *Attachment B*), there is low potential for encountering historic properties at Project Area A; nonetheless, the lack of archaeological research directly associated with the WWTP indicates that the subsurface cultural context is unknown. The rehabilitation of the existing recycled water force main (Project Area B) would be conducted in coral dune sands. Therefore, it would have the potential to impact subsurface archaeological sites. However, the extent of ground disturbance in Project Area B would be minimized because the force main would be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining. Additionally, ground disturbance in Project Area B would occur in areas where previous ground disturbance would have taken place when the force main was installed.

The recommended mitigation for work in Project Area B (which is within SIHP Site 00103) is archaeological monitoring, while the recommended commitment for Project Area A is archaeological monitoring for identification purposes; both efforts are to be guided by a State Historic Preservation Division (SHPD) approved Archaeological Monitoring Plan (AMP). The AMP will establish protocols for the recording and mitigation of subsurface cultural deposits in accordance with Hawaii Administrative Rules (HAR) §13-279-4. Should iwi kupuna be inadvertently discovered during ground-disturbing activities, all work in the immediate vicinity of the find will immediately cease and the protocols established in HAR §13-300-40 will be implemented

**Enclosure 4: Consultations**

An NHPA Section 106 notice/advertisement was published in the Environmental Review Program's *The Environmental Notice* on July 8, 2020.

Letters were sent to Native Hawaiian Organizations (NHOs) and other historically focused and community groups interested in and knowledgeable about the local sites, inviting them to participate in Section 106 consultation. Letters were sent to the NHOs and potentially interested parties listed in *Attachment C*.

# Attachment A: Project Area of Potential Effect

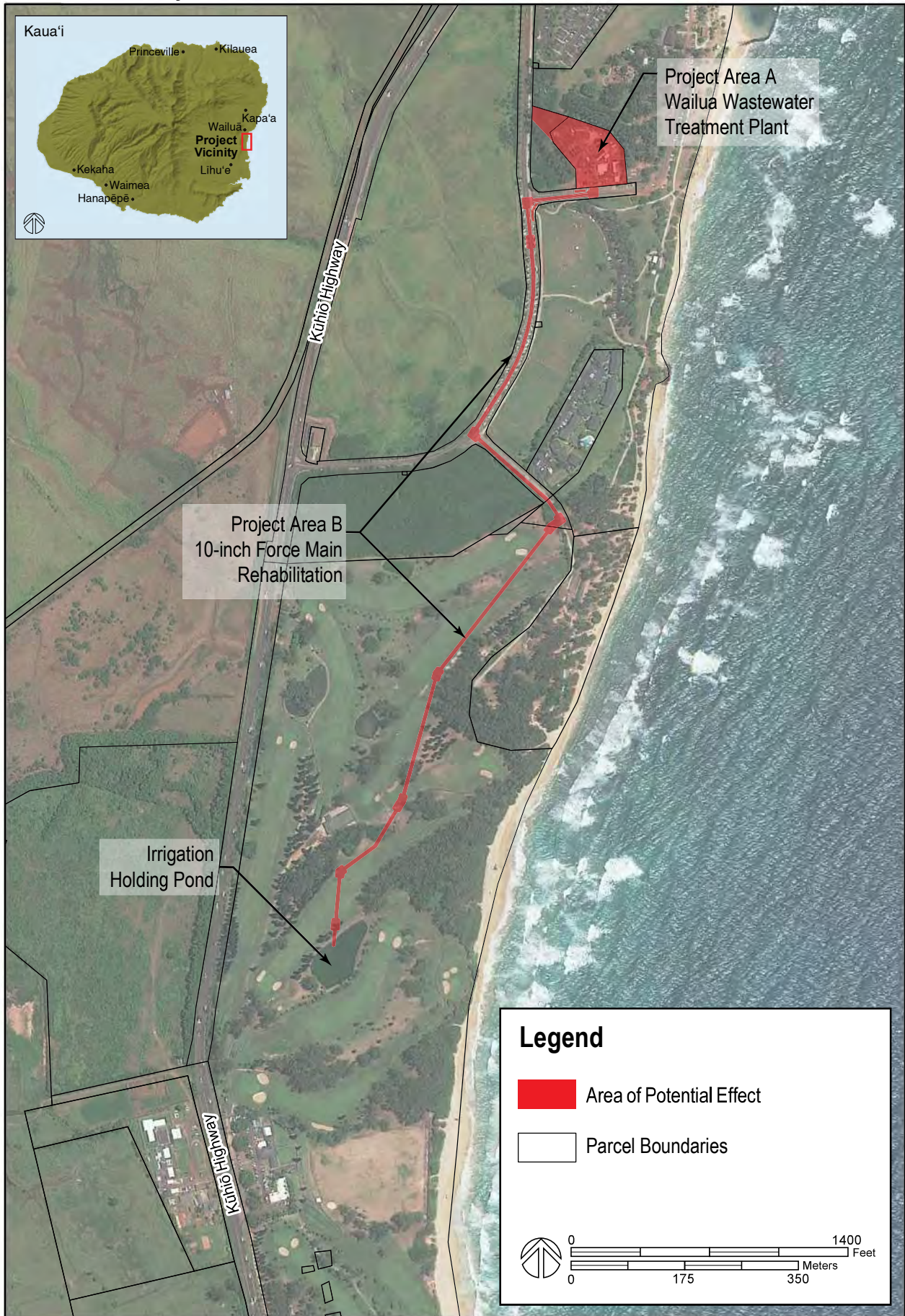


Figure 1: Full Project APE Map

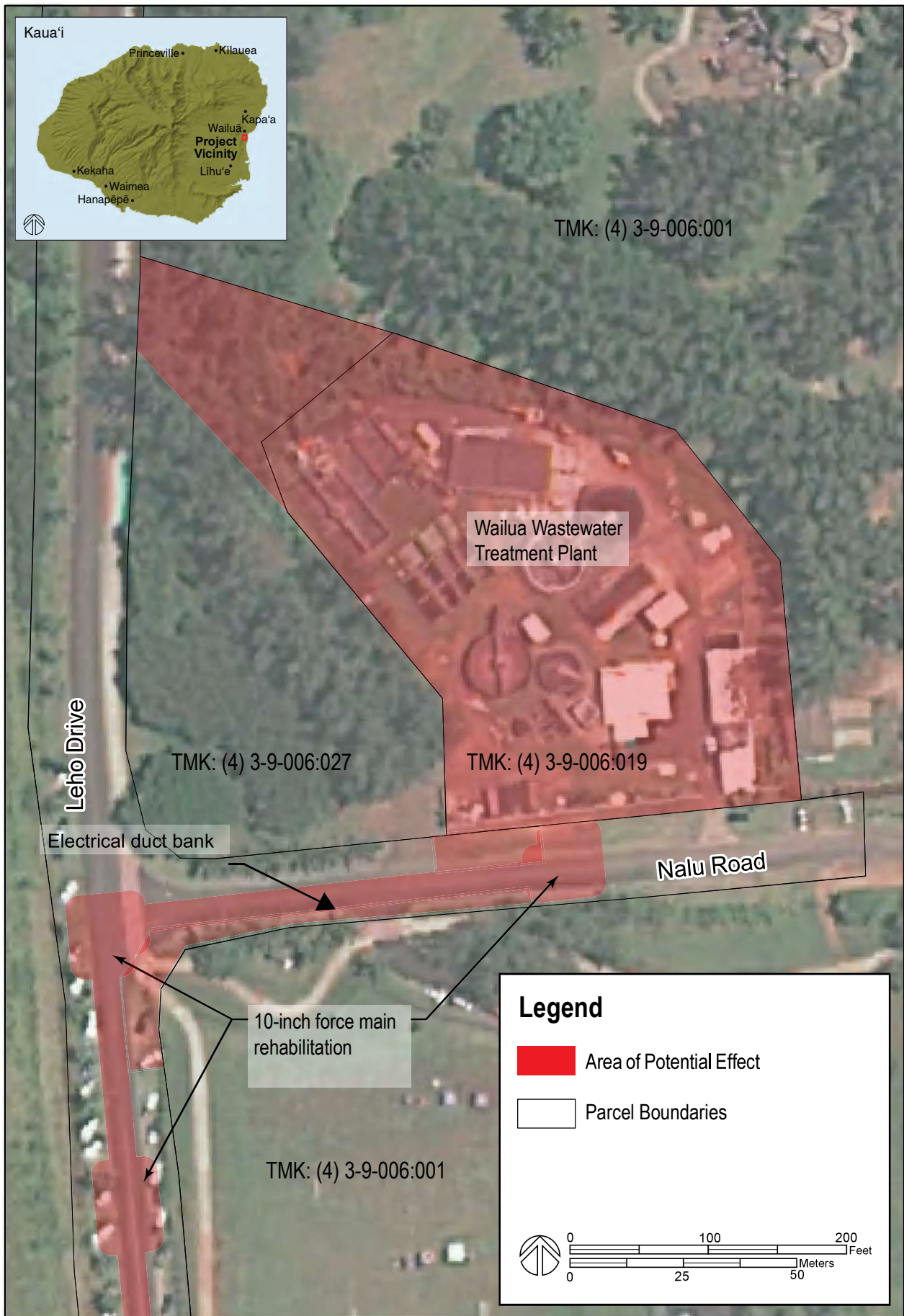


Figure 2: Project Area A - Wailua Wastewater Treatment Plant

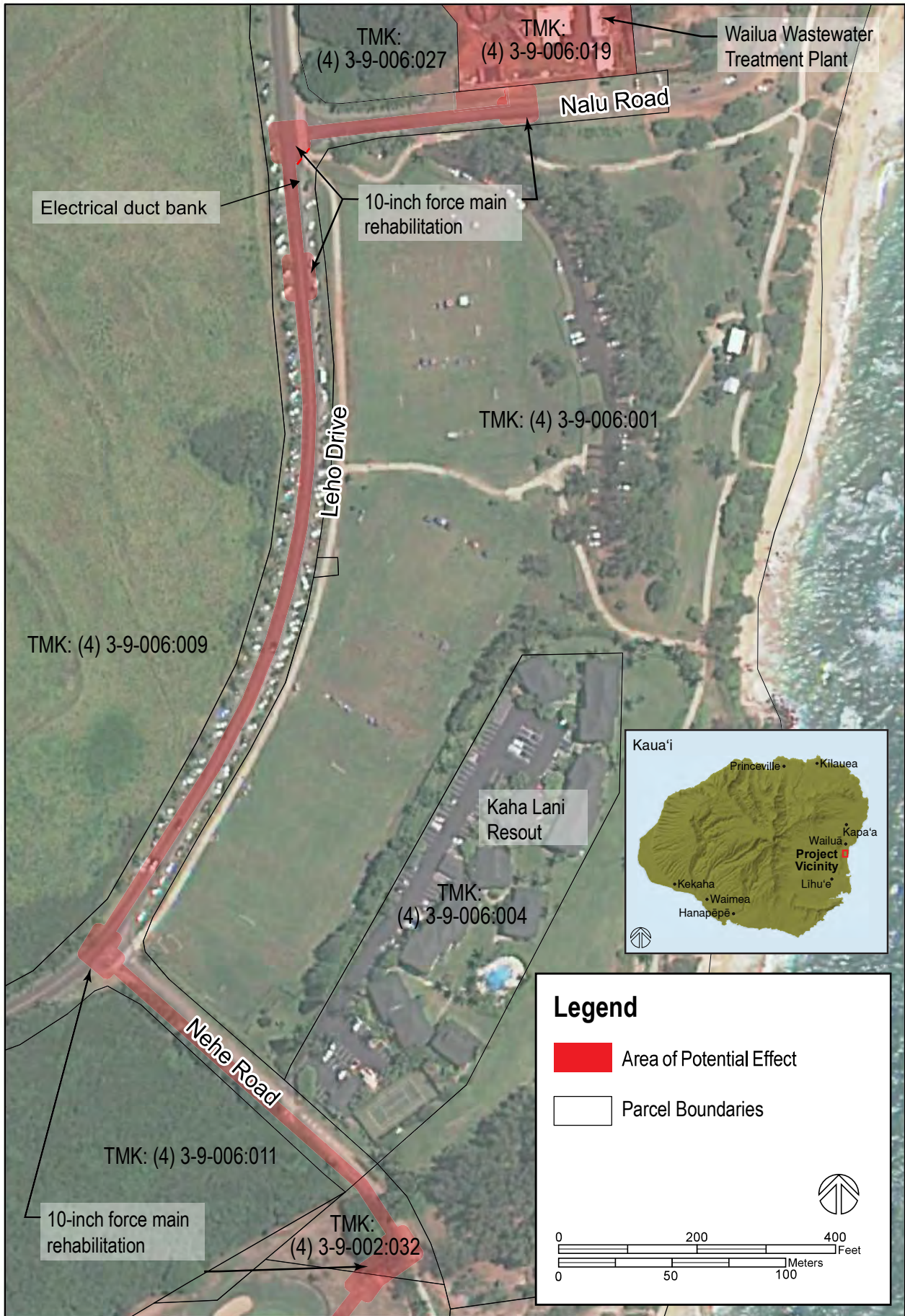


Figure 3: Project Area B - Northern portion of the 10-inch Recycled Water Force Main Rehabilitation

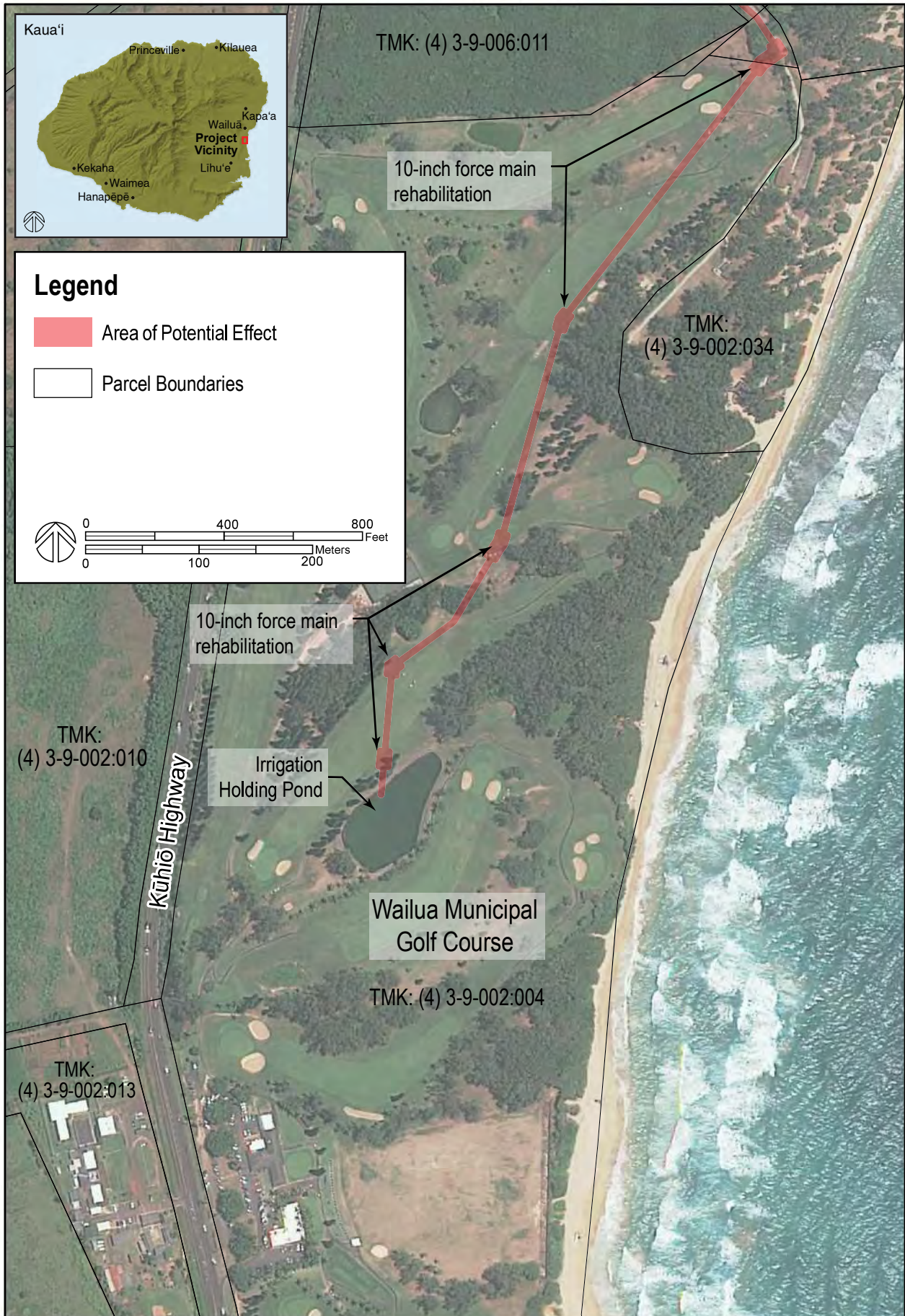


Figure 4: Project Area B - Southern portion of the 10-inch Recycled Water Force Main Rehabilitation



## **DRAFT REPORT**

# **Archaeological Literature Review in Support of Wailua Waste Water Treatment Plant (WWTP) Alternative Effluent Disposal System Design— Phase 2, Wailua Ahupua‘a, Puna District, Island of Kaua‘i, State of Hawaii**

TMK: (4) 3-9-006:019 and 027 (por.); (4) 3-9-002:004  
and 032, and (4) 3-9-006: 999 (Nalu Road, Leho  
Drive, and Nehe Road)

*Prepared for:*

**HHF Planners, Inc.**

Pacific Guardian Center, Makai Tower  
733 Bishop Street, Suite 2590  
Honolulu, Hawaii 96813

November 2022

**PACIFIC CONSULTING SERVICES, INCORPORATED**  
720 IWILEI ROAD, HONOLULU HAWAII 96817

DRAFT REPORT  
Archaeological Literature Review in Support of  
Wailua Wastewater Treatment Plant (WWTP)  
Alternative Effluent Disposal System Design–Phase 2,  
Wailua Ahupua‘a, Puna District, Island of Kaua‘i, State of Hawaii  
TMK: (4) 3-9-006: 019 and 027 (por.); (4) 3-9-002:004 and 032, and  
(4) 3-9-006: 999 (Nalu Road, Leho Drive, and Nehe Road)

by

Nicole I. Vernon, M.A.  
and  
Stephan D. Clark, B.S.

Sara Collins, Ph.D.,  
Principal Investigator

Prepared By:  
Pacific Consulting Services, Inc.  
720 Iwilei Road, Suite 424  
Honolulu, HI 96817

Prepared For:  
HHF Planners  
733 Bishop Street, Suite 2590  
Honolulu, HI 96813

On Behalf Of:  
Department of Public Works, County of Kaua‘i

November 2022

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## INTRODUCTION

At the request of HHF Planners, Pacific Consulting Services, Inc. (PCSI), has prepared this Archaeological Literature Review (ALR) in support of the Wailua Wastewater Treatment Plant (WWTP) Alternative Effluent Disposal System Design—Phase 2 project, in Wailua, on the Island of Kaua'i, in the State of Hawaii<sup>1</sup>. The project proponent is the County of Kaua'i, Department of Public Works (DPW), and the land is owned by the County of Kaua'i at Tax Map Keys (TMKs) (4) 3-9-006:019 and 027 and by the State of Hawaii at TMK (4) 3-9-002:004 and 032 (also 3-9-006: 999 [Nalu Rd., Leho Dr., and Nehe Rd.]). The location of the project is shown in Figure 1. The project scope of work includes improvements to the existing Wailua WWTP and the WWTP's ocean outfall, as well as rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course.

A historical, cultural, and archaeological background study was conducted in order to evaluate any potential effect on historic properties and to recommend mitigation of any adverse effect, if warranted. This work was carried out in accordance with Hawaii Revised Statutes (HRS) Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division Rules), Chapter 275 (*Rules Governing Procedures for Historic Preservation Review for Governmental Projects Covered Under Sections 6E-7 and 6E-8, HRS*).

## PROJECT AREA, LOCATION, AND DESCRIPTION

The project area comprises two locales, designated Project Areas A and B, which are within Wailua Ahupua'a (an *ahupua'a* is a traditional Hawaiian land division), Puna District, Island of Kaua'i, State of Hawaii. The project area locales are located on the east side of Kaua'i along the coast (see Figure 1). The combined acreage of the two project areas is 5.02 acres (2.03 hectares).

Since 1976, the Wailua Municipal Golf Course has been using R-2 quality-treated effluent from the Wailua WWTP for irrigation. Any excess treated effluent has been routed to the existing ocean outfall. This occurs more frequently during excessive rainy periods. As part of the proposed improvements, the County of Kaua'i would modify the existing diffusers at the ocean outfall. The modifications would consist of extending the existing riser pipes at the three functional outfall diffuser heads. The work to install the modification would take place entirely in the ocean. Therefore, it is not included in the current project area and not addressed in this report.

Project Area A is the WWTP, which encompasses approximately 2.43 acres (0.98 hectares) including the entire TMK (4) 3-9-006-019, a portion of the adjacent parcel TMK (4) 3-9-006:027 (por), and a portion of the Nalu Drive right of way (TMK [4] 3-9-006: 999 [por.]). The location of Project Area A is shown in Figures 2 through 4. A range of improvements are being proposed to maintain and upgrade existing plant processes. These include but may not be limited to:

1. Access Road
  - a. Construction of a new access road.
2. Headworks
  - a. Construction of a new headworks.
3. Surge Basin Modification
  - a. Re-use/re-purposing of existing tankage. No ground disturbance required.

---

<sup>1</sup> PCSI follows the latest edition of the Society for American Archaeology (SAA) Style Guide, especially regarding textual elements (e.g., numbers, dates, statistical copy, italicization, capitalization, hyphenation, and accents and diacritical marks). The authority for English spelling is the most recent edition of *Merriam-Webster's Collegiate Dictionary*. Unless noted, the authorities for Hawaiian spelling and geographic place names are the *Hawaiian Dictionary* (Pukui and Elbert 2003), the most recent listing of the Hawai'i Board on Geographic Names (HBGN), and *Place Names of Hawaii* (Pukui and Elbert 2004).

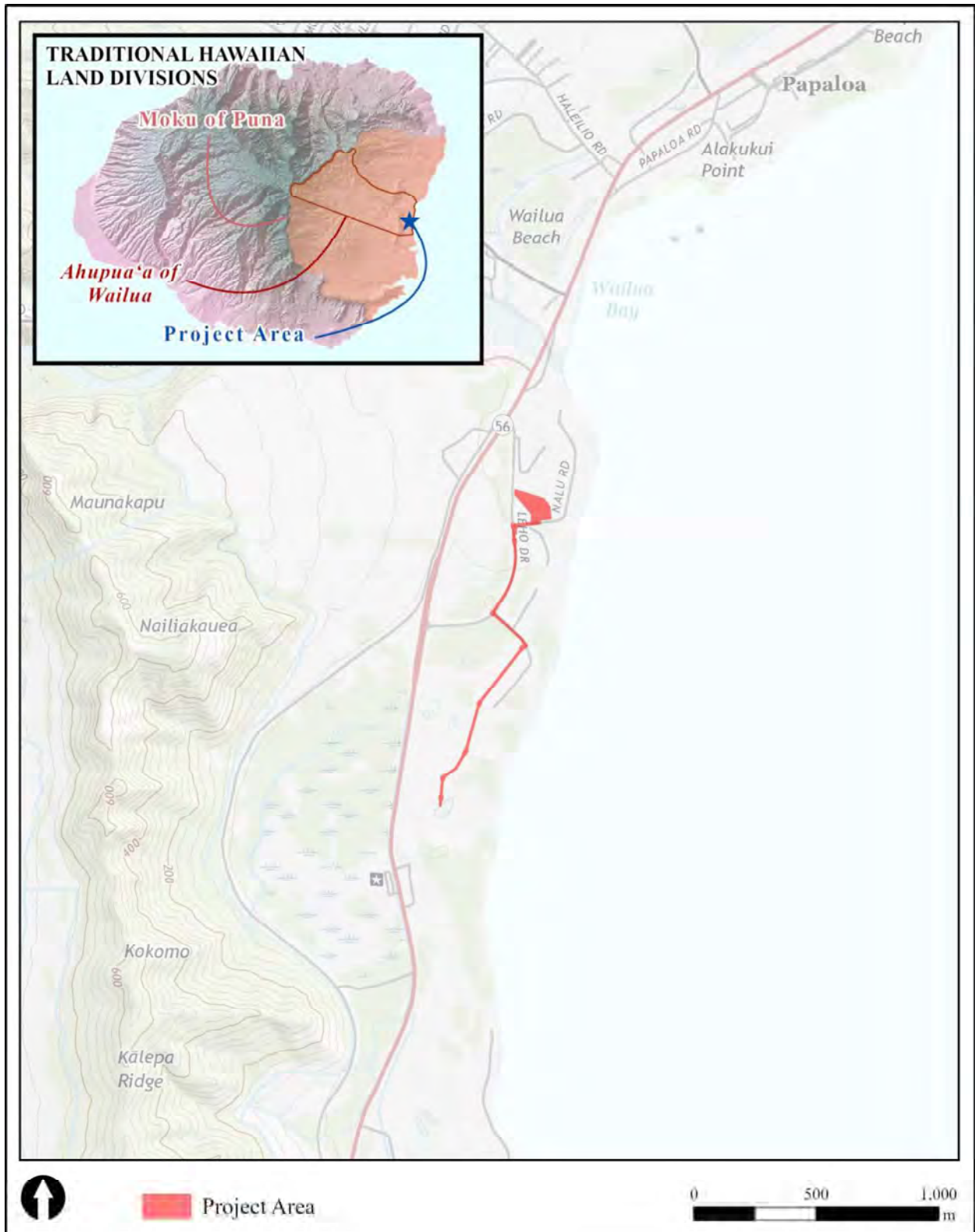


Figure 1. Location of the Project Area on the U.S.G.S. Kapa'a Topographical Quadrangle Map (USGS 2017).

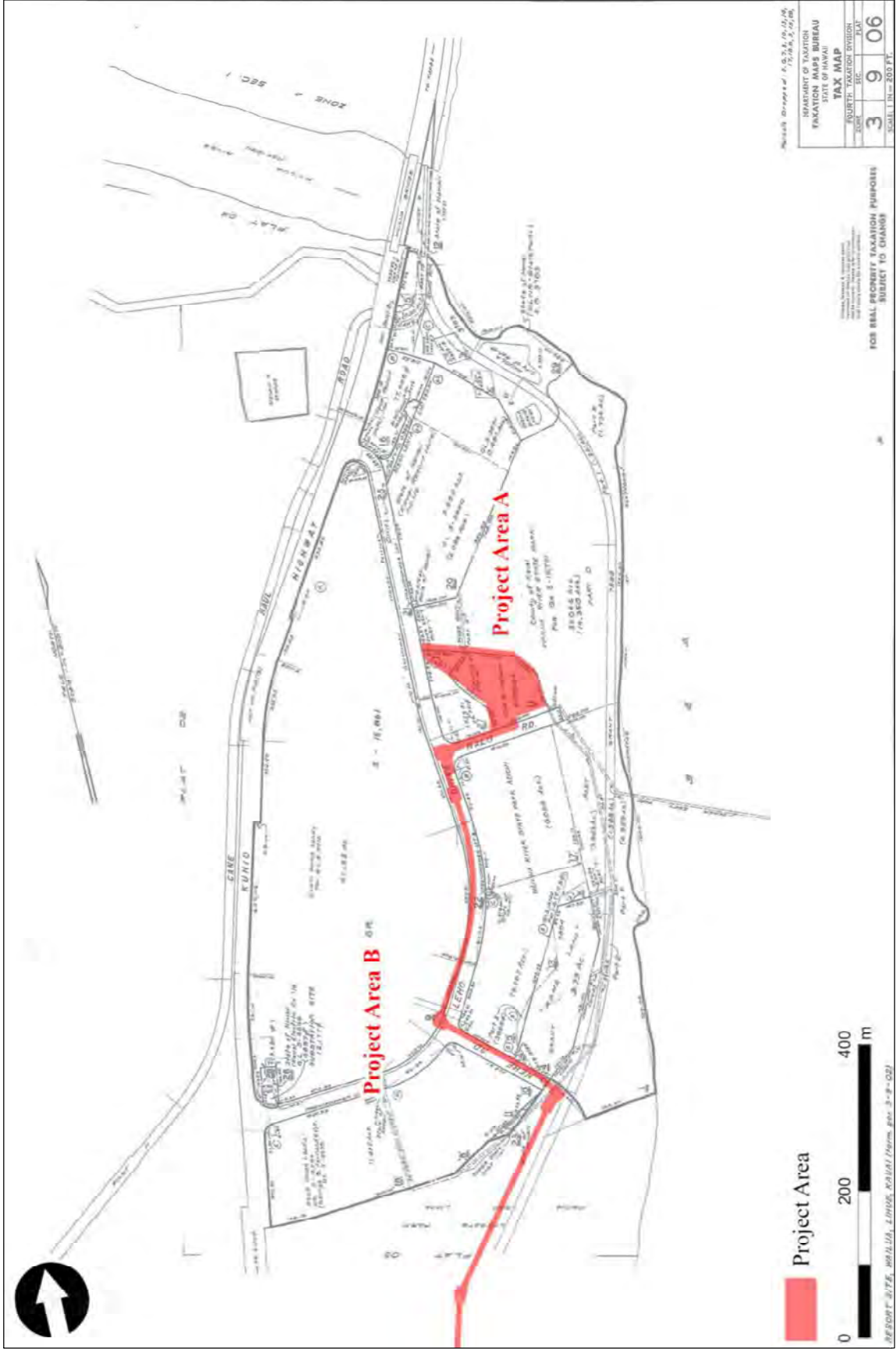


Figure 2. Project Areas A and B on TMK (4) 3-9-06 Plat Map (Tax Maps Branch 1961).



4. Primary Filters
  - a. No ground disturbance required.
5. Biological Treatment Process Modification
  - b. Re-use/re-purposing of existing tankage. No ground disturbance required.
6. Solids Disposal Process
  - c. Construction of a new Rotary Drum Thickener Platform.

Other forthcoming projects at the WWTP site (Project Area A) also include:

1. Aeration Basin Modifications
  - a. Modifications to existing tankage. No ground disturbance required.
2. Clarifier Modifications
  - a. Modifications to existing tankage. No ground disturbance required.
3. Filter Bay and Chlorine Tank Modifications
  - a. Modifications to existing tankage. No ground disturbance required.
4. New Filter
  - a. Construction for a new tertiary filter.
5. On-Site Generation of Hypochlorite
  - a. Construction of new on-site hypochlorite generation building.
6. Replace effluent pumps
  - a. No ground disturbance required.
7. Electrical upgrades
  - a. Construction of a new Motor Control Centre and Generator building and associated conduit to the new processes.
  - b. Installation of new electrical conduit to connect to the Kaua'i Island Utility Cooperative (KIUC) system.

Project Area B involves the rehabilitation of an existing 10-inch force main that conveys R-2 effluent from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course (Figures 2, 3, and 4). The force main is approximately 4,600 feet long and is within (from north to south: TMKs (4) 3-9-006:019, 3-9-006:027, 3-9-002:032, and 3-9-002:004; and (4) 3-9-006: 999 [Nalu Rd., Leho Dr., and Nehe Rd.]). It was constructed in 1976 and is nearing the end of its design life. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining, which will limit the amount of excavation required.

## **ENVIRONMENTAL BACKGROUND**

Kaua'i is roughly 53 kilometers (33 miles) long and 46.0 kilometers (25 miles) wide, and covers 1,432.26 square kilometers (553 square miles). The island consists of a single great shield volcano, deeply eroded and veneered by volcanic activity (Macdonald and Abbott 1970:381). The island has a variety of climates and variations in topography. Wailua Ahupua'a is located on the eastern side of Kaua'i, situated in the Līhu'e Basin, a flank caldera (Macdonald and Abbott 1970:381). The Wailua River, the largest river in Hawaii, is the main drainage system for the Līhu'e Basin. The river consists of the North and South Forks, along with other minor tributaries. The river is affected by the tides and measures 3.2 kilometers (2 miles) inland to the junction of the North and South Forks. The following sections describe the environment within the project area.

### **TOPOGRAPHY AND SOILS**

Soil units in and near the project area are shown in Figure 5. Project Area A is underlain by Koloa stony silty clay with 15 to 25 percent slopes (KvD), Lihue silty clay with 0 to 8 percent slopes (LhB), and Mokuleia fine sandy loam (Mr). Project Area B is underlain by Lihue silty clay with zero to eight percent slopes (LhB), Mokuleia fine sandy loam (Mr), and dune lands (DL).



Figure 3. Aerial Image Showing Project Areas A and B (Esri et al. 2019).



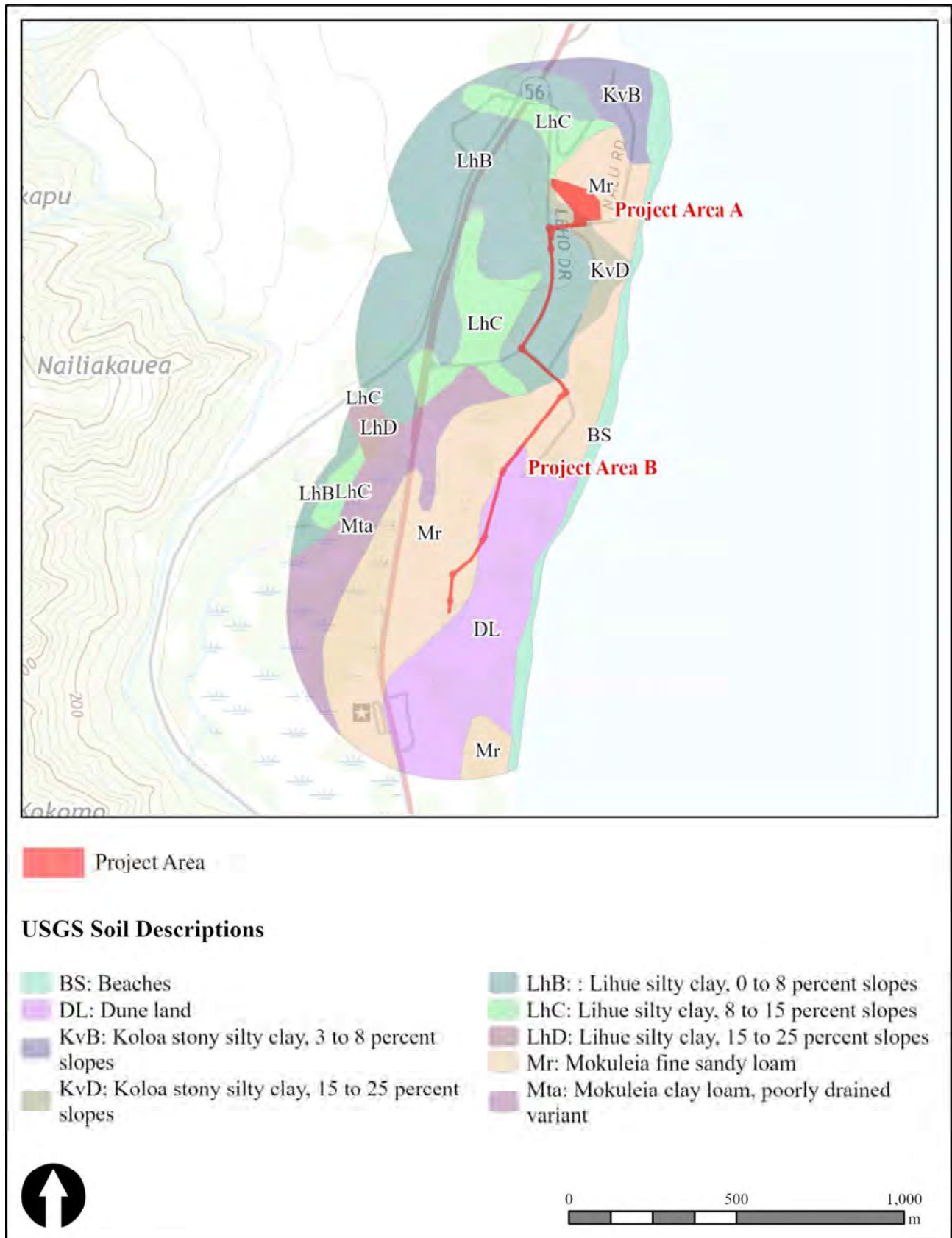


Figure 5. Soils Present in the Vicinity of Project Areas A and B.

Koloa stony silty clay with 15 to 25 percent slopes (KvD) developed in material weathered from basic igneous rock and consists of well-drained soils on slopes of old volcanic vents and upland ridges (Foote et al. 1972:74–75). Hard rock is found at a depth of 20 to 40 inches. The erosion hazard for this soil is moderate to severe. Land use includes pasture, woodland, and wildlife habitat, while natural vegetation is dominated by *koa haole* (*Leucaena leucocephala*) (Wagner et al. 1990).

Lihue silty clay with 0 to 8 percent slopes (LhB) developed in material weathered from basic igneous rock and is found on the tops of broad interfluves in the uplands (Foote et al. 1972:82). It is well-drained with moderately rapid permeability, slow runoff is slow, and slight erosion hazard. Land use for the Lihue series soils includes irrigated sugarcane and pineapple, pasture, truck crops, orchards, wildlife habitat, woodland, and homesites, while natural vegetation consists of lantana (*Lantana camara*), guava (*Psidium spp.*), *koa haole* (*Leucaena leucocephala*), *ōi* (*Stachytarpheta cayennensis*), kikuyu grass (*Pennisetum clandestinum*), molasses grass (*Melinis minutiflora*), guinea grass (*Megathyrsus maximus*), Bermuda grass (*Cynodon dactylon*), and Java plum (*Syzygium cumini*) (Wagner et al. 1990).

Mokuleia fine sandy loam (Mr) formed in recent alluvium deposited over coral sand and is found on the eastern and northern coastal plains of Kaua'i (Foote et al. 1972:95). It is nearly level. Runoff is very slow, the erosion hazard is slight, and permeability is moderately rapid in the surface layer and rapid in the subsoil (Foote et al. 1972:96). Land use for this soil unit is pasture. In drier areas the natural vegetation may include *kiawe* (*Prosopis pallida*), *klu* (*Acacia farnesiana*), *koa haole* (*Leucaena leucocephala*), and Bermuda grass (*Cynodon dactylon*), and in wetter areas napier grass (*Pennisetum purpureum*), guava (*Psidium spp.*), and *ōi* (*Stachytarpheta cayennensis*) (Wagner et al. 1990) in the wetter areas.

Dune land (DL) is composed of hills and ridges of sand-sized particles formed by wind (Foote et al. 1972:29). The sand is comprised primarily of seashells and coral. This land contains no soil horizons due to either the active shifting of the hills and ridges or its recent development. Land use for dune land is wildlife habitat and recreation; it has also been a source of liming material (Foote et al. 1972:29). Vegetation is typically minimal, but Australian Pine (*Casuarina spp.*), *koa haole* (*Leucaena leucocephala*), *kamani haole* (*Terminalia catappa*), *kiawe* (*Prosopis pallida*), and mixed grasses may be present.

An additional description of dune land in the project area is provided from Beardsley (1994). This description is specific to the Wailua Municipal Golf Course:

The dune land...extends southward from the mouth of the Wailua River. From this northern point at the river mouth, the dunes extend linearly along the shore, gradually shifting inland about 1,200 m (0.75 mi) from the river. From this inland location, the high dunes extend another 1,300 m (about 0.8 mi) to a point just north of the WGC clubhouse and 400 m inland from the beach. The dunes continue for another 1,500 m or so to the south before they gradually diminish and disappear. They are composed of soft white coralline beach sand that accumulates from east to west, blown by the prevailing wind. This is an active landform that shifts over time; however, a few episodes of stabilized surfaces, that is surfaces which have supported the establishment of vegetation and development of an A horizon, appear at variable depths throughout the dunes...In the recent past the dunes have been modified by the development of the Wailua Golf Course. Landscaping activities have been the primary agent of modification, although construction of some of the fairways, where dunes have been leveled, artificially enhanced, or cut in two, has also contributed to the changes in dune land [Beardsley 1994:13].

## RAINFALL AND VEGETATION

The project area receives a fair amount of rainfall. Data for Kaua'i Island indicates that rainfall in the project area averages 1,189.0 millimeters (mm), or 46.81 inches per year (Giambelluca et al. 2013). Project Area A includes the existing WWTP and a portion of the adjacent vacant property. Vegetation consists of nonnative grasses, Australian Pine (*Casuarina spp.*), and *koa haole* (*Leucaena leucocephala*) (Wagner et al. 1990). Project Area B includes the existing 10-inch force main which runs along the roadway rights of way (e.g., Nalo Road, Leho Drive, and Nehe Road) and extends through the Wailua Municipal Golf Course to the irrigation holding pond. Vegetation consists of manicured grass bordered by Australian Pine (*Casuarina spp.*), Cook pine (*Araucaria columnaris*), and *niu* (coconut, *Cocos nucifera*) (Wagner et al. 1990).

## HISTORICAL BACKGROUND

This section presents the ethno-historical and archaeological background information of the project area. Data from the background research were compiled to create an overview of traditional Hawaiian and historic-era land use and subsistence practices. Previous archaeological research in the vicinity of the project area is reviewed and anticipated archaeological findings are discussed.

## LEGENDARY AND TRADITIONAL HISTORY

The Hawaiian cultural landscape can be described through *mo'ōlelo* and *wahi pana*, or legendary places. *Mo'ōlelo* may be myths, legends, proverbs, and events surrounding well-known individuals in Hawaiian history (Pukui and Elbert 1986:254). The significance of Wailua is evident in its associated *mo'ōlelo* and *wahi pana*. The following discussion is a brief representation of the available information for the immediate project area. To gain a more thorough understating of the entire *ahupua'a*, the reader is directed to Dickey (1917), Fornander (1916-1917, 1918-1919); Kalākaua (1888), Rice (1923), and Smith (1955).

According to Pukui et al. (1974:224), Wailua literally means “two waters.” This may refer to the North and South Forks of the Wailua River. However, Kamakau (1976:7) offers a different origin of the toponym. According to Kamakau, the name is from the *ali'i nui* (high chief) Wailuanuiho'āno:

“Wailuanui-a-Ho'ano was born in 'Ewa, Oahu, and his descendants went to Kaua'i and to Maui, and wherever they settled they called the land after the name of their ancestor. Wailua was a son of La'akona, ancestor of the 'Ewa family by Ka-ho'ano-o-Kalani. His name, Wailuanui-a-Ho'ano, came from adding the name of his mother. Thus, some names were derived from those of ancestors.” [Kamakau 1976:7].

Consequently, Wailua was known as “Wailua-Nui-Hoano, or great, sacred Wailua, a land taboo to common people” (Dickey 1917:14).

Wailua was one of two royal centers on the Island of Kaua'i. It was chosen by the *ali'i* (chiefs) for its fertile soil, fresh water, rich marine resources, safe canoe landings, and good surf (Yent 1995:20). The area *makai* (toward the sea), or east, of Nounou and Kālepa Ridges was a ruling center occupied periodically by the ruling chief and his staff. The area *mauka* (toward the mountain), or west was used for agriculture; there is evidence of taro field systems and alluvial terraces along the Wailua River (Yent 1995:21).

Traditionally, Wailua was an area where gods and *ali'i* gathered. The large numbers of *heiau* (traditional Hawaiian ritual site or temple) and other cultural sites confirm the historical the importance of this area. An early western visitor to the island, George Washington Bates (1854), stated that:

The Wailua River stands associated with the very genius of romance and superstition. Every object on the banks, every rock in the stream, and every cliff by which it is overlooked, has attached to it some legend of lovers, warriors, priests, and kings [Bates 1854:190].

One of the earliest voyagers to Kaua'i was Mō'ikeha of Kahiki; he brought a calabash of winds and planted the first *kalo* (taro) and *'uala* (sweet potato). Mō'ikeha had a *hānai* (foster) son, La'a-mai-kahiki, who traveled to Kaua'i and brought to Wailua the god Lono-i-ka-ou-ali'i and the first *kaeke*, which is a temple drum made from the trunk of a coconut tree and shark skin (Dickey 1917:25; Fornander 1880:62).

Malae Heiau, also known as Makaukiu (Dickey 1917) or Malaeha'akoa (Keaweamahi 1876 cited in Flores 1995), is the largest existing *heiau* on Kaua'i, although a larger *heiau* was once present at Nawiliwili. It is situated on the south side of the Wailua River, immediately inland (west) of Kūhio Highway. It is designated State Inventory of Historic Places (SIHP) Site 50-30-08-00104. According to legend, Malae Heiau was built by Menehune (mythical race of small people who worked at night, building fishponds, roads, and temples). At this *heiau* a beautiful maiden, Ka'ililauokekoa, was born. She was skilled at *kōnane* (Hawaiian game similar to checkers) and surfing. She was the daughter of La'a and the granddaughter of Mō'ikeha and would someday be the queen of Kaua'i (Dickey 1917:25–26).

Another legendary person associated with Kaua'i is the strong man Kapakohana<sup>2</sup> (Beckwith 1970:344; Fornander 1918-1919:210–213). It is said he discovered that a hairless cannibal from Hanakāpī'ai had arrived in Wailua and was intent on eating the people of the village. Being brave and unafraid, he fought the cannibal until he grew tired. To avoid defeat he suggested a friendship and to share a meal of taro. After some time, the cannibal became less vigilant and did not suspect that Kapakohana had been insincere. One night, Kapakohana and 80 warriors surrounded the cannibal's house, but the cannibal escaped and devoured all the warriors except Kapakohana. Another long battle ensued and Kapakohana finally triumphed and killed the cannibal by striking him on the temple several times. "Kapakohana then took out the eyes of the cannibal to be used as bait for shark fishing. He next stripped the bones clean and used them for a place to hang up his calabashes. The rest of the body was then carried to the temple and placed on the altar as a sacrifice" (Fornander 1918-1919:212).

On the south side of the Wailua River mouth are Hikinaakalā Heiau, Hau'ola, and Pae-ki'i-māhū-o-Wailua petroglyphs, SIHP Site 50-30-08-00105. According to Dickey (1917:15), Hau'ola was a *pu'uhonua* (place of refuge). Hau'ola is associated with Manamanaiakalua, which is a place near Māmā'akualono Cave (Fern Grotto) where there is said to be an *'ōhi'a lehua* tree without any flowers. The flowers of this tree are located underwater in the surf off of Hauola, at a place called Kalauawehe (Carpenter and Yent 1997:12; Dickey 1917:33).

The Pae-ki'i-māhū-o-Wailua petroglyphs have multiple associations and are the only known rock art site in Hawaii with an associated hula (see Barrere et al. 1980:81; Cox and Stasack 1970:13). According to Judge Lyle A. Dickey (1917:17), who was a local resident and authority on the history of Kaua'i (Soboleski 2015:498), the petroglyph rocks were a portion of the *pu'uhonua* wall along the river where the flow was different. He also relates two origin stories for the boulders. In the first he states that "a sculptor of ancient times, carving idols, could only make one to suit him and threw the others away. These rocks are some of them, the marks being the hieroglyphics of the ancient sculptor" (Dickey 1917:16).

---

<sup>2</sup> In Dickey (1917) Kapakohana is also spelled Kapokehana and Kapohana.

The other origin is told in a legend of Māui and his brothers (Dickey 1917:16–18). In order to unite the Hawaiian Islands Maui needed to catch a powerful fish known as Luehu. He went fishing with his eight brothers each month on the night of Lono:

His mother, Hina, told him not to disturb any bailing dish he might find floating in the water at the mouth of Wailua River, as this would be his beautiful sister, Hinake-kaa. However, when Maui saw a dish for bailing out canoes floating near he told his brothers not to look behind them on pain of death and picked up the bailing dish and put it behind him in the canoe, where it turned into a beautiful woman.

As soon as Luehu was caught the Hawaiian Islands began to draw together. As Kauai and Oahu came near great crowds gathered on the shores of Oahu and cheered. This did not disturb the brothers of Maui at first, who paddled steadily, but when the cheerers exclaimed at the beauty of the woman behind Maui, all the brothers turned at once to look. Immediately the great fish became loose from the hook and the islands slid apart as they had been. Only two islands had actually touched each other. The point near the Nawiliwili lighthouse had touched Kaena Point on Oahu and as they drew apart a piece of Oahu was caught on Kauai and a piece of Kauai on Oahu. This rock off Kaena Point is still called "Pohaku o Kauai," Rock of Kauai.

Because of their looking back, Maui's brothers were on their return to Wailua turned into stones and set across the mouth of the Wailua River [Dickey 1917:18].

An additional legend was noted by Dr. William Kikuchi that accounts for the origin of the petroglyph stones. This story involves the demigoddess Kapo, a half-sister of Pele:

Kapo and her party left Ni'ihau for Kaua'i and came upon a surfing competition at Wailua. Here Kapo and her sisters were invited by some of the men to ride on the famous surf of Wailua called Maka'iwa. Accepting, they rode the first wave in pairs with the men. On the second wave, using their supernatural powers, they left the men behind while they rode to shore and awaited the third wave. The third wave, which was described as a mountain of water rather than a normal surf, plummeted the men and forced them beneath the wave to their death. There they were changed into stone at the mouth of the Wailua River. Since then, these boulders are known as the row of images, or *pae ki'i*, and can still be seen when wave and river action removes the sand cover [Kikuchi 1984:3].

## TRADITIONAL LAND USE

Wailua was the main royal residence on the island of Kaua'i (Bennett 1930:57; Bennett 1931:96), was a favored location for *ali'i* because it offered abundant resources for subsistence and sport related activities (Yent 1995:21). Because the *ali'i* could stress an area's resources, Wailua was not occupied year-round (Yent 1995:21), and Waimea served as a seasonal royal residence (Bingham 1855:242; Cox 1975:5). Based on the association of Wailua with the *ali'i nui* Wailuānuiahō'ano and Mō'ikeha, the area was a social and political center of the kingdom of Kaua'i by AD 1300–1350 (Yent 1995:32).

Wailua's importance is also indicated by the Pōhaku Ho'ohānau (birthstones) at Holoholokū Heiau (SIHP Site 50-30-08-00106), situated on the north side of Wailua River and slightly inland, which was a birthplace for *ali'i*. Likewise, the complex of *heiau* surrounding Wailua River is indicative of Wailua's status. There are thought to have formerly been 10 *heiau* in the *ahupua'a*, spanning from the coast to the mountains (Drennan 2008:18).

## HISTORIC LAND USE

The earliest documentation of Wailua by western voyagers comes from the journals of Captain George Vancouver who sailed along the shore in 1793. Previously he sailed with Captain James Cook and anchored at Waimea, only to find that no high chiefs resided in the village.



Though there was no safe anchorage at Wailua, Vancouver visited off-shore in 1793. He gave the following description of the land:

This part seemed to be very well watered, as three other rapid small streams were observed to flow into the sea within the limits above mentioned. This portion of Attouai, the most fertile and pleasant district of the island, is the principal residence of the King, or, in his absence, of the superior chief, who generally takes up his abode in an extensive village, about a league to the southward of the north-east point of the island. Here Enemo the regent, with the young prince Tamooerrie, were now living (Vancouver 1798: 221–222).

Rev. John Mortimer Lydgate (1920:5), who was also a plantation manager and a surveyor for the Hawaiian Kingdom and later for the Territory of Hawai'i (Soboleski 2015:312), further explains the appeal of Wailua as a place for royal residence:

The double valleys at Wailua furnish broad stretches of excellent taro lands well-watered and reliably sufficient for a large population. The sea and river fisheries furnished the needed fish for a similar large population, and in addition to this there were broad stretches of kula land on either side and mauka for other forms of agriculture [Lydgate 1920:5].

The U.S. Exploring Expedition visited Wailua in October 1840. At the time, Debora Kapule Kekaiha'akūlou, known as Kapule, resided in Wailua. She was a member of Kaua'i's royal family and the former wife of Kaumuali'i, the last independent *ali'i nui* of Kaua'i and Ni'i'hau (Mills 2002:111). She had been granted lands at Wailua by Ka'ahumanu, *kuhina nui* (regent) of the islands after the rebellion of 1824 led by Kaumuali'i's son George. She first moved to Wailua in 1935 and resided there until 1950 when she moved to her former home of Waimea (Mills 2002:184). The following is a description of the U.S. Exploring Expedition's time in Wailua:

The country on this route was uninteresting, until they reached Wailua, the residence of Deborah, a chief woman of the islands, readily known as such from her enormous size, and the cast of her countenance. She has a person living with her called Oliva Chapin, who speaks English, and has learned how to extort money. Deborah has about forty men in her district; but they were absent, being employed in the mountains cutting timber to pay the tax to the king.

Near Deborah's residence are extensive fishponds belonging to her [located at today's Coco Palms on the north side of Wailua river], which have been made with great labour: they are of different degrees of saltiness. The fish are taken from the sea when young and put into the saltiest pond; as they grow larger, they are removed into one less salty, and are finally fattened in fresh water. While our gentlemen were there, Deborah received young fish in payment of the poll-tax, which were immediately transferred to her ponds.

Wailua, (two waters,) was formerly a place of some importance. It is situated on a small stream of the same name, in a barren, sandy spot.

Deborah furnished them with a double canoe, to carry them up the river to visit the falls. Taking the western branch, they ascended it for two and a half miles.

There are many good taro-patches and sugar plantations on its banks. They landed in what appeared to have been an old crater, in front of a basin, with high perpendicular bank. The low grounds along the river are extremely fertile, producing bread-fruit, sugar-cane, oranges, etc. The latter, however, are suffering from the blight, and some of the trees were covered with a black smut, produced by a species of aphid.

In ascending, an insulated black rock is passed, known as the "Muu," which has been detached from a high rocky bluff that is remarkable for the dikes visible in it [Wilkes 1845:68].

The widespread agriculture along the Wailua River was reported by Bates (1854) during a canoe ride inland. He described how the river wound its way through numerous taro plantations as well as orange and coconut tree groves (Bates 1854:190).

During the Mahele of 1848, Debora Kapule and her son Iosia Kaumuali'i claimed most of the *makai* (seaward) land in Wailua. The remaining land in Wailua, including the current project area, was declared Crown Lands under Kamehameha III (Stauffer 1993:113; Yent 1995:9). Resulting from the Kuelana Act of 1850, two Land Commission Awards (LCAs) were granted north of Project Area A, south of the Wailua River. These included LCA 3555:2 to Kiaipali in the *'ili* (an *'ili* is a division of an *ahupua'a*) of Malaehakoa and LCA 9403:2 to Pahio in Malaihanono, both of which consisted of a *pahale* (house lot). Their locations are shown in Figure 6.

The Henry A. Pierce & Company was founded in 1849, which would later be known as Lihue Plantation Company Ltd. (Saito and Campbell 1987). Into the late 1800s the plantation expanded, and in 1878 leased 30,000 acres at Wailua. The eastern extent of the field system by 1939 in relation to the project area can be seen in Figure 7.

By the 1870s the taro planted in alluvial terraces along the Wailua River was replaced with rice, while the uplands were planted in sugarcane and used for cattle grazing (Yent 1995:21). Handy (1940) wrote the following about Wailua:

Along the lower 2 miles of Wailua River, above the sandy coastal plain, are many broad, open, level areas, formerly terraces, now mostly sugar. Opaekaa Stream, which flows into tidewater Wailua River, watered many terraces both above and below the falls. The large area of terraces below the falls is now planted mostly in rice, a few of the upper terraces being used for sweet potatoes, while the uppermost are pasture [Handy 1940:67–68].

The current project area falls within the original boundary of Lydgate Park. The aforementioned Rev. Lydgate had petitioned the territorial governor to set aside the land as a public park (Else 2017). In 1921 the park was named after Lydgate. This was a year after the Ahukini Terminal & Railway Company (A.T. & R.) built the railroad from Ahukini to Anahola to carry sugarcane, workers, and freight (Yent 1995:22). The railway can be seen running on the east side of the road near Project Area B in Figure 8, and along the shoreline near Project Area A in Figure 9. The conversion from railroad to truck haul occurred from 1957 to 1959 and marked the end of sugar cane transport by railroad on Kaua'i (Condé and Best 1973:165-169).

The south portion of Lydgate Park became the Wailua Municipal Golf Course in the 1930s. Then, in the 1960s, the course was expanded and Wailua Resort (today's Kaha Lani Resort) was constructed. In 1962, the park was added to the Wailua River State Park. In 1992 the park was subdivided, whereby the 4.8 acres containing Hikinaakalā Heiau was retained by State Parks and the remaining 45.5 acres were transferred to the County of Kaua'i.

## PREVIOUS ARCHAEOLOGICAL STUDIES

There have been numerous archaeological studies conducted within Wailua Ahupua'a. This overview limits the discussion to studies within 500 meters of the project area. Generally, recorded archaeological sites in this area associated with the pre-Contact and early historic periods are concentrated on the east side of Kūhiō Highway, while sites on the west side are associated with the historic period. This can be attributed to the corresponding presence of sand dunes on the east and sugarcane plantation fields on the west. During previous investigations along Kūhiō Highway, no archaeological sites have been identified near the current project area (see Dega and Powell 2003; Hammatt et al. 1994; Stine and Hammatt 2012; Tulchin and Hammatt 2009). Figure 10 shows the location of the previous archaeological studies near the project area, which are summarized in Table 1. Locations of archaeological sites are shown in Figures 11 and 12. All site numbers in Figures 11 and 12 follow SIHP Site 50-30-08-.

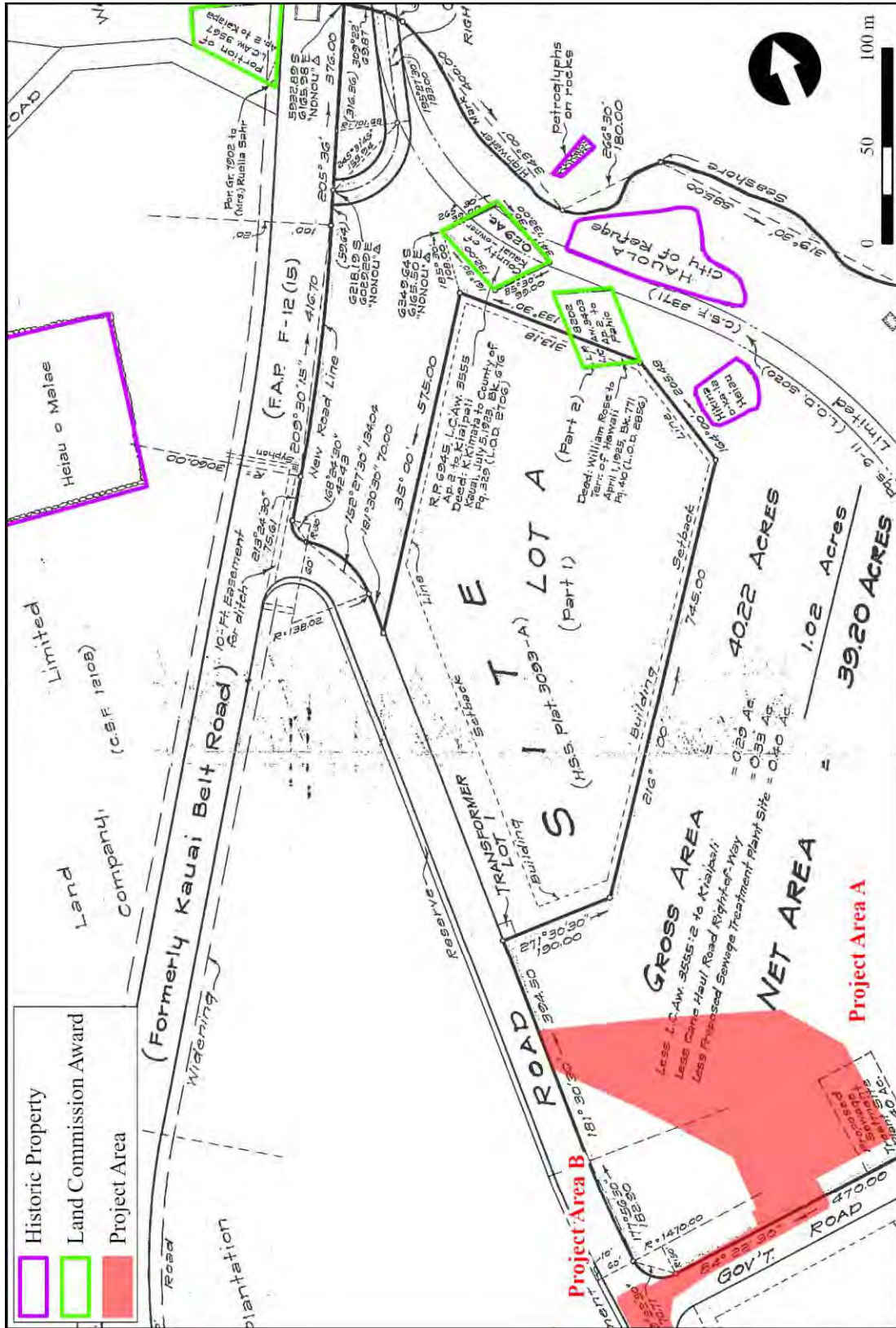


Figure 6. Portion of Wailua Park Map Showing Locations of LCAs near Project Areas A and B (Lydgate 1921).

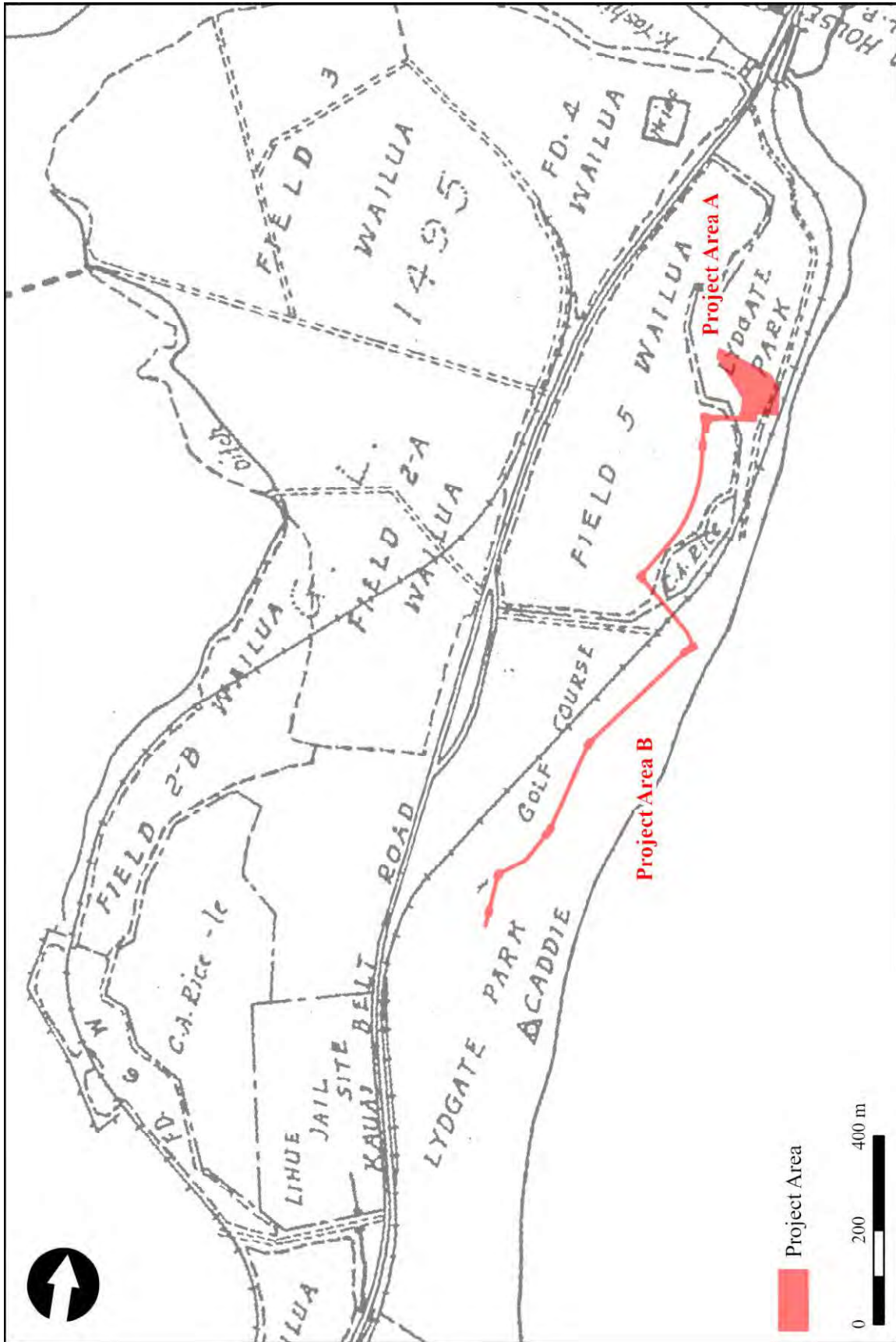


Figure 7. Portion of Lihue Plantation Map Showing Location of Project Areas A and B (Anonymous 1939)

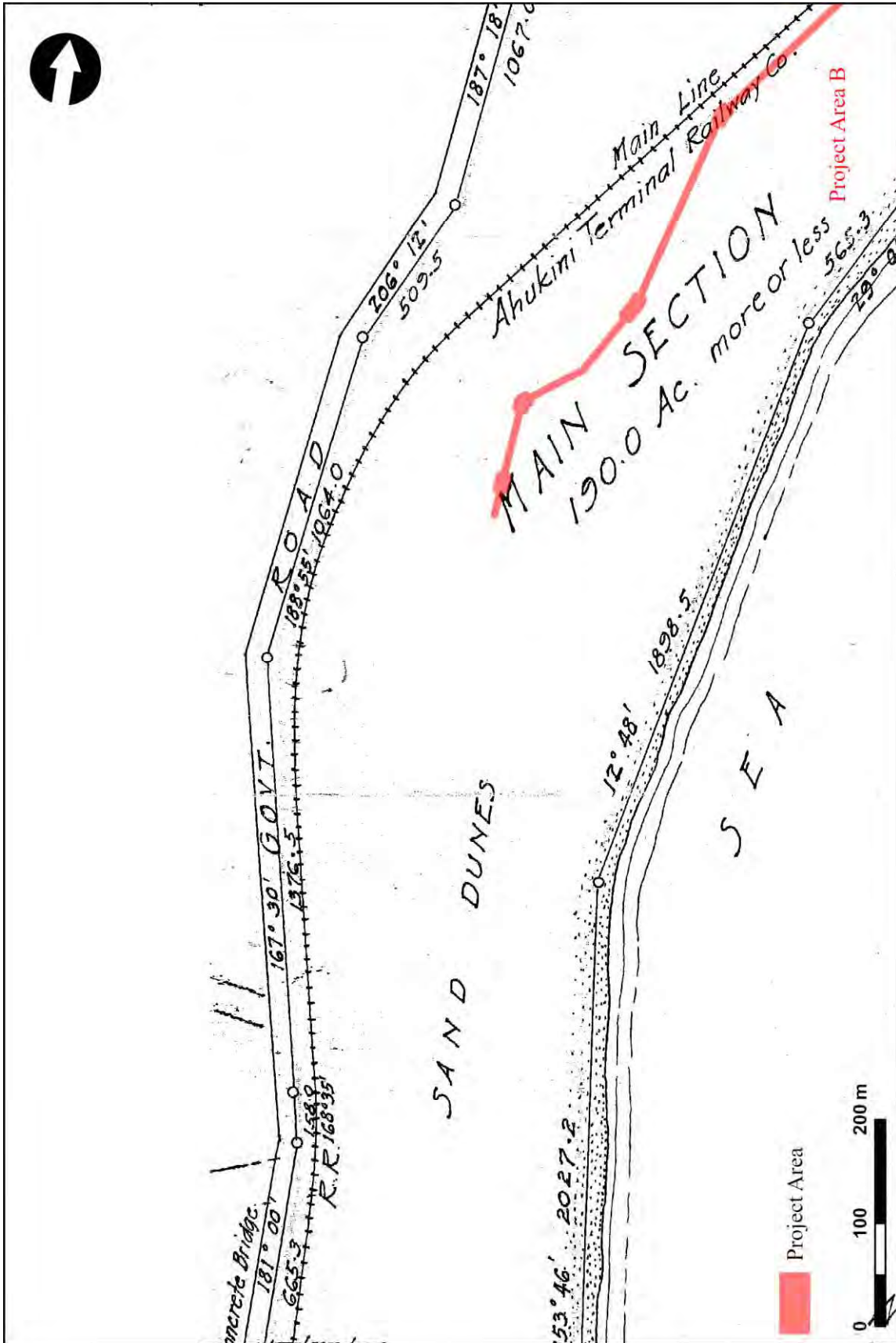


Figure 8. Portion of Proposed State Park Map Showing the Location of Railway Near Project Area B (Kato 1961).

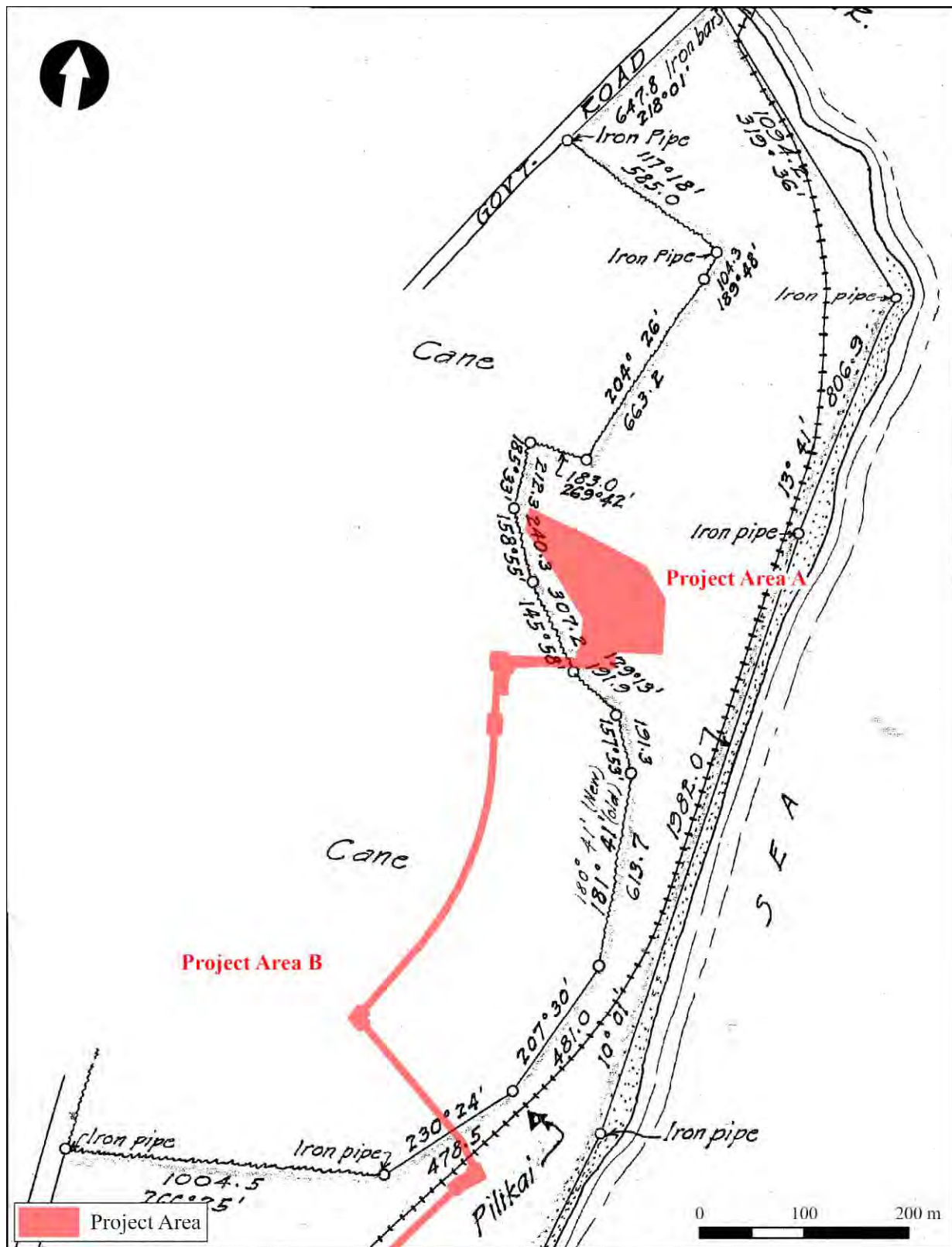
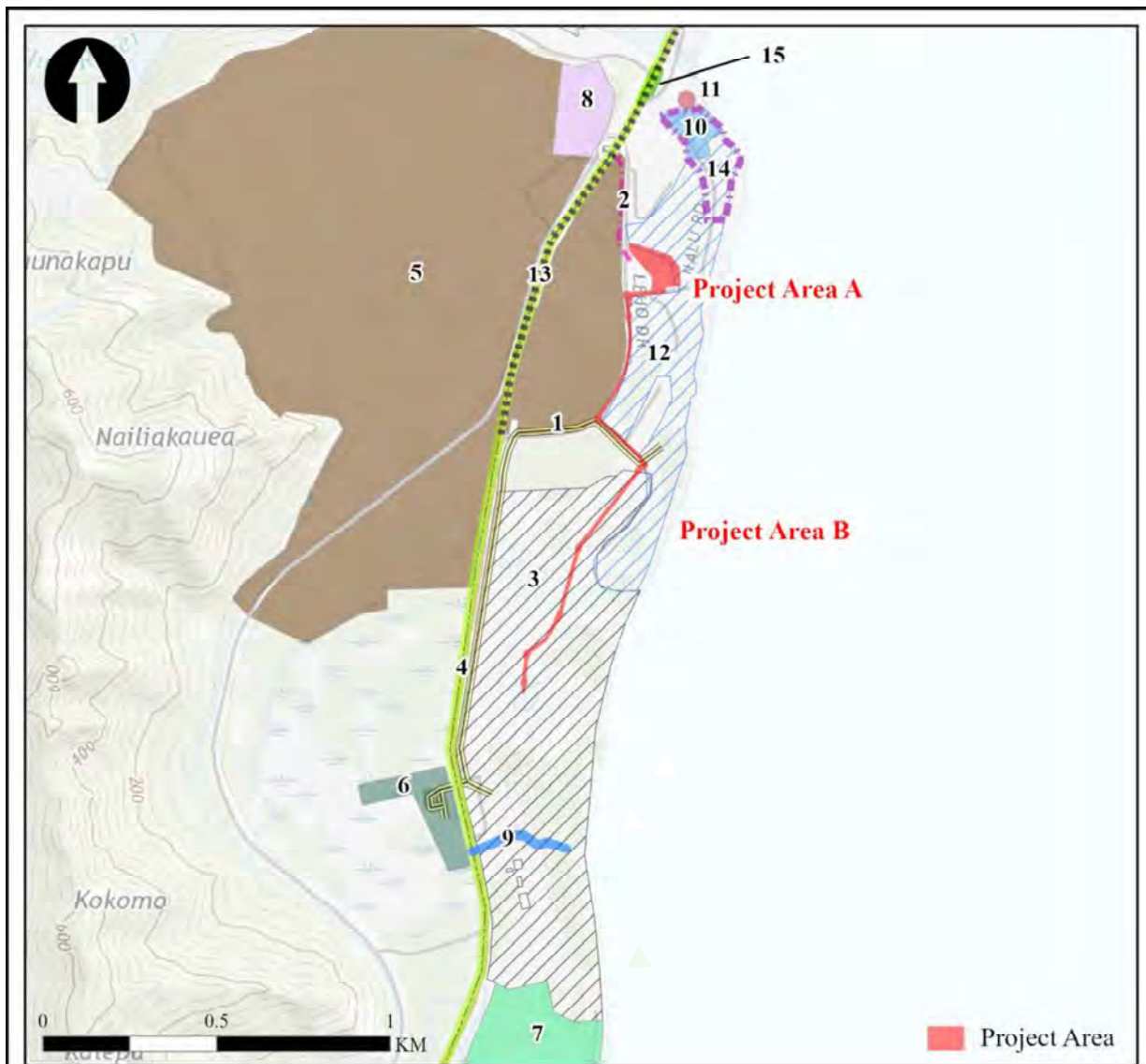


Figure 9. Portion of Proposed State Park Map Showing Location of Railway Near Project Area A and B (Kato 1961).



**Previous Investigation**

- |   |   |
|---|---|
| 1. Beardsley 1994   | 9. Folk and Hammatt 1992; Folk and Hammatt 1995; Folk et al. 1994         |
| 2. Carney and Hammatt 2007  | 10. Kikuchi 1974; Yent 1989, 2000   |
| 3. Cox 1977   | 11. Kikuchi 1984; Yent 1991c  |
| 4. Dega and Powell 2003   | 12. Morawski and Dega 2003; Shideler et al. 2001; Walton and Spilker 1974 |
| 5. Drennan 2007   | 13. Stine and Hammatt 2012; Tulehin and Hammatt 2009;                     |
| 6. Erklens and Welch 1993   | 87, 1992  |
| 7. Fager and Spear 2000   | 15. Yent 1991a  |
| 8. Flores 1995; Kikuchi 1973, 1987; Yent 1991b, 1992, 1997a, 2005 |   |

Figure 10. Locations of Previous Archaeological Studies in the Vicinity of the Project Areas A and B.

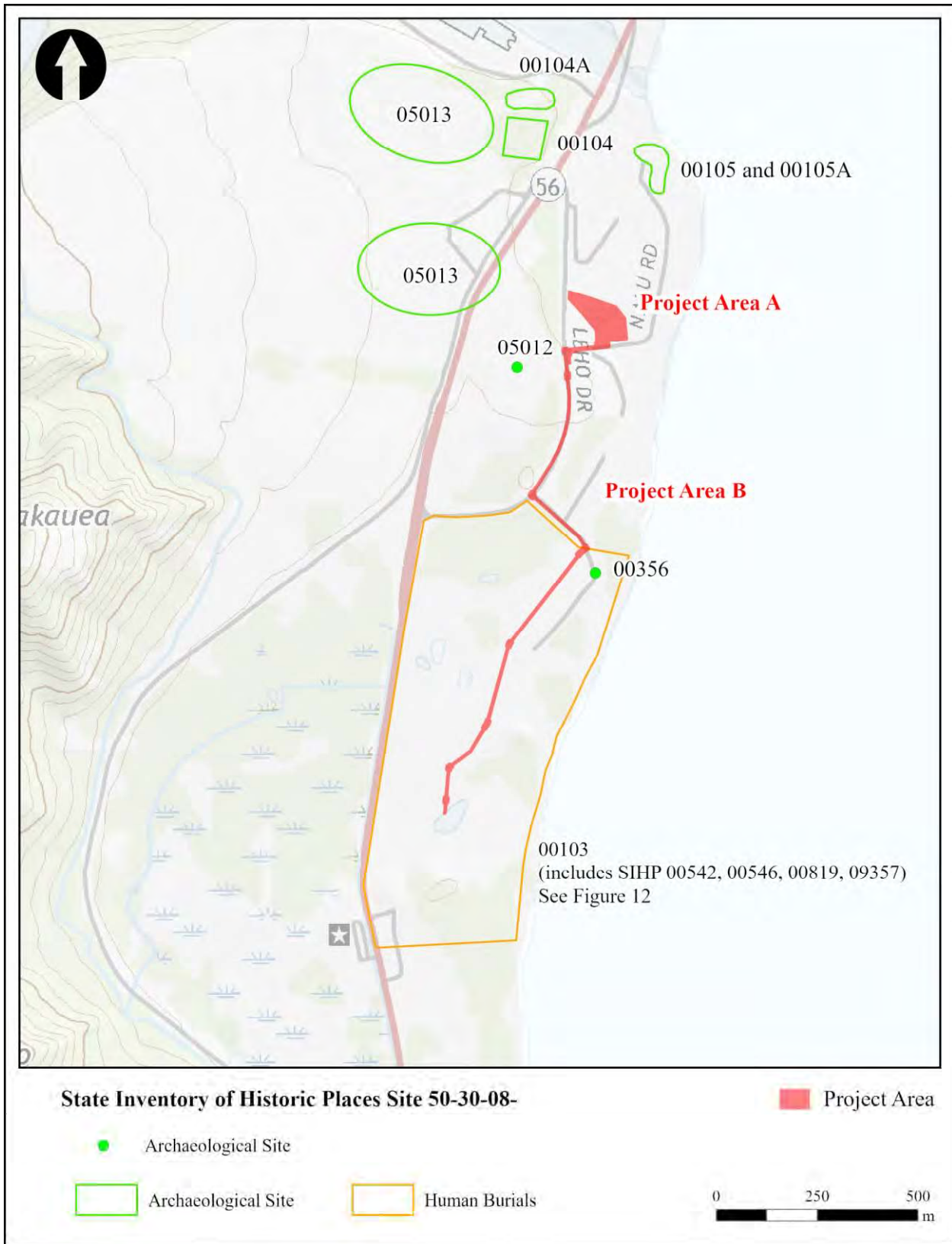


Figure 11. Locations of Known Historic Properties in the Vicinity of the Project Areas A and B.



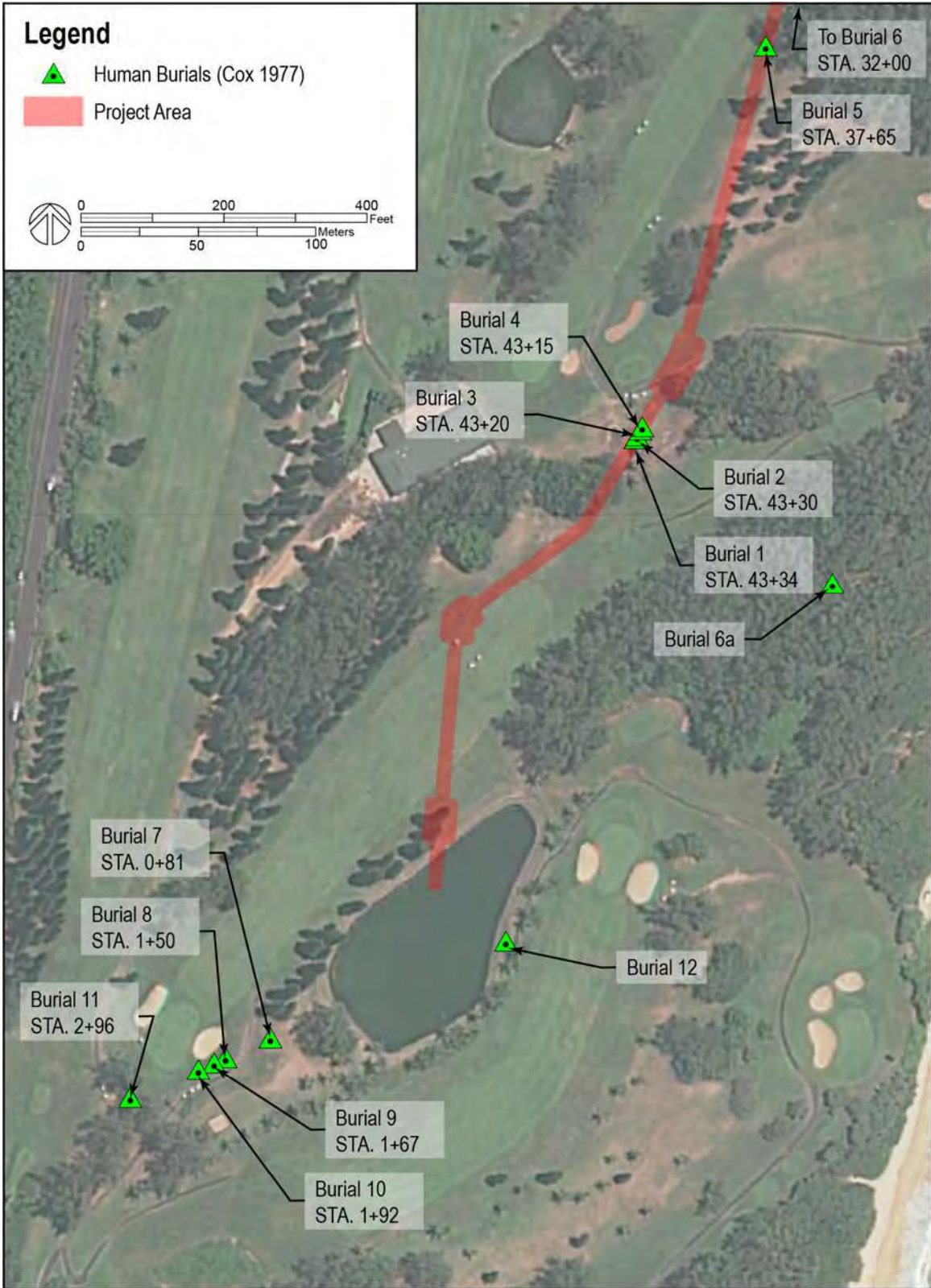


Figure 12. Locations of Burials Identified in Cox (1977) Near Project Area B.

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference                     | TMK/<br>Location  | Nature of<br>Study               | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results  | Proposed Project<br>Anticipated Effect                                       |
|-------------------------------|---|----------------------------------|----------------------------|--|--|
| Thrum*<br>1906a               | Island wide   | Survey of<br>Kaua'i <i>heiau</i> | 00104                      | Malae Heiau  | No Effect  |
|                               |   |                                  | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Bennett*<br>1931              | Island wide   | Arch. Survey                     | 00103                      | Dune burials   | Effect with proposed mitigation measures (site-wide determination for 00103) |
|                               |   |                                  | 00104                      | Malae Heiau  | No Effect  |
|                               |   |                                  | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Kikuchi<br>1974               | 3-9-006:029/<br>Hikinaakalā<br>Heiau                      | <i>Heiau</i> Study               | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Walton<br>and Spilker<br>1974 | 3-9-006:004/<br>Lydgate State<br>Park Pavilion            | Assess. and<br>Testing           | -                          | No significant finds.  | No Effect  |
| Cox 1977                      | 3-9-006:001/<br>Wailua Golf<br>Course                     | Burial<br>Recovery               | 00103                      | 13 human burials and disarticulated human skeletal remains (also designated Sites - 00542 to -00546 and -00819, but considered within Site 103)  | Effect with proposed mitigation measures (site-wide determination for 00103) |
| Kikuchi<br>1984               | 3-9-006:029/<br>Wailua<br>Petroglyph<br>Boulders          | Mapping of<br>Petroglyphs        | 00105A                     | 36 figures, possibly additional in river   | No Effect  |
| Kikuchi<br>1987               | 3-9-002:012/<br>Malae Heiau                               | Adze<br>Study                    | 00104A                     | Artifact scatter   | No Effect  |
| Yent 1987                     | 3-9-006:001,<br>004/<br>South of mouth<br>of Wailua River | Monitoring                       | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Yent 1989                     | 3-9-006:004<br>Hikinaakalā<br>Heiau and<br>Hau'ola        | Mapping and<br>Testing           | 00105                      | Hikinaakalā Heiau; determined two periods of occupation: historic and earlier period, undetermined if associated with <i>heiau</i> construction. | No Effect  |

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference                    | TMK/<br>Location  | Nature of<br>Study                           | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results   | Proposed Project<br>Anticipated Effect   |
|------------------------------|---|--|----------------------------|---|--|
| Yent<br>1991a                | 3-9-006:001/<br>Lydgate Area  | Arch. Testing                                | -                          | Possible pre-<br>contact cultural<br>deposit.                           | No Effect  |
| Yent<br>1991b                | 3-9-002:012/<br>Malae Heiau   | Enviro.<br>Assess.                           | 00104                      | Malae Heiau   | No Effect  |
| Yent<br>1991c                | 3-9-006:004/<br>Wailua<br>Petroglyphs   | Damage<br>Assess.                            | 00105A                     | Petroglyphs   | No Effect  |
| Folk and<br>Hammatt<br>1992  | 3-9-002:004/<br>Wailua Golf<br>Course   | Assess.                                      | -                          | No significant finds.   | No Effect  |
| Yent 1992                    | State Parks on<br>Kaua'i  | Hurricane<br>Damage<br>Assess.               | 00104<br>00105             | Malae Heiau<br>Hikinaakalā Heiau<br>and Hau'ola                         | No Effect<br>No Effect   |
| Erklens<br>and Welch<br>1993 | 3-9-005:13/<br>Kaua'i<br>Community<br>Correctional<br>Center  | Arch.<br>Assess.                             | -                          | Notes probability of<br>human burials                                   | No Effect  |
| Beardsley<br>1994            | 3-9-002:004, 3-<br>9-005:13, 3-9-<br>006:001 and<br>011/<br>Kaua'i<br>Community<br>Correctional<br>Center and the<br>Wailua County<br>Golf Course | Subsurface<br>Testing<br>Inventory<br>Survey | 00103<br>(09357)           | One burial<br>designated Site<br>09357, but<br>considered Site<br>00103 | Effect with proposed<br>mitigation measures (site-<br>wide determination for<br>00103) |
| Folk et al.<br>1994          | 3-9-002:004/<br>Wailua County<br>Golf Course  | Arch.<br>Inventory<br>Survey                 | -                          | No significant finds.   | No Effect  |
| Hammatt<br>et al. 1994       | Kūhiō Highway<br>from<br>Hanamaulu to<br>Kapa'a<br>Ahupua'a   | Document<br>Review and<br>Assess.            | -                          | No significant finds.   | No Effect  |
| Flores<br>1995               | 3-9-002:012/<br>Malae Heiau   | Historical<br>and Cultural<br>Research       | 00104                      | Malae Heiau   | No Effect  |

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference              | TMK/<br>Location                            | Nature of<br>Study                          | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results  | Proposed Project<br>Anticipated Effect                                       |
|------------------------|---|---|----------------------------|--|--|
| Folk and Hammatt 1995  | 3-9-002:004/<br>Wailua County Golf Course   | Monitoring                                  | 00103<br>(01980)           | Remains of eight individuals from disturbed or secondary deposit; designated 01980, but considered Site 00103  | Effect with proposed mitigation measures (site-wide determination for 00103) |
| Yent 1997b             | 3-9-002:012/<br>Malae Heiau                 | Vegetation Removal and Landscape Plan       | 00104                      | Malae Heiau  | No Effect  |
| Yent 1997c             | 3-9-006:004<br>Hikinaakalā Heiau            | Vegetation Removal and Landscape Plan       | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Fager and Spear 2000   | 3-9-005:001/<br>Wailua Golf Course          | Arch. Monitoring                            | 00103                      | 44 burials and 42 instances of disarticulated human skeletal remains; subsurface cultural layer (with traditional artifacts) and three fire pit features, dated AD 1440 to 1670. | Effect with proposed mitigation measures (site-wide determination for 00103) |
| Shideler et al. 2000   | 3-9-006:001/<br>Lydgate Park                | Inventory Survey                            | 00105                      | Hikinaakalā Heiau and Hau'ola; no new sites  | No Effect  |
| Yent 2000              | 3-9-006:004<br>Hikinaakalā Heiau and Hauola | Vegetation Removal and Signage Installation | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Shideler et al. 2001   | 3-9-006:001/<br>Lydgate Park                | Arch. Assess.                               | 00105                      | Hikinaakalā Heiau and Hau'ola; no new sites  | No Effect  |
| Dega and Powell 2003   | Kūhiō Hwy.                                  | Arch. Monitoring                            | +                          | No sites near current project area.  | No Effect  |
| Morawski and Dega 2003 | 3-9-006:001/<br>Lydgate Park                | Arch. Monitoring                            | 00103                      | Two burials and two instances of isolated human skeletal remains.  | Effect with proposed mitigation measures (site-wide determination for 00103) |
|                        |   |   | 00356                      | Pre-Contact cultural layer.  | No Effect  |

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference                         | TMK/<br>Location  | Nature of<br>Study                         | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results  | Proposed Project<br>Anticipated Effect |
|-----------------------------------|---|--|----------------------------|--|--|
| Yent<br>2005a                     | 3-9-02:012/<br>Malae Heiau  | Inventory<br>Survey                        | 00104                      | Malae Heiau  | No Effect                              |
| Yent<br>2005b                     | 3-9-02:012/<br>Malae Heiau  | Preservation,<br>and<br>monitoring<br>Plan | 00104                      | Malae Heiau  | No Effect                              |
| Carney<br>and<br>Hammatt<br>2007  | 3-9-006:001/<br>Leho Drive  | Arch.<br>Monitoring                        | -                          | No significant finds.  | No Effect                              |
| Drennan<br>2008                   | 3-9-002:012, 24,<br>25 and 3-9-<br>006:009/<br>Wailua<br>Residential<br>Subdivision | Arch.<br>Inventory<br>Survey               | 05012                      | Plantation era<br>agricultural water<br>diversion with<br>irrigation features. | No Effect                              |
|                                   |   |  | 05013                      | Pre-contact lithic<br>scatter  | No Effect                              |
|                                   |   |  | +                          |  | No Effect                              |
| Tulchin<br>and<br>Hammatt<br>2009 | Kūhiō Hwy.,<br>Aleka Loop to<br>Leho Dr.  | Arch.<br>Assess.                           | -                          | No significant finds.  | No Effect                              |
| Stine and<br>Hammatt<br>2012      | Kūhiō Hwy.,<br>Aleka Loop to<br>Leho Dr.  | Arch.<br>Inventory<br>Survey               | +                          | No sites near<br>current project area.   | No Effect                              |

\*State Inventory of Historic Places      +Identified sites over 500 meters from current project area.

### Early Twentieth Century *Heiau* Investigations

The *heiau* in Wailua were first documented by Thrum (1906a) when he conducted a survey of Kuaʻi *heiau* for the Hawaiian Annual for 1907. Five *heiau* were recorded in the Wailua River area, two of which are near the current project area: Malae Heiau and Hikinaakalā Heiau. These *heiau* were resurveyed by Bennett (1931) several decades later, at which time he also recorded SIHP Site 00103, which comprises the dune burials along the coast at Wailua (see Figure 11). Both Malae and Hikinaakalā Heiau are properties included in the Wailua Complex of Heiau National Historic Landmark, which was designated in 1962, and they are included in the Wailua Heiau Complex listed on the Hawaii State Register of Historic Places as SIHP Site 50-30-08-00502 (see Figure 11). Also included in the NHL are petroglyphs located on the riverbank adjacent to Hikinaakalā Heiau.

### Hikinaakalā Heiau, Hauʻola, and Pae-kiʻi-māhū-o-Wailua Petroglyphs

In the last fifty years numerous studies have been conducted at Hikinaakalā Heiau, Hauʻola, and Pae-kiʻi-māhū-o-Wailua petroglyphs. Dr. William Kikuchi (1974; 1984) conducted studies at these sites, followed by Martha Yent of the State Parks (Yent 1987; 1989; 1991c; 1997c;

2000). Kikuchi produced site maps (1974) and a detailed study of the petroglyphs (1984). In 1987, Yent (1987) monitored the demolition of an old comfort station and soil borings for a new comfort station adjacent to the *heiau* site; no subsurface deposits were encountered. Subsequently, Yent (1989) conducted mapping and testing at Hikinaakalā Heiau and Hau'ola (SIHP Site 00105), which revealed a historic and earlier period of occupation for the site. It was undetermined if the earlier period was associated with the *heiau* construction.

In 1991, the Wailua petroglyph boulders were damaged during bulldozing at the mouth of Wailua River. An assessment report was prepared by Yent (1991c). Another damage assessment was prepared the following year due to Hurricane Iniki, which covered all State Parks on Kaua'i (Yent 1992). This report also included results of monitoring the cleanup at the sites, which mainly involved removal of fallen trees at Hikinaakalā Heiau and Hau'ola. No cleanup was recommended for Malae Heiau or for the Wailua Petroglyphs.

In the late 1990s, a vegetation removal and landscaping plan was prepared by Yent (1997c) for Hikinaakalā Heiau. This was followed with a report on the vegetation removal and the installation of interpretive signage (Yent 2000).

### **Malae (Malaeha'akoa) Heiau**

After a 1990 sugarcane harvest adjacent to SIHP Site 00104, Malae Heiau (Malaeha'akoa Heiau), an artifact scatter was exposed (Yent 1991b:22). A surface collection was carried out, which yielded adze preforms, flakes, and cores around the exterior of the *heiau* wall. This artifact scatter was designated SIHP Site 00104A. Kikuchi (1987) had also conducted a study of adze fragments from the *heiau* area, which Drennan (2008:22) reports were recovered after a sugarcane harvest in 1973. Yent later conducted planning and monitoring for vegetation removal and landscaping (Yent 1997b), which was followed with a report on the removal of a banyan tree at the site (Yent 1997a). Yent also conducted archaeological inventory survey at the *heiau* (Yent 2005a) and prepared a preservation and archaeological monitoring plan (2005b). Additional work concerning this site included historical and cultural research reported by Flores (1995).

### **Wailua Municipal Golf Course and Kaua'i Community Correctional Center**

The golf course was created in 1920 by Charlie Fern, Jim Corstorphine, James Spalding, and Dan Arcia following their survey of a Lihue Plantation Dairy pasture as a possible golf course. They created a 3-hole golf course (today the 10th, 11th, and 12th fairways). In 1930, Francis H. 'Ii Brown expanded the course to nine holes. In 1962, Toyo Shirai reshaped the original 9-hole course and added 9 new holes for a full 18-hole course (Garden Island, July 14, 2013).

Bennet (1931) first recorded SIHP Site 00103, which comprises the pre-and post-Contact period burials at the coastal sand dunes south of Wailua River (see Figure 11). This area is now primarily the site of Wailua Municipal Golf Course and Lydgate Park. To date, approximately 100 human burials dating to the pre-Contact and historic periods have been encountered (Bushnell et al. 2004:63). According to local informants, "hundreds" of *iwī* (bones) were uncovered in the 1960s when the central driving range was constructed (Erkelens and Welch 1993:3).

In the 1970s, a burial recovery project was undertaken, which recorded 13 human burials and disarticulated skeletal remains at the golf course (Cox 1977). The project was conducted in connection with the Hood Corporation's force main and effluent holding pond construction activities in the golf course. All human remains were reinterred at their original find locations; however, in one instance the original location of fragmented human skeletal remains was unknown, and the remains were reinterred in the project corridor. The burial locations were recorded using construction excavation pins to facilitate relocation by survey; 4<sup>7</sup>/20 penny spikes

were also included during reburial to assisted in relocation using a metal detector. The following 13 burial location descriptions are from the Cox (1977) report (see Figure 12):

**Burial 1:** A single adult. Top of cranium was 51 cm. (20.08 in.) below the existing surface and 110 cm; (43.31 in.) to the north or right of the 10 in. pipe centerline, at pin 43+34, Cluster A . . . in clean sand. . . The burial was photographed, recorded, limited measurements were taken, then reburied with *ti* leaves and a *pule* at the same location, depth and position on 24 May 1977.

**Burial 2:** Partial-cranium and mandible only. The remains were recovered from the trenching spoils pile and exact spatial location is uncertain. . . The backhoe bucket load that the find came out of was from about 150 cm. (59.06 in.) depth, and on the 10" pipe centerline, at pin 40+30, Cluster A. The sketches, photos and some measurements were made, then the remains were reburied on 25 May 1977, a day after they were found. The reburial was at the same pin location, but 160 cm (62.99 in.) north of the centerline and at 60 cm (23.62 in.) depth. The reburial included *ti*, and identifying label on pink flagging tape in a small round, flat plastic container placed a few centimeters above the remains, and a 20 penny spike just above that.

**Burial 3:** Partial. The remains were recovered at pin 43+20 to 24, Cluster A. The cranium was at the latter from a bucket load approximately 2 m. (6.96 ft ) depth and on centerline. The remains were recorded and measurements were taken with metric tape and sliding calipers. On 27 May 1977, the collected remains were reburied 1 m. (3.28 ft.) south of the pipe centerline at pin 43+24, 120 cm. (47.24 in.) below existing surface. The burial included *ti*, a label on flagging tape in a plastic container and a 20 penny spike.

**Burial 4:** A single young adult. The majority of the remains were collected at a depth of about 160 cm. (62.99 in.) below existing grade at pin 43+15, Cluster A, on centerline of the 10" line. The remains were recorded, and photographed. The cranium sketched and the lot measured, and then reburied on 27 May 1977. The reburial was about 110 cm. (43.31 in.) south and east of the pipe alignment at pin 43+15, at a depth of 120 cm. (47.24 in.). This reburial included *ti*, a label and a 20 penny spike.

**Burial 5:** Fragments of cranium. Found on the surface at pin 37+65, 27 May 1977. The find was collected, recorded and sketched, then reburied on 21 June 1977, at pin 37+65.

**Burial 6:** Fragment of a tibia. Found at pin 32+00, of unknown depth. The fragment was recorded, sketched and later reburied on 21 June 1977, at pin 32+00.

**Burial 6a:** An adult, probably complete. This burial was not actually within the contract area, but as portions of the remains were recovered on-site as result of construction activities, it is included here.

The scattered remains were found a ft er backfill and grading operations around the effluent holding pond. Sand that had been stored just inland of the shore dune was befog utilized for final grade fill. This This burial was located just below the surface. It had been uncovered and then run over by the loading equipment just below this stockpile. The County had used this area as a sand quarry at various times in the past . . . The County grounds manager recalled a burial had been found some years ago in this general location. As that find was uncovered in a dune, and reburied there during filling up a series of low spots, the present find is probably not the same individual. Location: Approximately 152.40 m. (500 ft) northeast of the northeast end of the holding pond in low area just inland of beach dune. The fragments were collected and returned to the original location, photographed and reburied on 21 June 1977, at the *makai* dune site.

**Burial 7:** A segment of a calotte. The find consisted of two skull cap fragments. These were probably from the same individual as they were found together at the bottom of the trench during excavation. The larger piece was the lower segment (perhaps 1/4 to 1/3) of a right parietal, and shows some suturing. Location: Recovered at a depth of 150 cm. (59.06 in.) below existing grade, on the 12" pipe centerline at pin 0+81, Cluster B, on 15 July 1977. The remains were collected, recorded, sketched and then reburied at the same location on 17 July 1977. The reburial at depth of 1 m. (3.28 ft.) included *ti*, a label in small plastic container and a 20 penny spike.

**Burial 8:** Partial single individual. The scattered remains of a single adult or perhaps young adult, were collected over a period of three days starting on 15 June 1977. The majority of the fractured remains came out of the spoils pile, the remainder at about 150 cm. (59.06 in.) depth ... Location: On or slightly to right of centerline of the 12" pipeline, at a depth of 150 cm. (59.06 in.) [pipe laid at 3 m. (9.84 ft.) here] below grade, at pin 1+50, Cluster B . . . The remains were reburied with *ti*, a label, and 20 penny spike on 20 June 1977, at the same location and at a depth of 120 cm. (47.24 in.).

**Burial 9:** Cranium only. This excellently preserved cranium was found at the bottom of the trench when the construction crew was clearing away a cave in on 15 June 1977. Location: Found at depth of 320 cm. (125.98 in.), but after sand slump from right or north of centerline at pin 1+67, Cluster B, on the 12" pipeline where the north trench wall had been 130 cm. (51.18 in.) to the right of the centerline before the cave in, it was 210 cm. (82.68 in.) after. Actual depth of burial was indeterminate. The sample was recorded, sketched, measured and photographed, then reburied on 20 June 1977. The reburial in the same location at 120 cm. (47.24 in.) depth included *ti*, a label, and a .20 penny spike.

**Burial 16:** An adult, possibly complete. This very well-preserved burial was located in situ in the left, or south wall of the trench. Location: In situ in south wall of 12" pipe trench at pin 1+92, Cluster B, 245 cm. (96.46 in.) left of centerline, and 170 cm. (66.93 in.) below existing (but probably artificial) grade. The skull was removed for recording and measurement. The remainder of the find was left in situ. After backfilling the pipe, the cranium and mandible were reburied at 90 cm. (35.43 in.) depth just above the original location. The burial was completed with *ti*, a label and .20 penny spike.

**Burial 11:** A nearly complete adult. This individual was found with the cranium slightly out-of-place nearest the centerline due to construction activities. Location: Found on 16 July 1977, at pin 2+96, Cluster B, on the 12" pipeline, 135 cm. (53.15 in.) to the right, or north of centerline and 120 cm. (47.24 in.) below existing grade. The remains were collected, recorded, measured and then reburied on 21 June 1977, at the same location and 100 cm. (39.37 in.) below grade (may not be finish grade after landscaping). The reburial was completed with *ti*, a tape label in a small plastic container, and above that a 20 penny spike.

**Burial 12:** Partial. This find consisted of two small fragments of a cranium located on the surface at the southeast edge of the holding pond. They were found by the construction crew after grade levelling for landscaping. Location: Unknown. The remains were recorded and sketched, then reburied 49.20 m. (15 ft.) west of the pond outlet box, 150 cm. (59.06 in.) to north and approximately 100 cm. (39.37 in.) above the 12" pipeline. The final depth below grade is unknown as backfill had not been completed when consultation terminated. The reburial included *ti*, tape label and 20 penny spike.

In the early 1990s, subsurface testing and inventory survey was carried out for the Kaua'i Community Correctional Center and Wailua Municipal Golf Course Sewage Force Main Project (Beardsley 1994). One burial, SIHP Site 09357, now considered to be SIHP Site 00103, was recorded on the west side of the highway at the Kaua'i Community Correctional Center, across



from the Wailua Municipal Golf Course. These burials were reinterred at the original burial locations.

During monitoring for fiber optic cable installation across the golf course, just south of the Kaua'i Community Correctional Center, the remains of eight individuals were documented in a disturbed or secondary deposit (Folk and Hammatt 1995). These burials were disinterred and stored by the SHPD on Kaua'i.

Further north on the golf course, 44 human burials and 42 instances of disarticulated human skeletal remains were recorded during monitoring of irrigation renovation (Fager and Spear 2000). Additional features identified included a subsurface cultural layer with traditional artifacts and three fire pit features. One of the fire pit features yielded the date range of AD 1440 to 1670. The human burials were reinterred at the Wailua Golf Course Reinterment Facility.

### **Lydgate Park**

Archaeological investigations within today's Lydgate Park boundary have yielded finds consistent with other studies at the sand dunes south of Wailua River. Yent (1991a) conducted archaeological testing for the Kūhiō Highway Contraflow Project. The testing was located at the mouth of Wailua River and encountered a possible pre-Contact cultural deposit. During monitoring for the Lydgate Park bike and pedestrian path, three human burials and two instances of isolated human skeletal remains were documented (Morawski and Dega 2003). The finds were assigned to SIHP Site 00103. All human remains were reinterred at the Wailua Golf Course Reinterment Facility. A pre-Contact cultural layer was also encountered, which was designated SIHP Site 00356 (see Figure 11).

### **Wailua Residential Subdivision**

In the late 2000s, Scientific Consultant Services, Inc. conducted an inventory survey of a 240-acre area west of Kūhiō Highway for a residential development project (Drennan 2008). The survey identified three new archaeological sites comprising of nine features. Two of the sites are within 500 meters of the current project area. SIHP Site 05012, Feature 5 is a Plantation Era ditch, and SIHP Site 05013 is a pre-Contact lithic scatter comprising four loci, two of which are near the current project area. Additionally, a historic rock wall was identified through archival research, which was later located and identified as an earthen berm along Kūhiō Highway; no SIHP site number was assigned.

## **HISTORICAL PROPERTIES LOCATED NEAR THE PROJECT AREA**

This section presents summary descriptions of the known sites in the vicinity of the project area, all of which were mentioned in the above section. Portions of Project Area B are within the boundary of SIHP Site 00103. The locations of the sites are shown on the previously referenced Figure 11. Sites were previously assessed for significance following the criterion listed below for the HRHP and the corresponding NRHP Criterion A through D:

- **Criterion a:** Applies to properties associated with events that have made a significant contribution to the broad patterns of history.
- **Criterion b:** applies to properties associated with the lives of persons important in our past.
- **Criterion c:** applies to properties that embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value.

- **Criterion d:** applies to properties that have yielded or have the potential to yield information important to our understanding of the past
- **Criterion e:** applies to properties that have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property, or due to associations with traditional beliefs, events or oral accounts.

#### **SIHP Site 50-30-08-00103 and SIHP Site 00356**

SIHP Site 00103 encompasses approximately 100 human burials encountered within the sand dunes of coastal Wailua, south of the Wailua River (see Figure 11). This area is traditionally known as Walio (or Alio) (Bushnell et al. 2004:57, 100). The following instances of burial discovery have been documented within SIHP Site 00103: 13 human burials and disarticulated human skeletal remains encountered in the 1970s at Wailua Municipal Golf Course, also designated SIHP Sites 00542 to 00546 and 00819 (Cox 1977); one burial encountered at Wailua Municipal Golf Course in the early 1990s, also designated SIHP Site 09357 (Beardsley 1994); remains of eight individuals from a disturbed or secondary deposit at Wailua Municipal Golf Course, also designated SIHP Site 01980; 44 human burials and 42 instances of disarticulated human skeletal remains encountered at Wailua Gold Course (Fager and Spear 2000); and two human burials and two instances of isolated human skeletal remains encountered at Lydgate Park (Morawski and Dega 2003). These burials date to the pre-Contact and early Historic Period. However, it has also been mentioned by Stanley B. Porteus (1962) that some of the burials may not be Hawaiian. He states that “about 2,000 Polynesians, mostly Gilbert Islanders” immigrated to the island for work in the late nineteenth century (Kuykendall 1967:127). “Those that did not die returned home—the rest were buried in the sand dunes alongside what is now the golf course near Kapaa, Kauai [Wailua Municipal Golf Course]” (Porteus 1962:159). SIHP Site 00103 was assessed as significant for information potential (Criterion d of the State and Criterion D National Register of Historic Places) and cultural value (Criterion e of the State Register of Historic Places).

Also documented within SIHP Site 00103 is SIHP Site 00356 (see Figure 11). This site is a subsurface cultural layer (with traditional artifacts) and three fire pit features. One of the fire pit features yielded a date range of AD 1440 to 1670 (Fager and Spear 2000). SIHP Site 00356 was assessed as significant for information potential (Criterion d of the State and Criterion D National Register of Historic Places).

#### **SIHP Site 50-30-08-00104**

SIHP Site 00104, Malae Heiau, or Malaeha’akoa Heiau, is situated on the west side of Kūhiō Highway and just south of the Wailua River (see Figure 11). It is said to have been built by Menehune and partially torn down by Queen Debora Kapule around 1830 (Dickey 1917:25). Kapule, having converted to Christianity, demolished the interior for use as a cattle pen (Dickey 1917:25). Thrum (1906b) offers the following description of the *heiau*:

The largest now of Kauai’s list, is the heiau of Malae, in central Wailua, measuring 273 x 324 feet, with buttressed corners extending 13 feet, the only one of the kind known on the islands. Its high and substantial walls are in good condition, but its inner divisions and temple features were torn down by Deborah Kapule, the deserted Queen of Kaumualii, somewhere about 1830. A ledge about two feet high and some six feet wide is said to have extended all around its four walls (similar to the feature noted in Oahu’s largest temple), described as the seating place of the people during ceremonies. The companion heiau of Malae was Poliahu, situated some little distance from it, further inland, but in plain sight of each other. It is also a walled heiau; of medium size, and in fair condition [Thrum 1906b:66].

This site is part of the Waialua Complex of Heiau, a National Historic Landmark. It was assessed as significant under Criteria B through E.

#### **SIHP Site 50-30-08-00105 and SIHP 00504A**

SIHP Site 00105, Hikinaakalā Heiau and Hau'ola, and SIHP Site 00105A, the Pae-ki'i-māhū-o-Wailua Petroglyphs (SIHP Site 00105A), are situated on the south side of the mouth of the Wailua River (see Figure 11). SIHP Sites 00105 and 00105A are part of the Waialua Complex of Heiau, a National Historic Landmark. It was assessed as significant under Criteria B through E.

Hikinaakalā can be translated as “the sunrise” or “the rising of the sun” (Kikuchi 1974:4; Pukui et al. 1974:45). Hau'ola is believed to be the ancient place name for the beach area and is also the name of pu'uohonua (place of refuge) north of the heiau (Yent 1995:34). According to Yent (1995:17), the rectangular foundation of the walls appears to remain in the same condition as when mapped by Bennett in 1931, with the exception of the northeast corner. The following site descriptions are from Thrum (1906a) and Bennett (1931):

The ruins of this heiau stand along the shore near the south side of the stream, 395 feet long, 56 feet at rear and 80 feet on the front. It shows three distinct divisions, paved; the inner section still in fair condition 120 feet in depth. E end and S. E. corner walls are 6 feet high and 11 feet thick, of heavy stones. Two large boulders stand near the middle near the division wall of this section. The outer or front section of 80 feet includes a width that runs back beyond the division wall [Thrum 1906a:41].

Today much of the stone has been removed, reducing the walls to bare outlines, and obliterating the paving entirely. The outer section is also destroyed. The stones remaining show the construction of the walls to have been that of placing large stone slabs on edge in a double row, 8 feet wide, and filling in between with smaller stones. The division between the front and the middle sections is now marked by a rough row of stone that extends 50 feet or more west of the line of the old wall. This is probably later work, an assumption substantiated by the finding of a stone, the surface of which was used for adz grinding as part of this wall though in a position impossible for use. The Kauai Historical Society has called this a place of refuge “Hauola” as well as a heiau [Bennett 1931:125–126].

The petroglyphs (SIHP Site 00105A) appear on a cluster of boulders situated at the mouth of Wailua River, and are often obscured by sand (see Figure 13). Yent (1995:17) reports that the boulders have been mapped on three occasions: by Banks and Bishop Museum in 1949 (no report published), Kikuchi in 1973 (Kikuchi 1974), and Yent in 1991 (Yent 1991c). In 1973, Kikuchi recorded 35 petroglyphs, including human forms (stick figures and profile, outline forms), ovals, linear patterns, and spiral. Grinding surfaces, likely from polishing adzes, are also present, and some of the overlay the petroglyphs indicating that some of the ground surfaces post-date the rock art. Bulldozing has occurred at the mouth of the river since the 1940s, which has caused damage to the site (Yent 1995:17), and many petroglyphs recorded by Kikuchi in 1973 could not be relocated in 1991 (see Yent 1991c).

#### **SIHP Site 50-30-08-00502**

Wailua Heiau Complex is listed on the Hawaii State Register of Historic Places and the National Register of Historic Places. It was designated a National Historic Landmark (NHL) in 1962. The NHL comprises four *heiau*—Malae (Malaeha'akoa; SIHP Site 00104), Poli'ahu (SIHP Site 00107), Holoholoku (Kalaeokamanu; SIHP Site 00106), and Hikina'akalā (SIHP Site 00105)—as well as Pohaku Ho'ohānau (Birthstones; SIHP Site 00106), the Bell Stone Site (SIHP

Site 00335), Hua'ola (SIHP Site 00105), and Pae-ki'i-māhū-o-Wailua Petroglyphs (SIHP Site 00104A). The Wailua NHL is significant under National Register Criteria A, B, C and D for its size, quality, setting, historic association and information potential (Dunbar 1988).

#### **SIHP Site 50-30-08-05012, Feature 5**

SIHP Site 05012 is a historic agricultural water transportation system comprising five features and three sub-features. These features represent a sample of the approximately 100 features the site is believed to comprise. Only Feature 5 is near the current project area (see Figure 13), which was described as follows:

Feature 5 was a ditch that descends in elevation from 226 to 81 ft. amsl and is 1280 m in length; it is 3.0 m wide (see Figure 6) (Figure 15). The ditch was curvilinear and was oriented northwest-southeast (136°/316°). The feature was U-shaped and was excavated along the base contour of the northeast side of Kālepa Ridge [Drennan 2008:35].

SIHP Site 05012 was assessed as significant for information yielded (Criterion d of the State and Criterion D National Register of Historic Places); no further work was recommended.

#### **SIHP Site 50-30-08-05013**

SIHP Site 05013 consists of a pre-Contact surface lithic scatter with four loci and one outlier. Locus A and Locus B are near the current project area (see Figure 13). At Locus A, 111 artifacts were recorded, which covered a 313 m long by 242 m wide area on level terrain, beginning roughly 48 m west of Malae Heiau (SIHP Site 00104). It may be associated with Malae Heiau (SIHP Site 00104/00104A) and the Wailua Heiau Complex (SIHP Site 00502). Locus B was documented 249 m south of Malae Heiau and measured 200 m in an east-west direction. SIHP Site 05013 was assessed as significant for information potential (Criterion d of the State and Criterion D National Register of Historic Places); data recovery was recommended.

#### **Wailua WWTP**

The Wailua WWTP was originally constructed in 1964 and was designed by Sunn, Low, Tom & Hara, Inc. Consulting Engineers. The original 1964 WWTP site plan is presented in Figure 13. The original site plan identifies five structures that are still present at the site. These structures include the rapid bloc basins, sludge drying beds, abandoned chlorine contact basin, control building, and boundary wall. One additional structure, the breakroom building, does not appear on the original 1964 site plan, but it does appear as existing on the subsequent 1976 WWTP expansion plans. For the purposes of this analysis, it is assumed that the breakroom building was also constructed circa 1964. Therefore, there are six structures at the WWTP site that are greater than 50 years old. These structures are described in Table 2.

Since its original construction in 1964, the WWTP has undergone multiple phases of expansion and construction to meet increased demand for wastewater treatment and to comply with permitting requirements. The WWTP expansions have introduced a range of new structures and equipment at the WWTP site. An aerial image of the current WWTP site is shown in Figure 14 with the original structures called out. The original 1964 structures at the WWTP are utilitarian in nature and the multiple phases of expansion and modifications at the WWTP have altered the original site design. Therefore, the original structures fail to meet the criteria for significance and integrity that would make them eligible for the National Register of Historic Places.

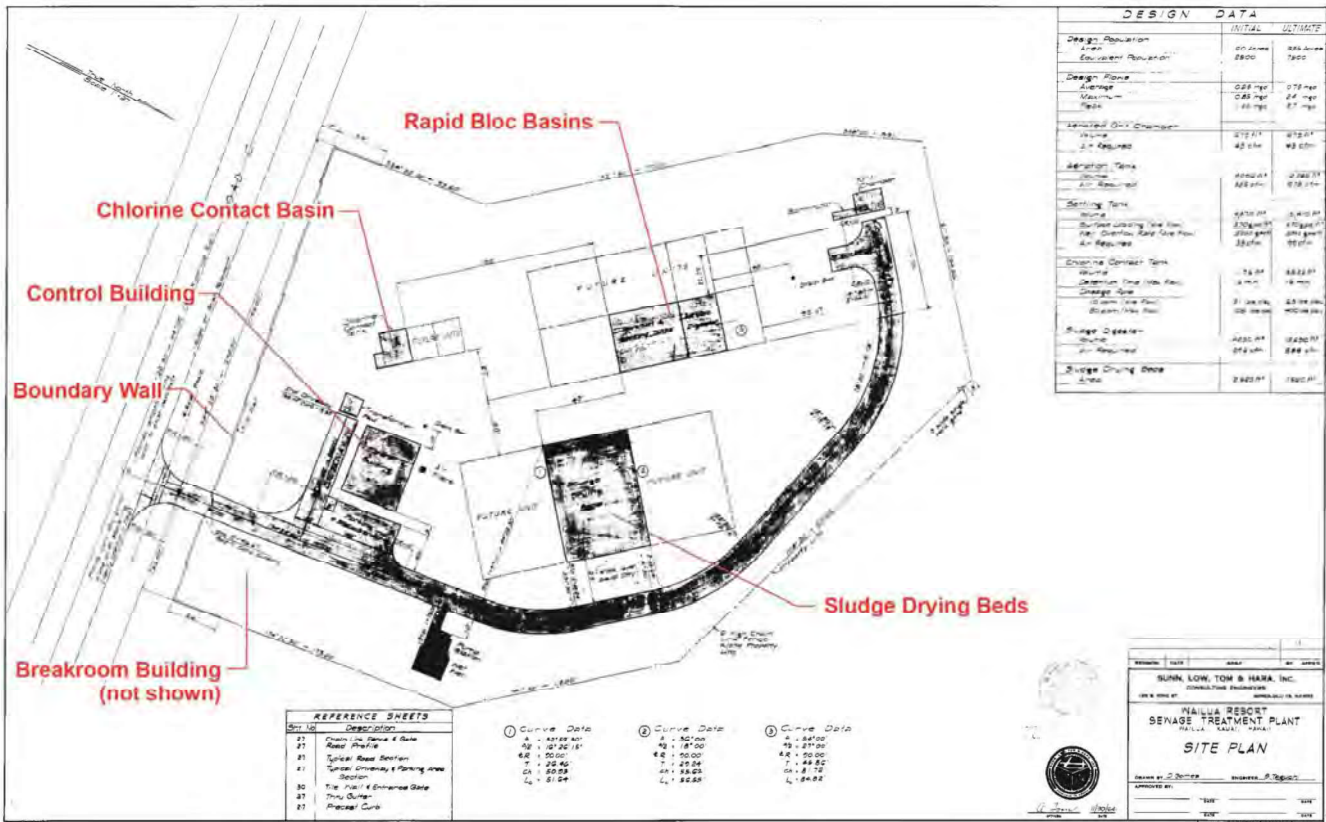



Figure 13. Wailua Wastewater Treatment Plant Site Plan, 1964.




Figure 14. Wailua Wastewater Treatment Plant, Current Site Layout.

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**


| Name<br>Date Constructed<br>Designer   | Description and Function  | Status and Impact<br>of Proposed<br>Action  | Photo   |
|--|---|---|---|
| <p>Rapid Bloc Basins</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers</p> | <p>The Rapid Bloc Basin (AKA: Aeration &amp; Settling Tanks and Aerobic Digester) is a series of open concrete tanks of rectangular form and relatively uniform size. The first two tanks are the aeration and settling tanks and measure 30'-4"x17'-6". The third tank is the aerobic digester and its dimensions are 29'-4"x18'-6". The tanks are partially subgrade and partially above grade. Three catwalks with 1 ½" galvanized steel pipe railing and stanchions traverse the top of the tanks. Two metal pipes run along the outer two catwalks. The Rapid Bloc Basins provided aeration of the wastewater to stabilize and further treat it.</p> | <p>Decommissioned (date unknown); Structure is not currently operable but will remain in place.</p> |  |

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**


| Name<br>Date Constructed<br>Designer  | Description and Function   | Status and Impact<br>of Proposed<br>Action            | Photo   |
|---|--|---|---|
| <p>Sludge Drying Beds</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers</p> | <p>The Sludge Drying Beds are a series of three open concrete beds. The three parallel beds are approximately 60' long and 44'-8" wide, each bed about 14' wide separated by low interior walls. Beds are built partially subgrade with 2' walls extending above grade. The head of the structure is connected to the Aerobic Digester via a 6" sludge line. The beds are slightly sloping with a perforated metal drain pipe running down the middle of each bed and a redwood stop gate at the foot of each bed. A 9" layer of sand covers the surface of the sludge beds. Biosolids (sludge) are applied onto the surface of the sand to dry prior to disposal at the landfill.</p> | <p>Still in use;<br/>Structure to remain in place</p> |  |




**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function  | Status and Impact<br>of Proposed<br>Action   | Photo   |
|---|---|--|---|
| <p>Abandoned Chlorine Contact Basin</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers</p> | <p>The Chlorine Contact Basin (aka Chlorine Contact Tank) is a grouping of three open, reinforced concrete tanks of different sizes. The form of the basin is generally rectangular with dimensions of approximately 19'-2" x 18'. The tanks are about 8'-4" deep with a portion of the tank extending above grade and the majority below grade. A flow box is situated on the opposite end of the opening. A short staircase and a metal handrail allow for overhead visual monitoring of the basin. The Chlorine Contact Basin is used to provide contact time for effluent disinfection prior to disposal.</p> | <p>Decommissioned (1976). Replaced with new chlorine contact basin in a different location. Proposed demolition of 1964 basin to make way for Rotary Drum Thickener and new access road.</p> |  |


**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function   | Status and Impact<br>of Proposed<br>Action            | Photo   |
|---|--|---|---|
| <p>Breakroom Building</p> <p>Between 1964 and 1974</p> <p>No data on designer</p> | <p>The Breakroom Building is a single-story masonry structure with a flat roof and rectangular form. The dimensions of the structure are 42'x18'. The roof has an approximately 3' overhang on all sides. A large white frieze board with no decorative elements extends along the length of the exterior. Building corners have an alternating brick length pattern resembling quoining. There are four small fenestrations on the west façade with jalousie windows. The building interior contains a lunchroom, restroom, showers, and lockers for employees.</p> | <p>Still in use;<br/>Structure to remain in place</p> |  |

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function  | Status and Impact<br>of Proposed<br>Action            | Photo   |
|---|---|---|---|
| <p>Control Building</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers &amp;</p> <p>Bradley &amp; Wong, Architects</p> | <p>The Control Building is a single-story masonry building with a rectangular layout. It has concrete block walls and a flat roof with a slightly raised central ridgeline and overhang. Overall dimensions are approximately 37' x 30'. The north side of the building has six narrow windows and follows a general pattern alternating between 4' wall sections with 2' wide windows. The remaining façades do not show a strict pattern. The interior of the building comprises space for the following rooms: blower room, chlorinator room, yard equipment storage, storage, toilet, and laboratory and office.</p> <p>The Control Building contains the computer SCADA controls and motor controls that operate the wastewater treatment plant.</p> | <p>Still in use;<br/>Structure to remain in place</p> |  |

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer   | Description and Function   | Status and Impact<br>of Proposed<br>Action   | Photo   |
|--|--|--|---|
| Boundary Wall<br><br>1964<br><br>Sunn, Low, Tom &<br>Hara, Inc., Engineers<br>&<br>Bradley & Wong,<br>Architects | The boundary wall (aka concrete block fence) is a 6' high wall and extends approximately 245' along the south side of the property, parallel to Nalu Road. The wall wraps around the western boundary of the plant extending an additional 25'. It is constructed of concrete block with a cap tile and is organized as a series of sections or bays. Each bay steps down with the sloping terrain and is recessed in a stair step pattern. The boundary wall is painted white and functions as a buffer for the utility and to control access | Still in use;<br>Proposed demolition and replacement with new wall to expand WWTP access footprint |  |

## **ANTICIPATED HISTORIC PROPERTIES IN THE PROJECT AREA**

Several archaeological sites were previously identified at or near the project area. Malae Heiau (SIHP Site 00104) and Hikinaakalā Heiau (SIHP Site 00105), part of the Wailua Complex of Heiaus NHL, are located over 1,000 feet north of Project Area A, and would not be affected by the proposed action.

SIHP Site 05012, a historic period ditch associated with Lihue Plantation, is located approximately 630 feet west of Project Area A and approximately 370 feet west of Project Area B and would not be affected by the proposed action (see Figure 11).

At the Wailua Municipal Golf Course, Project Area B is within or partially within the boundaries of SIHP Site 00103, which comprises at least 100 human burials documented within the coastal sand dunes south of the Wailua River.

## **SUMMARY AND ASSESSMENT**

The proposed project areas include two project areas. At Project Area A, the Wailua WWTP, ground-disturbing activities include construction of a new access road, a new headworks, and construction of a new Rotary Drum Thickener Platform. Project Area B involves the rehabilitation of the 10-inch force main connecting the Wailua WWTP to the Wailua Municipal Golf Course irrigation holding pond. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining, which will limit the amount of excavation required.

Work conducted for this review and assessment included archival map and document research and a review of previous archaeological investigations conducted near the four project area locales. All work was carried out in accordance with Hawaii Revised Statutes (HRS) Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division Rules), Chapter 275 (*Rules Governing Procedures for Historic Preservation Review for Governmental Projects Covered Under Sections 6E-7 and 6E-8, HRS*). Background research indicates that Project Area A was formerly adjacent to, and likely at least partially within, a former sugarcane field of the Lihue Planation (see Figure 7). Prior to the sugar production era, two LCAs were present to the north of Project Area A, south of the Wailua River. Records indicate these LCAs consisted of house lots. Project Area B is situated on the coastal sand dune, which is the location of SIHP Site 00103, a traditional Hawaiian burial area.

Of the two project areas, only Project Area A includes existing structures that are greater than 50 years old and could be considered historic. Project Area A encompasses the WWTP and involves a range of improvements to maintain and upgrade existing plant processes. There are six structures located at the WWTP that are greater than 50 years old. Four of these structures (the rapid bloc basins, the sludge drying beds, the breakroom building, and the control building) would remain in place, and would not be affected by the proposed improvements. Two of these structures (the abandoned chlorine contact basin and the boundary wall) would be demolished to make room for the proposed improvements. However, neither of these structures is eligible for listing on the NRHP. Therefore, no effects to historic structures are expected at the WWTP.

Of the two project area locales, archaeological sites, including human burials, are more likely to be encountered at Project Area B where coral dune sands are present. Based on underlying soils (see Figure 5) and the land use history gleaned from a historical map of Lihue Planation (see Figure 7), there is low potential for encountering historic properties at Project Area A; nonetheless, the lack of archaeological research directly associated with the WWTP indicates that the subsurface cultural context is unknown. The rehabilitation of the existing recycled water force main (Project Area B) would be conducted in coral dune sands. Therefore, it would have the potential to impact subsurface archaeological sites.

The recommended effect determination for Project Areas A and B is, therefore, “effect with proposed mitigation commitments.” The recommended mitigation for work in Project Area B (which is within SIHP Site 00103) is archaeological monitoring, while the recommended commitment for Project Area A is archaeological monitoring for identification purposes; both efforts to be guided by an SHPD-approved Archaeological Monitoring Plan (AMP). The AMP will establish protocols for the recording and mitigation of subsurface cultural deposits in accordance with HAR §13-279-4. Should *iwi kupuna* be inadvertently discovered during ground disturbing activities, all work in the immediate vicinity of the find will immediately cease and the protocols established in HAR §13-300-40 will be implemented.

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## Attachment C: NHO Distribution List

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| Suzanne Case     | State Historic Preservation Officer and Chairperson, Department of Land and Natural Resources      | <a href="mailto:dlnr.intake.shpd@hawaii.gov">dlnr.intake.shpd@hawaii.gov</a><br>Kakuhihewa Building<br>601 Kamokila Blvd., Suite 555<br>Kapolei, HI 96707<br>Ph: (808) 692-8015<br>Fax: (808) 692-8020 |
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| Annelle Amaral   | President, Association of Hawaiian Civic Clubs   | PO Box 1135<br>Honolulu, HI 96807<br><a href="mailto:AHCC.Nuhou@gmail.com">AHCC.Nuhou@gmail.com</a>  |
| Aubrey Summers   | Chair, Kaua'i Historic Preservation Commission, County of Kaua'i                                   | 4444 Rice Street, Suite A473<br>Līhu'e, Kaua'i 96766   |
| Blossom Feiteira | President, Association of Hawaiians for Homestead Lands  | 2149 Lauwiliwili St., Ste. 200<br>Kapolei, HI 96707<br><a href="mailto:info@ahhl.org">info@ahhl.org</a>  |
| Curt Cottrell    | Administrator, Division of State Parks, Department of Land and Natural Resources                   | Department of Land and Natural Resources<br>Division of State Parks<br>P.O. Box 621<br>Honolulu, HI 96809<br><a href="mailto:dlnr@hawaii.gov">dlnr@hawaii.gov</a>                                      |
| Dan Ahuna        | OHA, Kaua'i Island Rep   | PO Box 1355<br>Kapa'a, HI 96746<br><a href="mailto:dana@oha.org">dana@oha.org</a>  |
| Dennis Ragsdale  | Advocate General, Order of Kamehameha I  | 1777 Ala Moana Blvd., #142-102<br>Honolulu, HI 96815<br><a href="mailto:order@kamehameha-1.org">order@kamehameha-1.org</a>   |

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| Donna Kaliko Santos  | Nā Kuleana o Kānaka 'Ōiwi   | PO Box 1541<br>Līhu'e, HI 96766<br><a href="mailto:kaliko08@outlook.com">kaliko08@outlook.com</a>   |
| Randy Wichman        | Acting Director, Kaua'i Historical Society                        | 4396 Rice St. #101<br>Līhu'e, HI 96766<br><a href="mailto:info@kauaihistoricalsociety.org">info@kauaihistoricalsociety.org</a>                              |
| Sylvia Hussey, Ed.D  | Ka Pouhana/Chief Executive Officer, Office of Hawaiian Affairs    | 560 N. Nimitz Hwy., Suite 200<br>Honolulu, HI 96817<br><a href="mailto:sylviah@oha.org">sylviah@oha.org</a>   |
| Keith Yap            | Chair, Kaua'i/Niihau Island Burial Council                        | PO Box 156<br>Kaunakakai, HI 96747  |
| Kiersten Faulkner    | Executive Director, Historic Hawai'i Foundation                   | 680 Iwilei Road Dole Office Building Tower, Suite 690<br>Honolulu, HI 96817<br><a href="mailto:Kiersten@historichawaii.org">Kiersten@historichawaii.org</a> |
| Kippen de Alba Chu   | Executive Director, Friends of 'Iolani Palace                     | PO Box 2259<br>Honolulu, HI 96804<br><a href="mailto:info@iolanipalace.org">info@iolanipalace.org</a>   |
| La'akea Sukanuma     | President, The Mary Kawena Pūku'i Cultural Preservation Society   | 835 Ahuwale Street<br>Honolulu, HI 96821<br><a href="mailto:marykawenapukui@gmail.com">marykawenapukui@gmail.com</a>  |
| Liberta Hussey Albao | President, Queen Debra Kapule Hawaiian Civic Club                 | <a href="mailto:libertaha@hotmail.com">libertaha@hotmail.com</a>  |
| Troy Tanigawa        | Acting County Engineer, Public Works Department, County of Kaua'i | 4444 Rice Street, Suite 275<br>Līhu'e, HI 96766<br><a href="mailto:publicworks@kauai.gov">publicworks@kauai.gov</a>   |
| Mahealani Cypher     | Secretary, Ko'olau Foundation                                     | PO Box 4749<br>Kaneohe, HI 96744<br><a href="mailto:malamapono744@aol.com">malamapono744@aol.com</a>  |
| Mililani B. Trask    | Convenor, Na Koa Ikaika Ka Lahui Hawaii                           | PO Box 6377<br>Hilo, HI 96720<br><a href="mailto:mililani.trask@icllchawaii.com">mililani.trask@icllchawaii.com</a>   |

| Name               | Affiliation  | Contact Information   |
|--------------------|--|---|
| Napali Woode       | Senior Vice President,<br>Council for Native Hawaiian<br>Advancement | 2149 Lauwiliwili St., Ste. 200<br>Kapolei, HI 96707<br><a href="mailto:info@hawaiiancouncil.org">info@hawaiiancouncil.org</a> |
| Noa Mau-Espirito   | Na Mookupuna o Wailua  | 6200 Olohena Rd, Unit A<br>Kapaa, HI 96746<br><a href="mailto:nkeliiua@gmail.com">nkeliiua@gmail.com</a>                      |
| Noelani Josselin   | Cultural Practitioner  | <a href="mailto:noelanijosselin@yahoo.com">noelanijosselin@yahoo.com</a>  |
| Patrick T. Porter  | Director, Department of<br>Parks and Recreation,<br>County of Kaua'i | 444 Rice St.<br>Mo'ikeha Building, Suite 105<br>Līhu'e, HI 96766  |
| Rayne Regush       | Chair, Wailua-Kapa'a<br>Neighborhood Association                     | <a href="mailto:rayneregush@aol.com">rayneregush@aol.com</a>  |
| Sylvia M. Hussey   | Executive Director, Native<br>Hawaiian Education Council             | 735 Bishop Street, Suite 224<br>Honolulu, HI 96813<br><a href="mailto:nhec@nhec.org">nhec@nhec.org</a>                        |
| Taffi Wise         | Executive Director, Kanu o<br>ka 'Āina Learning 'Ohana<br>(KALO)     | PO Box 6511<br>Kamuela, HI 96743<br><a href="mailto:taffi@kalo.org">taffi@kalo.org</a>  |
| Billy Kaohelauli'i | Aha Moku Council Rep,<br>Kaua'i                                      | AMAC<br>2249 Kuai Road<br>Koloa, HI 96756<br>(808) 742-9575   |





APPENDIX D

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U.S. Army Corps of Engineers  
Nationwide Permit Documentation



22 July 2022

Albert Williams  
Honolulu District, U.S. Army Corps of Engineers  
Building 252  
Fort Shafter, Hawai'i, 96858-5440

Subject: Department of Army Nationwide Permit 3 Application and Supporting Documents  
Wailua WWTP Ocean Outfall Modifications  
Wailua, Kaua'i, Hawai'i  
Seaward of TMK (4) 3-9-006:001  
K/J 1867012\*00

Dear Albert Williams:

The County of Kaua'i Wastewater Management Division manages the Wailua Wastewater Treatment Plant (WWTP) and outfall on Kaua'i. Periodically, the outfall diffusers get covered with sand and they are unable to safely discharge treated wastewater, increasing the risk for a spill. Immediate and significant economic hardship to the County and public may occur if a spill occurs.

Kennedy Jenks is assisting the County of Kaua'i with the preparation of this permit package for modification to the existing ocean outfall. This application is a request for a permit to allow for the construction of risers to lift the existing outfall diffusers vertically.

We are please to submit the attached Department of Army Nationwide Permit 3 standard application and supporting documents for the proposed project. Pleas find enclosed the following documentation:

1. Department of the Army Nationwide Permit 3 Permit Application
2. Attachment 1 – Additional Information and Best Management Practices Plan (BMPP)
3. Attachment 2 – Drawings and Figures

We respectfully request that you consider our application for the Wailua WWP Ocean Outfall Modifications. Should you have any questions or comments, please contact Stephen Esaki at 808-218-6058 ([stephenesaki@kennedyjenks.com](mailto:stephenesaki@kennedyjenks.com))

Albert Williams  
Honolulu District, U.S. Army Corps of Engineers  
22 July 2022  
Page 2

Very truly yours,  
KENNEDY/JENKS CONSULTANTS

Stephen Esaki  
Associate Engineer

Enclosure

cc: Donn Kakuda, PE., County of Kaua'i  
John Hagihara, HHF Planners

U.S. Army Corps of Engineers (USACE)  
**NATIONWIDE PERMIT PRE-CONSTRUCTION NOTIFICATION (PCN)**

33 CFR 330. The proponent agency is CECW-CO-R.

**Form Approved -**  
**OMB No. 0710-0003**  
**Expires: 02-28-2022**

**DATA REQUIRED BY THE PRIVACY ACT OF 1974**

**Authority** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332.

**Principal Purpose** Information provided on this form will be used in evaluating the nationwide permit pre-construction notification.

**Routine Uses** This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of the agency coordination process.

**Disclosure** Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

The public reporting burden for this collection of information, 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at [whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil](mailto:whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PLEASE DO NOT RETURN YOUR RESPONSE TO THE ABOVE EMAIL.**

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (*see sample drawings and/or instructions*) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

**(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)**

|                    |                      |                  |                              |
|--------------------|----------------------|------------------|------------------------------|
| 1. APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED | 4. DATE APPLICATION COMPLETE |
|--------------------|----------------------|------------------|------------------------------|

**(ITEMS BELOW TO BE FILLED BY APPLICANT)**

|  |  |
|--|--|
| <p>5. APPLICANT'S NAME</p> <p>First - <b>Troy</b> Middle - Last - <b>Tanigawa</b></p> <p>Company - <b>County of Kaua'i, Department of Public Works</b></p> <p>Company Title - <b>Acting County Engineer</b></p> <p>E-mail Address - <b>TTanigawa@kauai.gov</b></p> | <p>8. AUTHORIZED AGENT'S NAME AND TITLE (<i>agent is not required</i>)</p> <p>First - <b>Stephen</b> Middle - Last - <b>Esaki</b></p> <p>Company - <b>Kennedy/Jenks Consultants, Inc.</b></p> <p>E-mail Address - <b>StephenEsaki@Kennedyjenks.com</b></p> |
| <p>6. APPLICANT'S ADDRESS:</p> <p>Address- <b>4444 Rice Street, Suite 500</b></p> <p>City - <b>Līhu'e</b> State - <b>HI</b> Zip - <b>96766</b> Country - <b>USA</b></p>  | <p>9. AGENT'S ADDRESS:</p> <p>Address- <b>707 Richards Street, Suite 528</b></p> <p>City - <b>Honolulu</b> State - <b>HI</b> Zip - <b>96813</b> Country - <b>USA</b></p>   |
| <p>7. APPLICANT'S PHONE NOS. with AREA CODE</p> <p>a. Residence      b. Business      c. Fax      d. Mobile</p> <p align="center"><b>(808) 241-4082</b></p>  | <p>10. AGENT'S PHONE NOS. with AREA CODE</p> <p>a. Residence      b. Business      c. Fax      d. Mobile</p> <p align="center"><b>(808) 218-6058</b></p>   |

**STATEMENT OF AUTHORIZATION**

11. I hereby authorize, Stephen Esaki to act in my behalf as my agent in the processing of this this nationwide permit pre-construction notification and to furnish, upon request, supplemental information in support of this nationwide permit pre-construction notification.

Troy Tanigawa  
Troy Tanigawa (Jul 19, 2022 11:19 HST)

SIGNATURE OF APPLICANT      DATE

**NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY**

12. PROJECT NAME or TITLE (*see instructions*)

**Wailua WWTP Alternative Effluent Disposal System Design**

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

13. NAME OF WATERBODY, IF KNOWN (if applicable)

Pacific Ocean

14. PROPOSED ACTIVITY STREET ADDRESS (if applicable)

4460 Nalu Road

15. LOCATION OF PROPOSED ACTIVITY (see instructions)

Latitude

°N

Longitude

°W

22.037

159.3342

City:

State: Zip:

Kapaa, HI, 96746

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID

Municipality

(4)-3-9-006:019

Section

Township

Range

17. DIRECTIONS TO THE SITE.

See Attachment 1.

18. IDENTIFY THE SPECIFIC NATIONWIDE PERMIT(S) YOU PROPOSE TO USE:

Nationwide Permit 3

19. DESCRIPTION OF PROPOSED NATIONWIDE PERMIT ACTIVITY (see instructions)

See Attachment 1.

20. DESCRIPTION OF PROPOSED MITIGATION MEASURES (see instructions)

See Attachment 1.

21. PURPOSE OF NATIONWIDE PERMIT ACTIVITY (Describe the reason or purpose of the project, see instructions)

See Attachment 1.

22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by Proposed Nationwide Permit Activity (see instructions)

Acres 0

Linear Feet 0

Cubic Yards Dredged or Discharged 0

**Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site.**

23. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project on any related activity (see instructions)

No other NWPs are anticipated for this project.

24. If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and requires pre-construction notification, explain how the compensatory mitigation requirement in paragraph (c) of general condition 23 will be satisfied, or explain why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required for the proposed activity.

Not applicable.

25. Is Any Portion of the Nationwide Permit Activity Already Complete?  Yes  No If Yes, describe the completed work:

26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. (see instructions)

See Attachment 1.

27. List any historic properties that have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic property or properties. (see instructions)

None.

28. For a proposed NWP activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, identify the Wild and Scenic River or the "study river":

Not applicable.

29. If the proposed NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, have you submitted a written request for section 408 permission from the Corps district having jurisdiction over that project?  Yes  No

If "yes", please provide the date your request was submitted to the Corps District: Not applicable.

30. If the terms of the NWP(s) you want to use require additional information to be included in the PCN, please include that information in this space or provide it on an additional sheet of paper marked Block 30. (see instructions)

See Attachment 1.

31. Pre-construction notification is hereby made for one or more nationwide permit(s) to authorize the work described in this notification. I certify that this information in this pre-construction notification is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Troy Tanigawa

Troy Tanigawa (Jul 19, 2022 11:19 HST)

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The Pre-Construction Notification must be signed by the person who desires to undertake the proposed activity (applicant) and, if the statement in block 11 has been filled out and signed, the authorized agent.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**Instructions for Preparing a  
Department of the Army  
Nationwide Permit (NWP) Pre-Construction Notification (PCN)**

**Blocks 1 through 4.** To be completed by the Corps of Engineers.

**Block 5. Applicant' Name.** Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the preconstruction notification, please attach a sheet of paper with the necessary information marked Block 5.

**Block 6. Address of Applicant.** Please provide the full address of the party or parties responsible for the PCN. If more space is needed, attach an extra sheet of paper marked Block 6.

**Block 7. Applicant Telephone Number(s).** Please provide the telephone number where you can usually be reached during normal business hours.

**Blocks 8 through 11.** To be completed, if you choose to have an agent.

**Block 8. Authorized Agent's Name and Title.** Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

**Blocks 9 and 10. Agent's Address and Telephone Number.** Please provide the complete mailing address of the agent, along with the telephone number where he / she can be reached during normal business hours.

**Block 11. Statement of Authorization.** To be completed by the applicant, if an agent is to be employed.

**Block 12. Proposed Nationwide Permit Activity Name or Title.** Please provide a name identifying the proposed NWP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

**Block 13. Name of Waterbody.** Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the NWP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

**Block 14. Proposed Activity Street Address.** If the proposed NWP activity is located at a site having a street address (not a box number), please enter it in Block 14.

**Block 15. Location of Proposed Activity.** Enter the latitude and longitude of where the proposed NWP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area requiring evaluation. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 15.

**Block 16. Other Location Descriptions.** If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality where the site is located.

**Block 17. Directions to the Site.** Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide a description of the location of the proposed NWP activity, such as lot numbers, tract numbers, or you may choose to locate the proposed NWP activity site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed NWP activity site if known. If there are multiple locations, please indicate directions to each location on a separate sheet of paper and mark as Block 17.

**Block 18. Identify the Specific Nationwide Permit(s) You Propose to Use.** List the number(s) of the Nationwide Permit(s) you want to use to authorize the proposed activity (e.g., NWP 29).

**Block 19. Description of the Proposed Nationwide Permit Activity.** Describe the proposed NWP activity, including the direct and indirect adverse environmental effects the activity would cause. The description of the proposed activity should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal. Identify the materials to be used in construction, as well as the methods by which the work is to be done.

Provide sketches when necessary to show that the proposed NWP activity complies with the terms of the applicable NWP(s). Sketches usually clarify the activity and result in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed NWP activity (e.g., a conceptual plan), but do not need to be detailed engineering plans.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 19.



**Block 20. Description of Proposed Mitigation Measures.** Describe any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed NWP activity. The description of any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or additional mitigation measures.

**Block 21. Purpose of Nationwide Permit Activity.** Describe the purpose and need for the proposed NWP activity. What will it be used for and why? Also include a brief description of any related activities associated with the proposed project. Provide the approximate dates you plan to begin and complete all work.

**Block 22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by the Proposed Nationwide Permit Activity.** For discharges of dredged or fill material into waters of the United States, provide the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained by the proposed NWP activity. For structures or work in navigable waters of the United States subject to Section 10 of the Rivers and Harbors Act of 1899, provide the amount of navigable waters filled, dredged, occupied by one or more structures (e.g., aids to navigation, mooring buoys) by the proposed NWP activity.

For multiple NWPs, or for separate and distant crossings of waters of the United States authorized by NWPs 12 or 14, attach an extra sheet of paper marked Block 21 to provide the quantities of wetlands, streams, or other types of waters filled, flooded, excavated, or drained (or dredged or occupied by structures, if in waters subject to Section 10 of the Rivers and Harbors Act of 1899) for each NWP. For NWPs 12 and 14, include the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained for each separate and distance crossing of waters or wetlands. If more space is needed, attach an extra sheet of paper marked Block 21.

**Block 23. Identify Any Other Nationwide Permit(s), Regional General Permit(s), or Individual Permit(s) Used to Authorize Any Part of Proposed Activity or Any Related Activity.** List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. For linear projects, list other separate and distant crossings of waters and wetlands authorized by NWPs 12 or 14 that do not require PCNs. If more space is needed, attach an extra sheet of paper marked Block 22.

**Block 24. Compensatory Mitigation Statement for Losses of Greater Than 1/10-Acre of Wetlands When Pre-Construction Notification is Required.** Paragraph (c) of NWP general condition 23 requires compensatory mitigation at a minimum one-for-one replacement ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation is more environmentally appropriate or the adverse environmental effects of the proposed NWP activity are no more than minimal without compensatory mitigation, and provides an activity-specific waiver of this requirement. Describe the proposed compensatory mitigation for wetland losses greater than 1/10 acre, or provide an explanation of why the district engineer should not require wetland compensatory mitigation for the proposed NWP activity. If more space is needed, attach an extra sheet of paper marked Block 23.

**Block 25. Is Any Portion of the Nationwide Permit Activity Already Complete?** Describe any work that has already been completed for the NWP activity.

**Block 26. List the Name(s) of Any Species Listed As Endangered or Threatened under the Endangered Species Act that Might be Affected by the Nationwide Permit Activity.** If you are not a federal agency, and if any listed species or designated critical habitat might be affected or is in the vicinity of the proposed NWP activity, or if the proposed NWP activity is located in designated critical habitat, list the name(s) of those endangered or threatened species that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 7 of the Endangered Species Act.

**Block 27. List Any Historic Properties that Have the Potential to be Affected by the Nationwide Permit Activity.** If you are not a federal agency, and if any historic properties have the potential to be affected by the proposed NWP activity, list the name(s) of those historic properties that have the potential to be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

**Block 28. List the Wild and Scenic River or Congressionally Designated Study River if the Nationwide Permit Activity Would Occur in such a River.** If the proposed NWP activity will occur in a river in the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" under the Wild and Scenic Rivers Act, provide the name of the river. For a list of Wild and Scenic Rivers and study rivers, please visit <http://www.rivers.gov/>

**Block 29. Nationwide Permit Activities that also Require Permission from the Corps Under 33 U.S.C. 408.** If the proposed NWP activity also requires permission from the Corps under 33 U.S.C. 408 because it will temporarily or permanently alter, occupy, or use a Corps federal authorized civil works project, indicate whether you have submitted a written request for section 408 permission from the Corps district having jurisdiction over that project.

**Block 30. Other Information Required For Nationwide Permit Pre-Construction Notifications.** The terms of some of the Nationwide Permits include additional information requirements for preconstruction notifications:

- \* NWP 3, Maintenance –information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals.
- \* NWP 31, Maintenance of Existing Flood Control Facilities –a description of the maintenance baseline and the dredged material disposal site.
- \* NWP 33, Temporary Construction, Access, and Dewatering –a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions.
- \* NWP 44, Mining Activities –if reclamation is required by other statutes, then a copy of the final reclamation plan must be submitted with the pre-construction notification.
- \* NWP 45, Repair of Uplands Damaged by Discrete Events –documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration.
- \* NWP 48, Commercial Shellfish Aquaculture Activities –(1) a map showing the boundaries of the project area, with latitude and longitude coordinates for each corner of the project area; (2) the name(s) of the species that will be cultivated during the period this NWP is in effect; (3) whether canopy predator nets will be used; (4) whether suspended cultivation techniques will be used; and (5) general water depths in the project area (a detailed survey is not required).
- \* NWP 49, Coal Remining Activities –a document describing how the overall mining plan will result in a net increase in aquatic resource functions to the district engineer and receive written authorization prior to commencing the activity.
- \* NWP 50, Underground Coal Mining Activities –if reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification.

If more space is needed, attach an extra sheet of paper marked Block 29.

**Blocks 31 and 32.** For bank stabilization activities, we are collecting information on the use of living shorelines in coastal waters and lakes to inform future NWP rulemaking efforts. If the PCN is for a proposed NWP 13 activity, and it is located in coastal waters or a lake, please check the appropriate box in block 31 to indicate whether you considered the use of a living shoreline to protect your property from erosion. If the PCN is for a proposed NWP 13 activity, and it is located in coastal waters or a lake, please check the appropriate box in block 32 to indicate whether there are contractors in your area that construct living shorelines.

**Block 33. Signature of Applicant or Agent.** The PCN must be signed by the person proposing to undertake the NWP activity, and if applicable, the authorized party (agent) that prepared the PCN. The signature of the person proposing to undertake the NWP activity shall be an affirmation that the party submitting the PCN possesses the requisite property rights to undertake the NWP activity (including compliance with special conditions, mitigation, etc.).

#### **DELINEATION OF WETLANDS, OTHER SPECIAL AQUATIC SITES, AND OTHER WATERS**

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. The 45 day PCN review period will not start until the delineation is submitted or has been completed by the Corps.

#### **DRAWINGS AND ILLUSTRATIONS**

##### **General Information.**

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross-Section Map. Identify each illustration with a figure or attachment number. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings should also be included. Please submit one original, or good quality copy, of all drawings on 8½x11 inch plain white paper (electronic media may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross-section). While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.

#### **ADDITIONAL INFORMATION AND REQUIREMENTS**

For proposed NWP activities that involve discharges into waters of the United States, water quality certification from the State, Tribe, or EPA must be obtained or waived (see NWP general condition 25). Some States, Tribes, or EPA have issued water quality certification for one or more NWPs. Please check the appropriate Corps district web site to see if water quality certification has already been issued for the NWP(s) you wish to use. For proposed NWP activities in coastal states, state Coastal Zone Management Act consistency concurrence must be obtained, or a presumption of concurrence must occur (see NWP general condition 26). Some States have issued Coastal Zone Management Act consistency concurrences for one or more NWPs. Please check the appropriate Corps district web site to see if Coastal Zone Management Act consistency concurrence has already been issued for the NWP(s) you wish to use.

# **Attachment 1**

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Additional Information

## 16. State Tax Parcel ID

The proposed Work is to connect to the existing pipe flanges with new flexible rubber spools of the existing Wailua Wastewater Treatment Plant (WWTP) ocean outfall to elevate the outfall's diffuser outlets. The Wailua WWTP ocean outfall is located seaward of Tax Map Key: (4) 3-9-006:001.

The proposed Work is part of a larger project that will construct and upgrade new treatment processes for the Wailua Wastewater Treatment Plant (WWTP) which will help to improve the enhance its reliability and to maintain the delivery of treatment effluent to the Wailua Municipal Golf Course for irrigation. The Wailua WWTP is located at (4)-3-9-006:019.

## 17. Directions to the Site

The Wailua WWTP ocean outfall is located seaward of Tax Map Key: (4) 3-9-006:001.

The Wailua WWTP is located at 4460 Nalu Road, Kapaa, Hawaii 96746.

## 18. Nature of Activity

The proposed Work is to connect to the existing pipe flanges with new flexible rubber spools of the existing ocean outfall to elevate the outfall's diffuser outlets.

The proposed Work is part of a larger project that will construct and upgrade new treatment processes for the Wailua Wastewater Treatment Plant (WWTP) which will help to improve the enhance its reliability and to maintain the delivery of treatment effluent to the Wailua Municipal Golf Course for irrigation. The WWTP improvements will be permitted under National Environmental Policy Act (NEPA).

## 19. Description of Proposed Activity and 21. Purpose of Nationwide Permit Activity

The Wailua WWTP is located at 4460 Nalu Road on 2.033 acres (TMK: (4) 3-9-006:019) of County-owned land. The treatment plant provides secondary treatment and disinfection to produce R-2 quality effluent for reuse. The plant was originally constructed in 1964 and receives wastewater from the Kapa'a, Papaloa, Waipouli and Wailua areas. The plant was originally designed to treat an average flow of 0.5 million gallons per day (MGD). The plant has undergone four phases of expansion and construction, with the most recent in 1992. The current WWTP has a rated treatment design capacity of 1.5 MGD.

The Wailua Municipal Golf Course is located at 3-5350 Kuhio Highway, south of the WWTP. It is situated on four separate TMKs parcels ((4) 3-9-002: parcels 4, 5 and 6 and (4) 3-9-005: parcel 1) comprising an area of 243.73 acres. The Wailua Municipal Golf Course has been using R-2 effluent from the WWTP for golf course irrigation since 1976 as its primary source of irrigation water. Excess treated effluent is currently discharged to an existing permitted ocean outfall connected to the WWTP. General precautions for all uses of recycled water are explained in the Hawai'i Department of Health's Guidelines for the Treatment and Use of Recycled Water (May 15, 2002). The use of R-2 effluent for golf course irrigation is acceptable for golf course landscapes where an adequate buffer exists between the areas being sprayed and the adjacent residential or publicly accessible area. The irrigation practices at the

Wailua Municipal Golf Course meet the buffer requirement and irrigate during periods only when the public is not present.

Typically, during non-rainy months (April to September), treated effluent is discharged from the WWTP through the existing ocean outfall from Tuesday morning to Thursday morning (about three days of flow per week). The outfall requires flushing for approximately three days a week to prevent clogging of the ocean outfall diffusers from migrating sand driven by the ocean currents. In order to divert effluent to the outfall, the WWTP disinfection operation is adjusted to meet ocean outfall disposal lower chlorine residual requirements. During the rainy season (October through February), the Wailua Municipal Golf Course requires less water and R-2 flows are routed predominantly to the ocean outfall. In 2017, approximately 60 percent of the total flows were discharged to the ocean. The remaining 40 percent of the plant effluent was used to irrigate the Wailua Municipal Golf Course.

In the past, the outfalls diffusers have been covered over completely with sand. When this occurs, the Wailua WWTP is unable to use the ocean outfall and relies solely on the Wailua Golf Course irrigation for the proper disposal of the treated effluent. The Work is to raise the outfall's diffuser outlet elevations to reduce the likelihood of being clogged with sand thereby improving the reliability of the outfall for continued effluent disposal.

The outfall is located at:

Latitude: 22.037°N

Longitude: 159.3342°W

#### Proposed Outfall Modification Plan

The proposed Outfall Modification Plan (Appendix 1) provides description of how the work will be accomplished.

The Outfall Modification Plan provided in Appendix 1 describes the work plan, existing environment, best management practices, and an adaptive management plan in detail. Please refer to the Plan for additional drawings and figures.

The proposed outfall modification is anticipated to take no more than one month from mobilization on-site.

## 20. Description of Proposed Mitigation Measures

Please refer to Attachment 1 – Best Management Practices Plan.

### **BMPs for Potential Effects on ESA:**

The proposed project activities may affect but is not likely to adversely affect ESA-listed species with the implementation of the BMPs. The complete description of the BMPs for ESA is provided in Attachment 3. A discussion of the applicability of BMPs to each potential effect on ESA listed in box 4(c) is discussed below.

Shut-down Zone: Constant vigilance shall be kept for the presence of ESA-listed marine species during all aspects of the proposed action. A competent observer will visually survey the project area each day, beginning 30 minutes prior to the start of work and during all in-water activities. Work may not commence if an ESA-listed marine species is observed within 50 yards of the proposed work. Once work has begun, all work will stop when an ESA-listed marine species is observed within 50 yards of the proposed work (i.e. Shut-down Zone), and shall only resume after the animal departs the area voluntarily or until 30 minutes passed since the previous sighting.

1. Exposure to elevated noise levels: “Shut-down Zone” described above will be implemented to ensure no direct, physical impacts will occur to protected species.
2. Disturbance from human activity and equipment operation: “Shut-down Zone” described above will be implemented to ensure no direct, physical impacts will occur to protected species.
3. Direct physical contact: “Shut-down Zone” described above will be implemented to ensure ESA-listed marine species will not be close enough to the activities to cause direct, physical contact. Additionally, all materials will be introduced into the marine environment in a controlled manner that will minimize disturbance and impacts.
4. Collision with vessels: “Shut-down Zone” described above will be implemented to ensure no direct, physical impacts will occur to protected species. Vessel operators shall alter course or halt in order to remain at least 50 yards from marine mammals and sea turtles. When piloting vessels at or within 50 yards from marine mammals and sea turtles, reduce vessel speed to 10 knots or less. If a marine mammal or sea turtle approaches the vessel, vessel operators will put the engine in neutral until the animal is at least 50 yards away, and then move away slowly.
5. Entanglement: The project’s equipment will be managed closely, such that only lines, chains and lift bags will be deployed in the water when necessary. The vessel(s) anchor lines will be kept taut when deployed.

#### **BMPs for Potential Effects on EFH:**

The proposed project activities may affect but is not likely to adversely affect EFG-listed species with the implementation of the BMPs. The complete description of BMPs for the EFH is provided in Attachment 3. A discussion of the applicability of BMPs to each potential effect on EFH listed in box 4(c) is provided below.

1. Placement of anchors: Anchor locations would be visually inspected to ensure they are on unimpeded sand bottom during the benthic assessment. In addition, the anchor location would be verified by divers prior to setting anchors during operations.

26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the propose NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity.  
Please see the proposed Outfall Modification Plan (Appendix 1).

30. If the terms of the NWP(s) that you want to use require additional information to be included in the PCN, please include that information in this space or provide it on an additional sheet of paper marked Block 30.  
Please see the proposed Outfall Modification Plan (Appendix 1).

### Additional Information: Endangered Species Act

A separate Receiving Water Biological Communities Monitoring Program to satisfy the outfall's NPDES permit is provided at the end of Appendix 2.

Observations of the diffusers indicate that there is no evidence of deposition of effluent material on the reed surface. The high degree of water motion, created by seaward-flowing rip current that has been a consistent feature of the area during all surveys to date, rapidly dilutes and disperses the effluent.

While the effluent discharge cannot be unequivocally be eliminated as a factor in the lack of benthos, particularly corals, in the vicinity of the diffusers, other environmental factors must also be considered. The primary factor appears to be a seaward-flowing rip current of high turbid water and suspended sediment that continually flows offshore through the gap in the reed where the diffusers are located. As most of the reed flat is very shallow, one of the only avenues of seaward return from the surf zone is through the channel occupied by the outfall. The turbid water in the rip is likely a result of the resuspension of particulate material (sand) and the inner surf zone. There have been no visual indications during previous surveys of any disease or pathological abnormalities with any of the biota or fish in the area of the discharge.

Mammals in the vicinity of the WWTP include feral cat, roof rat, cattle, dog, pig, and the Hawaiian hoary bat. Birds that are associated with the prevalent vegetation type along the eastern coast of Kaua'i include cardinal spotted dove, barred dove, mockingbird, mynah, ricebird, white eye, house sparrow, elepaio, pueo, and golden plover. Elepaio and pueo are native Hawaiian birds, and the golden plover is an indigenous Hawaiian bird.

There were no coral colonies observed along the diffusers during site visits. Turf algae and coral were present at the outer margins of the area during the site visits and has been documented as part of the NOAA maps for the area, as provided by PacIOOS Voyager. The outfall channel is dominated by uncolonized sandy substrate.

No Green Sea Turtles, Hawksbill Sea Turtles, Humpback Whales, or Hawaiian Monk Seals were observed during any of the previous site visits to the outfall. However, sand beaches like the one mauka of the outfall are an important element for sea turtle and monk seal habitats. The project site is within Hawaiian Monk Seal critical habitat, but is not within the Humpback Whale Sanctuary. The following species are reported to be in the project vicinity and listed as federally threatened and endangered species.

Federally threatened species:

- Newell's shearwater (*Puffinus auricularis newelli*)

Federally endangered species:

- Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*)
- Hawaiian hoary bat (*Lasurus cinereus semotus*)
- Hawaiian duck (*Anas wyvilliana*)
- Hawaiian stilt (*Himantopus mexicanus knudseni*)
- Hawaiian goose (*Branta sandvicensis*)
- Hawaiian moorhen (*Gallinula chloropus sandvicensis*)



- Hawaiian coot (*Fulica alai*)
- Hawaiian monk seal (*Monachus schauinslandi*)

Human Use:

Any impacts to human use will be minor and temporary. The outfall channel has dangerous rip current moving offshore through it and is not a popular place for recreation. Work in the water will be coordinated to avoid operational and navigation impacts.

Historical/Cultural Resources:

The proposed project is located outside of sensitive archaeological area in the ocean and is not anticipated to affect known archeological resources. Should any unanticipated archaeological site(s), such as walls, platforms, pavements mounds or remains such as artifacts, burials, or concentrations of charcoal or shells be uncovered by the work activity, all work shall cease in the immediate area and the contractor shall notify the State Historic Preservation Division at 808-692-8015. No work shall resume until the owner/contractor obtains clearance from the Historic Preservation Division.

## **Attachment 1 – Appendix 1**

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Outfall Modification Plan and Best Management Practices Plan



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Honolulu, HI 96813  
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## **Outfall Modifications Work Plan**

25 May 2022

Prepared for

**County of Kaua'i, Wastewater  
Management Division**

4444 Rice Street, Suite 500  
Lihue, HI 96766

KJ Project No. 1867016\*00

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## Section 1: Introduction

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The Wailua Wastewater Treatment Plant (WWTP) is located at 4460 Nalu Road on 2.033 acres [TMK: (4) 3-9-006:019] of County of Kaua'i (County)-owned land. The WWTP provides secondary treatment and disinfection to produce R-2 quality effluent for reuse. The plant was originally constructed in 1964 and receives wastewater from the Kapa'a, Papaloa, Waipouli, and Wailua areas. The plant was originally designed to treat an average flow of 0.5 million gallons per day (MGD). The plant has undergone four phases of expansion and construction, with the most recent in 1992. The current WWTP has a rated treatment design capacity of 1.5 MGD.

The Wailua Municipal Golf Course is located at 3-5350 Kuhio Highway, south of the WWTP. It is situated on four separate TMKs parcels [(4) 3-9-002: parcels 4, 5 and 6 and (4) 3-9-005: parcel 1] comprising an area of 243.73 acres. The Wailua Municipal Golf Course has been using R-2 effluent from the WWTP for golf course irrigation since 1976 as its primary source of irrigation water. Excess treated effluent is currently discharged to an existing permitted ocean outfall connected to the WWTP. General precautions for all uses of recycled water are explained in the Hawai'i Department of Health's Guidelines for the Treatment and Use of Recycled Water (15 May 2002). The use of R-2 effluent for golf course irrigation is acceptable for golf course landscapes where an adequate buffer exists between the areas being sprayed and the adjacent residential or publicly accessible area. The irrigation practices at the Wailua Municipal Golf Course meet the buffer requirement and irrigate during periods only when the public is not present.

Typically, during non-rainy months (April to September), treated effluent is discharged from the WWTP through the existing ocean outfall from Tuesday morning to Thursday morning (about 3 days of flow per week). The outfall requires flushing for approximately 3 days a week to prevent clogging of the ocean outfall diffusers from migrating sand driven by the ocean currents. In order to divert effluent to the outfall, the WWTP disinfection operation is adjusted to meet ocean outfall disposal lower chlorine residual requirements. During the rainy season (October through February), the Wailua Municipal Golf Course requires less water and R-2 flows are routed predominantly to the ocean outfall. In 2017, approximately 60 percent of the total flows were discharged to the ocean. The remaining 40 percent of the plant effluent was used to irrigate the Wailua Municipal Golf Course.

In the past, the outfalls diffusers have been covered over completely with sand. When this occurs, the Wailua WWTP is unable to use the ocean outfall and relies solely on the Wailua Golf Course irrigation for the proper disposal of the treated effluent. The work is to raise the outfall's diffuser outlet elevations to reduce the likelihood of being clogged with sand; thereby, improving the reliability of the outfall for continued effluent disposal.

The outfall is located in a notch in the reef approximately 670 feet from shore in waters approximately 30 feet deep (22.037° N, 159.3342° W). The end of the outfall has six 4-inch diffusers where the excess R-2 recycled water or periodic R-3 recycled water is discharged.

## 1.1 Project Location

The Wailua WWTP is located on the eastern shore of Kaua'i in Wailua, as shown on Figure 1. The outfall modification is for the outfall offshore of the WWTP shown on Figure 2. The nearest neighboring properties are the Lydgate Park and the Kaha Lani Resort.



**Figure 1: Project Vicinity**



**Figure 2: Outfall Location and Neighboring Properties**



## **Section 2: Outfall Modification Work Plan**

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### **2.1 Purpose**

The Wailua WWTP ocean outfall diffusers were covered by sand during the period of March 2018 through June 2018. When the ocean outfall diffusers are covered with sand, the Wailua WWTP must rely solely on the Wailua Municipal Golf Course for effluent disposal by use of the recycled water or storage.

This places a strain on both the Wailua WWTP and Wailua Municipal Golf Course to safely manage and store the treated effluent in a way that is safe for the public.

There are two situations that potentially lead to hazardous outcomes:

- 1) If the diffusers are covered by the sand and the Wailua WWTP is not able to treat the wastewater to R-2 recycled water quality, then the County will be forced to discharge R-3 effluent to the Wailua Municipal Golf Course to prevent a spill from occurring at the Wailua WWTP and Lydgate Park. If the Wailua Municipal Golf Course does not have sufficient storage in their existing lined irrigation holding pond to store the generated R-3 effluent, the County will have no other options available for R-3 effluent disposal and will result in a spill at the Wailua Municipal Golf Course with direct impacts to the safety and health of the public since the County is only permitted to use R-2 recycled water on the golf course. A spill may also lead to shutting down the golf course and potential fines.

If the golf course uses the lined irrigation holding pond to store the generated R-3 effluent, then the golf course will not be able to use its irrigation system as it is not permitted for R-3 irrigation. If the lined storage pond is filled, the wastewater spill will overflow to an unlined pond with an unknown percolation rate and will result in the closure of the Wailua Golf Course so that the public can be kept safe from the wastewater spill.

The anticipated scenario where the Wailua WWTP is unable to produce R-2 quality recycled water consists of process upsets and equipment failures. A process upset could occur if toxic substances are introduced into the wastewater collection system, such as a high concentration of chlorine when a resort drains the water in their swimming pool. This would kill the microorganisms which remove the organic matter in the wastewater and as a result, the proper level of treatment would not be attained. It would likely take more than a month before the microorganisms could be reestablished and the WWTP could treat the wastewater to meet R-2 recycled water standards.

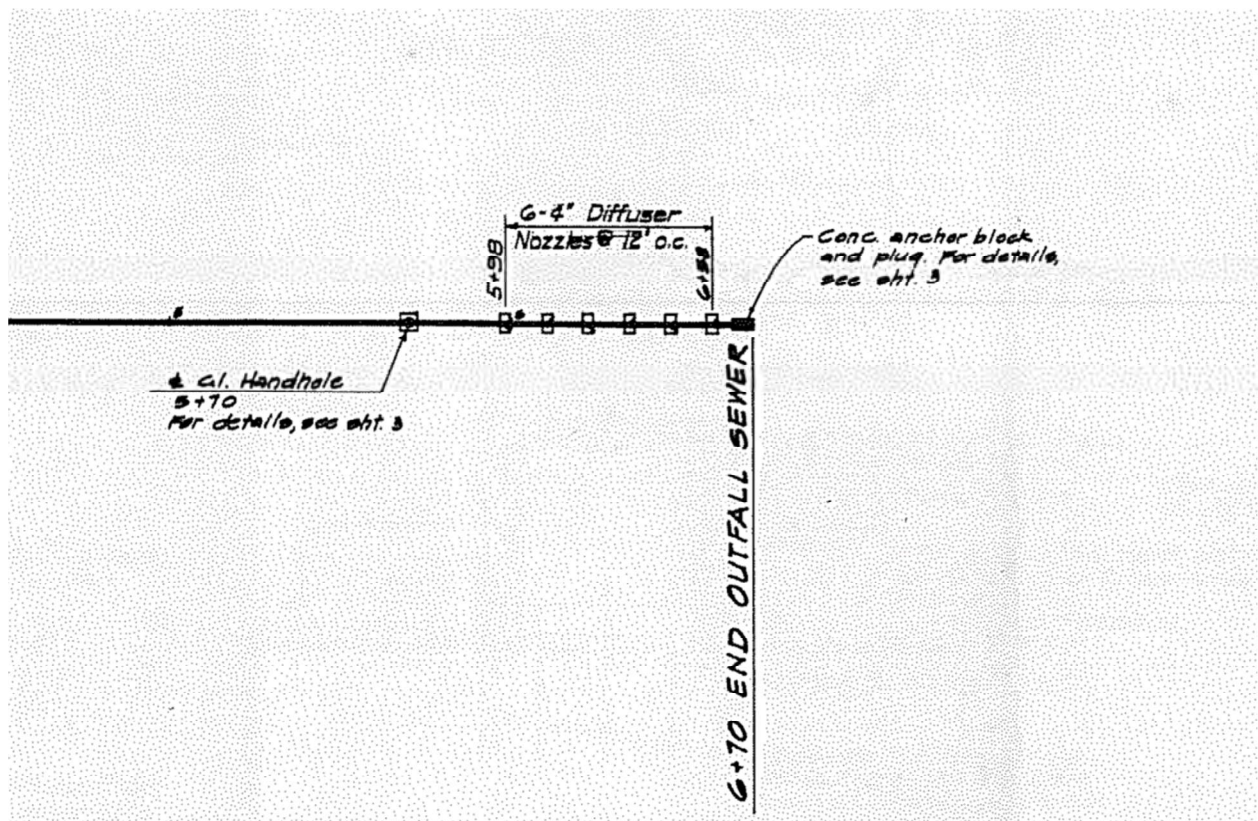
A second scenario could involve an equipment failure such as a failure to the tertiary filter or to the chlorine dosing equipment. Under this scenario, the WWTP would not be able to treat the wastewater to meet R-2 recycled water standards until the equipment is repaired.

A third scenario could include the failure of the effluent pumps or recycled water force main which delivers the treated R-2 recycled water to the golf course. The treated recycled water would then have no other disposal alternatives.

- 2) Heavy rains in the WWTP's service area could result in high volumes of wastewater through infiltration and inflow (I/I). If the WWTP is unable to handle the additional I/I, there could be a spill at the Wailua WWTP which would impact Lydgate Park. The peak flows could be more than the golf course's irrigation demand, especially during rainy events when irrigation demand is low. Typically, in major storm events, treated effluent is directed to the outfall to accommodate the high flow rates. If the outfall diffusers are covered in sand, a spill could occur at the WWTP.

## 2.2 Project Scope

The existing ocean outfall consists of six (6) 4-inch diffusers that are evenly spaced along the crown of the 15-inch reinforced concrete pipe (RCP) outfall as shown on Figure 3. In its current configuration, three (3) of the existing diffusers are blind flanged closed while three (3) are in use. Photographs of the outfall diffusers from a 8 April 2021 inspection performed by Marine Research Consultants, Inc. is provided in Photos 1 through 6 below.



**Figure 3: Outfall Diffuser Plan**

**Photo 1 – Outfall Diffuser 26**



**Photo 2 – Outfall Diffuser 27**



**Photo 3 – Outfall Diffuser 28**



**Photo 4 – Outfall Diffuser 29**



**Photo 5 – Outfall Diffuser 30**



**Photo 6 – Outfall Diffuser 31**



The project scope involves the addition of rubber spool diffuser risers attached to the existing outfall diffusers number 27, 30, and 31. The diffuser riser heights will be determined in design and is preliminarily estimated to be 2-foot high. To attach the rubber spool risers to the existing flange faces of each diffuser, the flange faces will first need to be cleared of coral or algae growth.

## **2.3 Proposed Outfall Modification Design**

### **2.3.1 Project Design**

The proposed design is to attach rubber spool pipe risers to the flanged ends of the existing outfall diffusers. This work will increase the elevation of the diffuser outlets reducing the likelihood of sand inundation.

All equipment and materials will be transported to the project site by the work vessel. The work vessel would place its anchor at in the vicinity of the outfall. The anchor locations would be verified by divers to be in a location free of coral prior to setting anchors during operations.

The project site is located in a small paleochannel that incises the reef. The project site is characterized by rough seas, deep water, and extremely strong currents. The shallow reef flat on both sides of the outfall location drains through the gap in the reef, resulting in high currents even during relatively placid conditions on the eastern shoreline.

The dive team would access the diffusers, remove debris from the flange faces of the three open diffusers, and attach the new modifications to the flange faces.

### **2.3.2 Regulatory Jurisdictions**

#### **2.3.2.1 Hawai'i State Conservation District**

The project is located in its entirety within the State of Hawai'i Conservation District. Submerged lands, part of the Resource Subzone of the Conservation District, extend across the seafloor from the 3-mile offshore limit to the shoreline, as defined in Hawai'i Revised Statute (HRS) Section 205A and identified by the highest wash of the highest wave, not to include tsunami or hurricane waves.

#### **2.3.2.2 Special Management area and Shoreline Setback Area**

The project is located entirely makai of the shoreline, as identified in the Hawai'i Revised Statute Chapter 205A. As such, it is located makai of the Kaua'i County Special Management Area and jurisdiction.

#### **2.3.2.3 Navigable Waters and Clean Water Act Section 404**

The proposed construction is in navigable waters and would be on outfall diffusers which are located at an approximate elevation of -30 feet mean sea level (MSL), putting the project area in the jurisdiction of the Department of the Army.

#### **2.3.2.4 Clean Water Act Section 401**

Work would be within State Waters.

#### **2.3.2.5 Clean Water Act Section 402 National Pollutant Discharge Elimination System**

The Department of Health protects, maintains, and improves the quality of State waters. The proposed outfall modification is on an outfall in State waters with an existing National Pollutant Discharge Elimination System (NPDES) permit.

## **Section 3: Project Outcomes**

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### **3.1 Outfall Reliability**

The outcome of this work will be improved reliability of the existing ocean outfall. Without the proposed outfall diffuser modifications, the Wailua WWTP is at increased risk of a reoccurrence of a blocked outfall as occurred in March 2018. If the WWTP is unable to use the outfall and the Wailua Municipal Golf Course has insufficient storage or demand for the treated effluent, then a spill may occur putting the safety and health of the public at risk. The proposed outfall diffuser modification poses minimal environmental risk to the public while improving the reliability of the outfall to continue flowing in critical times.

### **3.2 Environmental Effects**

The proposed outfall diffuser modification is anticipated to have minimal impact on the environment. The diffuser modification seeks to only elevate the diffuser outlets, while keeping them in the same location. The existing outfall diffusers are located within a high-velocity rip current. The modifications are not anticipated to affect the mixing effect that the rip current has on the discharged effluent.

### **3.3 Recreational Uses**

The proposed construction is not anticipated to have any effects on the recreational or human uses. The project area is not a popular destination for the public due to the hazardous rip current. There are no anticipated impacts to the Beach Park mauka of the project.

### **3.4 Neighboring Parcels**

No impact from this construction is expected on the neighboring parcels or affects to the upstream WWTP or wastewater collection system.

### **3.5 Cultural or Historic Sites**

There are no cultural or historic sites that have been identified in the waters at the outfall site or at the proposed side-cast site. As such, there would be no anticipated impacts to the cultural or historic resources.

## **Section 4: Alternatives**

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### **4.1 No Action**

If “No Action” is chosen, the diffusers may become covered in sand as occurred in March 2018. During periods where the diffusers are inundated with sand drifts, the WWTP loses one of its two redundant effluent disposal locations, and the County will be forced to rely solely on the Wailua Municipal Golf Course for irrigation reuse of the effluent. In the event the Wailua WWTP is not able to treat wastewater to its typical R-2 recycled water standard, then the County will be forced to discharge R-3 effluent to the Wailua Municipal Golf Course to prevent a spill from occurring at the WWTP and at Lydgate Park. This will result in a wastewater spill at the Wailua Municipal Golf Course and carry with it significant impacts to public safety. There are no other options for the disposal of R-3 recycled water during periods when the outfall is plugged.

The Wailua Golf Course would not be able to irrigate with R-3 water and will have to store and hold the R-3 water in their existing lined irrigation holding pond. Should the flow of R-3 water exceed the capacity of the lined irrigation holding pond, the R-3 will flow through an existing overflow pipe to an adjacent unlined pond to keep the public safe from the wastewater spill.

The County has already secured the Army Corps of Engineers (USACE) permit for the emergency dredging of the ocean outfall to react rapidly to sand drifts should they occur. This existing USACE permit allows the County to rapidly deploy to remove sand drifts. However, there still remains a risk of wastewater spill depending on the timing of the drifts, the WWTP’s ability to produce R-2 effluent, and the capacity of the lined irrigation holding pond.

This is not the preferred option.



## **Section 5: Best Management Practices Plan**

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The purpose of this Best Management Practices Plan (BMPP) is to ensure that adequate protective measures are in place during the construction of the Wailua WWTP ocean outfall. This BMPP is designed to prevent, if possible, or minimize adverse impacts on the environment. The project specifications will require the Contractor to adhere to environmental protection measures, including, but not limited to, those included in this BMPP. This BMPP is inclusive of the appropriate measures identified in the Pac-SLOPES documents.

### **5.1 General Requirements**

This section covers the requirements of environmental and pollution control during construction activities. The Contractor shall be responsible for conformance to all appropriate Chapters of Title 11 Public Health Regulations for the Department of Health, State of Hawai'i.

1. With the exception of those measures set forth elsewhere in this BMPP, environmental protection shall consist of the prevention of environmental pollution as a result of construction operations under this project. For the purpose of this BMPP, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utilization of the environment for aesthetic and recreational purposes.
2. The work shall include the following:
  - a. Make sure that all permits required for this project are obtained and valid for the construction period.
  - b. Provide all facilities, equipment, and structural controls for minimizing adverse impacts on the environment during the construction period.
3. Applicable Regulations: In order to provide for abatement and control of environmental pollution arising from the construction activities of the Contractor and subcontractors in the performance of the work, the work shall comply with the intent of the applicable federal, state, and local laws and regulations concerning environmental pollution control and abatement.

### **5.2 Suitable Material**

1. All equipment and material shall be free of contaminants of any kind including excessive silt, sludge, anoxic, or decaying organic matter, clay, dirt, oil, floating debris, grease or foam, or any other pollutant that would produce an undesirable condition to the shoreline or water quality. The equipment will be ground to the project site in clean condition.
2. All materials shall be free from any objectionable sludge, oil, grease, scum, excessive silt, organic material, or other floating material.

### 5.3 Historic or Cultural Features

1. No adverse impacts to any historical or cultural features are expected. The work does not include disturbance of offshore sand and is limited to disturbing the flange faces of the existing ocean outfall diffusers.

### 5.4 Environmental Protection

1. All permits and clearances shall be obtained prior to the start of any sand clearing activities. The Contractor and subcontractors shall ensure that all diffuser modifications comply with all permit conditions and commitments made with environmental agencies.
2. The Contractor shall perform the work in a manner that minimizes environmental pollution and damages as a result of the outfall modification construction. The environmental resources within the project boundaries shall be protected during the entire duration of the outfall construction activities.
3. The Contractor shall complete daily inspection of equipment for conditions that could cause spills or leaks; clean equipment prior to operation near the water; properly site storage, refueling, and servicing sites; and implement spill response procedures and stormy weather preparation plans.
4. The project shall be completed in accordance with all applicable State and County health and safety regulations.
5. The Contractor shall provide notifications to the National Marine Fisheries Services (NMFS), [efhesaconsult@noaa.gov](mailto:efhesaconsult@noaa.gov), including the Protected Resources Division, at least 72 hours prior to the scheduled start of activities.
6. Project operations must cease if unusual conditions, such as large tidal events and high surf conditions affect the project site, except for efforts to avoid or minimize resource damage.
7. The mooring system shall employ the minimum line length necessary to account for expected fluctuation in water depth due to tides and waves.
8. Mooring system shall be designed to keep the line as tight as possible, with the intent to eliminate the potential for loops to form.
9. Mooring lines shall consist of a single line. No additional liner or material capable of entangling marine life may be attached to the mooring line or to any other part of the deployed system.
10. Mooring systems shall be designed to keep the gear off the bottom, by use of a mid-line flow when appropriate, with the intent to eliminate scouring of corals or entanglement of the line on the substrate.
11. Mooring systems, including those used for temporary markers, scientific sensor buoys, or vessel moorings, shall be completely removed from the marine environment

immediately at the completion of the authorized work or the end of the mooring's service life. The only exception to this rule shall be mooring anchors such as eyebolts that are epoxied into the substrate and which pose little or no risk to the marine life.

## **5.5 Solid Waste and Disposal**

1. Project site inspection and debris sweeps will be completed at the end of each workday. A full inspection of the project site will be conducted at the end of the project to ensure that no visible debris introduced by the outfall diffuser modification efforts or project waste is present at the site upon completion of the project.
2. Any activity related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at conclusion of the day.
3. The Contractor shall not dispose of any concrete, steel, wood, and any other debris into State or Federal Waters.
4. No contamination (trash or debris disposal, alien species introductions, etc.) of marine (reef flats, lagoons, open oceans, etc.) environments adjacent to the project site shall result from project related activities.
5. The Contractor shall remove all floating or submerged materials and/or debris at the end of each day, with the exception of BMPs, as needed.
6. The Contractor shall ensure that the Oil Spill Response Plan (provided below) is in place and shall detail procedures for managing the accidental release of petroleum products to the aquatic environment during sand clearing efforts. Absorbent pads, containment booms, and skimmers will be available to facilitate the cleanup of petroleum spills.
7. Any spills or other contaminations shall be immediately reported to the Department of Health (DOH) Clean Water Branch (808-586-4309).
8. In the event that floating hydrocarbon (oil, gas) products are observed, the Contractor or the designated individual will be responsible for directing in-water work be halted so that appropriate corrective measures are taken in accordance with the Oil Spill Response Plan. The Department of Land and Natural Resources shall be notified as soon as practicable, and activity causing the plume will be modified by containment. The responsible individual will document the event and the measures taken to correct the issue and will report the incident (with photographs) to the Office of Conservation and Coastal Lands and the Department of the Army Regulatory Office as soon as is practicable. Work may continue only after the issue is no longer visible.
9. No contamination of the marine environment shall result from the permitted activities. Particular care must be taken to ensure that no petroleum products, trash, or other debris enter near-shore and open ocean waters. When such material is found within the project area, the Contractor, or the designated construction agent, shall collect, and dispose of this material at an approved upland disposal site.

10. Waste materials and waste waters directly derived from sand clearing activities shall not be allowed to leak, leach, or otherwise enter marine waters.

## **5.6 Waste Waters**

The work shall be conducted so as to prevent the discharge or accidental spillage of pollutants, solid waste debris, and other objectionable wastes in surface waters.

## **5.7 Erosion Control**

The work will entail no disturbance on subsurface sand and no sand clearing activities. Prior to commencing with the work, the Contractor shall visually inspect the area immediately surrounding the diffusers. Visual inspections will be documented with photographs, a photo-oriented map, and written description of observations.

## **5.8 Noise Control**

1. BMPs shall be utilized to minimize adverse effects to air quality and noise levels, including the use of emission control devices.
2. The Contractor shall conform at all times with Hawai'i Administrative Rules (HAR) Title 11 Section 46 Community Noise Control, State Department of Health, Public Health Regulations. The Contractor shall obtain and pay for a community noise permit from the DOH when equipment or other devices emit noise at levels exceeding the allowable limits.
3. Equipment shall be equipped with suitable mufflers to maintain noise within limits complying with applicable regulations.
4. Starting of equipment meeting allowable noise limits shall not be performed prior to 7:00 a.m. without prior approval. Equipment exceeding allowable noise limits shall not be started up prior to 7:30 a.m.

## **5.9 Dust Control**

1. Dust, which could damage crops, orchards, cultivated fields, or cause nuisance to persons, shall be abated and control measures shall be performed.
2. The Contractor, for the duration of the contract, shall maintain all excavations embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within or without the project limits free from dust which would cause a hazard to the work, or the operations of other contractors, or to persons or property. Industry accepted methods of stabilization suitable for the area involved, such as sprinkling or similar methods will be permitted. Chemicals or oil treating shall not be used.

3. The Contractor shall prevent dust from becoming airborne at all times including non-working hours, weekends, and holidays in conformance with the DOH, HAR Title 11, Chapter 60 – Air Pollution Control.

### **5.10 Air Pollution Control**

1. Emission: The Contractor shall not be allowed to operate equipment and vehicles that show excessive emissions of exhaust gases until corrective repairs or adjustments are made.

### **5.11 Oil Spill Containment**

1. The Contractor shall ensure that the Oil Spill Response Plan, detailed in this document, is in place which shall detail procedures for managing the accidental release of petroleum products to the aquatic environment during construction. Fusing of project related vehicles and equipment should take place away from the water. Absorbent pads, containment booms, and skimmers will be stored onsite to facilitate the cleanup of petroleum spills.
2. Any spills or other contaminations shall be immediately reported to the DOH Clean Water Branch (808-586-4309) and through email: [cleanwaterbranch@doh.hawaii.gov](mailto:cleanwaterbranch@doh.hawaii.gov).

### **5.12 Monitoring/Measures for Visually Detected Containment**

1. All work operations shall be performed in conformance with the applicable provisions of the HAR, Title 11 Chapter 55 Water Pollution Control and Title 11, Chapter 54 Water Quality Standards, and to the Erosion and Sedimentation Control Standards and Guidelines of the Department of Public Works, County of Kaua'i, Hawaii.
2. The Contractor shall keep activities under surveillance, management, and control to avoid pollution of surface or marine waters. Daily visual inspection of the construction site and its environs will be conducted by a designated individual, or their representative, to verify that the permitted activities do not result in uncontrolled adverse environmental impacts. Visual inspections will be documented with photographs and written description.
  - a. Daily Inspection: The project site will be inspected daily to ensure BMPs are maintained to confine and isolate potential pollutants from being discharged into surrounding areas. The site will be inspected to ensure that materials are properly stored, rubbish is being collected and disposed of properly, etc.
  - b. Deficiencies identified by daily inspections shall be corrected immediately. Work activities will stop and remain stopped until the deficiencies have been corrected.
3. Prior to delivery to the site, all construction materials shall be inspected to ensure they are free of contaminants to any kind including: excessive silt, sludge, anoxic or decaying organic matter, turbidity, temperature or abnormal water chemistry, clay, dirt, organic

- material, oil, floating debris, grease or foam, or any other pollutant that would produce an undesirable condition to the beach or water quality.
4. No contamination of the marine environment shall result from the permitted activities. Particular care must be taken to ensure that no petroleum products, trash, or other debris enter near-shore and open ocean waters. When such material is found within the project area, the Contractor, or their designated construction agent, shall collect, and dispose of their material at an approved upland disposal site.
  5. Waste materials and waste waters directly derived from construction activities shall not be allowed to leak, leach, or otherwise enter marine waters.
  6. In the event that floating hydrocarbon (oil, gas) products are observed, the Contractor or their designated individual will be responsible for directing that in-water work be halted so that appropriate corrective measures are taken in accordance with the Oil Spill Response Plan. The Department of Land and Natural Resources shall be notified as soon as practicable, and the activity causing the plume will be modified by containment. The responsible individual will document the event and the measures taken to correct the issue and will report the incident (with photographs) to the Office of Conservation and Coastal Lands and the Department of Army Regulatory Office as soon as is practicable. Work may continue only after the issue is no longer visible.

### **5.13 Water Quality Monitoring**

1. The Contractor shall visually monitor the nearshore for turbidity or other water quality issues that may be associated with the sand clearing operations.
2. The Contractor shall incorporate all erosion control measures shown in the drawings and the BMPP for this project. The plans may be modified as necessary to adjust to conditions that develop during construction. Any changes to the BMPP must immediately submitted to the Department of Army (DA) for review.

### **5.14 Protected Marine Species**

1. The project manager shall designate a competent observer to survey the marine areas adjacent to the proposed action for U.S. Endangered Species Act (ESA)-listed marine species, including but not limited to the green sea turtle, hawksbill sea turtle, and Hawaiian monk seal.
2. Visual surveys for the ESA-listed marine species shall be made prior to the start of work each day, and prior to resumption of work following any break of more than 1/2 hour, to ensure that no protected species are in the area (typically within 50 yards of the proposed work).
3. Work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work and shall only begin/resume after the animals have voluntarily departed the area. If the ESA-listed marine species are notified after work has already

- begun, that work may continue only if there is no way for the activity to adversely affect the animal(s).
4. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.
  5. All onsite project personnel must be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal laws. Specified information on the laws and guidelines for listed species in Hawai'i, American Samoa, and Guam may be found at <https://www.fisheries.noaa.gov/species-directory>
  6. The Contractor shall keep a record of all protected species sightings, incidents of disturbance, or injury, shall provide a report to the State and NMFS, and will be the contact person for any issues involving green sea turtles during the construction.
  7. Upon sighting of a monk seal or turtle within the safety zone during project activity, immediately halt the activity until the animal has left the zone. In the event that a marine protected species enters the safety zone and the project activity cannot be halted, conduct observations, and immediately contact NMFS staff in Honolulu to facilitate agency assessment of collected data. Contact the Marine Wildlife Emergency Response Hotline 888-256-9840 or directly at 808-651-7668.
  8. The Contractor shall immediately report any incidental take of marine mammals. The incident must be reported immediately to National Oceanic and Atmospheric Administration (NOAA) Fisheries' 24-hour hotline 1-888-256-9840, and the Regulatory Branch of the USACE at (808) 835-4303. In Hawai'i, any injuries incidents of disturbance or injury to sea turtles must be immediately reported and must include the name and telephone number of a point of contact, the location of the incident, and nature of the take and/or injury. The incident should also be reported to the NOAA Pacific Islands Regional Office (808-725-5000).
  9. Equipment operators shall employ "soft starts" when initiating work that directly impacts the bottom. Buckets and other equipment shall be sent to the bottom in a slow and controlled manner for the first several cycled before achieving full operational impact strength of tempo.
  10. All objects lowered to the bottom shall be lowered in a controlled manner. This can be achieved through the use of buoyance controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of decent.
  11. Equipment, anchor(s), or materials shall not be deployed in areas containing live corals, seagrass beds, or other significant resources.
  12. For any equipment used in undertaking the authorized work, the 160-decibel (dB) and 120-dB isopleths shall not exceed the 50-yard shut-down range for impulsive and continuous sound sources, respectively.

13. Vessel operators shall alter course to remain at least 100 yards from whales, and at least 50 yards from other marine mammals and sea turtles.
14. Vessel operators shall reduce vessel speed to 10 knots or less when piloting vessels in the proximity of marine mammals, and to 5 knots or less when piloting vessels in areas of known or suspected turtle activity.
15. If approved by a marine mammal or turtle, the vessel operator shall put the engine in neutral and allow the animal to pass.
16. Vessel operators shall not encircle or trap marine mammals or sea turtles between multiple vessels or between vessels and the shore.

### **5.15 Operational Controls**

1. This plan will be reviewed with the project field staff prior to the start of work.
2. All activities impacting the environment will not begin until appropriate BMPs are properly installed.
3. Construction will be immediately stopped, reduced, or modified; and/or new or revised BMPs will be immediately implemented as needed to stop or prevent polluted discharges to receiving waters. New or revised BMPs will be approved by appropriate regulatory agencies prior to re-commencing work.

### **5.16 Structure, Authority, and Responsibility**

1. The Project Manager/Superintendent/Project Engineer will ensure compliance with this plan.
2. The Project Manager/Superintendent/Project Engineer will appoint and train one (1) additional individual to properly install all BMPs and to comply with all aspects of this plan.
3. The Property Owner(s)/Applicant is/are also responsible for compliance with the BMPP.

### **5.17 Training**

1. Employees will be instructed in the proper installation of the BMP materials.
2. BMPs will be covered in a toolbox safety meeting.
3. BMPs will be discussed, as applicable, for each new phase of work.



## **5.18 Inspection and Monitoring**

1. The Project Manager/Superintendent/Project Engineer or the assigned trained individual will conduct a visual inspection of all BMPs daily.
2. All minor repairs and maintenance of the BMPs will be completed within 48 hours of detection. Major repairs of BMPs shall be completed as soon as practical, and in-water work shall be stopped until repairs are complete.
3. If any BMP is damaged, work will immediately be stopped and shall not resume until repairs to the BMP have been completed.

## **5.19 Emergency Procedures**

1. Natural disaster-related pollutant discharge: See Contingency Plan.
2. Spill prevention and control: See Emergency Spill Response Plan.

## **5.20 Record Keeping and Documentation**

1. A copy of this BMPP will be kept on site.
2. All BMP inspection reports will be kept on site.
3. Records of inspection and repair of control measures will be retained in the project files for a minimum of 5 years.

## **5.21 Suspension of Work**

1. Violations of any of the above requirements or any other pollution control requirements which may be specified in the Technical Specifications shall be cause for suspension of the work creating such violation. No additional compensation shall be due to the Contractor for remedial measures to correct the offense. Also, no extension of time will be granted for delays cause by such suspensions.
2. If no corrective action is taken by the Contractor within 72 hours after a suspension is ordered by the Owner, the Owner reserves the right to take whatever action is necessary to correct the situation and to deduct all cost incurred by the Owner in taking such action from monies due to the Contractor.
3. The Owner may also suspend any operations which they fees are creating pollution problems although they may not be in violation of the above-mentioned requirements. In this instance, the work shall be done by force account.

## Section 6: Contingency Plan

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The following plan shall be implemented by the Contractor to prevent/respond to polluted discharges resulting from a severe storm or natural disaster. It is the Contractor's responsibility to abide by the following plan, as well as any other binding plan, agreement regulation, rule, law, or ordinance applicable.

1. All contractors associated with the work will follow this plan when a severe storm is either forecast or anticipated. Contractors must:
  - a. Regularly monitor local weather reports for forecasted and/or anticipated severe storm events, advisories, watches, warning, or alerts. The Contractor shall inspect and document the condition of all erosion control measures on that day prior, during, and after all events. The Contractor shall prepare for forecasted and/or anticipated severe weather events to minimize the potential for polluted discharges.
  - b. Secure the construction site. Securing the site should generally include:
    - i. Removing or securing equipment, machinery, and maintenance materials.
    - ii. Cleaning up all maintenance debris.
    - iii. Implement all BMPs detailed in the BMPP. This includes BMPs for materials management, spill prevention, and erosion and sediment control.
  - c. In the event of a severe weather advisory (hurricanes, tropical storms, natural disasters) or when deemed necessary, cease regular construction operations. Work crews must finalize securing the project site and evacuate until the severe weather condition has passed.
  - d. Upon return to the site, all BMPs shall be inspected, repaired, and/or re-installed as needed. If repair is necessary, it shall be initiated immediately after the inspection, and repairs or replacement will be complete within 24 hours. To facilitate repair or replacement, the Contractor will be required to store surplus material on the project site if the site is located where replacement materials will not be readily available.
  - e. When there either has been a discharge which violates Hawai'i Water Pollution rules and regulations OR there is an imminent threat of a discharge which violates Hawai'i Water Pollution rules and regulations and/or endangers human and/or environmental health, the permittee shall at a minimum execute the following steps:
    - i. Assess whether construction needs to stop or if additional BMPs are needed to stop or prevent a violation.

- ii. Take all reasonable measures to protect human and environmental health.
- iii. Notify responsible parties listed below and immediately notify the DOH of the incident. The notification shall also include the identity of the pollutant sources and the implemented control or mitigation measures.
  1. Donn Kakuda 808-241-4084
  2. Stephen Esaki, Kenney Jenks 808-218-6058
  3. Department of Health
    - a. Clean Water Branch (During regular working hours):  
808-586-4309
    - b. Hawai'i State Hospital Operators (After hours):  
808-247-2191
- iv. Document corrective actions, take photographs of discharge and receiving waters.
- v. Take representative samples of the affected water, as resulted from the discharge(s), and submit analytical reports to the DOH Clean Water Branch.
- vi. Revise BMPP to prevent future discharges of a similar nature.

## **Section 7: Emergency Spill Response Plan**

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### **7.1 Pre-Emergency Planning**

1. An initial and periodic assessment shall be made of the project site and potential hazardous spills that may be encountered during the normal course of work. This plan is not intended to address issues relating to materials such as polychlorinated biphenyl (PCB), Lead, Asbestos, etc. since these types of materials would have specific work plans. No PCB, Lead, or Asbestos materials are anticipated for this work. This plan should be revised as necessary to correspond to the assessment and resubmitted to the appropriate regulatory agencies.
2. A Hazardous Materials inventory list and material safety data sheets (MSDS) to include subcontractor's materials, will be filed in a binder and located in the Project Office. The inventory list and MSDSs will be updated and maintained by the Project Manager and site safety officer as new materials are added.
3. Personnel will consult the applicable MSDS prior to its use.
4. Personnel will handle hazardous materials safely and use personal protective equipment (PPE), recommended/required by the MSDS when handling hazardous materials.
5. Personnel will receive "Hazard Communication" training within 3 working days of arrival and "product specific" training prior to the initial use/exposure of a product. This training will be conducted by the Project Manager/Superintendent or site safety officer.
6. All personnel will be trained on the contents of this plan within the first month of maintenance and at least annually thereafter. The training should include a rehearsal of this plan. An attendance sheet will be kept on file at the Project Office.
7. Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved safety cans or Department of Transportation (DOT)-approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less. For quantities of 1 gallon or less, only the original container or approved metal safety can be used, for storage, use of handling of flammable liquids.
8. Flammable or combustible liquids shall not be stored in areas used for exits, stairways, or normally used for safe passage of people.

### **7.2 Personnel Roles, Lines of Authority, and Communication**

1. Emergency Response Coordinator (ERC)
  - a. The Project Superintendent is the designated ERC. If the Project Superintendent is not available, the safety officer is the designated ERC.

- b. The ERC will be in charge of and will coordinate the appropriate emergency response procedures in this plan.
2. Emergency Response Team (ERT)
  - a. The ERT consists of the Construction General Foreman, Labor Foreman, and a Laborer designated by the Project Superintendent.
  - b. The ERT will appropriately respond to the emergency in accordance with this plan at the direction of the ERC.

### **7.3 Emergency Alerting and Response Procedures**

1. Any person causing or discovering a known hazardous or unknown release or spill will:
  - a. Immediately alert nearby personnel who may be exposed to the effects of the release or spill.
  - b. Report the release or spill immediately to the ERC and the ERT. All pertinent information regarding the release should be provided to the ERC, such as the amount and type of material release, location of the release, and other factors, which may affect the response operation.
  - c. If the spill or release is a petroleum product or known non-toxic chemical, the person will take immediate and appropriate measures to stop or limit the rate of release, (i.e., close the spigot to the drum or form oil or curing compound) and/or contain or stop the migration of the release (i.e., create a berm of dirt around the release) until the ERC and ERT arrive.
  - d. If the spill release is toxic, highly flammable, or unknown chemical, the person will first notify the ERC before approaching the spill area from upwind to determine the source, type, and quantity of the release. The person should monitor the spill until the ERC and ERT arrive.
  - e. The ERC will assess possible hazards to human health or the environment that may result from the release, fire, or explosion.
  - f. IF the spill or release is less than 25 gallons of a known petroleum product or non-toxic chemical, the ERC will direct the ERT to contain and clean up the spill or release.
  - g. If the spill or release is toxic or unknown, the ERC will immediately notify the County of Kaua'i Fire Department and ask for assistance from the HAZMAT Response Team.
  - h. Immediately after the emergency, the ERC will arrange for disposing of the recovered waste, contaminated soil, or any other material that results from the release, fire, or explosion at the project site in accordance with the County of

Kaua'i and State regulations and manufacturer's instruction (if source of spill or release is known).

#### **7.4 Emergency Notification and Reporting Procedures**

1. In the event that a release enters the storm or sewer system, the ERC will immediately notify the National Response Center (NRC) at 1-800-424-8802, the DOH, Hazard Evaluation and Emergency Response Office (HEER) at 1-808-586-4249 and Local Emergency Planning Committee (LEPC) at 808-634-0310 (After hours: 808-241-1711).
2. The ERC will immediately notify the appropriate agencies and submit written follow-up notification in accordance with the Hazardous Substance Release Notification Guideline.

#### **7.5 Safe Distance Staging Area**

1. A staging area at a safe distance upwind and higher than the location of the spill or release and its source will be immediately established.
2. Access to the spill or release location will be cleared for emergency vehicles and equipment to be used to contain and clean up the spill or release.

#### **7.6 Site Security and Control**

1. If the spill or release is located on or near the roadway, stop all traffic until the release is cleaned up.
2. If the spill or release is located away from vehicle or pedestrian traffic, install barricades/safety fencing around the affected area.
3. If the spill or release occurs during night operations, provide adequate light, and use ground guides to escort emergency vehicles to the affected area.

#### **7.7 Evacuation Routes and Procedures**

1. Persons injured during the emergency condition will be evacuated to the staging area where they will be treated and or further evacuated to the nearest medical facility. The appropriate MSDS(s) will be provided to emergency service personal and are intended to be delivered to the emergency room physicians.
2. Persons working in the affected area and who are not needed in the response effort, will report to the staging area for accountability.

#### **7.8 Decontamination and Disposal Procedures**

1. Persons involved in the spill clean-up are required to perform personal hygiene, utilizing soap and fresh water prior to eating, drinking, or smoking.

2. Contaminated PPE shall be appropriately cleaned and disinfected if possible. If this is not possible, it shall be disposed of per the same requirements of the contaminated substance.
3. Sorbent pads/materials and the spilled substance will be placed in appropriate containers and disposed of as specified by the appropriate MSDS.
4. Contaminated soil will be placed in an appropriate container(s) or on plastic sheeting. The ERC will arrange with an environmental service company to properly characterize, prepare the manifest, label the containers, transport, and dispose of the contaminated soil. The generator's copy of the manifest will be kept in the project files for a minimum of 3 years.
5. In the event of the substantial release (25 gallons or more) of a suspected or known toxic chemical, the Fire Department HAZMAT Response Team will be called to control/clean up the release. They will establish and provide the decontamination operations as required.

## **7.9 Emergency Medical Treatment and First Aid**

1. First aid kits will be maintained at the project field office, all company vehicles, and gang boxes.
2. Injured person(s) will be treated at the staging area by a certified first aid trained individual at the project site until the ambulance arrives or they are evacuated to the nearest medical facility.
3. The appropriate MSDS(s) will be provided to emergency service personnel and are intended to be delivered to the emergency room physicians.

## **7.10 After the Spill Procedures**

1. The ERC will review what happened and implement changes and/or corrections to prevent a spill from occurring and to improve the spill response and clean-up procedures. This plan will be revised to reflect the changes, corrections, and/or improvements implemented.
2. The ERC will prepare a record of the spill response and keep it in the project files for a minimum of 3 years.
3. The ERC will submit Follow-Up Notification to HEER when required.
4. Spill response kits shall be replenished directly after the emergency.

## 7.11 Emergency Contacts

- |  |              |
|--|--------------|
| 1. National Response Center  | 800-424-8802 |
| 2. Coast Guard Operations Center, Honolulu<br>(Working Hours)  | 808-522-8264 |
| 3. Hawai'i State Department of Health<br><br>Hawai'i Evaluation and Emergency Response (HEER)                          | 808-586-4249 |
| 4. Kaua'i County Fire Department   | 911          |
| 5. In the event that a release enters the storm or sewer system<br>The ERC will immediately notify NRC, HEER, and LEPC | TBD          |
| 6. State Historic Preservation Division  | 808-692-8015 |
| 7. Donald Fujimoto, County of Kaua'i Wastewater Management Division  | 808-241-4083 |
| 8. Stephen Esaki, Kennedy Jenks, Permit Agent  | 808-218-6058 |



## **Attachment 1 – Appendix 2**

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Receiving Water Biological Communities Monitoring Program

**RECEIVING WATER BIOLOGICAL  
COMMUNITIES MONITORING PROGRAM  
FOR THE WAILUA WASTEWATER  
TREATMENT PLANT,  
WAILUA, KAUAI, HAWAII  
2016**

**Prepared for**

**The Division of Wastewater Management  
Department of Public Works, County of Kauai  
Lihue, Kauai, Hawaii**

**by**

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**Submitted  
April 2017**

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## **INTRODUCTION**

National Pollution Discharge Elimination System (NPDES) Permit No. HI 0020257 was issued by the Hawaii State Department of Health (DOH) on November 1, 2013 authorizing discharge from the Wailua Wastewater Treatment Plant to receiving waters in the Pacific Ocean. This permit requires monitoring of biological communities and once every four years in order to determine effects of the discharge with respect to a Zone of Mixing (ZOM). The ZOM is the water area of the Pacific Ocean which lies within a square with boundaries 1,500 feet on a side with Outfall Serial No. 001 bisecting the northwest side of the square (Figure 1). Key components of benthic (bottom-dwelling) communities include stony (hermatypic) and soft corals, benthic algae, motile macroinvertebrates and reef fish. Beginning in 2002, effluent from the Wailua WWTP was used primarily for irrigation of the neighboring Wailua Golf Course. Consequently, the County of Kauai, in consultation with the DOH, discontinued the benthic monitoring between 2003 through 2005, with monitoring commencing again in 2006. Hence there was a four-year hiatus between the 2002 and 2006. Since 2006, discharge from the Wailua ocean outfall has occurred intermittently, thereby requiring benthic monitoring in 2008, 2010, 2012 and 2016. Presented below are the methods and results of the benthic monitoring survey in the vicinity of the Wailua Wastewater Treatment Facility ZOM conducted in December 2016.

## **METHODS**

All fieldwork was conducted on December 23, 2016. Fieldwork was carried out by divers using SCUBA equipment, and working off of a 13-foot boat. Five transect stations were surveyed: Station 1 was located approximately 5 meters (m) to the north of the multipoint diffusers that comprise the ocean outfall; Station 2 was located approximately 5 m to the south of the diffusers; Station 3 was located along the northeastern boundary of the ZOM; Station 4 was located along the southwestern edge of the ZOM. Station 5 was located approximately 200 m to the southwest of the ZOM boundary (Figure 1). Water depth at Transects 1 and 2 was approximately 9 m (29 feet); water depth at Transects 3-5 was approximately 7 m (23 feet). Latitude and longitude of transecting sites as determined by Global Positioning System are shown in Table 1. Station locations replicated as closely as possible the stations established in the monitoring surveys conducted in 1997-2012.

At each of five sampling locations, a 50-m (160-foot) long transect tape was stretched along the bottom. Transect lines were oriented perpendicular to the shoreline. Care was taken to place transects in "random" locations that were not

biased toward either peak or low coral cover. At each transect site, a quadrat frame with dimensions of one m x 0.7 m (3 feet x 2 feet) was sequentially placed over ten random marks on the transect tape so that the tape bisected the long axis of the frame. At each mark a digital color photograph recorded the segment of reef area enclosed by the quadrat frame. Quadrats were photographed with a digital camera fitted with a super-wide angle lens (14 mm, 94° field of view). The camera was mounted on a four-legged frame to ensure exact repeatability of quadrat area. The photographic technique provides excellent resolution of the detail of the benthic structure, to the degree that individual calices of certain corals are distinguishable. A copy of the photographs is included in this report as Appendix A.

In addition to the photo-quadrats, a diver with knowledge of the taxonomy of resident species (S. Dollar) visually estimated the percent cover of corals, algae and bared substrata (i.e., sand, limestone) enclosed within the entire quadrat frame. Sea urchins, and other benthic macro-invertebrates located within the quadrat were also counted. No attempt was made to disturb the substratum to observe organisms, and no attempt was made to identify and enumerate cryptic species dwelling within the reef framework. Only macrofaunal species greater than approximately 1 centimeter were recorded.

Following fieldwork, area coverage of each component of bottom cover in the quadrat photos was determined using an overlay grid divided into 200 equally sized segments. The number of segments of each benthic species and substratum type within each grid are summed to calculate area coverage. Thus, for each transect, there is the equivalent of 2,000 data points. Verification of species identification was performed using the information collected in the field. In addition, field data provided input on small organisms that were not visible in photographs. Thus, the method provides for accurate estimates of abundance of organisms that cover a large percentage of the reef surfaces through photographic coverage, as well as occurrence of very small and/or rare organisms that are not visible in photographs. Few, if any other methods provide for such accurate characterization of both extremes of benthic community structure.

Results of the photo-quadrats and in-situ cover estimates were used to calculate indices of community structure, abundance and distribution (e.g., percent cover, number of species) and species diversity.

The photo-quadrat transect method is a modification of the technique described in Kinzie and Snider (1978), and has been employed in numerous field studies of Hawaiian reef communities (e.g., Dollar 1979, Grigg and Maragos 1974). The method was selected for the Wailua Wastewater Treatment Facility monitoring program because it has proven to be particularly useful for quantifying coverage of attached benthos such as corals and large epifauna (e.g., sea urchins, sea cucumbers) that are components of the communities in the study area. In addition, the method provides a permanent photographic record which can be useful in long-term investigations.

Quantitative assessment of reef fish community structure was conducted in conjunction with the benthic surveys. As the transect tape was laid along the bottom, all fish observed within a band approximately 2 meters (6 ft) wide along the transect path were identified by species name and enumerated. Care was taken to conduct the fish surveys so that the minimum disturbance was created by divers, ensuring the least possible dispersal of fish. Only readily visible individuals were included in the census. No attempt was made to seek out cryptic species or individuals sheltered within the coral. This transect method is an adaptation of techniques described in Hobson (1974). In addition, any endangered or protected species, particularly sea turtles, that were noted within the survey area were reported.

## **RESULTS AND DISCUSSION**

### General Physiography

Prior to presenting quantitative survey results, it is important to describe the overall setting of the marine environment in the survey region. The shoreline in the area is composed of sandy beaches grading into a shallow, gently sloping nearshore limestone reef platform. Bisecting the limestone platform are numerous sand-filled channels or grooves that are oriented primarily perpendicular to the shoreline. Owing to the orientation of the shoreline (facing northeast) the area is directly impacted by northeasterly tradewind seas. In addition, refracting long period swells from the south and north also generate breaking surf on the nearshore reef platform. As a result, the nearshore area is generally under near constant impact from wave stress, which is an important factor in regulating the composition of the benthic communities.

The area where the Wailua ocean outfall diffuser is located is somewhat

anomalous from the majority of the nearshore area of the coastline off eastern Kauai. The multiport diffuser is located at the bottom of a trench at a depth of approximately 9 m (29 feet). Immediately to the northeast of the diffusers, a near vertical limestone cliff rises to a depth of approximately 2 m (8 feet) and terminates in a flat reef bench. The face of the cliff is cut with numerous undercuts and fissures, providing a good habitat for fish, and large mixed species schools of surgeonfish have been observed in the past near the cliff face. To the southwest of the diffuser, bottom topography is different than to the north, as no steep cliff face occurs. Rather, the bottom consists of a gently sloping flat limestone platform that is predominantly covered by a layer of sand. The outfall pipe is partially buried in a trench covered with a layer of armor stone that extends from the shoreline to the diffuser location. At the diffuser site, the bottom consists of a bed of sand from which the diffuser ports extend. The diffusers are elbow shaped ports. During the 2016 survey, only three diffuser ports were visible, with one of these ports almost entirely buried in sand. Effluent was observed discharging from the diffusers during the 2016 survey (Figures 2-4).

The trench where the diffuser is located also serves as a channel where water that is carried toward shore by wave action is returned seaward in a rapidly moving rip current. The velocity of the current resuspends sediment and carries the suspended material, as well as the effluent plumes, seaward. Owing to the suspension of sediment from the rip current, the water column in the vicinity of the diffusers has been very turbid during all surveys to date. However, there was no indication of deposition of organic material on the sand bed surrounding the diffusers. During the 2016 survey, the rip current was especially strong as north swells were impacting the shoreline. The rip was so strong that survey personnel were not able to maintain position to photograph the survey quadrats at transects 1 and 2, and only visual observations of biota were recorded at these sites. As no living corals were present at transects 1 and 2, the lack of photo-documentation does not result in a gap in the data.

During a survey inspection of the diffuser area in April 2012 the entire set of diffusers was covered by a thick layer of sand. Subsequent dredging of the sand re-exposed the diffusers. During the biota survey September 2012 survey, there was no indication that sand movement had resulted in the first stages of re-burial of the diffusers. However, as noted above, in 2016 all but two of the diffusers were located and one of these was nearly completely buried in sand.

## Benthic Community Structure

Table 2 shows percent cover of each species of coral in each quadrat on transects surveyed in December 2016. Table 3 shows total coral cover of each species on each transect, and the calculated mean total coral cover, number of species, species diversity, and standard deviation calculated from the quadrat data for each of the ten surveys conducted from 1998 to 2016. Figure 5 shows histograms of total coral cover and the two most common coral species, *Porites lobata* and *Pocillopora meandrina*, on each transect during each survey year from 1998 to 2016.

Observations of the transect sites and the transect data over the entire 20-year duration of the monitoring program indicates that coral cover is extremely sparse in the region near the diffuser ports (Transects 1-2) (Tables 2-3, Figures 2-5). Bottom cover on Transect 1 consists almost entirely of fossil limestone covered with sediment-bound turf, which Transect 2 consists of the sand floor of the channel where the diffuser ports are located. Coral cover on the fossil limestone consisted only of rare small flat encrustations, primarily of *Porites lobata* and *Palythoa tuberculosa* and isolated small heads of *Pocillopora meandrina*. During the 2006, 2008, 2012 and 2016 surveys, no living corals were encountered on Transect 1. During the surveys prior to 2006, and in 2010 total coral cover ranged from 0.4% to 4.0% on Transect 1. During 2006, 2010, 2012 and 2016, no corals were encountered on Transect 2, while during past surveys coral cover has been between 0.2% to 0.8% on this transect (Table 3). During all surveys, coral cover was the lowest recorded on Transects 1 and 2 compared to the other transects located at the boundaries of, and beyond the ZOM. In addition, motile invertebrates (e.g., sea cucumbers, sea urchins) and benthic frondose algae were consistently absent on transects 1 and 2 during all surveys. While portions of the bared limestone surface were tinged pink from a thin layer of encrusting coralline algae, the majority of the limestone surface was covered with a layer of fine grey-brown sediment.

Coral cover was substantially higher on Transects 3-5 compared to Transects 1-2 during all surveys (Table 2). Transect 3, located at the northeastern boundary of the ZOM, had coral cover of about 10% in 2001, 4% in 2002 through 2010, and cover returning to about 7-10% in 2012 and 2016. The corals with the highest cover at this site were branched hemispherical colonies of *Pocillopora meandrina* and small flat encrustations of *Porites lobata* (Table 3).

During the 2016 survey, as in many previous surveys, coral cover peaked on Transect 4 (21%), located on the southwest boundary of the ZOM. As in most



surveys, coral cover on Transect 5 (16%), located outside, and to the south of the ZOM has been consistently slightly lower than on Transect 4, but higher than on Transects 1-3 (Table 2). The dominant species on Transects 4 and 5 during all surveys were *Pocillopora meandrina*, *Porites lobata*, and *Montipora* spp. During all surveys except in 2012 and 2016, numerous small solitary corals (likely *Cycloseris vaughan* or *Fungia granulosa*) had been observed on Transects 4 and 5. During 2008, numerous small colonies of these solitary corals were observed on every quadrat of Transects 3-5, in numbers far greater than observed in any previous survey. While not as numerous as in 2008, solitary corals were also abundant on Transects 4 and 5 in 2011.

Total coral cover on Transect 4 during the surveys in 1997-2016 ranged from 4.6% to 21.3%; while the range on Transect 5 was 4.3% to 15.9%. Hence, on the transects on the boundaries of the ZOM (3 and 4), there was no indication of an overall decrease in coral cover over time compared with the control transect (5). As such, there is no indication that there are decreases in coral cover that might be a result of effects of the discharge from the Wailua WWTP.

During all surveys, there has been a conspicuous absence of motile macroinvertebrates at any of the transect sites. During the 2010-2016 surveys, no sea urchins were observed within photo-quadrats. In 2008, the only macroinvertebrates to occur on the survey transects were several banded sea urchins (*Echinothrix calamaris*) on Transect 3 and a single collector urchin (*Tripneustes gratilla*) on Transect 1. In the 2001 survey, a single sea cucumber (*Honothuria atra*) was observed within the entire study area.

While the majority of the limestone reef surface on Transects 3-5 was covered with a veneer of algal turf, frondose algae were not abundant on any of the transects. Other than encrusting and branching red coralline algae (primarily *Porolithon* and *Neogoniolithon* spp), the most abundant species was the green calcareous algae *Halimeda opuntia*, which occurred as small clusters on Transects 3-5. Tufts of the blue-green alga *Lyngbya* sp. and were also common on Transects 3-5. During the 2006 survey, tufts of the gold algae *Chrysocystis fragilis* (family Chrysophyta) were also noted on the reef surface of Transects 4 and 5. This species is a gelatinous colonial alga that is found on reef flats throughout the Pacific and reproduces primarily by asexual colony fragmentation (Lobban et al. 1995). In Hawaii, this alga is often observed during the summer months when wave action is minimal, attached to the bases of living coral colonies. The slightest water motion is adequate to dislodge and resuspend the alga from its point of attachment. Usually, *C. fragilis* is removed from the reefs in winter months by surge from long-

period swells and does not re-establish until calm periods in the summer (Dollar and Grigg 2004). The occurrence of the alga on the reefs off Wailua indicates relatively calm conditions prior to the survey in October 2006. However, there were no observations of *C. fragilis* during the 2008-2016 surveys.

### Reef Fish Community Structure

Results of transect counts of fish are presented in Table 4. A total of 502 individuals representing 28 species were noted on the five transects. On individual transects, the highest number of individuals (187) and species (28) Transect 4. The predominant reef fish in the vicinity of the Wailua Ocean Outfall consisted of several groups. In past surveys, large mixed schools of surgeonfish were abundant near the vertical wall adjacent to Transect 1, consisting predominantly of the ringtail surgeonfish (pualu, *A. blochii*), the brown surgeonfish (ma'i'i'i, *A. nigrofuscus*), the orangeband surgeonfish (na'ena'e, *A. olivaceus*, and the whitebar surgeonfish, maikiko, *A. leucopareius*) and the goldring surgeonfish (kole, *Ctenochaetus strigosus*), and the unicornfish (*Naso unicornis*). During past surveys, large schools of nenuue (*Kyphosus bigibbus*) were observed near the wall, but were not present during the 2008-2016 surveys. Other common fish that have been consistently observed near the vertical wall adjacent to the sewage diffusers are from the families Labridae (hinalea lauwili, *Thallosoma duperrey*), and Mullidae (weke or goat fish, *Mulloides flavolineatus*).

On Transects 2, reef fish abundance was lowest of all sites, primarily as a result of the absence of the vertical rock wall or any other form of vertical relief on the sand-covered bottom. The same pattern of reduced fish abundance on Transect 2 has been consistent through all surveys of the Wailua WWTP ZOM. The flat bottom was relatively devoid of fish with only 2 individuals observed in 2010 and none in 2012 and 2016. Fish abundance was higher on Transects 3-5 with most individuals noted in the vicinity of holes, fissures and coral mounds on the reef platform.

These results in 2016 indicate that fish abundance is highest in the same area where living coral cover, as the highest fish abundance has occurred in an area of low coral cover was highest. The peak abundance of fish at Transect 4 appears to be a result of the increased substratum complexity created by the undercuts and holes on the reef which provide a sheltered habitat for fish. There were no apparent factors why the schools of fish were not observed on Transect 1 from 2010 to 2016.

No green sea turtles or other endangered or threatened species were observed underwater or on the surface during the entire 2016 survey.

## **SUMMARY**

Five quantitative line transects established in December 1997 in the vicinity of the Wailua Wastewater Treatment Facility ocean outfall were evaluated for a eleventh time in December 2016. Two transects are located at a depth of approximately 9 m, parallel to the outfall diffuser section. Two transects were located along the boundaries of the ZOM, and one transect was located approximately 200 m southwest of the edge of the ZOM. The transects at the edge and beyond the ZOM were located on the relatively flat limestone platform that typifies the nearshore reef off of Wailua.

Results of benthic transect surveys in 2016 revealed no living corals on Transects 1 and 2, both of which are located adjacent to the outfall diffusers. The lack of coral cover is not likely a result of effluent discharge, as there has been only limited effluent discharge over the past year. Rather, lack of coral cover is a function of the observed burial of the area with a thick layer of sand that has been dredged to re-expose the diffuser ports. In addition, the extremely harsh physical conditions in that area of the diffusers in the form of extreme sediment resuspension and scour are factors that would limit or prevent coral settlement and growth. Coral cover of the reef surface at the northeastern boundary of the ZOM (Transect 3) was approximately 7%. At the two transect sites to the southwest of the diffuser (Transects 4 and 5), coral cover was higher (21% and 16%, respectively) than northeast of the diffuser. The consistently lower coral cover to the north of the diffuser may be a result of closer proximity to discharge from the Wailua River.

When results of the entire monitoring program are examined for Transects 4 and 5, it is apparent that there is a cyclical pattern of sequentially increasing and decreasing cover over time (Figure 5). During the years 1997-1999 coral cover is relatively high, followed by a substantial depression in 2000, increasing values to 2002-2006, and another overall decrease in 2008-2010. Coral cover again increased during the 2012 and 2016 surveys. Such a pattern may reflect the varying magnitude of wave stress and associated cycle of coral damage and recovery over time. As discharge from the outfall was intermittent following periods of heavy rains and emergencies between 2002-2006, and coral cover

increased during this period, it appears that the discharge had no negative effect on coral community structure.

Motile invertebrates and frondose benthic algae have been scarce at the transect sites adjacent to the diffuser throughout the course of monitoring. The near absence of motile invertebrates is likely a result of the extremely vigorous wave forces that are a near constant condition of the area. Such wave forces produce both significant concussive forces and high levels of abrading suspended sediment which make the habitat unsuitable for colonization of most benthic organisms.

In 2016 reef fish abundance corresponded with coral cover, as the highest abundance of fish occurred on Transects 4 and 5, where coral cover is highest. In past surveys, high numbers of fish, notably mixed schools of surgeonfish have been observed on the vertical face adjacent to Transect 1, presumable as a result of increased substratum complexity created by the vertical cliff face that was unique to the region immediately to the north of the diffuser. These schools of fish were not observed during the 2010-2016 surveys.

Observations of the diffusers indicate that there is no evidence of deposition of sewage material on the reef surface. The high degree of water motion, created by a seaward flowing rip has been a consistent feature of the area during all surveys to date, rapidly dilutes and disperses the effluent.

While the effluent discharge cannot be unequivocally eliminated as a factor in the lack of benthos, particularly corals, in the vicinity of the diffusers, other environmental factors must also be considered. The primary factor appears to be a seaward flowing rip current of highly turbid water and suspended sediment that continually flows offshore through the gap in the reef where the diffusers are located. As most of the reef flat is very shallow, one of the only avenues of seaward return from the surf zone is through the channel occupied by the outfall. The turbid water in the rip is likely a result of resuspension of particulate material (sand) in the inner surf zone. Previous removal of a layer of sand that completely buried the diffuser ports, and recent observations of partial burial of the diffusers, corroborates that extensive quantities of suspended sediment move through the gap in the reef where the outfall discharges are located.

There was no visual indication of any disease or pathological abnormalities with any of the biota or fish in the area of the discharge.

In conclusion, results of the eleventh benthic monitoring survey over a 20-year period indicates that there are not any impacts to the marine environment resulting from discharge of effluent from the Wailua Wastewater Treatment Plant. The reasons for lack of impact are: 1) the natural rigor of the area from water movement (currents and wave impact) and sediment scour and deposition prevents the establishment of benthic communities; 2) the discharged effluent is entrained in a freshwater plume that rises and is rapidly dispersed by wave and current action with minimal or no contact with the ocean floor; 3) fish communities have generally been similar or higher at one of the stations closest to the diffusers compared to other survey sites, suggesting that some effects of the discharge might be considered as positive, rather than negative.



April 11, 2017

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Principal Investigator  
Steven Dollar, PhD.

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Date

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FIGURE 1. Aerial photograph of ocean off of Wailua Wastewater Treatment Plant on eastern shoreline of the Island of Kauai showing locations of five biological monitoring survey stations. Stations 1 and 2 are located adjacent to the ocean outfall diffusers; Stations 3 and 4 are located on the northern and southern boundaries of the Zone of Mixing, and Station 5 is a control station south of the Zone of Mixing.

TABLE 1. Latitude and longitude of five biological survey transect stations in the vicinity Wailua Wastewater Treatment Plant. For locations of transect sites, see Figure

| TRANSECT | Latitude<br>(north) |         | Longitude<br>(west) |         |
|----------|---------------------|---------|---------------------|---------|
|          | degree              | minutes | degree              | minutes |
| 1        | 22                  | 02.220  | 159                 | 20.054  |
| 2        | 22                  | 02.220  | 159                 | 20.054  |
| 3        | 22                  | 02.306  | 159                 | 19.990  |
| 4        | 22                  | 02.092  | 159                 | 19.990  |
| 5        | 22                  | 01.889  | 159                 | 19.999  |





FIGURE 2. Photographs of two Wailua Wastewater Treatment Plant ocean diffuser ports discharging effluent taken on December 23, 2016. Second port can be seen faintly in the background. Note difference in sand cover around ports between Figures 4 (2012) and 3-4 (2016).



FIGURE 3. Photographs of partially buried Wailua Wastewater Treatment Plant ocean diffuser ports discharging effluent on December 23, 2016.



FIGURE 4. Photographs of two Wailua Wastewater Treatment Plant ocean diffuser ports discharging effluent taken on September 21, 2012. Note difference in sand cover of the area compared to photos taken in 2016 (Figures 2 and 3).

**TABLE 2. Percent cover of coral species and coralline algae on photo-quadrate transects in the vicinity of the Wailua Wastewater Treatment Plant ocean outfall. For transect site location see Figure 1.**

| TRANSECT SITE:   | Wailua WWTP       | MEAN CORAL COVER  | 0.0 % |     |     |     |     |     |     |     |               |
|------------------|-------------------|-------------------|-------|-----|-----|-----|-----|-----|-----|-----|---------------|
|                  | Transect 1        | STD. DEV.         | 0.0   |     |     |     |     |     |     |     |               |
| DATE:            | December 23, 2016 | SPECIES COUNT     | 0     |     |     |     |     |     |     |     |               |
|                  |                   | SPECIES DIVERSITY | 0.00  |     |     |     |     |     |     |     |               |
| SPECIES          | QUADRAT           |                   |       |     |     |     |     |     |     |     | SPECIES TOTAL |
|                  | 1                 | 2                 | 3     | 4   | 5   | 6   | 7   | 8   | 9   | 10  |               |
|                  |                   |                   |       |     |     |     |     |     |     |     | 0.0           |
| QUAD CORAL TOTAL | 0                 | 0                 | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0.0           |
| Calcareous algae |                   |                   |       |     |     |     |     |     |     |     | 0.0           |
| Limestone/turf   | 75                | 75                | 75    | 75  | 75  | 75  | 75  | 75  | 75  | 75  | 75.0          |
| Sand             | 25                | 25                | 25    | 25  | 25  | 25  | 25  | 25  | 25  | 25  | 25.0          |
| NON-CORAL TOTAL  | 100               | 100               | 100   | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100.0         |

| TRANSECT SITE:   | Wailua WWTP       | MEAN CORAL COVER  | 0.0 % |     |     |     |     |     |     |     |               |
|------------------|-------------------|-------------------|-------|-----|-----|-----|-----|-----|-----|-----|---------------|
|                  | Transect 2        | STD. DEV.         | 0.0   |     |     |     |     |     |     |     |               |
| DATE:            | December 23, 2016 | SPECIES COUNT     | 0     |     |     |     |     |     |     |     |               |
|                  |                   | SPECIES DIVERSITY | 0.00  |     |     |     |     |     |     |     |               |
| SPECIES          | QUADRAT           |                   |       |     |     |     |     |     |     |     | SPECIES TOTAL |
|                  | 1                 | 2                 | 3     | 4   | 5   | 6   | 7   | 8   | 9   | 10  |               |
|                  |                   |                   |       |     |     |     |     |     |     |     | 0.0           |
| QUAD CORAL TOTAL | 0                 | 0                 | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0.0           |
| Calcareous algae |                   |                   |       |     |     |     |     |     |     |     | 0.0           |
| Limestone/turf   |                   |                   |       |     |     |     |     |     |     |     | 0.0           |
| Sand             | 100               | 100               | 100   | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100.0         |
| NON-CORAL TOTAL  | 100               | 100               | 100   | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100.0         |

| TRANSECT SITE:               | Wailua WWTP       | MEAN CORAL COVER  | 8.2 % |     |    |    |    |    |    |    |               |
|------------------------------|-------------------|-------------------|-------|-----|----|----|----|----|----|----|---------------|
|                              | Transect 3        | STD. DEV.         | 7.2   |     |    |    |    |    |    |    |               |
| DATE:                        | December 23, 2016 | SPECIES COUNT     | 5     |     |    |    |    |    |    |    |               |
|                              |                   | SPECIES DIVERSITY | 1.02  |     |    |    |    |    |    |    |               |
| SPECIES                      | QUADRAT           |                   |       |     |    |    |    |    |    |    | SPECIES TOTAL |
|                              | 1                 | 2                 | 3     | 4   | 5  | 6  | 7  | 8  | 9  | 10 |               |
| <i>Porites lobata</i>        | 2                 | 4                 | 1     |     | 1  | 1  | 5  | 1  | 1  | 1  | 1.7           |
| <i>Porites compressa</i>     | 2                 | 1                 |       |     | 2  |    |    | 2  |    |    | 0.7           |
| <i>Pocillopora meandrina</i> |                   | 8                 | 4     |     | 3  | 8  | 12 | 18 |    |    | 5.3           |
| <i>Montipora patula</i>      |                   |                   |       |     |    |    |    | 1  |    |    | 0.1           |
| <i>Palythoa tuberculosa</i>  |                   | 1                 | 2     |     |    |    |    | 1  |    |    | 0.4           |
| QUAD CORAL TOTAL             | 4                 | 14                | 7     | 0   | 6  | 9  | 18 | 22 | 1  | 1  | 8.2           |
| Calcareous algae             | 10                | 6                 | 10    |     | 9  | 12 | 11 |    | 1  |    | 5.9           |
| Limestone/turf               | 86                | 80                | 83    | 100 | 85 | 79 | 71 | 78 | 98 | 99 | 85.9          |
| Sand                         |                   |                   |       |     |    |    |    |    |    |    | 0.0           |
| NON-CORAL TOTAL              | 96                | 86                | 93    | 100 | 94 | 91 | 82 | 78 | 99 | 99 | 91.8          |

| TRANSECT SITE:               | Wailua WWTP       | MEAN CORAL COVER  | 21.3 % |    |    |    |    |    |    |    |               |
|------------------------------|-------------------|-------------------|--------|----|----|----|----|----|----|----|---------------|
|                              | Transect 4        | STD. DEV.         | 8.9    |    |    |    |    |    |    |    |               |
| DATE:                        | December 23, 2016 | SPECIES COUNT     | 5      |    |    |    |    |    |    |    |               |
|                              |                   | SPECIES DIVERSITY | 1.25   |    |    |    |    |    |    |    |               |
| SPECIES                      | QUADRAT           |                   |        |    |    |    |    |    |    |    | SPECIES TOTAL |
|                              | 1                 | 2                 | 3      | 4  | 5  | 6  | 7  | 8  | 9  | 10 |               |
| <i>Porites lobata</i>        | 16                | 16                | 2      | 3  |    | 4  | 16 | 2  | 19 | 1  | 7.9           |
| <i>Pocillopora meandrina</i> | 2                 | 17                | 26     | 11 | 11 | 4  |    | 9  | 2  | 5  | 8.7           |
| <i>Porites compressa</i>     | 1                 | 2                 |        |    | 1  |    |    |    |    | 2  | 0.6           |
| <i>Montipora patula</i>      |                   | 1                 | 1      | 8  |    |    |    | 23 |    |    | 3.3           |
| <i>Palythoa tuberculosa</i>  |                   |                   | 1      |    | 1  | 6  |    |    |    |    | 0.8           |
| QUAD CORAL TOTAL             | 19                | 36                | 30     | 22 | 13 | 14 | 16 | 34 | 21 | 8  | 21.3          |
| Calcareous algae             | 5                 | 2                 | 3      | 13 | 6  | 8  | 2  |    |    | 1  | 4.0           |
| Limestone/turf               | 76                | 62                | 67     | 65 | 81 | 78 | 82 | 66 | 79 | 91 | 74.7          |
| Sand                         |                   |                   |        |    |    |    |    |    |    |    | 0.0           |
| NON-CORAL TOTAL              | 81                | 64                | 70     | 78 | 87 | 86 | 84 | 66 | 79 | 92 | 78.7          |

| TRANSECT SITE:               | Wailua WWTP       | MEAN CORAL COVER  | 15.9 % |    |    |    |    |    |    |    |               |
|------------------------------|-------------------|-------------------|--------|----|----|----|----|----|----|----|---------------|
|                              | Transect 5        | STD. DEV.         | 15.0   |    |    |    |    |    |    |    |               |
| DATE:                        | December 23, 2016 | SPECIES COUNT     | 5      |    |    |    |    |    |    |    |               |
|                              |                   | SPECIES DIVERSITY | 1.24   |    |    |    |    |    |    |    |               |
| SPECIES                      | QUADRAT           |                   |        |    |    |    |    |    |    |    | SPECIES TOTAL |
|                              | 1                 | 2                 | 3      | 4  | 5  | 6  | 7  | 8  | 9  | 10 |               |
| <i>Porites lobata</i>        | 3                 | 2                 |        | 20 | 4  | 4  | 4  | 6  |    | 3  | 4.6           |
| <i>Porites compressa</i>     |                   |                   | 1      |    | 2  |    | 5  |    |    |    | 0.8           |
| <i>Pocillopora meandrina</i> |                   | 23                | 6      | 17 | 4  | 2  | 6  | 5  |    | 5  | 6.8           |
| <i>Montipora patula</i>      |                   | 2                 | 12     | 18 |    |    |    |    | 1  | 3  | 3.6           |
| <i>Palythoa tuberculosa</i>  |                   |                   | 1      |    |    |    |    |    |    |    | 0.1           |
| QUAD CORAL TOTAL             | 3                 | 27                | 20     | 55 | 10 | 6  | 15 | 11 | 1  | 11 | 15.9          |
| Calcareous algae             |                   | 16                | 5      |    | 3  | 2  | 14 | 1  | 4  | 10 | 5.5           |
| Limestone/turf               | 97                | 57                | 75     | 45 | 87 | 92 | 51 | 88 | 95 | 79 | 76.6          |
| Sand                         |                   |                   |        |    |    |    | 20 |    |    |    | 2.0           |
| NON-CORAL TOTAL              | 97                | 73                | 80     | 45 | 90 | 94 | 85 | 89 | 99 | 89 | 84.1          |

TABLE 3. Percent cover of coral, non-coral substratum, and coral community statistics on transects in the vicinity of the Wailua Wastewater Treatment Plant Ocean Outfall for ten surveys conducted from 1998 to 2016 (surveys were not conducted in 2003, 2004, 2005, 2007, 2009 and 2010). For locations of transects, see Figure 1.

| TRANSECT 1                   | SURVEY MONTH-YEAR |       |       |       |       |       |       |       |       |       |
|------------------------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                              | 10-98             | 09-99 | 11-00 | 05-01 | 09-02 | 10-06 | 10-08 | 02-11 | 09-12 | 12-16 |
| <i>Porites lobata</i>        | 0.3               | 0.5   | 0.2   | 0.2   |       |       |       | 0.4   |       |       |
| <i>Pocillopora meandrina</i> |                   |       |       | 0.6   | 2.3   |       |       |       |       |       |
| <i>Montipora patula</i>      |                   | 0.2   | 0.3   |       | 1.7   |       |       |       |       |       |
| <i>Palythoa tuberculosa</i>  | 0.1               |       | 0.1   |       |       |       |       |       |       |       |
| TOTAL CORAL COVER            | 0.4               | 0.7   | 0.6   | 0.8   | 4.0   | 0.0   | 0.0   | 0.4   | 0.0   | 0.0   |
| NUMBER OF SPECIES            | 2.0               | 2.0   | 3.0   | 2.0   | 2.0   | 0.0   | 0.0   | 1.0   | 0.0   | 0.0   |
| CORAL COVER DIVERSITY        | 0.56              | 0.6   | 1.01  | 0.56  | 0.68  | 0     | 0     | 0     | 0     | 0     |
| ST. DEV.                     | 0.70              | 0.80  | 0.70  | 1.00  | 4.30  | 0.00  | 0.00  | 0.00  | 0.00  |       |
| NON-CORAL SUBSTRATA          |                   |       |       |       |       |       |       |       |       |       |
| Calcareous algae             | 17.3              | 11.4  | 25.6  | 20.4  | 42.5  | 4.7   | 0.9   | 0     | 0     | 0     |
| Algal turf/limestone         | 49.3              | 62.7  | 41.6  | 62.4  | 49    | 53    | 32.8  | 70.6  | 69.6  | 80    |
| Sand                         | 25.1              | 24.7  | 32.8  | 17.2  | 4.5   | 42.3  | 66.3  | 29    | 29.3  | 20    |
| Rubble                       | 7.9               | 0.5   |       |       |       |       |       |       |       |       |

| TRANSECT 2                   | SURVEY MONTH-YEAR |       |       |       |      |       |       |       |       |       |
|------------------------------|-------------------|-------|-------|-------|------|-------|-------|-------|-------|-------|
|                              | 10-98             | 09-99 | 11-00 | 05-01 | 9-02 | 10-06 | 10-08 | 02-11 | 09-12 | 12-16 |
| <i>Porites lobata</i>        | 0.2               | 0.2   | 0.3   | 0.3   |      |       | 0.2   |       |       |       |
| <i>Porites compressa</i>     |                   |       |       | 0.3   |      |       |       |       |       |       |
| <i>Pocillopora meandrina</i> |                   | 0.1   |       |       |      |       |       |       |       |       |
| <i>Montipora patula</i>      |                   |       | 0.2   |       | 0.1  |       |       |       |       |       |
| <i>Palythoa tuberculosa</i>  | 0.3               | 0.1   | 0.1   | 0.1   | 0.1  |       |       |       |       |       |
| TOTAL CORAL COVER            | 0.5               | 0.4   | 0.6   | 0.8   | 0.2  | 0.0   | 0.2   | 0.0   | 0.0   | 0.0   |
| NUMBER OF SPECIES            | 2                 | 3     | 3     | 2     | 2    | 0     | 0     | 0     | 0     | 0     |
| CORAL COVER DIVERSITY        | 0.67              | 1.04  | 1.01  | 1.00  | 0.69 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| ST. DEV.                     | 0.7               | 0.5   | 0.7   | 1.0   | 0.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| NON-CORAL SUBSTRATA          |                   |       |       |       |      |       |       |       |       |       |
| Porolithon                   |                   |       |       |       |      |       |       |       |       |       |
| Calcareous algae             | 3.4               | 6.5   | 25.6  | 20.4  | 4.6  | 3.1   |       |       |       |       |
| Algal turf/limestone         | 26.7              | 43.8  | 41.6  | 62.4  | 72.9 | 79.9  | 12.3  | 1     | 19.5  | 0     |
| Sand                         | 35.3              | 39.3  | 32.8  | 17.2  | 22.5 | 17.0  | 87.7  | 99.0  | 80.5  | 100.0 |
| Rubble                       | 34.1              | 10.0  |       |       |      |       |       |       |       |       |

| TRANSECT 3                    | SURVEY MONTH-YEAR |       |       |       |       |       |       |       |       |       |
|-------------------------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                               | 10-98             | 09-99 | 11-00 | 05-01 | 09-02 | 10-06 | 10-08 | 02-11 | 09-12 | 12-16 |
| <i>Porites lobata</i>         | 2.1               | 1.9   | 1.4   | 2.0   | 1.1   | 1.3   | 1.4   | 2.0   | 1.5   | 1.7   |
| <i>Porites compressa</i>      | 0.9               |       |       | 0.3   | 0.1   | 0.3   |       |       | 0.9   | 0.7   |
| <i>Pocillopora meandrina</i>  | 1.2               | 0.6   | 0.8   | 5.6   | 3.0   | 2.1   | 2.3   | 1.7   | 5.6   | 5.3   |
| <i>Montipora patula</i>       |                   | 0.1   | 0.4   | 2.4   |       | 0.9   |       | 0.3   | 1.7   | 0.1   |
| <i>Montipora capitata</i>     |                   |       |       | 0.1   |       |       |       |       | 0.3   |       |
| <i>Palythoa tuberculosa</i>   |                   | 0.3   | 0.1   | 0.1   |       | 0.1   |       |       | 0.2   | 0.4   |
| <i>Cycloseris vaughani</i>    |                   |       |       |       |       |       | 0.6   |       |       |       |
| <i>Pocillopora damicornis</i> |                   |       |       |       |       |       |       | 0.1   |       |       |
| TOTAL CORAL COVER             | 4.2               | 2.9   | 2.7   | 10.5  | 4.2   | 4.7   | 4.4   | 4.2   | 10.2  | 8.2   |
| NUMBER OF SPECIES             | 3                 | 4     | 3     | 2     | 3     | 5     | 4     | 5     | 6     | 5     |
| CORAL COVER DIVERSITY         | 1.0               | 0.95  | 1.01  | 1.03  | 0.59  | 1.29  | 0.97  | 1.09  | 1.3   | 1.02  |
| ST. DEV.                      | 3.4               | 3.6   | 0.7   | 1     | 4.5   | 3.7   | 3.5   | 3.1   | 9.2   | 7.2   |
| NON-CORAL SUBSTRATA           |                   |       |       |       |       |       |       |       |       |       |
| Calcareous algae              |                   |       | 25.6  | 20.4  |       | 3.8   | 3.2   | 0.9   | 10.3  | 5.9   |
| Algal turf/limestone          | 95.8              | 79.9  | 41.6  | 62.4  | 86.2  | 76.4  | 90.9  | 94.9  | 79.0  | 85.9  |
| Sand                          |                   | 17.2  | 32.8  | 17.2  | 10.3  | 15.1  |       |       | 0.5   |       |

| TRANSECT 4                   | SURVEY MONTH-YEAR |       |       |       |       |       |       |       |       |       |
|------------------------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                              | 10-98             | 09-99 | 11-00 | 05-01 | 09-02 | 10-06 | 10-08 | 02-11 | 09-12 | 12-16 |
| <i>Porites lobata</i>        | 3.7               | 4     | 1.3   | 2.4   | 1.2   | 4.9   | 3.3   | 4.3   | 8.6   | 7.9   |
| <i>Porites compressa</i>     | 1.1               | 1.9   | 0.5   | 0.4   |       | 0.0   | 0.2   | 0.9   | 1.8   | 0.6   |
| <i>Pocillopora meandrina</i> | 2.4               | 3.0   | 2.4   | 13.3  | 10.2  | 6.1   | 7.3   | 2.3   | 3.0   | 8.7   |
| <i>Pocillopora eydouxi</i>   |                   |       |       |       | 4.7   |       | 1.5   |       |       |       |
| <i>Montipora patula</i>      | 0.9               | 1.8   | 0.2   | 0.2   | 3.6   | 4.6   |       | 0.9   | 4.6   | 3.3   |
| <i>Montipora capitata</i>    | 0.1               |       |       |       |       | 1.0   |       | 0.5   |       |       |
| <i>Montipora flabellata</i>  |                   |       |       | 0.3   |       |       |       |       |       |       |
| <i>Fungia scutaria</i>       |                   |       | 0.1   |       |       |       |       |       |       |       |
| <i>Palythoa tuberculosa</i>  | 0.3               | 0.2   |       |       |       | 0.1   | 0.5   |       |       | 0.1   |
| <i>Cycloseris vaughani</i>   |                   |       |       |       |       |       |       | 0.6   | 0.6   |       |
| <i>Psammocora stellata</i>   |                   |       |       |       |       |       |       | 0.1   | 0.2   |       |
| TOTAL CORAL COVER            | 8.5               | 10.9  | 4.5   | 16.6  | 19.8  | 16.1  | 14.0  | 9.7   | 18.1  | 21.3  |
| NUMBER OF SPECIES            | 6                 | 5     | 5     | 5     | 5     | 5     | 7     | 7     | 5     | 5     |
| CORAL COVER DIVERSITY        | 1.39              | 1.40  | 1.01  | 0.80  | 0.85  | 1.28  | 1.34  | 1.33  | 1.26  | 1.25  |
| ST. DEV.                     | 3.0               | 6.1   | 0.7   | 1.0   | 12.6  | 6.3   | 10.4  | 3.8   | 9.4   | 8.9   |
| NON-CORAL SUBSTRATA          |                   |       |       |       |       |       |       |       |       |       |
| Calcareous algae             | 2.7               | 0.8   | 25.6  | 20.4  | 2.7   | 7.5   | 7.1   | 8.4   | 8.1   | 4.0   |
| Algal turf/limestone         | 87.7              | 88.3  | 41.6  | 62.4  | 77.5  | 76    | 75.4  | 78.4  | 73.8  | 74.7  |
| Sand                         | 1.1               |       | 32.8  | 17.2  |       |       | 3.5   | 3.5   |       |       |

| TRANSECT 5                   | SURVEY MONTH-YEAR |       |       |       |       |       |       |       |       |       |
|------------------------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                              | 10-98             | 09-99 | 11-00 | 05-01 | 09-02 | 10-06 | 10-08 | 11-02 | 09-12 | 12-16 |
| <i>Porites lobata</i>        | 5.9               | 3.3   | 2.1   | 0.8   | 5.1   | 2.6   | 3.9   | 5.9   | 6.6   | 4.6   |
| <i>Porites compressa</i>     | 0.2               | 0.3   | 0.6   | 0.4   | 0.4   | 0.8   | 0.8   | 1.2   | 0.8   | 0.8   |
| <i>Pocillopora meandrina</i> | 9.2               | 4.5   | 0.3   | 10.8  | 5.2   | 7.7   | 4.1   | 1.9   | 3.6   | 6.8   |
| <i>Montipora patula</i>      | 0.4               | 2.8   | 0.8   | 0.2   | 2.7   | 2.5   | 0.3   | 0.9   | 2.7   | 3.6   |
| <i>Montipora capitata</i>    |                   |       |       | 0.4   |       |       | 0.2   | 0.2   |       |       |
| <i>Fungia scutaria</i>       |                   |       | 0.1   | 0.3   |       | 0.1   |       |       |       |       |
| <i>Palythoa tuberculosa</i>  |                   | 0.2   |       | 0.1   | 0.1   | 0.3   |       |       | 0.4   | 0.1   |
| <i>Pavona varians</i>        |                   |       |       |       |       |       |       |       |       |       |
| <i>Pavona duerdeni</i>       | 0.1               |       |       |       |       |       |       |       |       |       |
| <i>Cycloseris vaughani</i>   |                   |       |       |       |       |       | 0.7   | 0.5   |       |       |
| TOTAL CORAL COVER            | 15.8              | 11.1  | 4.3   | 12.6  | 13.7  | 14.0  | 10.0  | 10.6  | 13.3  | 15.9  |
| NUMBER OF SPECIES            | 5                 | 5     | 6     | 6     | 6     | 6     | 6     | 6     | 4     | 5     |
| CORAL COVER DIVERSITY        | 0.86              | 1.24  | 1.01  | 0.52  | 1.19  | 1.23  | 1.30  | 1.31  | 1.13  | 1.24  |
| ST. DEV.                     | 5.2               | 11.1  | 0.7   | 1.0   | 8.0   | 7.7   | 7.9   | 4.4   | 8.9   | 15.0  |
| NON-CORAL SUBSTRATA          |                   |       |       |       |       |       |       |       |       |       |
| Calcareous algae             | 17.1              | 4.8   | 25.6  | 20.4  |       | 4.9   | 9.4   | 9.9   | 4.7   | 5.5   |
| Algal turf/limestone         | 67.1              | 84.1  | 41.6  | 62.4  | 86.6  | 81.1  | 80.6  | 79.0  | 80.0  | 76.6  |
| Sand                         |                   |       | 32.8  | 17.2  |       |       | 0.5   | 0.5   | 2.0   | 2.0   |

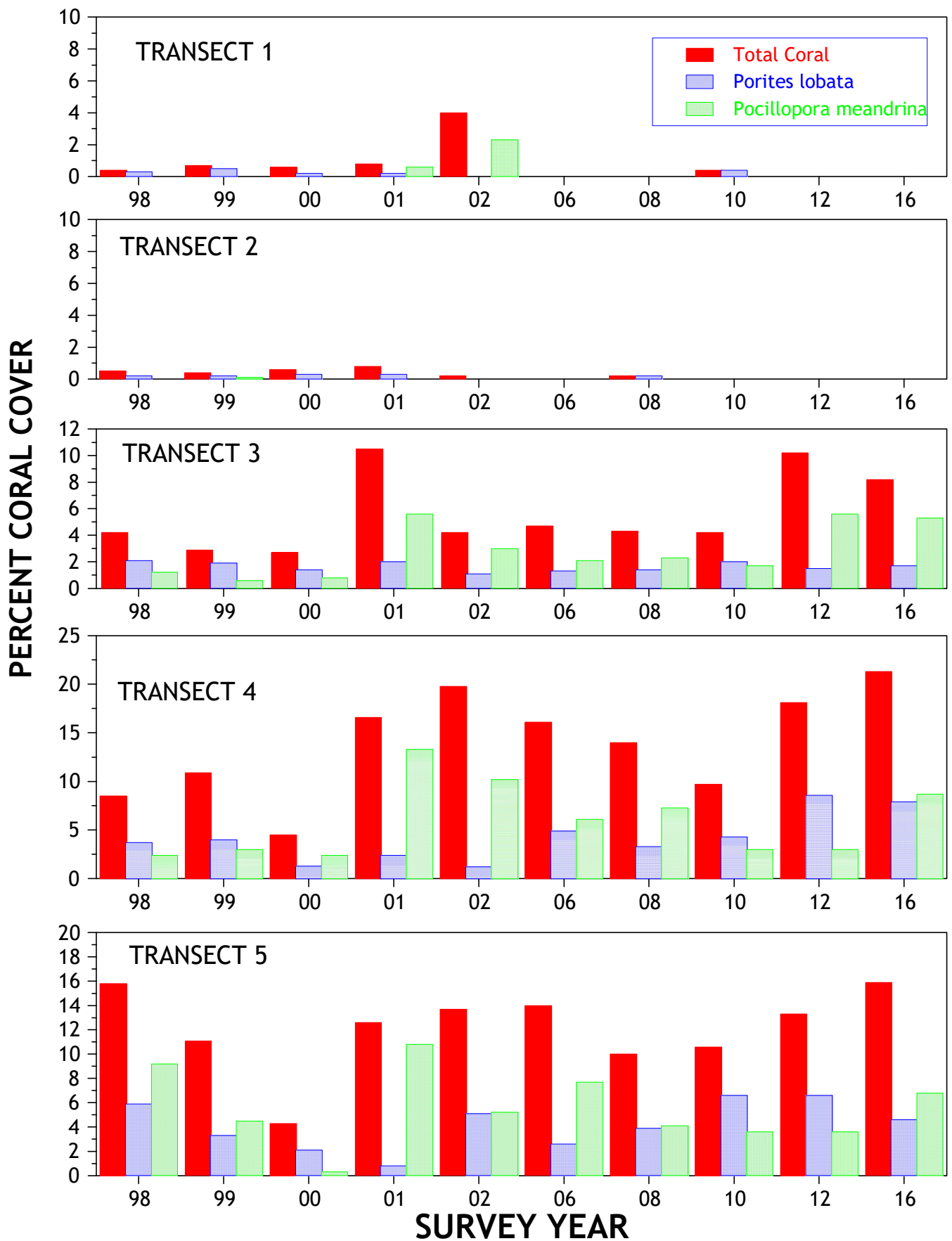
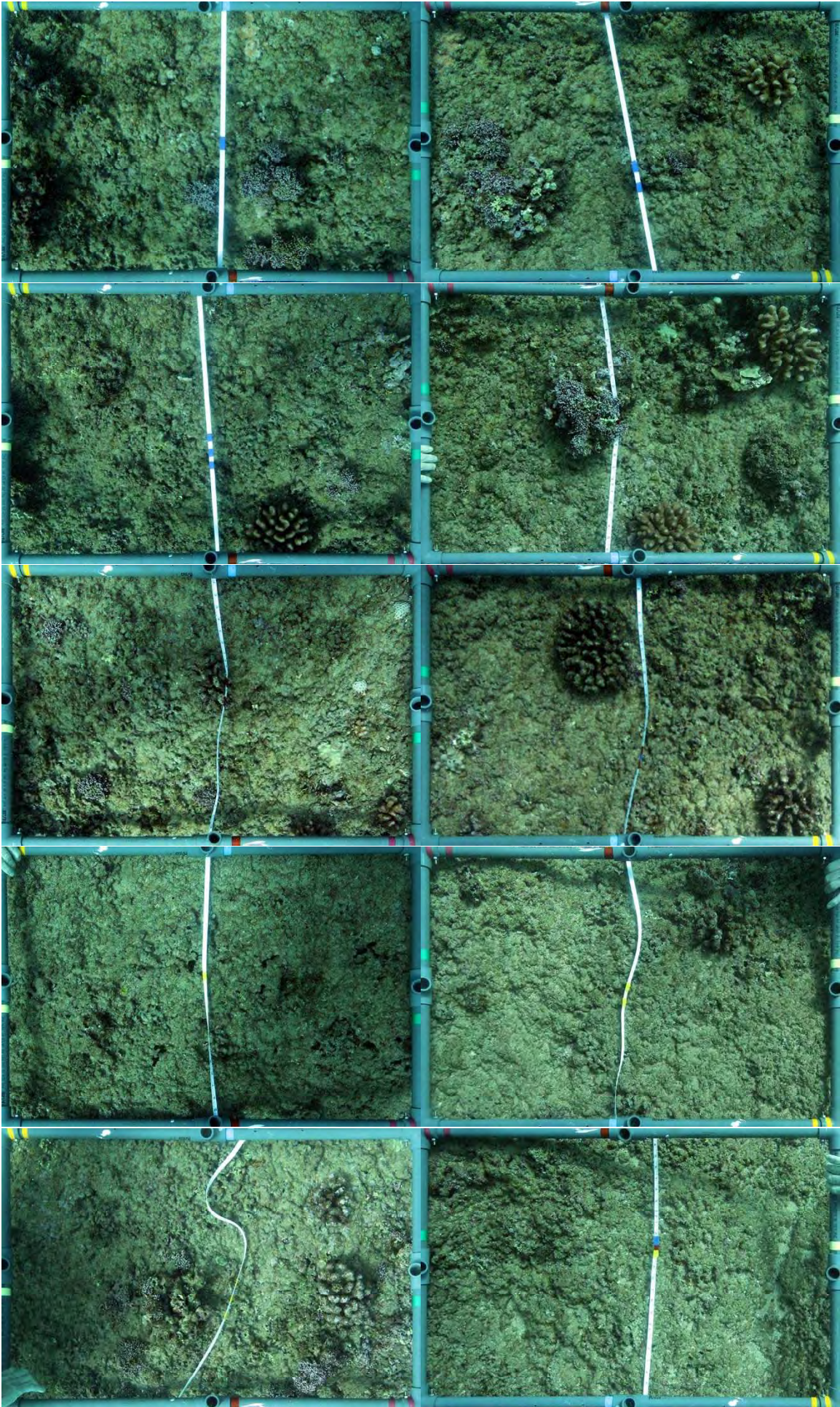


FIGURE 5. Histograms showing percent cover of all corals and two most abundant species (*Porites lobata* and *Pocillopora meandrina*) measured during surveys on transects located in the vicinity of the Wailua Wastewater Treatment Plant Ocean Outfall, Wailua, Kauai, Hawaii. Note differences in vertical scale of percent cover on each transect.

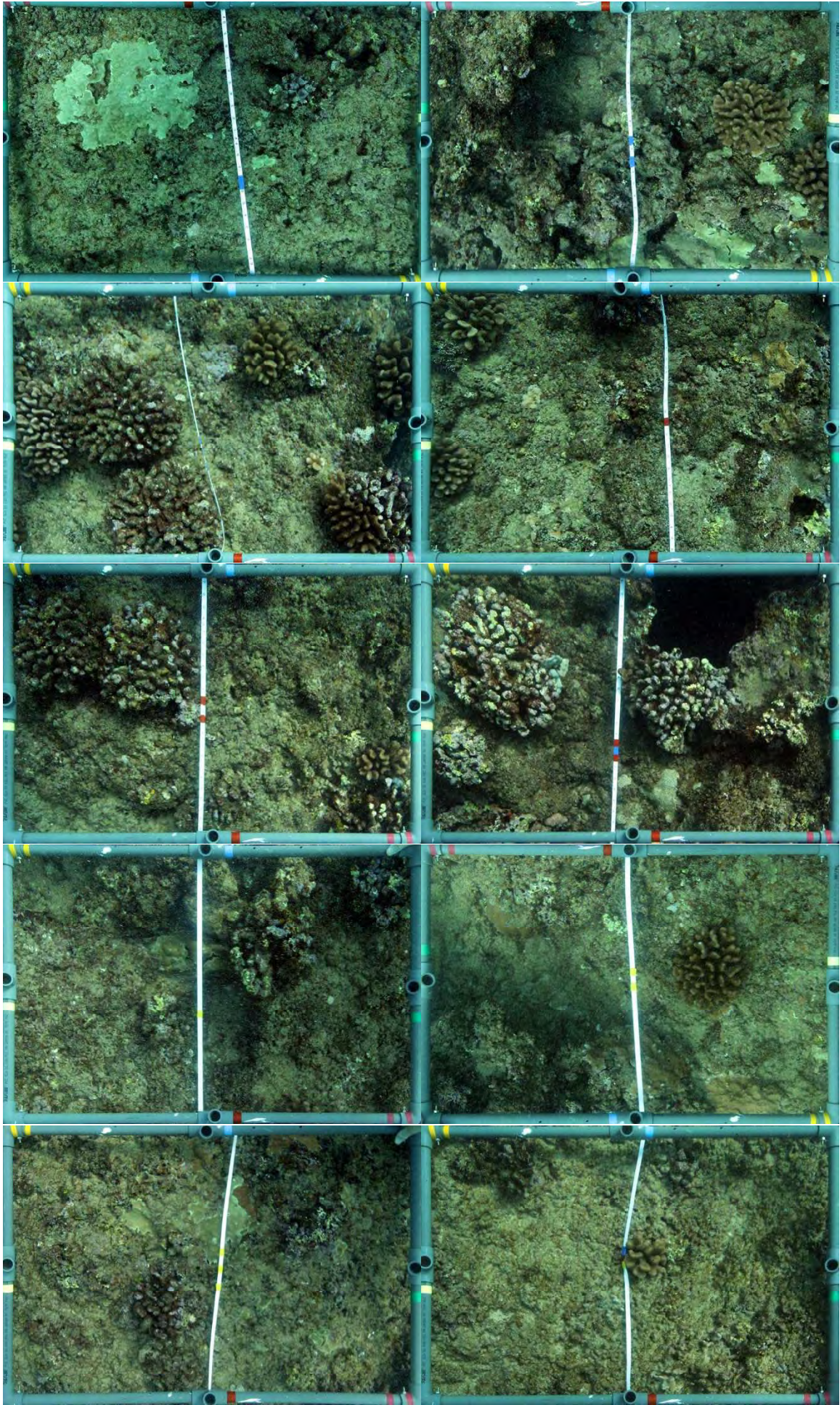
TABLE 4. Reef fish abundance on transects in the vicinity of the Wailua Wastewater Treatment Plant Ocean Outfall, December 23, 2016.

| FAMILY<br>Genus                 | TRANSECT |   |     |     |     |
|---------------------------------|----------|---|-----|-----|-----|
|                                 | 1        | 2 | 3   | 4   | 5   |
| HOLOCENTRIDAE                   |          |   |     |     |     |
| <i>Myripristes berndti</i>      |          |   | 3   | 10  | 3   |
| KYPHOSIDAE                      |          |   |     |     |     |
| <i>Kyphosus bigibbus</i>        |          |   | 1   | 5   |     |
| CIRRHITIDAE                     |          |   |     |     |     |
| <i>Paracurrhites arcatus</i>    |          |   | 6   | 8   | 5   |
| MULLIDAE                        |          |   |     |     |     |
| <i>Mulloides flavolineatus</i>  | 2        |   | 5   | 2   | 5   |
| <i>Mulloides variocolensis</i>  |          |   | 4   | 2   |     |
| CARANGIDAE                      |          |   |     |     |     |
| <i>Caranx melamphygus</i>       |          |   | 1   | 2   | 1   |
| LUTJANIDAE                      |          |   |     |     |     |
| <i>Lutjanus kasmira</i>         |          |   | 10  | 20  | 2   |
| CHAETODONTIDAE                  |          |   |     |     |     |
| <i>Chaetodon miliaris</i>       | 1        |   | 5   | 2   | 6   |
| <i>C. multicinctus</i>          | 2        |   | 6   | 4   | 1   |
| <i>C. quadramaculatus</i>       |          |   | 2   | 2   |     |
| <i>C. lunula</i>                |          |   | 2   |     | 2   |
| <i>C. unimaculatus</i>          |          |   |     |     | 2   |
| POMACENTRIDAE                   |          |   |     |     |     |
| <i>Abudefduf abdominalis</i>    |          |   | 4   | 8   | 5   |
| <i>Stegastes fasciolatus</i>    |          |   | 5   | 10  | 6   |
| <i>Chromis vanderbilti</i>      |          |   | 20  | 25  | 22  |
| <i>C. ovalis</i>                |          |   | 10  | 12  | 10  |
| <i>Dascyllus albisella</i>      |          |   | 12  | 15  | 20  |
| LABRIDAE                        |          |   |     |     |     |
| <i>Bodianus bilunulatus</i>     |          |   | 3   | 2   | 3   |
| <i>Thalassoma duperrey</i>      |          |   | 5   | 5   | 5   |
| SCARIDAE                        |          |   |     |     |     |
| <i>Chlorurus perspicillatus</i> |          |   |     |     |     |
| <i>Scarus spp.</i>              |          |   |     | 1   | 1   |
| ACANTHURIDAE                    |          |   |     |     |     |
| <i>A. triostegus</i>            | 5        |   | 6   | 5   | 4   |
| <i>A. olivaceus</i>             |          |   | 5   | 4   | 4   |
| <i>A. nigrofuscus</i>           | 2        |   | 6   | 6   | 6   |
| <i>Ctenochaetus strigosus</i>   | 4        |   | 6   | 12  | 6   |
| <i>Naso hexacanthus</i>         |          |   | 2   |     | 3   |
| <i>N. unicornis</i>             |          |   | 5   | 5   | 2   |
| <i>N. lituratus</i>             |          |   | 5   | 4   | 3   |
| <i>Zebrasoma flavescens</i>     |          |   | 8   | 8   | 4   |
| BALISTIDAE                      |          |   |     |     |     |
| <i>Melichthys niger</i>         |          |   | 10  | 6   | 5   |
| <i>Rhinecanthus rectangulus</i> |          |   | 1   | 1   | 2   |
| FISTULARIIDAE                   |          |   |     |     |     |
| <i>Aulostoma chinensis</i>      |          |   | 2   | 1   | 1   |
| NUMBER SPECIES                  | 6        | 0 | 29  | 28  | 28  |
| NUMBER INDIVIDUALS              | 16       | 0 | 160 | 187 | 139 |

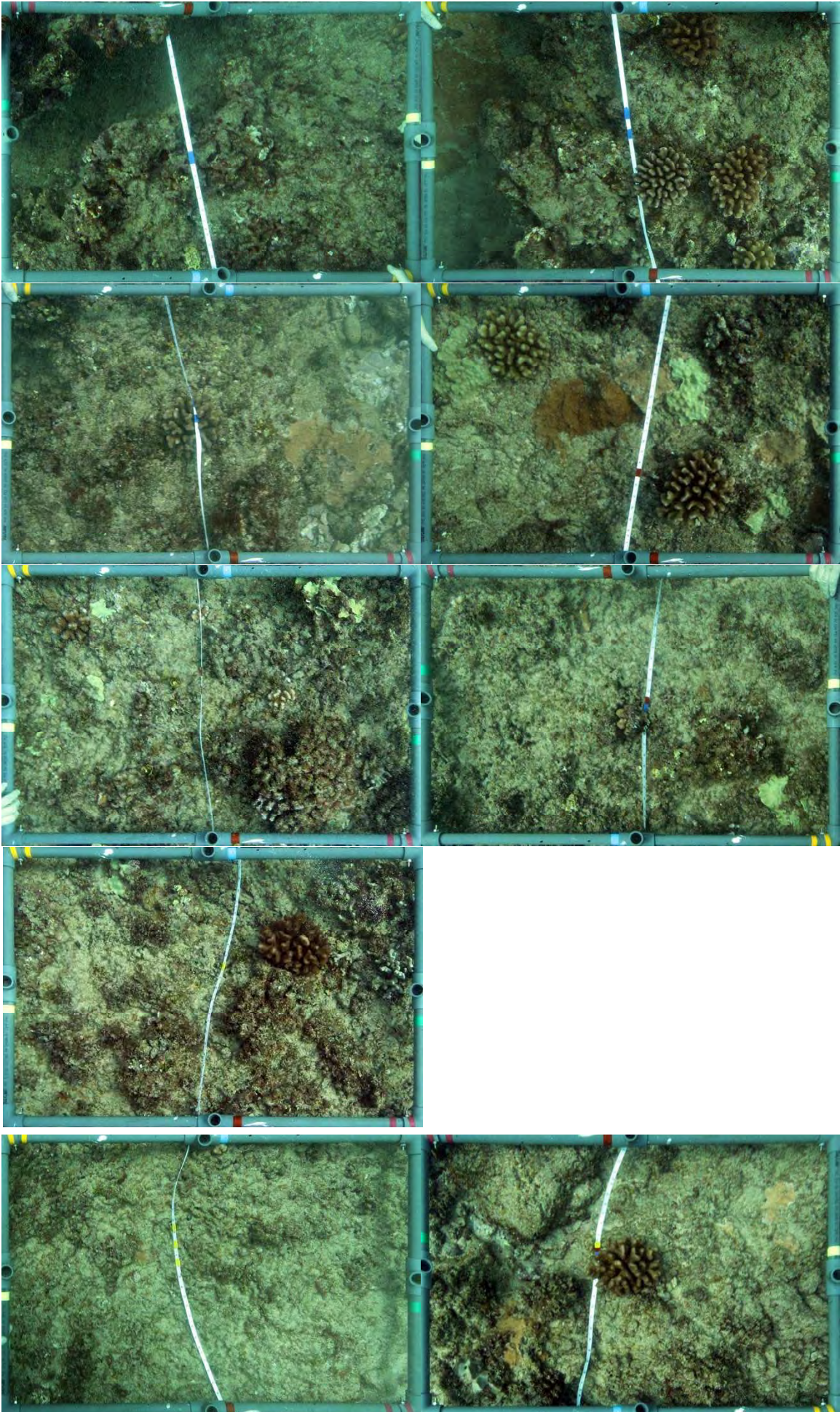


APPENDIX A-1. WAILUA STP - STATION 3 – 2016-12-23





APPENDIX A-2. WAILUA STP - STATION 4 – 2016-12-23

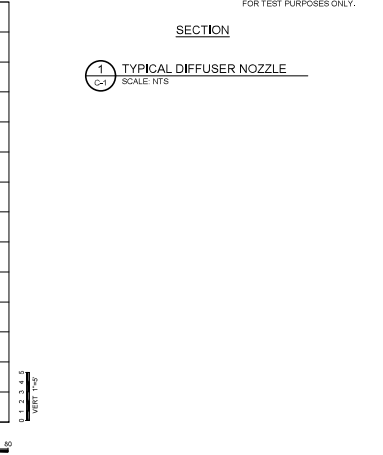
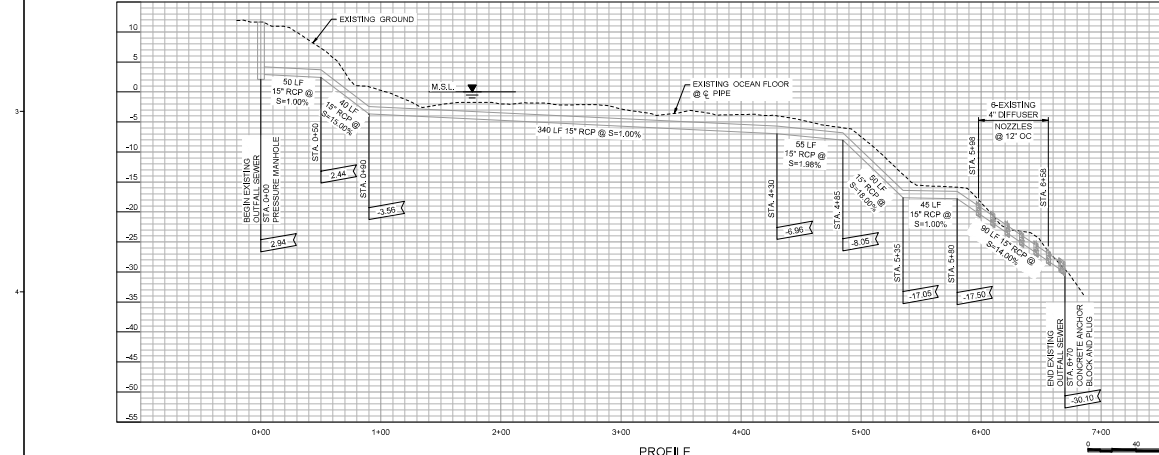
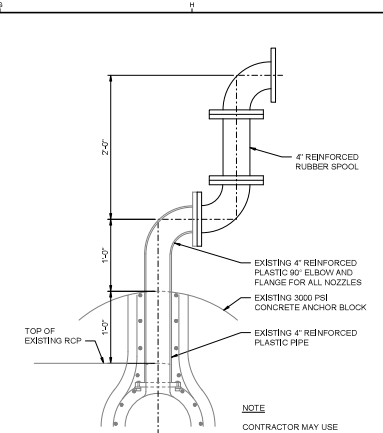
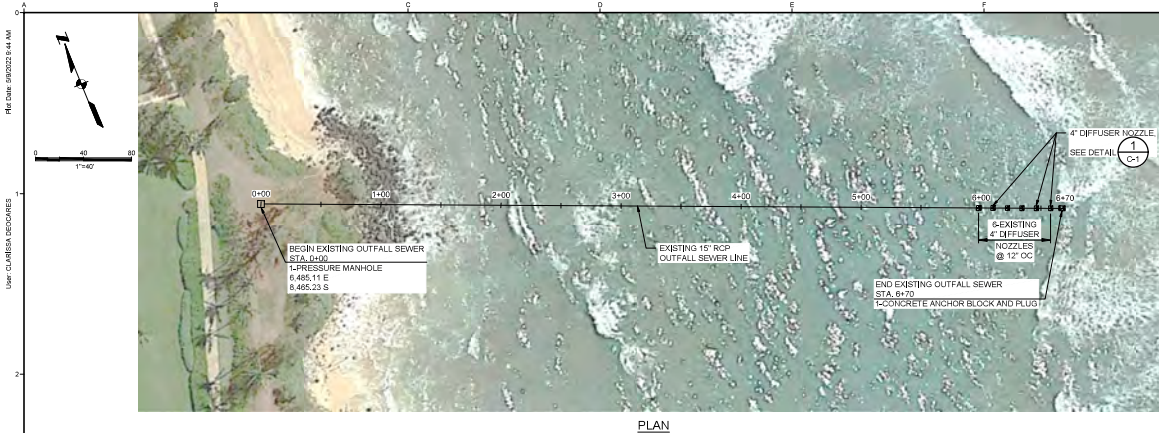


APPENDIX A-3. WAILUA STP - STATION 5 – 2016-12-23

## **Attachment 2**

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Drawings and Figures



|  |   |                                  |                                  |                                     |  |  |  |
|--|---|----------------------------------|----------------------------------|-------------------------------------|--|--|--|
| <b>##### - % SUBMITTAL</b><br><br>PRELIMINARY DESIGN PHASE<br>NOT FOR CONSTRUCTION<br>THIS DOCUMENT IS AN INTERIM DOCUMENT AND NOT SUITABLE FOR CONSTRUCTION. AS AN INTERIM DOCUMENT, IT MAY CONTAIN DATA THAT IS POTENTIALLY INACCURATE OR INCOMPLETE AND IS NOT TO BE RELIED UPON WITHOUT THE EXPRESS WRITTEN CONSENT OF THE PREPARER. | SCALES<br>1" = 10'<br>1" = 20'<br>IF THE BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY. |                                  |                                  | DESIGNED -<br>DRAWN CD<br>CHECKED - | COUNTY OF KAUAI<br>WASTEWATER MANAGEMENT DIVISION<br><b>WAILUA WASTEWATER TREATMENT PLANT<br/>         ALTERNATIVE EFFLUENT DISPOSAL SYSTEM DESIGN</b><br> | PLAN AND PROFILE<br>EXISTING OUTFALL SEWER | SCALE AS NOTED<br>JOB NO. 180706.00<br>DATE APRIL 2022<br>SHEET - OF -<br><b>C-1</b> |
|  | NO REVISION DATE BY   | PRELIMINARY NOT FOR CONSTRUCTION | PRELIMINARY NOT FOR CONSTRUCTION | Kennedy Jenks                       | PLAN AND PROFILE EXISTING OUTFALL SEWER  | Kennedy Jenks                              |  |



# Draft Letter to Army Corp

Final Audit Report

2022-07-19

|                 |  |
|-----------------|--|
| Created:        | 2022-07-18                                   |
| By:             | Donn Kakuda (dkakuda@kauai.gov)              |
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APPENDIX E

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Cultural Impact Assessment





# DRAFT REPORT

## Cultural Impact Assessment in Support of Wailua Waste Water Treatment Plant (WWTP) Alternative Effluent Disposal System Design— Phase 2, Wailua Ahupua‘a, Puna District, Island of Kaua‘i, State of Hawaii

TMK: (4) 3-9-006:019 and 027 (por.); (4) 3-9-002:004  
and 032, and (4) 3-9-006: 999 (Nalu Road, Leho  
Drive, and Nehe Road)

*Prepared for:*

**HHF Planners, Inc.**

Pacific Guardian Center, Makai Tower  
733 Bishop Street, Suite 2590  
Honolulu, Hawaii 96813

July 2023

PACIFIC CONSULTING SERVICES, INCORPORATED  
1130 NORTH NIMITZ HWY, SUITE C-300, HONOLULU HAWAII 96817



DRAFT REPORT  
Cultural Impact Assessment in Support of  
Wailua Wastewater Treatment Plant (WWTP)  
Alternative Effluent Disposal System Design–Phase 2,  
Wailua Ahupua‘a, Puna District, Island of Kaua‘i, State of Hawaii  
TMK: (4) 3-9-006: 019 and 027 (por.); (4) 3-9-002:004 and 032, and  
(4) 3-9-006: 999 (Nalu Road, Leho Drive, and Nehe Road)

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Prepared For:  
HHF Planners  
733 Bishop Street, Suite 2590  
Honolulu, Hawaii 96813

On Behalf Of:  
Department of Public Works, County of Kaua‘i

July 2023

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## INTRODUCTION

At the request of HHF Planners (HHF), Pacific Consulting Services, Inc. (PCSI), has prepared this Cultural Impact Assessment (CIA in support of the Wailua Wastewater Treatment Plant (WWTP) Alternative Effluent Disposal System Design–Phase 2 project, in Wailua, on the Island of Kaua‘i, in the State of Hawaii<sup>1</sup>. The project proponent is the County of Kaua‘i, Department of Public Works (DPW), and the land is owned by the County of Kaua‘i at Tax Map Keys (TMKs) (4) 3-9-006:019 and 027 and by the State of Hawaii at TMK (4) 3-9-002:004 and 032 (also 3-9-006: 999 [Nalu Rd., Leho Dr., and Nehe Rd.]). The location of the project is shown in Figure 1. The project scope of work includes improvements to the existing Wailua WWTP and the WWTP’s ocean outfall, as well as rehabilitation of the force main providing recycled water to the Wailua Municipal Golf Course.

A historical, cultural, and archaeological background study was conducted in order to evaluate any potential effect on historic properties and to recommend mitigation of any adverse effect, if warranted. That work was carried out in accordance with Hawaii Revised Statutes (HRS) Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division Rules), Chapter 275 (*Rules Governing Procedures for Historic Preservation Review for Governmental Projects Covered Under Sections 6E-7 and 6E-8, HRS*).

## PROJECT AREA, LOCATION, AND DESCRIPTION

The project area comprises two locales, designated Project Areas A and B, which are within Wailua Ahupua‘a (an *ahupua‘a* is a traditional Hawaiian land division), Puna District, Island of Kaua‘i, State of Hawaii. The project area locales are located on the east side of Kaua‘i along the coast (see Figure 1). The combined acreage of the two project areas is 5.02 acres (2.03 hectares).

Since 1976, the Wailua Municipal Golf Course has been using R-2 quality-treated effluent from the Wailua WWTP for irrigation. Any excess treated effluent has been routed to the existing ocean outfall. This occurs more frequently during excessive rainy periods. As part of the proposed improvements, the County of Kaua‘i would modify the existing diffusers at the ocean outfall. The modifications would consist of extending the existing riser pipes at the three functional outfall diffuser heads. The work to install the modification would take place entirely in the ocean. Therefore, it is not included in the current project area and not addressed in this report.

Project Area A is the WWTP, which encompasses approximately 5.02 acres (2.03 hectares) including the entire TMK (4) 3-9-006-019, a portion of the adjacent parcel TMK (4) 3-9-006:027 (por), and a portion of the Nalu Drive right of way (TMK [4] 3-9-006: 999 [por.]). The location of Project Area A is shown in Figures 2 through 4. A range of improvements are being proposed to maintain and upgrade existing plant processes. These include but may not be limited to:

- Access Road
  - Construction of a new access road.
- Headworks
  - Construction of a new headworks.
- Surge Basin Modification
  - Re-use/re-purposing of existing tankage. No ground disturbance required.

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<sup>1</sup> PCSI follows the latest edition of the Society for American Archaeology (SAA) Style Guide, especially regarding textual elements (e.g., numbers, dates, statistical copy, italicization, capitalization, hyphenation, and accents and diacritical marks). The authority for English spelling is the most recent edition of *Merriam-Webster’s Collegiate Dictionary*. Unless noted, the authorities for Hawaiian spelling and geographic place names are the *Hawaiian Dictionary* (Pukui and Elbert 2003), the most recent listing of the Hawai‘i Board on Geographic Names (HBGN), and *Place Names of Hawaii* (Pukui and Elbert 2004).

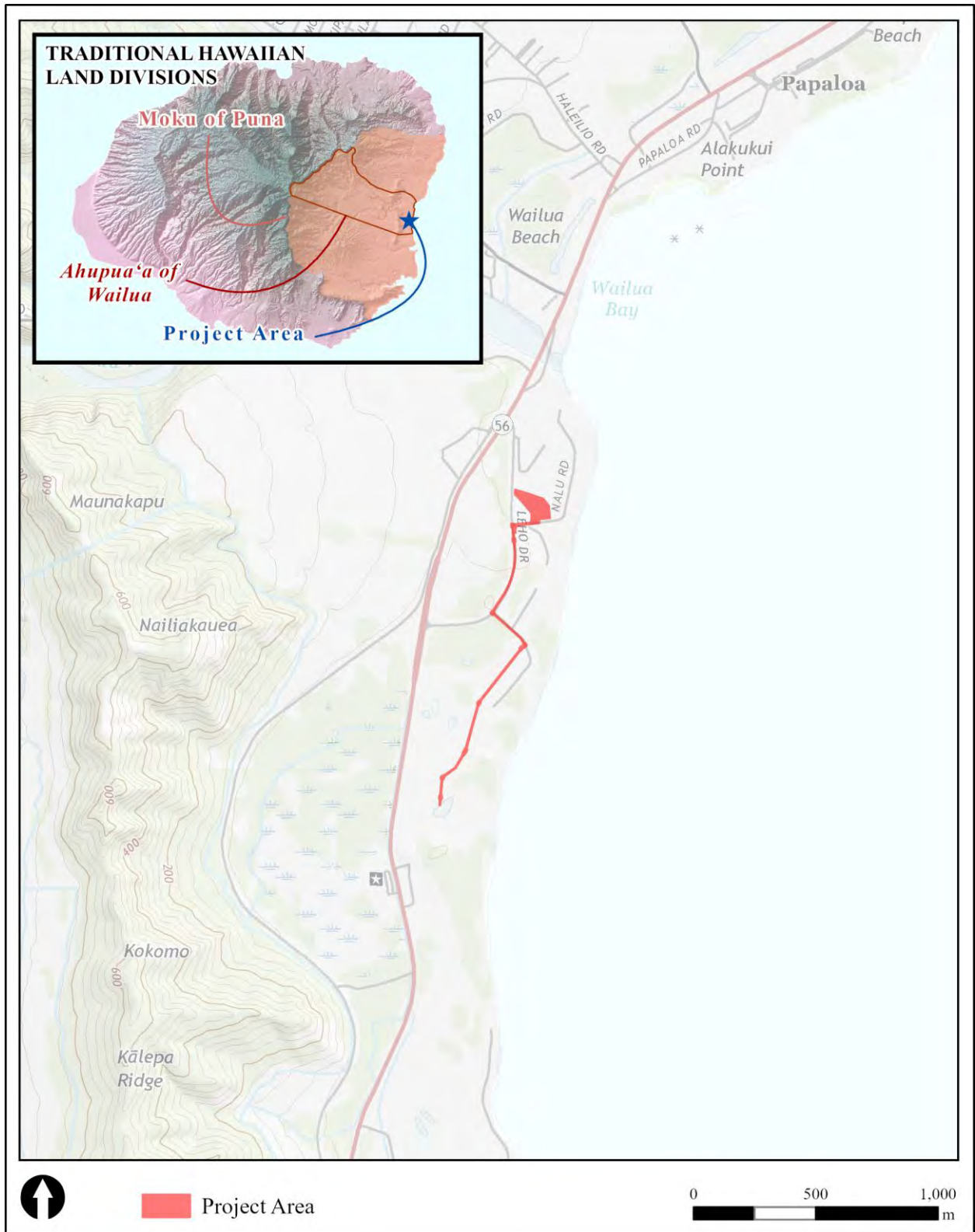


Figure 1. Location of the Project Area on the U.S.G.S. Kapa'a Topographical Quadrangle Map (USGS 2017).

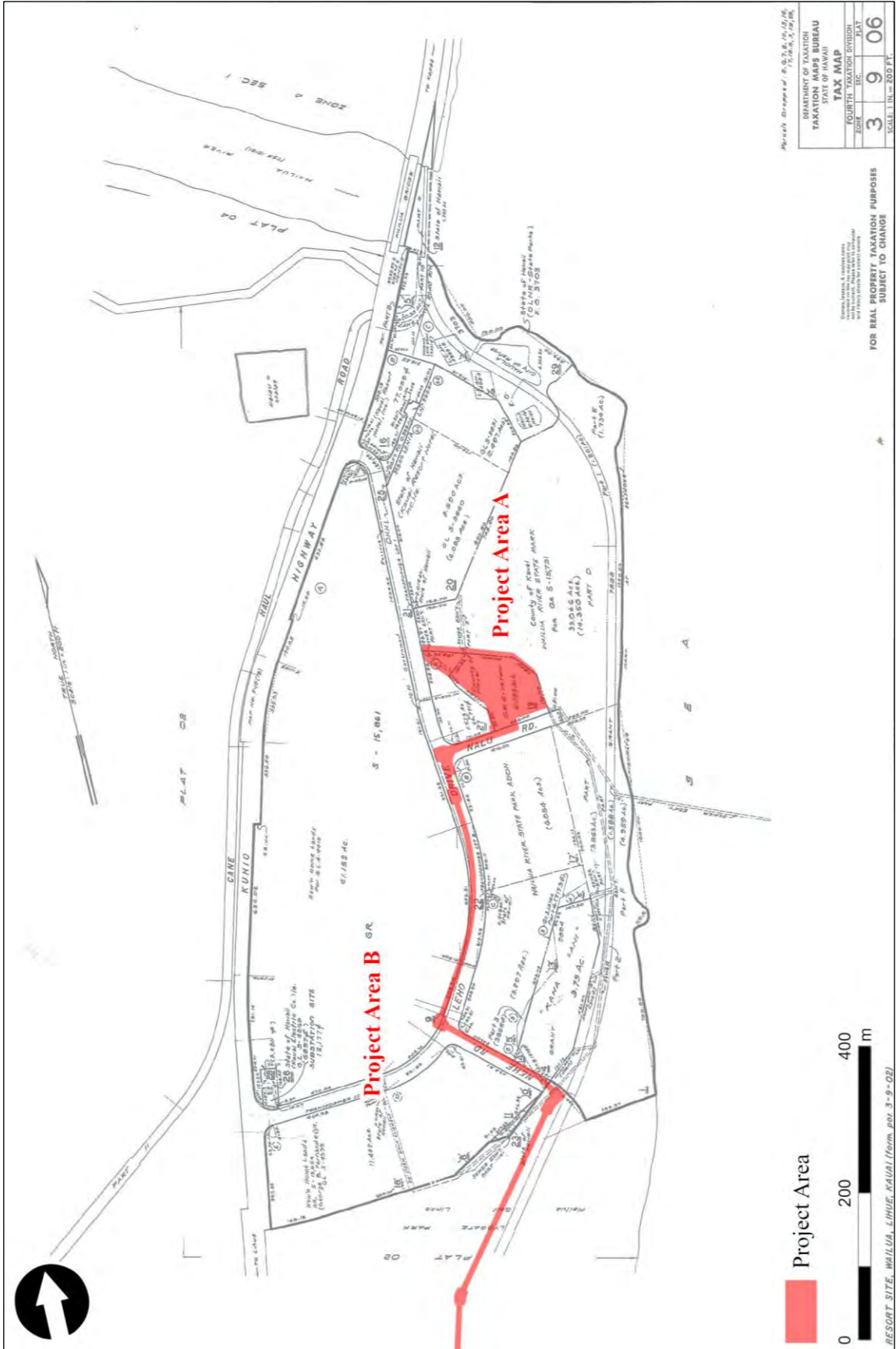


Figure 2. Project Areas A and B on TMK (4) 3-9-06 Plat Map (Tax Maps Branch 1961).



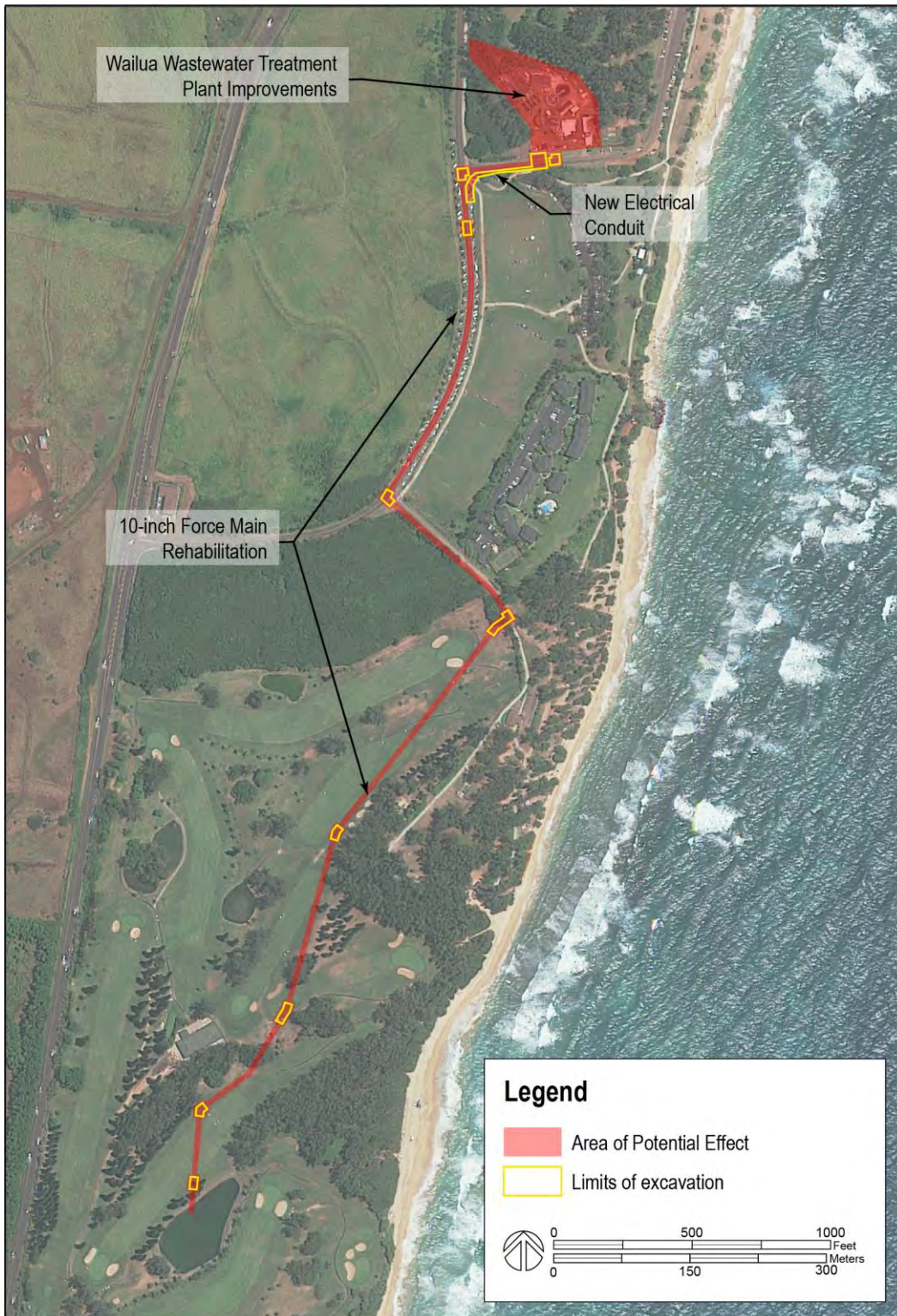


Figure 3. Aerial Image Showing Project Areas A and B (Esri et al. 2019).

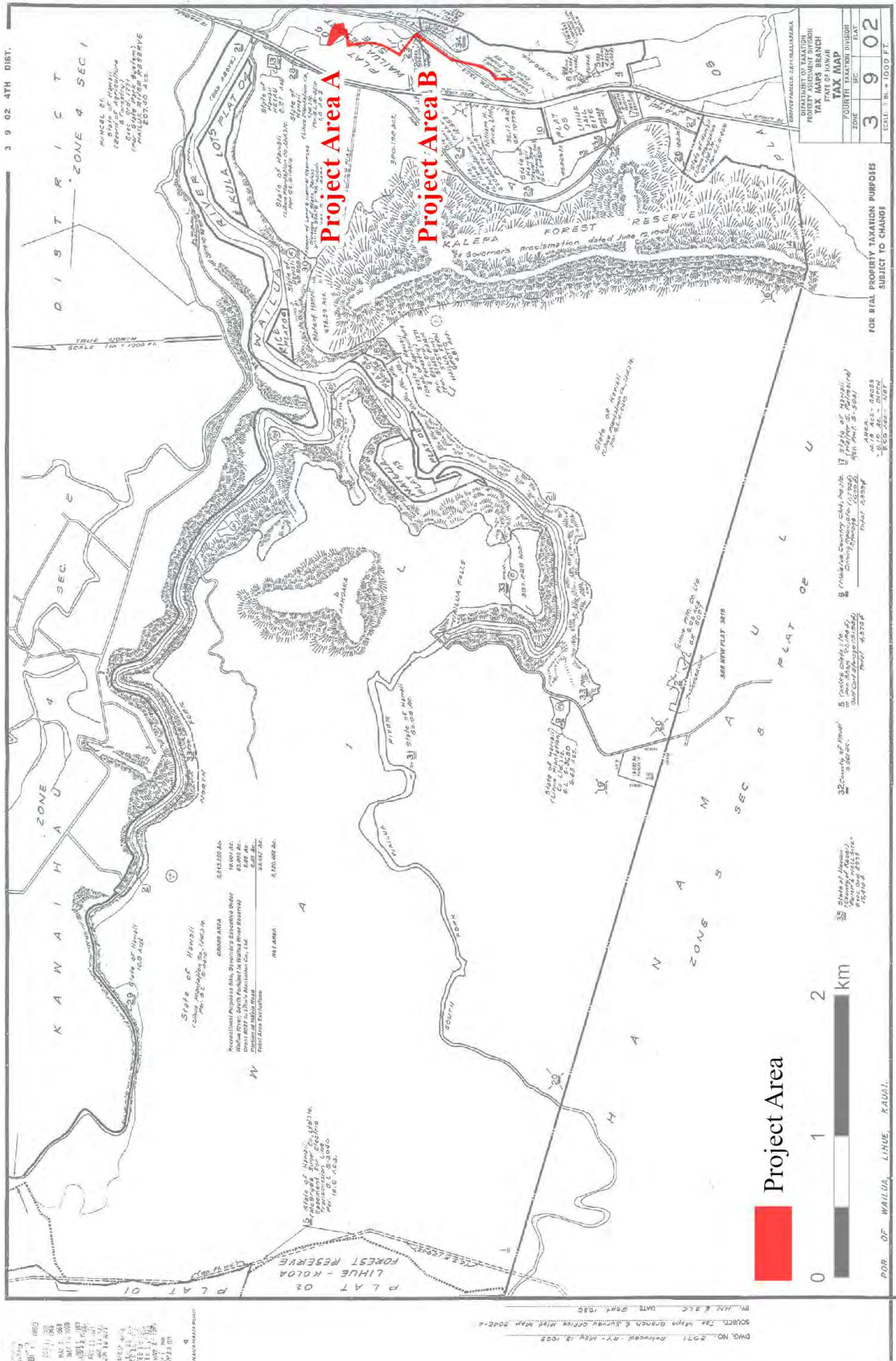


Figure 4. Project Areas A and B Shown TMK (1) 3-9-02 Plat Map (Tax Maps Branch 1936)

- Primary Filters
  - No ground disturbance required.
- Biological Treatment Process Modification
  - Re-use/re-purposing of existing tankage. No ground disturbance required.
- Solids Disposal Process
  - Construction of a new Rotary Drum Thickener Platform.
  - Other forthcoming projects at the WWTP site (Project Area A) also include:
- Aeration Basin Modifications
  - Modifications to existing tankage. No ground disturbance required.
- Clarifier Modifications
  - Modifications to existing tankage. No ground disturbance required.
- Filter Bay and Chlorine Tank Modifications
  - Modifications to existing tankage. No ground disturbance required.
- New Filter
  - Construction for a new tertiary filter.
- On-Site Generation of Hypochlorite
  - Construction of new on-site hypochlorite generation building.
- Replace effluent pumps
  - No ground disturbance required.
- Electrical upgrades
  - Construction of a new Motor Control Centre and Generator building and associated conduit to the new processes.
  - Installation of new electrical conduit to connect to the Kaua'i Island Utility Cooperative (KIUC) system.

Project Area B involves the rehabilitation of an existing 10-inch force main that conveys R-2 effluent from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course (see Figures 2, 3, and 4). The force main is approximately 4,600 feet long and is within (from north to south: TMKs (4) 3-9-006:019, 3-9-006:027, 3-9-002:032, and 3-9-002:004; and (4) 3-9-006: 999 [Nalu Rd., Leho Dr., and Nehe Rd.]). It was constructed in 1976 and is nearing the end of its design life. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining, which will limit the amount of excavation required.

## **PURPOSE OF THE CULTURAL IMPACT ASSESSMENT**

The purpose of developing this CIA was to gather together information concerning historic properties, cultural resources, and traditional practices that may be impacted by the proposed project. The CIA was prepared pursuant to Act 50<sup>2</sup> (House Bill No. 2895, signed into law on 26 April 2000), and in accordance with the Office of Environmental Quality Control (OEQC) “*Guidelines for Assessing Cultural Impact*,” (adopted by the State of Hawaii Environmental Council on 19 November 1997). The CIA was also prepared in accordance with Hawaii Revised Statute (HRS) Chapter 343 (Environmental Impact Statements), which serves to “...ensure that environmental concerns are given appropriate consideration in decision making...” (HRS Chapter 343-1).

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<sup>2</sup> Section 1 of Act 50 states that the preparation of environmental assessments...should identify and address effects on Hawaii’s culture, and traditional customary rights and notes that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ‘aloha spirit’ in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.”

## ENVIRONMENTAL BACKGROUND

Kaua'i is roughly 53 kilometers (33 miles) long and 46.0 kilometers (25 miles) wide, and covers 1,432.26 square kilometers (553 square miles). The island consists of a single great shield volcano, deeply eroded and veneered by volcanic activity (Macdonald and Abbott 1970:381). The island has a variety of climates and variations in topography. Wailua Ahupua'a is located on the eastern side of Kaua'i, situated in the Līhu'e Basin, a flank caldera (Macdonald and Abbott 1970:381). The Wailua River, the largest river in Hawaii, is the main drainage system for the Līhu'e Basin. The river consists of the North and South Forks, along with other minor tributaries. The river is affected by the tides and measures 3.2 kilometers (2 miles) inland to the junction of the North and South Forks. The following sections describe the environment within the project area.

### TOPOGRAPHY AND SOILS

Soil units in and near the project area are shown in Figure 5. Project Area A is underlain by Koloa stony silty clay with 15 to 25 percent slopes (KvD), Lihue silty clay with 0 to 8 percent slopes (LhB), and Mokuleia fine sandy loam (Mr). Project Area B is underlain by Lihue silty clay with zero to eight percent slopes (LhB), Mokuleia fine sandy loam (Mr), and dune lands (DL).

Koloa stony silty clay with 15 to 25 percent slopes (KvD) developed in material weathered from basic igneous rock and consists of well-drained soils on slopes of old volcanic vents and upland ridges (Foote et al. 1972:74–75). Hard rock is found at a depth of 20 to 40 inches. The erosion hazard for this soil is moderate to severe. Land use includes pasture, woodland, and wildlife habitat, while natural vegetation is dominated by *koa haole* (*Leucaena leucocephala*) (Wagner et al. 1990).

Lihue silty clay with 0 to 8 percent slopes (LhB) developed in material weathered from basic igneous rock and is found on the tops of broad interfluves in the uplands (Foote et al. 1972:82). It is well-drained with moderately rapid permeability, slow runoff is slow, and slight erosion hazard. Land use for the Lihue series soils includes irrigated sugarcane and pineapple, pasture, truck crops, orchards, wildlife habitat, woodland, and homesites, while natural vegetation consists of lantana (*Lantana camara*), guava (*Psidium spp.*), *koa haole* (*Leucaena leucocephala*), *ōi* (*Stachytarpheta cayennensis*), kikuyu grass (*Pennisetum clandestinum*), molasses grass (*Melinis minutiflora*), guinea grass (*Megathyrsus maximus*), Bermuda grass (*Cynodon dactylon*), and Java plum (*Syzygium cumini*) (Wagner et al. 1990).

Mokuleia fine sandy loam (Mr) formed in recent alluvium deposited over coral sand and is found on the eastern and northern coastal plains of Kaua'i (Foote et al. 1972:95). It is nearly level. Runoff is very slow, the erosion hazard is slight, and permeability is moderately rapid in the surface layer and rapid in the subsoil (Foote et al. 1972:96). Land use for this soil unit is pasture. In drier areas the natural vegetation may include *kiawe* (*Prosopis pallida*), *klu* (*Acacia farnesiana*), *koa haole* (*Leucaena leucocephala*), and Bermuda grass (*Cynodon dactylon*), and in wetter areas napier grass (*Pennisetum purpureum*), guava (*Psidium spp.*), and *ōi* (*Stachytarpheta cayennensis*) (Wagner et al. 1990) in the wetter areas.

Dune land (DL) is composed of hills and ridges of sand-sized particles formed by wind (Foote et al. 1972:29). The sand is comprised primarily of seashells and coral. This land contains no soil horizons due to either the active shifting of the hills and ridges or its recent development. Land use for dune land is wildlife habitat and recreation; it has also been a source of liming material (Foote et al. 1972:29). Vegetation is typically minimal, but Australian Pine (*Casuarina spp.*), *koa haole* (*Leucaena leucocephala*), *kamani haole* (*Terminalia catappa*), *kiawe* (*Prosopis pallida*), and mixed grasses may be present.

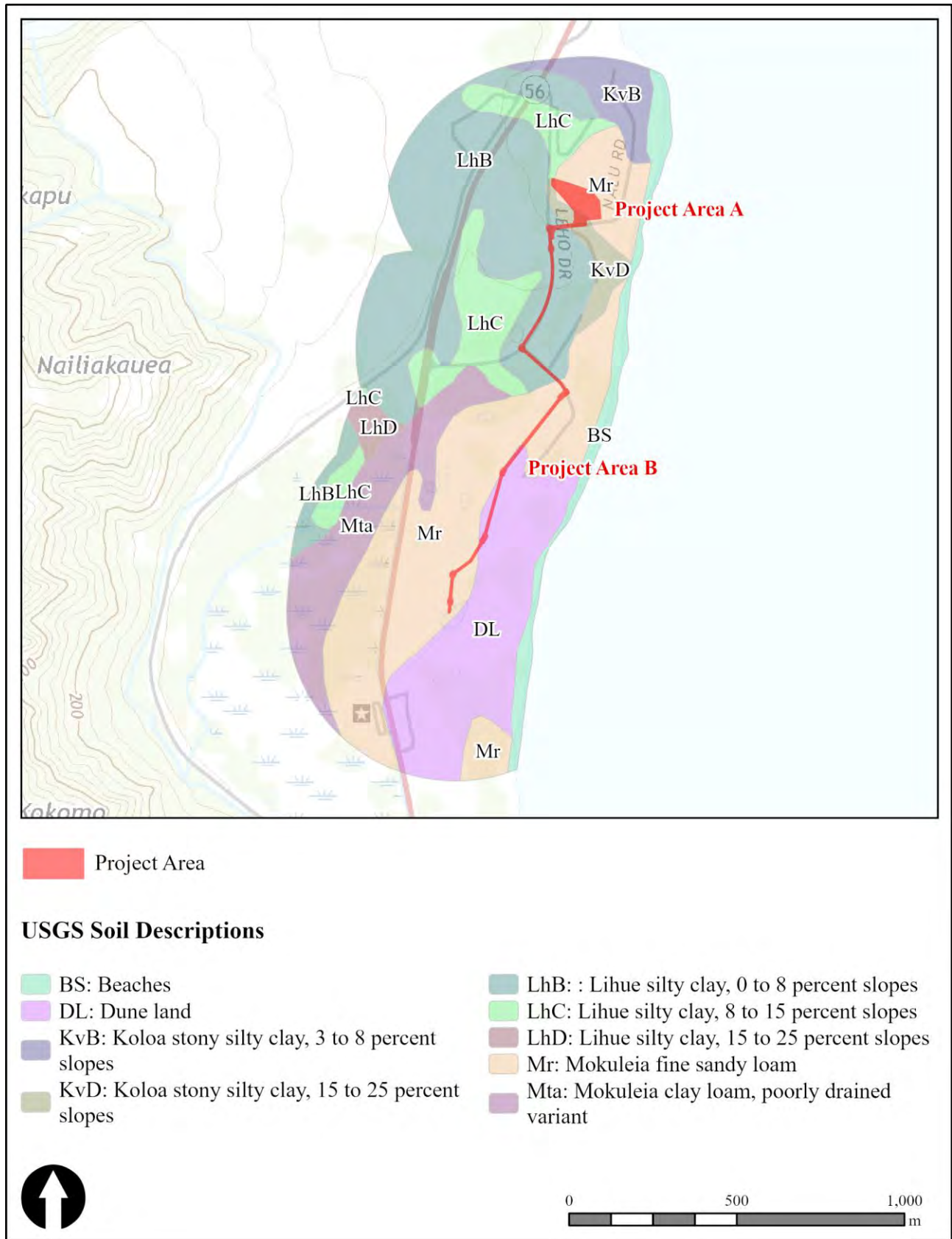


Figure 5. Soils Present in the Vicinity of Project Areas A and B.

An additional description of dune land in the project area is provided from Beardsley (1994). This description is specific to the Wailua Municipal Golf Course:

The dune land...extends southward from the mouth of the Wailua River. From this northern point at the river mouth, the dunes extend linearly along the shore, gradually shifting inland about 1,200 m (0.75 mi) from the river. From this inland location, the high dunes extend another 1,300 m (about 0.8 mi) to a point just north of the WGC clubhouse and 400 m inland from the beach. The dunes continue for another 1,500 m or so to the south before they gradually diminish and disappear. They are composed of soft white coralline beach sand that accumulates from east to west, blown by the prevailing wind. This is an active landform that shifts over time; however, a few episodes of stabilized surfaces, that is surfaces which have supported the establishment of vegetation and development of an A horizon, appear at variable depths throughout the dunes...In the recent past the dunes have been modified by the development of the Wailua Golf Course. Landscaping activities have been the primary agent of modification, although construction of some of the fairways, where dunes have been leveled, artificially enhanced, or cut in two, has also contributed to the changes in dune land [Beardsley 1994:13].

## RAINFALL AND VEGETATION

The project area receives a fair amount of rainfall. Data for Kaua'i Island indicates that rainfall in the project area averages 1,189.0 millimeters (mm), or 46.81 inches per year (Giambelluca et al. 2013). Project Area A includes the existing WWTP and a portion of the adjacent vacant property. Vegetation consists of nonnative grasses, Australian Pine (*Casuarina spp.*), and *koa haole* (*Leucaena leucocephala*) (Wagner et al. 1990). Project Area B includes the existing 10-inch force main which runs along the roadway rights of way (e.g., Nalo Road, Leho Drive, and Nehe Road) and extends through the Wailua Municipal Golf Course to the irrigation holding pond. Vegetation consists of manicured grass bordered by Australian Pine (*Casuarina spp.*), Cook pine (*Araucaria columnaris*), and *niu* (coconut, *Cocos nucifera*) (Wagner et al. 1990).

## HISTORICAL BACKGROUND

This section presents the ethno-historical and archaeological background information of the project area. Data from the background research were compiled to create an overview of traditional Hawaiian and historic-era land use and subsistence practices. Previous archaeological research in the vicinity of the project area is reviewed and anticipated archaeological findings are discussed.

## LEGENDARY AND TRADITIONAL HISTORY

The Hawaiian cultural landscape can be described through *mo'ōlelo* and *wahi pana*, or legendary places. *Mo'ōlelo* may be myths, legends, proverbs, and events surrounding well-known individuals in Hawaiian history (Pukui and Elbert 1986:254). The significance of Wailua is evident in its associated *mo'ōlelo* and *wahi pana*. The following discussion is a brief representation of the available information for the immediate project area. To gain a more thorough understating of the entire *ahupua'a*, the reader is directed to Dickey (1917), Fornander (1916-1917, 1918-1919); Kalākaua (1888), Rice (1923), and Smith (1955).

According to Pukui et al. (1974:224), Wailua literally means "two waters." This may refer to the North and South Forks of the Wailua River. However, Kamakau (1976:7) offers a different origin of the toponym. According to Kamakau, the name is from the *ali'i nui* (high chief) Wailuanuiho'āno:

"Wailuanui-a-Ho'ano was born in 'Ewa, Oahu, and his descendants went to Kaua'i and to Maui, and wherever they settled they called the land after the name of their ancestor. Wailua was a son of La'akona, ancestor of the 'Ewa family by Ka-ho'ano-o-Kalani. His

name, Wailuanui-a-Ho'ano, came from adding the name of his mother. Thus, some names were derived from those of ancestors." [Kamakau 1976:7].

Consequently, Wailua was known as "Wailua-Nui-Hoano, or great, sacred Wailua, a land taboo to common people" (Dickey 1917:14).

Wailua was one of two royal centers on the Island of Kaua'i. It was chosen by the *ali'i* (chiefs) for its fertile soil, fresh water, rich marine resources, safe canoe landings, and good surf (Yent 1995:20). The area *makai* (toward the sea), or east, of Nounou and Kālepa Ridges was a ruling center occupied periodically by the ruling chief and his staff. The area *mauka* (toward the mountain), or west was used for agriculture; there is evidence of taro field systems and alluvial terraces along the Wailua River (Yent 1995:21).

Traditionally, Wailua was an area where gods and *ali'i* gathered. The large numbers of *heiau* (traditional Hawaiian ritual site or temple) and other cultural sites confirm the historical the importance of this area. An early western visitor to the island, George Washington Bates (1854), stated that:

The Wailua River stands associated with the very genius of romance and superstition. Every object on the banks, every rock in the stream, and every cliff by which it is overlooked, has attached to it some legend of lovers, warriors, priests, and kings [Bates 1854:190].

One of the earliest voyagers to Kaua'i was Mō'īkeha of Kahiki; he brought a calabash of winds and planted the first *kalo* (taro) and *'uala* (sweet potato). Mō'īkeha had a *hānai* (foster) son, La'a-mai-kahiki, who traveled to Kaua'i and brought to Wailua the god Lono-i-ka-ou-ali'i and the first *kaeke*, which is a temple drum made from the trunk of a coconut tree and shark skin (Dickey 1917:25; Fornander 1880:62).

Malae Heiau, also known as Makaukiu (Dickey 1917) or Malaeha'akoa (Keaweamahi 1876 cited in Flores 1995), is the largest existing *heiau* on Kaua'i, although a larger *heiau* was once present at Nawiliwili. It is situated on the south side of the Wailua River, immediately inland (west) of Kūhio Highway. It is designated State Inventory of Historic Places (SIHP) Site 50-30-08-00104. According to legend, Malae Heiau was built by Menehune (mythical race of small people who worked at night, building fishponds, roads, and temples). At this *heiau* a beautiful maiden, Ka'ililauokekoa, was born. She was skilled at *kōnane* (Hawaiian game similar to checkers) and surfing. She was the daughter of La'a and the granddaughter of Mō'ikeha and would someday be the queen of Kaua'i (Dickey 1917:25–26).

Another legendary person associated with Kaua'i is the strong man Kapakohana<sup>3</sup> (Beckwith 1970:344; Fornander 1918-1919:210–213). It is said he discovered that a hairless cannibal from Hanakāpī'ai had arrived in Wailua and was intent on eating the people of the village. Being brave and unafraid, he fought the cannibal until he grew tired. To avoid defeat he suggested a friendship and to share a meal of taro. After some time, the cannibal became less vigilant and did not suspect that Kapokahana had been insincere. One night, Kapakohana and 80 warriors surrounded the cannibal's house, but the cannibal escaped and devoured all the warriors except Kapakohana. Another long battle ensued and Kapakohana finally triumphed and killed the cannibal by striking him on the temple several times. "Kapakohana then took out the eyes of the cannibal to be used as bait for shark fishing. He next stripped the bones clean and used them for a place to hang up his calabashes. The rest of the body was then carried to the temple and placed on the altar as a sacrifice" (Fornander 1918-1919:212).

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<sup>3</sup> In Dickey (1917) Kapakohana is also spelled Kapokehana and Kapohana.

On the south side of the Wailua River mouth are Hikinaakalā Heiau, Hau'ola, and Pae-ki'i-māhū-o-Wailua petroglyphs, SIHP Site 50-30-08-00105. According to Dickey (1917:15), Hau'ola was a *pu'uhonua* (place of refuge). Hau'ola is associated with Manamanaiakaluea, which is a place near Māmā'akualono Cave (Fern Grotto) where there is said to be an 'ōhi'a *lehua* tree without any flowers. The flowers of this tree are located underwater in the surf off of Hauola, at a place called Kalauawehe (Carpenter and Yent 1997:12; Dickey 1917:33).

The Pae-ki'i-māhū-o-Wailua petroglyphs have multiple associations and are the only known rock art site in Hawaii with an associated hula (see Barrere et al. 1980:81; Cox and Stasack 1970:13). According to Judge Lyle A. Dickey (1917:17), who was a local resident and authority on the history of Kaua'i (Soboleski 2015:498), the petroglyph rocks were a portion of the *pu'uhonua* wall along the river where the flow was different. He also relates two origin stories for the boulders. In the first he states that "a sculptor of ancient times, carving idols, could only make one to suit him and threw the others away. These rocks are some of them, the marks being the hieroglyphics of the ancient sculptor" (Dickey 1917:16).

The other origin is told in a legend of Māui and his brothers (Dickey 1917:16–18). In order to unite the Hawaiian Islands Maui needed to catch a powerful fish known as Luehu. He went fishing with his eight brothers each month on the night of Lono:

His mother, Hina, told him not to disturb any bailing dish he might find floating in the water at the mouth of Wailua River, as this would be his beautiful sister, Hinake-kaa. However, when Maui saw a dish for bailing out canoes floating near he told his brothers not to look behind them on pain of death and picked up the bailing dish and put it behind him in the canoe, where it turned into a beautiful woman.

As soon as Luehu was caught the Hawaiian Islands began to draw together. As Kauai and Oahu came near great crowds gathered on the shores of Oahu and cheered. This did not disturb the brothers of Maui at first, who paddled steadily, but when the cheerers exclaimed at the beauty of the woman behind Maui, all the brothers turned at once to look. Immediately the great fish became loose from the hook and the islands slid apart as they had been. Only two islands had actually touched each other. The point near the Nawiliwili lighthouse had touched Kaena Point on Oahu and as they drew apart a piece of Oahu was caught on Kauai and a piece of Kauai on Oahu. This rock off Kaena Point is still called "Pohaku o Kauai," Rock of Kauai.

Because of their looking back, Maui's brothers were on their return to Wailua turned into stones and set across the mouth of the Wailua River [Dickey 1917:18].

An additional legend was noted by Dr. William Kikuchi that accounts for the origin of the petroglyph stones. This story involves the demigoddess Kapo, a half-sister of Pele:

Kapo and her party left Ni'ihau for Kaua'i and came upon a surfing competition at Wailua. Here Kapo and her sisters were invited by some of the men to ride on the famous surf of Wailua called Maka'iwa. Accepting, they rode the first wave in pairs with the men. On the second wave, using their supernatural powers, they left the men behind while they rode to shore and awaited the third wave. The third wave, which was described as a mountain of water rather than a normal surf, plummeted the men and forced them beneath the wave to their death. There they were changed into stone at the mouth of the Wailua River. Since then, these boulders are known as the row of images, or *pae ki'i*, and can still be seen when wave and river action removes the sand cover [Kikuchi 1984:3].

## TRADITIONAL LAND USE

Wailua was the main royal residence on the island of Kaua'i (Bennett 1930:57; Bennett 1931:96), was a favored location for *ali'i* because it offered abundant resources for subsistence and sport related activities (Yent 1995:21). Because the *ali'i* could stress an area's resources,



Wailua was not occupied year-round (Yent 1995:21), and Waimea served as a seasonal royal residence (Bingham 1855:242; Cox 1975:5). Based on the association of Wailua with the *ali'i nui* Wailuānuiahō'ano and Mō'ikeha, the area was a social and political center of the kingdom of Kaua'i by AD 1300–1350 (Yent 1995:32).

Wailua's importance is also indicated by the Pōhaku Ho'ohānau (birthstones) at Holohokū Heiau (SIHP Site 50-30-08-00106), situated on the north side of Wailua River and slightly inland, which was a birthplace for *ali'i*. Likewise, the complex of *heiau* surrounding Wailua River is indicative of Wailua's status. There are thought to have formerly been 10 *heiau* in the *ahupua'a*, spanning from the coast to the mountains (Drennan 2008:18).

## HISTORIC LAND USE

The earliest documentation of Wailua by western voyagers comes from the journals of Captain George Vancouver who sailed along the shore in 1793. Previously he sailed with Captain James Cook and anchored at Waimea, only to find that no high chiefs resided in the village. Though there was no safe anchorage at Wailua, Vancouver visited off-shore in 1793. He gave the following description of the land:

This part seemed to be very well watered, as three other rapid small streams were observed to flow into the sea within the limits above mentioned. This portion of Attouai, the most fertile and pleasant district of the island, is the principal residence of the King, or, in his absence, of the superior chief, who generally takes up his abode in an extensive village, about a league to the southward of the north-east point of the island. Here Enemo the regent, with the young prince Tamooerrie, were now living (Vancouver 1798: 221–222).

Rev. John Mortimer Lydgate (1920:5), who was also a plantation manager and a surveyor for the Hawaiian Kingdom and later for the Territory of Hawai'i (Soboleski 2015:312), further explains the appeal of Wailua as a place for royal residence:

The double valleys at Wailua furnish broad stretches of excellent taro lands well-watered and reliably sufficient for a large population. The sea and river fisheries furnished the needed fish for a similar large population, and in addition to this there were broad stretches of kula land on either side and mauka for other forms of agriculture [Lydgate 1920:5].

The U.S. Exploring Expedition visited Wailua in October 1840. At the time, Debora Kapule Kekaiha'akūlou, known as Kapule, resided in Wailua. She was a member of Kaua'i's royal family and the former wife of Kaumuali'i, the last independent *ali'i nui* of Kaua'i and Ni'ihau (Mills 2002:111). She had been granted lands at Wailua by Ka'ahumanu, *kuhina nui* (regent) of the islands after the rebellion of 1824 led by Kaumuali'i's son George. She first moved to Wailua in 1935 and resided there until 1950 when she moved to her former home of Waimea (Mills 2002:184). The following is a description of the U.S. Exploring Expedition's time in Wailua:

The country on this route was uninteresting, until they reached Wailua, the residence of Deborah, a chief woman of the islands, readily known as such from her enormous size, and the cast of her countenance. She has a person living with her called Oliva Chapin, who speaks English, and has learned how to extort money. Deborah has about forty men in her district; but they were absent, being employed in the mountains cutting timber to pay the tax to the king.

Near Deborah's residence are extensive fishponds belonging to her [located at today's Coco Palms on the north side of Wailua river], which have been made with great labour: they are of different degrees of saltiness. The fish are taken from the sea when young and put into the saltiest pond; as they grow larger, they are removed into one less salty, and

are finally fattened in fresh water. While our gentlemen were there, Deborah received young fish in payment of the poll-tax, which were immediately transferred to her ponds.

Wailua, (two waters,) was formerly a place of some importance. It is situated on a small stream of the same name, in a barren, sandy spot.

Deborah furnished them with a double canoe, to carry them up the river to visit the falls. Taking the western branch, they ascended it for two and a half miles.

There are many good taro-patches and sugar plantations on its banks. They landed in what appeared to have been an old crater, in front of a basin, with high perpendicular bank. The low grounds along the river are extremely fertile, producing bread-fruit, sugar-cane, oranges, etc. The latter, however, are suffering from the blight, and some of the trees were covered with a black smut, produced by a species of aphid.

In ascending, an insulated black rock is passed, known as the "Muu," which has been detached from a high rocky bluff that is remarkable for the dikes visible in it [Wilkes 1845:68].

The widespread agriculture along the Wailua River was reported by Bates (1854) during a canoe ride inland. He described how the river wound its way through numerous taro plantations as well as orange and coconut tree groves (Bates 1854:190).

During the Mahele of 1848, Debora Kapule and her son Iosia Kaumuali'i claimed most of the *makai* (seaward) land in Wailua. The remaining land in Wailua, including the current project area, was declared Crown Lands under Kamehameha III (Stauffer 1993:113; Yent 1995:9). Resulting from the Kuelana Act of 1850, two Land Commission Awards (LCAs) were granted north of Project Area A, south of the Wailua River. These included LCA 3555:2 to Kiaipali in the *'ili* (an *'ili* is a division of an *ahupua'a*) of Malaehakoa and LCA 9403:2 to Pahio in Malaihanono, both of which consisted of a *pahale* (house lot). Their locations are shown in Figure 6.

The Henry A. Pierce & Company was founded in 1849, which would later be known as Lihue Plantation Company Ltd. (Saito and Campbell 1987). Into the late 1800s the plantation expanded, and in 1878 leased 30,000 acres at Wailua. The eastern extent of the field system by 1939 in relation to the project area can be seen in Figure 7.

By the 1870s the taro planted in alluvial terraces along the Wailua River was replaced with rice, while the uplands were planted in sugarcane and used for cattle grazing (Yent 1995:21). Handy (1940) wrote the following about Wailua:

Along the lower 2 miles of Wailua River, above the sandy coastal plain, are many broad, open, level areas, formerly terraces, now mostly sugar. Opaekaa Stream, which flows into tidewater Wailua River, watered many terraces both above and below the falls. The large area of terraces below the falls is now planted mostly in rice, a few of the upper terraces being used for sweet potatoes, while the uppermost are pasture [Handy 1940:67–68].

The current project area falls within the original boundary of Lydgate Park. The aforementioned Rev. Lydgate had petitioned the territorial governor to set aside the land as a public park (Else 2017). In 1921 the park was named after Lydgate. This was a year after the Ahukini Terminal & Railway Company (A.T. & R.) built the railroad from Ahukini to Anahola to carry sugarcane, workers, and freight (Yent 1995:22). The railway can be seen running on the east side of the road near Project Area B in Figure 8, and along the shoreline near Project Area A in Figure 9. The conversion from railroad to truck haul occurred from 1957 to 1959 and marked the end of sugar cane transport by railroad on Kaua'i (Condé and Best 1973:165-169).

The south portion of Lydgate Park became the Wailua Municipal Golf Course in the 1930s. Then, in the 1960s, the course was expanded and Wailua Resort (today's Kaha Lani Resort) was constructed. In 1962, the park was added to the Wailua River State Park. In 1992 the park was

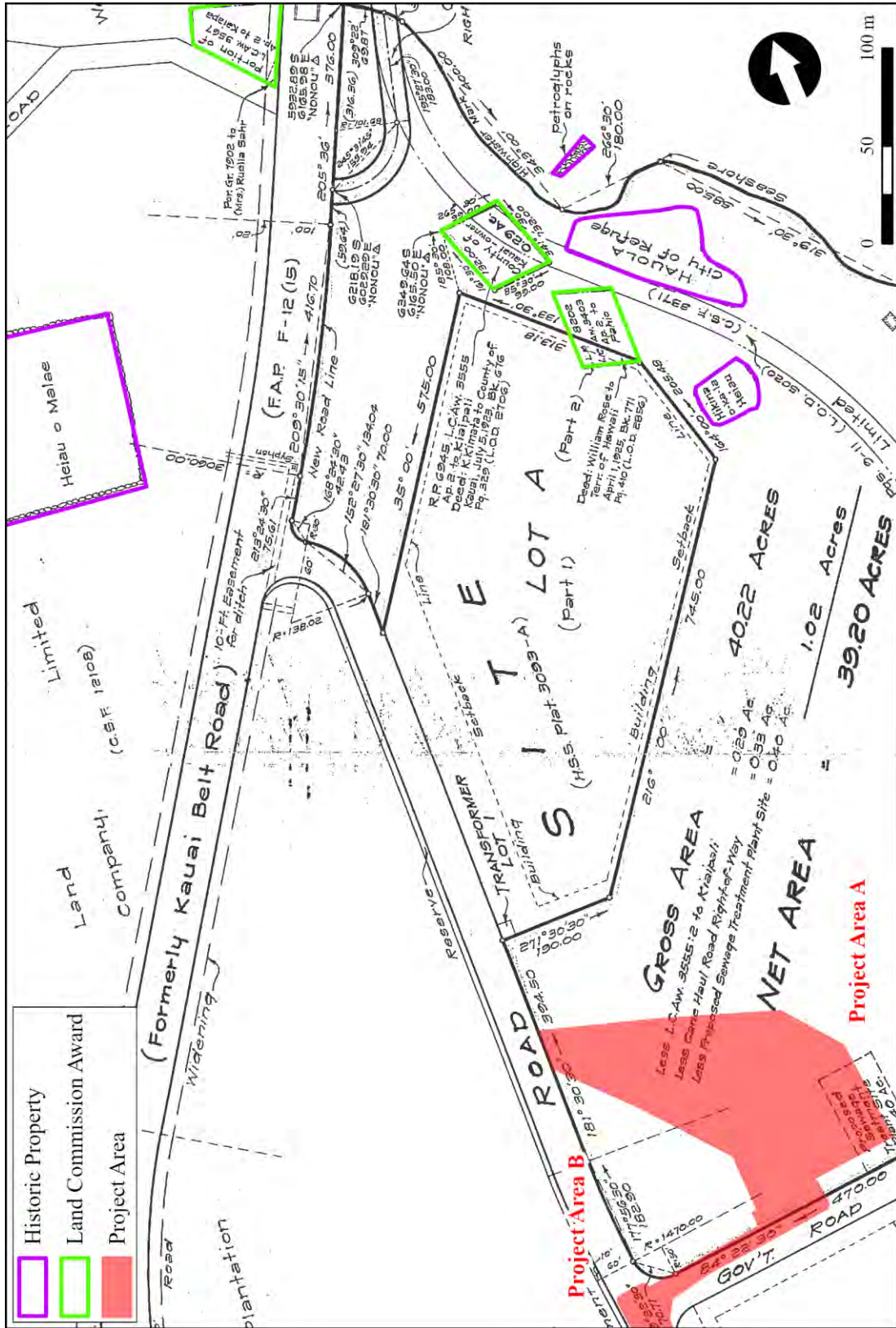


Figure 6. Portion of Wailua Park Map Showing Locations of LCAs near Project Areas A and B (Lydgate 1921).

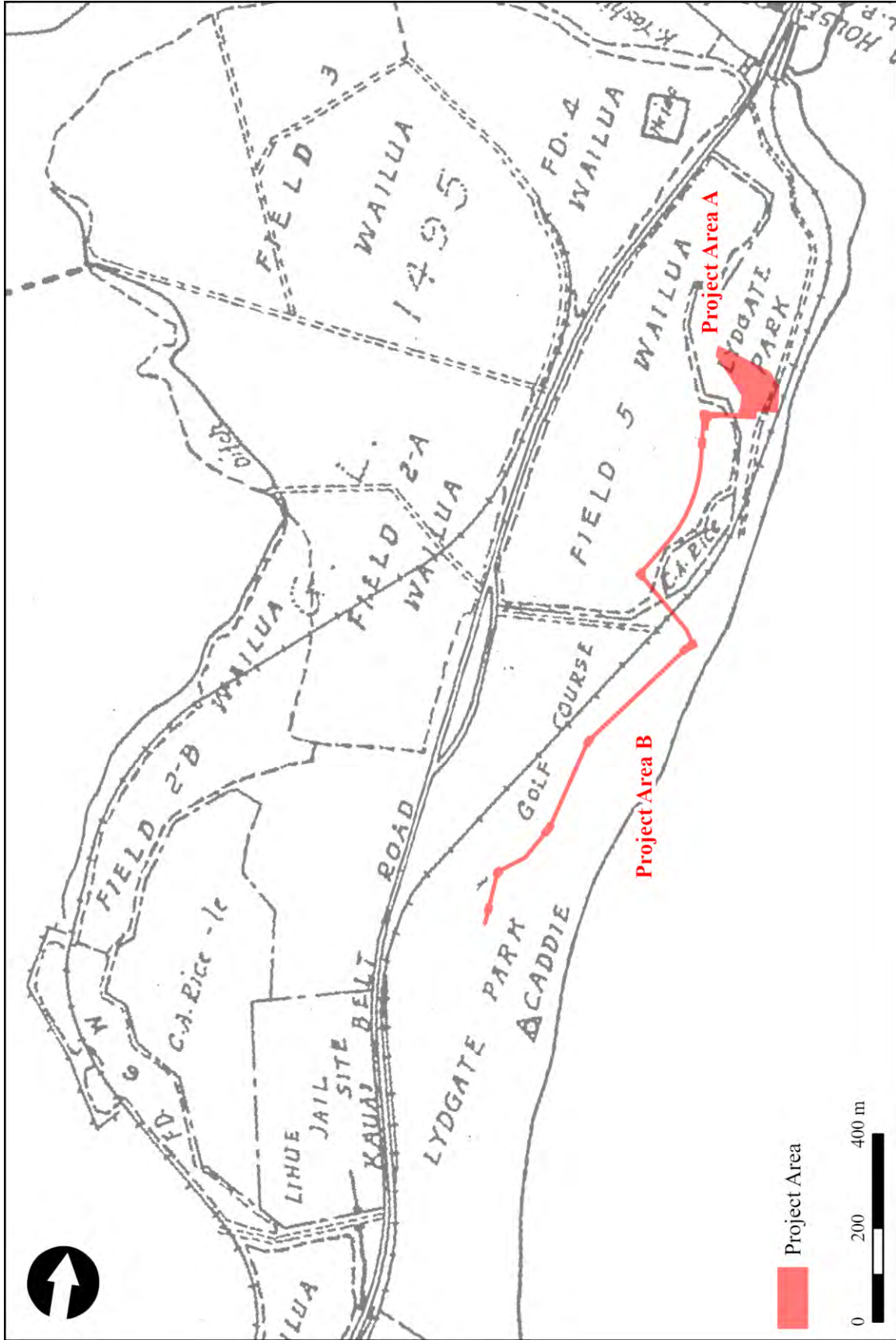


Figure 7. Portion of Lihue Plantation Map Showing Location of Project Areas A and B (Anonymous 1939)

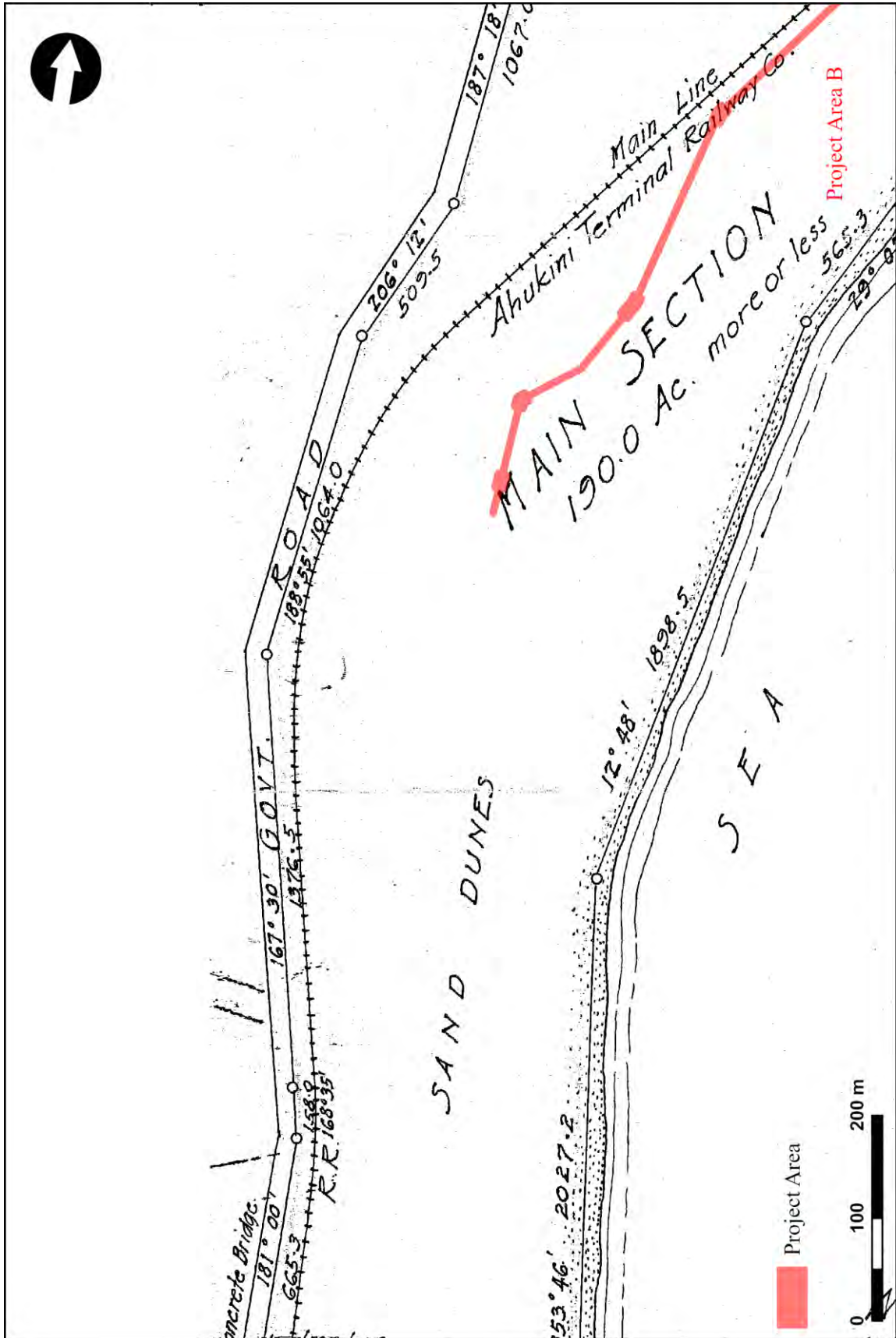


Figure 8. Portion of Proposed State Park Map Showing the Location of Railway Near Project Area B (Kato 1961).

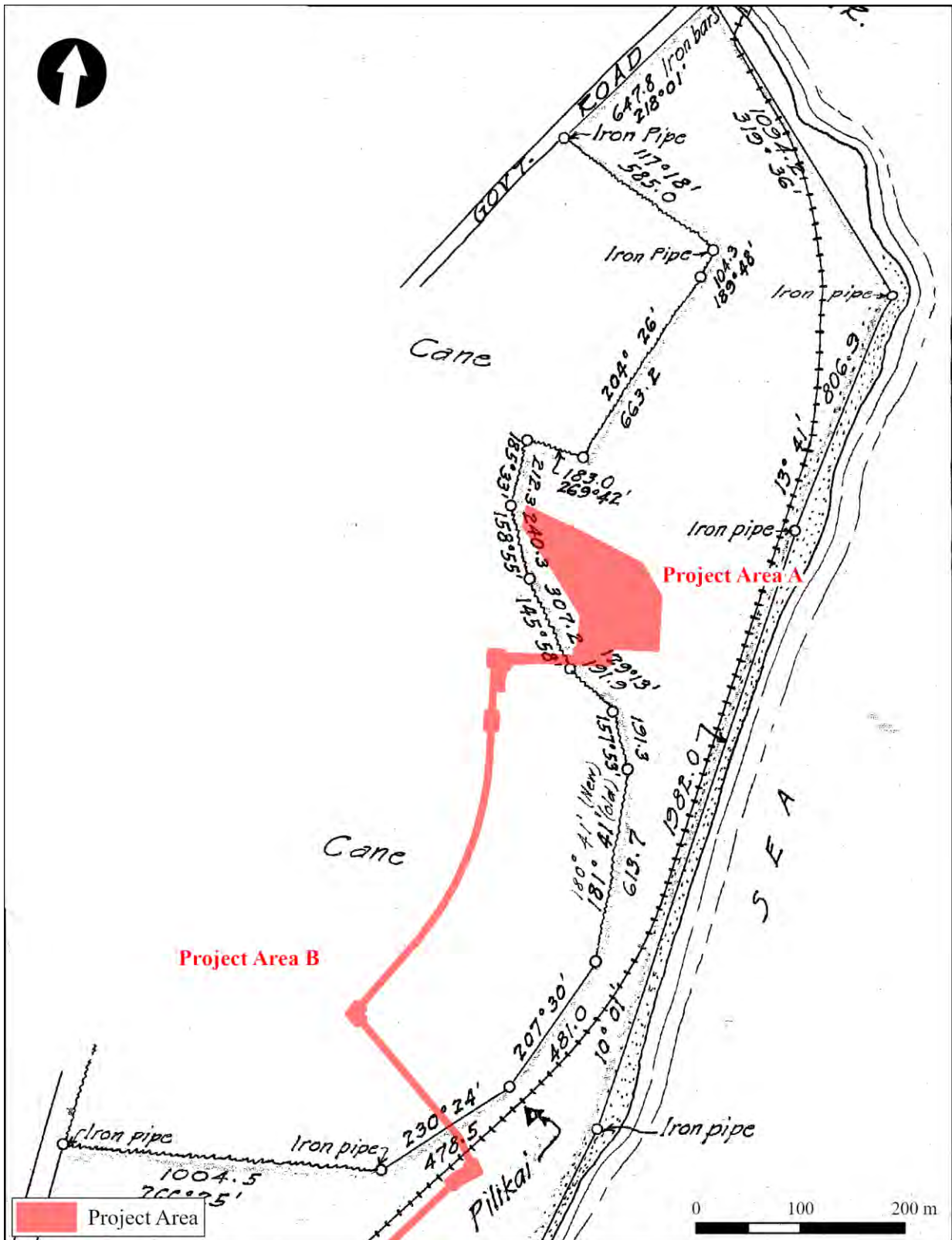


Figure 9. Portion of Proposed State Park Map Showing Location of Railway Near Project Area A and B (Kato 1961).

subdivided, whereby the 4.8 acres containing Hikinaakalā Heiau was retained by State Parks and the remaining 45.5 acres were transferred to the County of Kauaʻi.

## PREVIOUS ARCHAEOLOGICAL STUDIES

There have been numerous archaeological studies conducted within Wailua Ahupuaʻa. This overview limits the discussion to studies within 500 meters of the project area. Generally, recorded archaeological sites in this area associated with the pre-Contact and early historic periods are concentrated on the east side of Kūhiō Highway, while sites on the west side are associated with the historic period. This can be attributed to the corresponding presence of sand dunes on the east and sugarcane plantation fields on the west. During previous investigations along Kūhiō Highway, no archaeological sites have been identified near the current project area (see Dega and Powell 2003; Hammatt et al. 1994; Stine and Hammatt 2012; Tulchin and Hammatt 2009). Figure 10 shows the location of the previous archaeological studies near the project area, which are summarized in Table 1. Locations of archaeological sites are shown in Figures 11 and 12. All site numbers in Figures 11 and 12 follow SIHP Site 50-30-08-.

### Early Twentieth Century *Heiau* Investigations

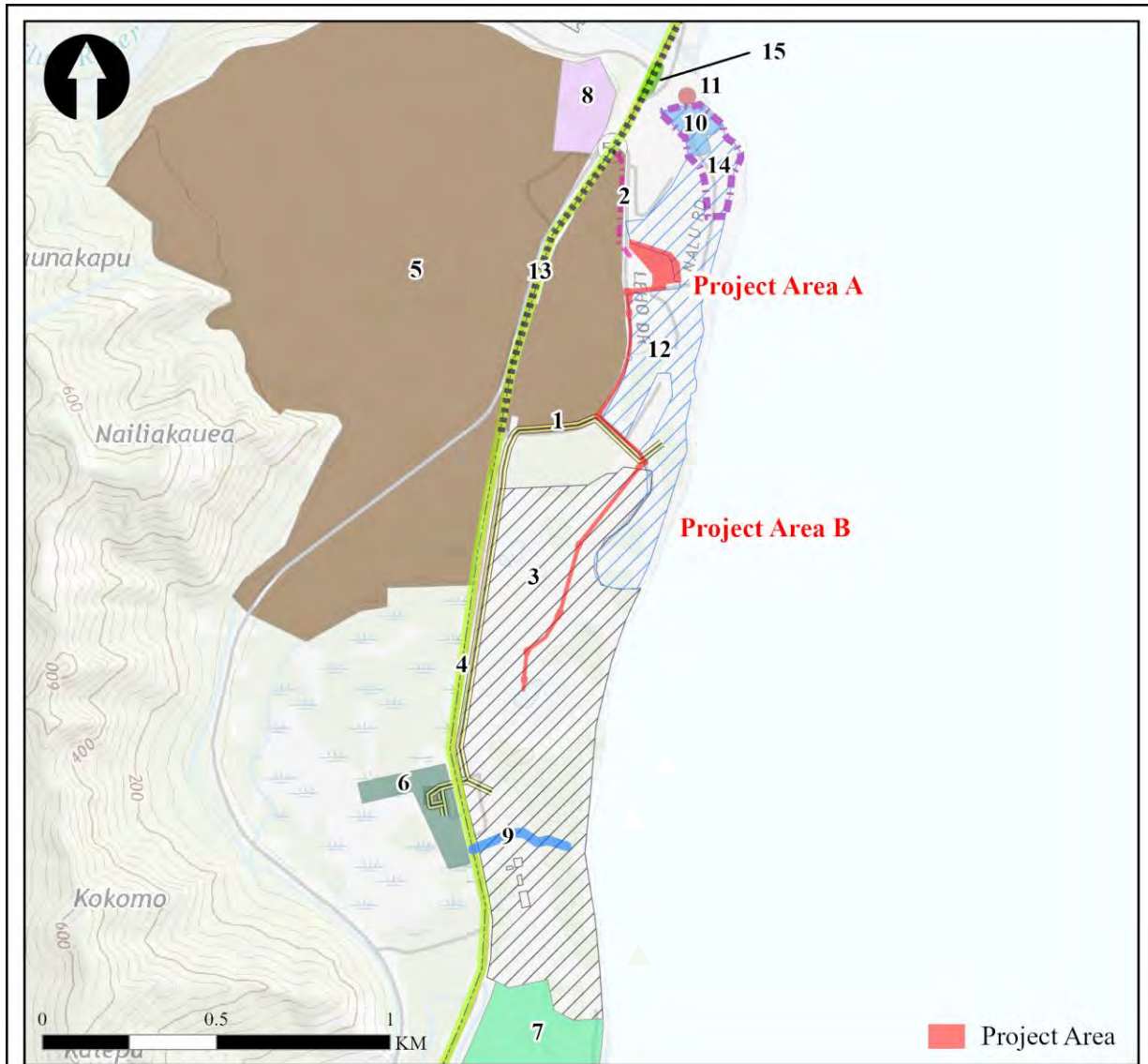
The *heiau* in Wailua were first documented by Thrum (1906a) when he conducted a survey of Kauaʻi *heiau* for the Hawaiian Annual for 1907. Five *heiau* were recorded in the Wailua River area, two of which are near the current project area: Malae Heiau and Hikinaakalā Heiau. These *heiau* were resurveyed by Bennett (1931) several decades later, at which time he also recorded SIHP Site 00103, which comprises the dune burials along the coast at Wailua (see Figure 11). Both Malae and Hikinaakalā Heiau are properties included in the Wailua Complex of Heiau National Historic Landmark, which was designated in 1962, and they are included in the Wailua Heiau Complex listed on the Hawaii State Register of Historic Places as SIHP Site 50-30-08-00502 (see Figure 11). Also included in the NHL are petroglyphs located on the riverbank adjacent to Hikinaakalā Heiau.

### Hikinaakalā Heiau, Hauʻola, and Pae-kiʻi-māhū-o-Wailua Petroglyphs

In the last fifty years numerous studies have been conducted at Hikinaakalā Heiau, Hauʻola, and Pae-kiʻi-māhū-o-Wailua petroglyphs. Dr. William Kikuchi (1974; 1984) conducted studies at these sites, followed by Martha Yent of the State Parks (Yent 1987; 1989; 1991c; 1997c; 2000). Kikuchi produced site maps (1974) and a detailed study of the petroglyphs (1984). In 1987, Yent (1987) monitored the demolition of an old comfort station and soil borings for a new comfort station adjacent to the *heiau* site; no subsurface deposits were encountered. Subsequently, Yent (1989) conducted mapping and testing at Hikinaakalā Heiau and Hauʻola (SIHP Site 00105), which revealed a historic and earlier period of occupation for the site. It was undetermined if the earlier period was associated with the *heiau* construction.

In 1991, the Wailua petroglyph boulders were damaged during bulldozing at the mouth of Wailua River. An assessment report was prepared by Yent (1991c). Another damage assessment was prepared the following year due to Hurricane Iniki, which covered all State Parks on Kauaʻi (Yent 1992). This report also included results of monitoring the cleanup at the sites, which mainly involved removal of fallen trees at Hikinaakalā Heiau and Hauʻola. No cleanup was recommended for Malae Heiau or for the Wailua Petroglyphs.

In the late 1990s, a vegetation removal and landscaping plan was prepared by Yent (1997c) for Hikinaakalā Heiau. This was followed with a report on the vegetation removal and the installation of interpretive signage (Yent 2000).



**Previous Investigation**

- |  |   |
|--|---|
| 1. Beardsley 1994  | 9. Folk and Hammatt 1992; Folk and Hammatt 1995; Folk et al. 1994         |
| 2. Carney and Hammatt 2007                                       | 10. Kikuchi 1974; Yent 1989, 2000   |
| 3. Cox 1977  | 11. Kikuchi 1984; Yent 1991c  |
| 4. Dega and Powell 2003  | 12. Morawski and Dega 2003; Shideler et al. 2001; Walton and Spilker 1974 |
| 5. Drennan 2007  | 13. Stine and Hammatt 2012; Tulchin and Hammatt 2009;                     |
| 6. Erklens and Welch 1993  | 87, 1992  |
| 7. Fager and Spear 2000  | 15. Yent 1991a  |
| 8. Flores 1995; Kikuchi 1973,1987; Yent 1991b, 1992, 1997a, 2005 |   |

Figure 10. Locations of Previous Archaeological Studies in the Vicinity of the Project Areas A and B.



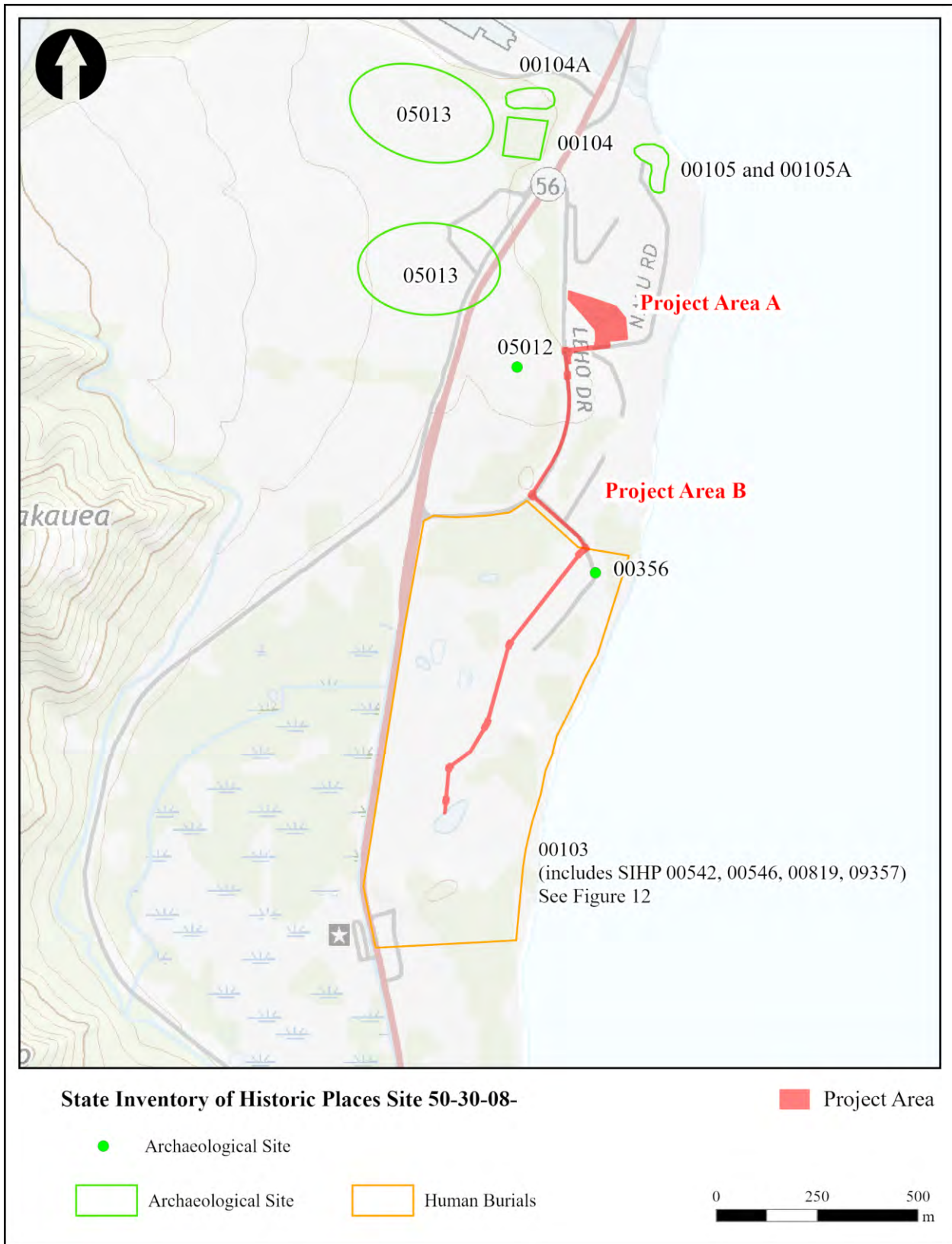


Figure 11. Locations of Known Historic Properties in the Vicinity of the Project Areas A and B.

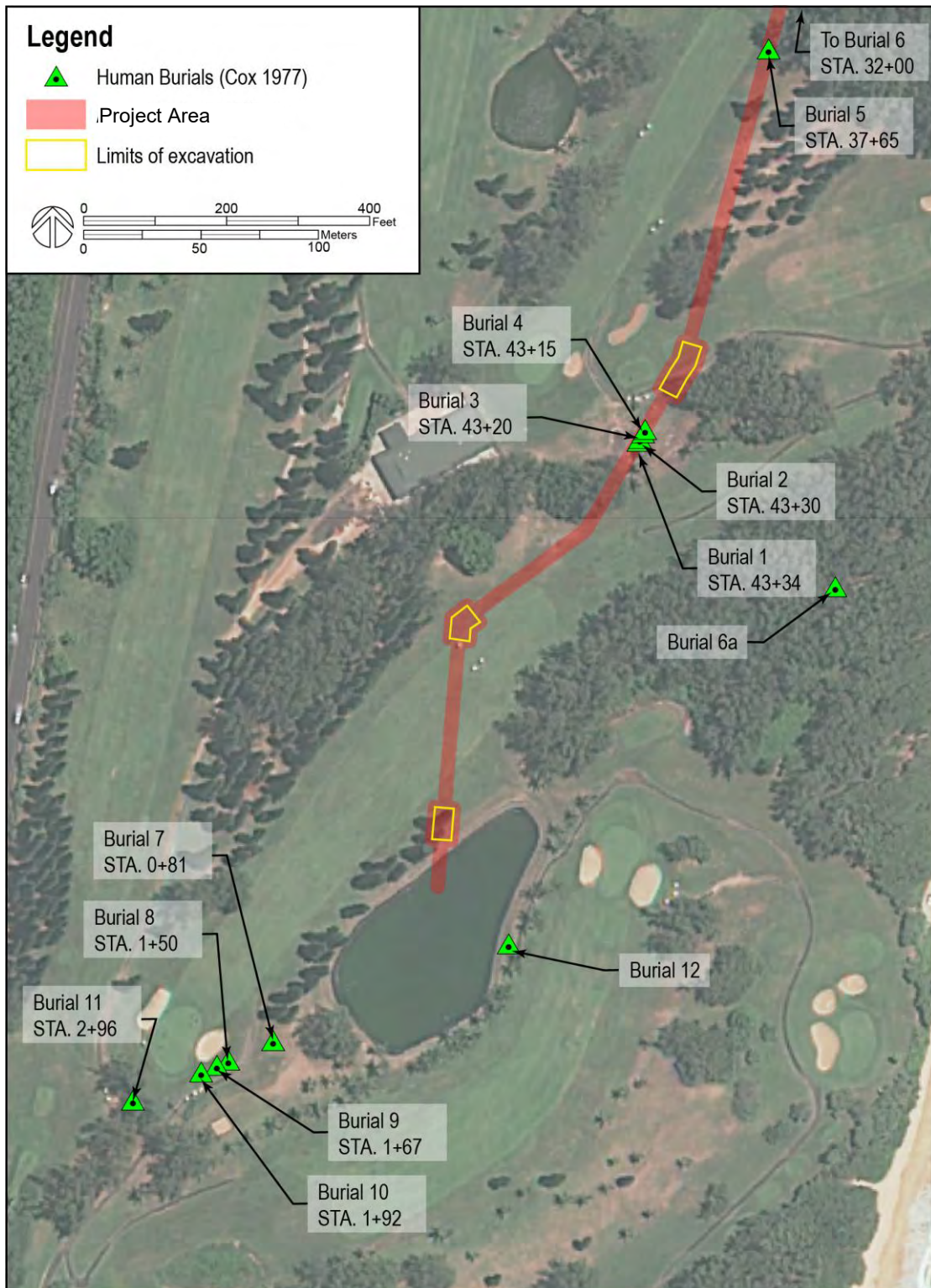


Figure 12. Locations of Burials Identified in Cox (1977) Near Project Area B.

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference                     | TMK/<br>Location  | Nature of<br>Study               | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results  | Proposed Project<br>Anticipated Effect                                       |
|-------------------------------|---|----------------------------------|----------------------------|--|--|
| Thrum*<br>1906a               | Island wide   | Survey of<br>Kaua'i <i>heiau</i> | 00104                      | Malae Heiau  | No Effect  |
|                               |   |                                  | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Bennett*<br>1931              | Island wide   | Arch. Survey                     | 00103                      | Dune burials   | Effect with proposed mitigation measures (site-wide determination for 00103) |
|                               |   |                                  | 00104                      | Malae Heiau  | No Effect  |
|                               |   |                                  | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Kikuchi<br>1974               | 3-9-006:029/<br>Hikinaakalā<br>Heiau                      | <i>Heiau</i> Study               | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Walton<br>and Spilker<br>1974 | 3-9-006:004/<br>Lydgate State<br>Park Pavilion            | Assess. and<br>Testing           | -                          | No significant finds.  | No Effect  |
| Cox 1977                      | 3-9-006:001/<br>Wailua Golf<br>Course                     | Burial<br>Recovery               | 00103                      | 13 human burials and disarticulated human skeletal remains (also designated Sites - 00542 to -00546 and -00819, but considered within Site 103)  | Effect with proposed mitigation measures (site-wide determination for 00103) |
| Kikuchi<br>1984               | 3-9-006:029/<br>Wailua<br>Petroglyph<br>Boulders          | Mapping of<br>Petroglyphs        | 00105A                     | 36 figures, possibly additional in river   | No Effect  |
| Kikuchi<br>1987               | 3-9-002:012/<br>Malae Heiau                               | Adze<br>Study                    | 00104A                     | Artifact scatter   | No Effect  |
| Yent 1987                     | 3-9-006:001,<br>004/<br>South of mouth<br>of Wailua River | Monitoring                       | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Yent 1989                     | 3-9-006:004<br>Hikinaakalā<br>Heiau and<br>Hau'ola        | Mapping and<br>Testing           | 00105                      | Hikinaakalā Heiau; determined two periods of occupation: historic and earlier period, undetermined if associated with <i>heiau</i> construction. | No Effect  |

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference                    | TMK/<br>Location   | Nature of<br>Study                           | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results   | Proposed Project<br>Anticipated Effect   |
|------------------------------|--|--|----------------------------|---|--|
| Yent<br>1991a                | 3-9-006:001/<br>Lydgate Area   | Arch. Testing                                | -                          | Possible pre-<br>contact cultural<br>deposit.                           | No Effect  |
| Yent<br>1991b                | 3-9-002:012/<br>Malae Heiau  | Enviro.<br>Assess.                           | 00104                      | Malae Heiau   | No Effect  |
| Yent<br>1991c                | 3-9-006:004/<br>Wailua<br>Petroglyphs  | Damage<br>Assess.                            | 00105A                     | Petroglyphs   | No Effect  |
| Folk and<br>Hammatt<br>1992  | 3-9-002:004/<br>Wailua Golf<br>Course  | Assess.                                      | -                          | No significant finds.   | No Effect  |
| Yent 1992                    | State Parks on<br>Kaua'i   | Hurricane<br>Damage<br>Assess.               | 00104<br>00105             | Malae Heiau<br>Hikinaakalā Heiau<br>and Hau'ola                         | No Effect<br>No Effect   |
| Erklens<br>and Welch<br>1993 | 3-9-005:13/<br>Kaua'i<br>Community<br>Correctional<br>Center   | Arch.<br>Assess.                             | -                          | Notes probability of<br>human burials                                   | No Effect  |
| Beardsley<br>1994            | 3-9-002:004,3-<br>9-005:13, 3-9-<br>006:001 and<br>011/<br>Kaua'i<br>Community<br>Correctional<br>Center and the<br>Wailua County<br>Golf Course | Subsurface<br>Testing<br>Inventory<br>Survey | 00103<br>(09357)           | One burial<br>designated Site<br>09357, but<br>considered Site<br>00103 | Effect with proposed<br>mitigation measures (site-<br>wide determination for<br>00103) |
| Folk et al.<br>1994          | 3-9-002:004/<br>Wailua County<br>Golf Course   | Arch.<br>Inventory<br>Survey                 | -                          | No significant finds.   | No Effect  |
| Hammatt<br>et al. 1994       | Kūhiō Highway<br>from<br>Hanamaulu to<br>Kapa'a<br>Ahupua'a  | Document<br>Review and<br>Assess.            | -                          | No significant finds.   | No Effect  |
| Flores<br>1995               | 3-9-002:012/<br>Malae Heiau  | Historical<br>and Cultural<br>Research       | 00104                      | Malae Heiau   | No Effect  |

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference              | TMK/<br>Location                            | Nature of<br>Study                          | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results  | Proposed Project<br>Anticipated Effect                                       |
|------------------------|---|---|----------------------------|--|--|
| Folk and Hammatt 1995  | 3-9-002:004/<br>Wailua County Golf Course   | Monitoring                                  | 00103<br>(01980)           | Remains of eight individuals from disturbed or secondary deposit; designated 01980, but considered Site 00103  | Effect with proposed mitigation measures (site-wide determination for 00103) |
| Yent 1997b             | 3-9-002:012/<br>Malae Heiau                 | Vegetation Removal and Landscape Plan       | 00104                      | Malae Heiau  | No Effect  |
| Yent 1997c             | 3-9-006:004<br>Hikinaakalā Heiau            | Vegetation Removal and Landscape Plan       | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Fager and Spear 2000   | 3-9-005:001/<br>Wailua Golf Course          | Arch. Monitoring                            | 00103                      | 44 burials and 42 instances of disarticulated human skeletal remains; subsurface cultural layer (with traditional artifacts) and three fire pit features, dated AD 1440 to 1670. | Effect with proposed mitigation measures (site-wide determination for 00103) |
| Shideler et al. 2000   | 3-9-006:001/<br>Lydgate Park                | Inventory Survey                            | 00105                      | Hikinaakalā Heiau and Hau'ola; no new sites  | No Effect  |
| Yent 2000              | 3-9-006:004<br>Hikinaakalā Heiau and Hauola | Vegetation Removal and Signage Installation | 00105                      | Hikinaakalā Heiau  | No Effect  |
| Shideler et al. 2001   | 3-9-006:001/<br>Lydgate Park                | Arch. Assess.                               | 00105                      | Hikinaakalā Heiau and Hau'ola; no new sites  | No Effect  |
| Dega and Powell 2003   | Kūhiō Hwy.                                  | Arch. Monitoring                            | +                          | No sites near current project area.  | No Effect  |
| Morawski and Dega 2003 | 3-9-006:001/<br>Lydgate Park                | Arch. Monitoring                            | 00103                      | Two burials and two instances of isolated human skeletal remains.  | Effect with proposed mitigation measures (site-wide determination for 00103) |
|                        |   |   | 00356                      | Pre-Contact cultural layer.  | No Effect  |

**Table 1. Previous Archaeological Studies and Historic Properties within 500 Meters of Project Areas A and B.**

| Reference                          | TMK/<br>Location  | Nature of<br>Study                         | SIHP*<br>Site<br>50-30-08- | Summary of<br>Results  | Proposed Project<br>Anticipated Effect |
|------------------------------------|---|--|----------------------------|--|--|
| Yent<br>2005a                      | 3-9-02:012/<br>Malae Heiau  | Inventory<br>Survey                        | 00104                      | Malae Heiau  | No Effect                              |
| Yent<br>2005b                      | 3-9-02:012/<br>Malae Heiau  | Preservation.<br>and<br>monitoring<br>Plan | 00104                      | Malae Heiau  | No Effect                              |
| Carney<br>and<br>Hamstatt<br>2007  | 3-9-006:001/<br>Leho Drive  | Arch.<br>Monitoring                        | -                          | No significant finds.  | No Effect                              |
| Drennan<br>2008                    | 3-9-002:012, 24,<br>25 and 3-9-<br>006:009/<br>Wailua<br>Residential<br>Subdivision | Arch.<br>Inventory<br>Survey               | 05012                      | Plantation era<br>agricultural water<br>diversion with<br>irrigation features. | No Effect                              |
|                                    |   |  | 05013                      | Pre-contact lithic<br>scatter  | No Effect                              |
|                                    |   |  | +                          |  | No Effect                              |
| Tulchin<br>and<br>Hamstatt<br>2009 | Kūhiō Hwy.,<br>Aleka Loop to<br>Leho Dr.  | Arch.<br>Assess.                           | -                          | No significant finds.  | No Effect                              |
| Stine and<br>Hamstatt<br>2012      | Kūhiō Hwy.,<br>Aleka Loop to<br>Leho Dr.  | Arch.<br>Inventory<br>Survey               | +                          | No sites near<br>current project area.   | No Effect                              |

\*State Inventory of Historic Places

+Identified sites over 500 meters from current project area.

### **Malae (Malaeha‘akoa) Heiau**

After a 1990 sugarcane harvest adjacent to SIHP Site 00104, Malae Heiau (Malaeha‘akoa Heiau), an artifact scatter was exposed (Yent 1991b:22). A surface collection was carried out, which yielded adze preforms, flakes, and cores around the exterior of the *heiau* wall. This artifact scatter was designated SIHP Site 00104A. Kikuchi (1987) had also conducted a study of adze fragments from the *heiau* area, which Drennan (2008:22) reports were recovered after a sugarcane harvest in 1973. Yent later conducted planning and monitoring for vegetation removal and landscaping (Yent 1997b), which was followed with a report on the removal of a banyan tree at the site (Yent 1997a). Yent also conducted archaeological inventory survey at the *heiau* (Yent 2005a) and prepared a preservation and archaeological monitoring plan (2005b). Additional work concerning this site included historical and cultural research reported by Flores (1995).

### **Wailua Municipal Golf Course and Kau‘i Community Correctional Center**

The golf course was created in 1920 by Charlie Fern, Jim Corstorphine, James Spalding, and Dan Arcia following their survey of a Lihue Plantation Dairy pasture as a possible golf course. They created a 3-hole golf course (today the 10th, 11th, and 12th fairways). In 1930, Francis H.

'I Brown expanded the course to nine holes. In 1962, Toyo Shirai reshaped the original 9-hole course and added 9 new holes for a full 18-hole course (Garden Island, July 14, 2013).

Bennet (1931) first recorded SIHP Site 00103, which comprises the pre-and post-Contact period burials at the coastal sand dunes south of Wailua River (see Figure 11). This area is now primarily the site of Wailua Municipal Golf Course and Lydgate Park. To date, approximately 100 human burials dating to the pre-Contact and historic periods have been encountered (Bushnell et al. 2004:63). According to local informants, “hundreds” of *iwi* (bones) were uncovered in the 1960s when the central driving range was constructed (Erkelens and Welch 1993:3).

In the 1970s, a burial recovery project was undertaken, which recorded 13 human burials and disarticulated skeletal remains at the golf course (Cox 1977). The project was conducted in connection with the Hood Corporation’s force main and effluent holding pond construction activities in the golf course. All human remains were reinterred at their original find locations; however, in one instance the original location of fragmented human skeletal remains was unknown, and the remains were reinterred in the project corridor. The burial locations were recorded using construction excavation pins to facilitate relocation by survey; 4”/20 penny spikes were also included during reburial to assist in relocation using a metal detector. The following 13 burial location descriptions are from the Cox (1977) report (see Figure 12):

**Burial 1:** A single adult. Top of cranium was 51 cm. (20.08 in.) below the existing surface and 110 cm; (43.31 in.) to the north or right of the 10 in. pipe centerline, at pin 43+34, Cluster A . . . in clean sand. . . The burial was photographed, recorded, limited measurements were taken, then reburied with *ti* leaves and a *pule* at the same location, depth and position on 24 May 1977.

**Burial 2:** Partial-cranium and mandible only. The remains were recovered from the trenching spoils pile and exact spatial location is uncertain. . . The backhoe bucket load that the find came out of was from about 150 cm. (59.06 in.) depth, and on the 10” pipe centerline, at pin 40+30, Cluster A. The sketches, photos and some measurements were made, then the remains were reburied on 25 May 1977, a day after they were found. The reburial was at the same pin location, but 160 cm (62.99 in.) north of the centerline and at 60 cm (23.62 in.) depth. The reburial included *ti*, and identifying label on pink flagging tape in a small round, flat plastic container placed a few centimeters above the remains, and a 20 penny spike just above that.

**Burial 3:** Partial. The remains were recovered at pin 43+20 to 24, Cluster A. The cranium was at the latter from a bucket load approximately 2 m. (6.96 ft ) depth and on centerline. The remains were recorded and measurements were taken with metric tape and sliding calipers. On 27 May 1977, the collected remains were reburied 1 m. (3.28 ft.) south of the pipe centerline at pin 43+24, 120 cm. (47.24 in.) below existing surface. The burial included *ti*, a label on flagging tape in a plastic container and a 20 penny spike.

**Burial 4:** A single young adult. The majority of the remains were collected at a depth of about 160 cm. (62.99 in.) below existing grade at pin 43+15, Cluster A, on centerline of the 10” line. The remains were recorded, and photographed. The cranium sketched and the lot measured, and then reburied on 27 May 1977. The reburial was about 110 cm. (43.31 in.) south and east of the pipe alignment at pin 43+15, at a depth of 120 cm. (47.24 in.). This reburial included *ti*, a label and a 20 penny spike.

**Burial 5:** Fragments of cranium. Found on the surface at pin 37+65, 27 May 1977. The find was collected, recorded and sketched, then reburied on 21 June 1977, at pin 37+65.

**Burial 6:** Fragment of a tibia. Found at pin 32+00, of unknown depth. The fragment was recorded, sketched and later reburied on 21 June 1977, at pin 32+00.

**Burial 6a:** An adult, probably complete. This burial was not actually within the contract area, but as portions of the remains were recovered on-site as result of construction activities, it is included here.

The scattered remains were found after backfill and grading operations around the effluent holding pond. Sand that had been stored just inland of the shore dune was being utilized for final grade fill. This burial was located just below the surface. It had been uncovered and then run over by the loading equipment just below this stockpile. The County had used this area as a sand quarry at various times in the past . . . The County grounds manager recalled a burial had been found some years ago in this general location. As that find was uncovered in a dune, and reburied there during filling up a series of low spots, the present find is probably not the same individual. Location: Approximately 152.40 m. (500 ft) northeast of the northeast end of the holding pond in low area just inland of beach dune. The fragments were collected and returned to the original location, photographed and reburied on 21 June 1977, at the *makai* dune site.

**Burial 7:** A segment of a calotte. The find consisted of two skull cap fragments. These were probably from the same individual as they were found together at the bottom of the trench during excavation. The larger piece was the lower segment (perhaps 1/4 to 1/3) of a right parietal, and shows some suturing. Location: Recovered at a depth of 150 cm. (59.06 in.) below existing grade, on the 12" pipe centerline at pin 0+81, Cluster B, on 15 July 1977. The remains were collected, recorded, sketched and then reburied at the same location on 17 July 1977. The reburial at depth of 1 m. (3.28 ft.) included *ti*, a label in small plastic container and a 20 penny spike.

**Burial 8:** Partial single individual. The scattered remains of a single adult or perhaps young adult, were collected over a period of three days starting on 15 June 1977. The majority of the fractured remains came out of the spoils pile, the remainder at about 150 cm. (59.06 in.) depth ... Location: On or slightly to right of centerline of the 12" pipeline, at a depth of 150 cm. (59.06 in.) [pipe laid at 3 m. (9.84 ft.) here] below grade, at pin 1+50, Cluster B . . . The remains were reburied with *ti*, a label, and 20 penny spike on 20 June 1977, at the same location and at a depth of 120 cm. (47.24 in.).

**Burial 9:** Cranium only. This excellently preserved cranium was found at the bottom of the trench when the construction crew was clearing away a cave in on 15 June 1977. Location: Found at depth of 320 cm. (125.98 in.), but after sand slump from right or north of centerline at pin 1+67, Cluster B, on the 12" pipeline where the north trench wall had been 130 cm. (51.18 in.) to the right of the centerline before the cave in, it was 210 cm. (82.68 in.) after. Actual depth of burial was indeterminate. The sample was recorded, sketched, measured and photographed, then reburied on 20 June 1977. The reburial in the same location at 120 cm. (47.24 in.) depth included *ti*, a label, and a .20 penny spike.

**Burial 16:** An adult, possibly complete. This very well-preserved burial was located in situ in the left, or south wall of the trench. Location: In situ in south wall of 12" pipe trench at pin 1+92, Cluster B, 245 cm. (96.46 in.) left of centerline, and 170 cm. (66.93 in.) below existing (but probably artificial) grade. The skull was removed for recording and measurement. The remainder of the find was left in situ. After backfilling the pipe, the cranium and mandible were reburied at 90 cm. (35.43 in.) depth just above the original location. The burial was completed with *ti*, a label and 20 penny spike.

**Burial 11:** A nearly complete adult. This individual was found with the cranium slightly out-of-place nearest the centerline due to construction activities. Location: Found on 16 July 1977, at pin 2+96, Cluster B, on the 12" pipeline, 135 cm. (53.15 in.) to the right, or north of centerline and 120 cm. (47.24 in.) below existing grade. The remains were collected, recorded, measured and then reburied on 21 June 1977, at the same location



and 100 cm. (39.37 in.) below grade (may not be finish grade after landscaping). The reburial was completed with *ti*, a tape label in a small plastic container, and above that a 20 penny spike.

**Burial 12:** Partial. This find consisted of two small fragments of a cranium located on the surface at the southeast edge of the holding pond. They were found by the construction crew after grade levelling for landscaping. Location: Unknown. The remains were recorded and sketched, then reburied 49.20 m. (15 ft.) west of the pond outlet box, 150 cm. (59.06 in.) to north and approximately 100 cm. (39.37 in.) above the 12" pipeline. The final depth below grade is unknown as backfill had not been completed when consultation terminated. The reburial included *ti*, tape label and 20 penny spike.

In the early 1990s, subsurface testing and inventory survey was carried out for the Kaua'i Community Correctional Center and Wailua Municipal Golf Course Sewage Force Main Project (Beardsley 1994). One burial, SIHP Site 09357, now considered to be SIHP Site 00103, was recorded on the west side of the highway at the Kaua'i Community Correctional Center, across from the Wailua Municipal Golf Course. These burials were reinterred at the original burial locations.

During monitoring for fiber optic cable installation across the golf course, just south of the Kaua'i Community Correctional Center, the remains of eight individuals were documented in a disturbed or secondary deposit (Folk and Hammatt 1995). These burials were disinterred and stored by the SHPD on Kaua'i.

Further north on the golf course, 44 human burials and 42 instances of disarticulated human skeletal remains were recorded during monitoring of irrigation renovation (Fager and Spear 2000). Additional features identified included a subsurface cultural layer with traditional artifacts and three fire pit features. One of the fire pit features yielded the date range of AD 1440 to 1670. The human burials were reinterred at the Wailua Golf Course Reinterment Facility.

### **Lydgate Park**

Archaeological investigations within today's Lydgate Park boundary have yielded finds consistent with other studies at the sand dunes south of Wailua River. Yent (1991a) conducted archaeological testing for the Kūhiō Highway Contraflow Project. The testing was located at the mouth of Wailua River and encountered a possible pre-Contact cultural deposit. During monitoring for the Lydgate Park bike and pedestrian path, three human burials and two instances of isolated human skeletal remains were documented (Morawski and Dega 2003). The finds were assigned to SIHP Site 00103. All human remains were reinterred at the Wailua Golf Course Reinterment Facility. A pre-Contact cultural layer was also encountered, which was designated SIHP Site 00356 (see Figure 11).

### **Wailua Residential Subdivision**

In the late 2000s, Scientific Consultant Services, Inc. conducted an inventory survey of a 240-acre area west of Kūhiō Highway for a residential development project (Drennan 2008). The survey identified three new archaeological sites comprising of nine features. Two of the sites are within 500 meters of the current project area. SIHP Site 05012, Feature 5 is a Plantation Era ditch, and SIHP Site 05013 is a pre-Contact lithic scatter comprising four loci, two of which are near the current project area. Additionally, a historic rock wall was identified through archival research, which was later located and identified as an earthen berm along Kūhiō Highway; no SIHP site number was assigned.

## **HISTORICAL PROPERTIES LOCATED NEAR THE PROJECT AREA**

This section presents summary descriptions of the known sites in the vicinity of the project area, all of which were mentioned in the above section. Portions of Project Area B are within the boundary of SIHP Site 00103. The locations of the sites are shown on the previously referenced Figure 11. Sites were previously assessed for significance following the criterion listed below for the HRHP and the corresponding NRHP Criterion A through D:

- **Criterion a:** Applies to properties associated with events that have made a significant contribution to the broad patterns of history.
- **Criterion b:** applies to properties associated with the lives of persons important in our past.
- **Criterion c:** applies to properties that embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value.
- **Criterion d:** applies to properties that have yielded or have the potential to yield information important to our understanding of the past
- **Criterion e:** applies to properties that have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property, or due to associations with traditional beliefs, events or oral accounts.

### **SIHP Site 50-30-08-00103 and SIHP Site 00356**

SIHP Site 00103 encompasses approximately 100 human burials encountered within the sand dunes of coastal Wailua, south of the Wailua River (see Figure 11). This area is traditionally known as Walio (or Alio) (Bushnell et al. 2004:57, 100). The following instances of burial discovery have been documented within SIHP Site 00103: 13 human burials and disarticulated human skeletal remains encountered in the 1970s at Wailua Municipal Golf Course, also designated SIHP Sites 00542 to 00546 and 00819 (Cox 1977); one burial encountered at Wailua Municipal Golf Course in the early 1990s, also designated SIHP Site 09357 (Beardsley 1994); remains of eight individuals from a disturbed or secondary deposit at Wailua Municipal Golf Course, also designated SIHP Site 01980; 44 human burials and 42 instances of disarticulated human skeletal remains encountered at Wailua Gold Course (Fager and Spear 2000); and two human burials and two instances of isolated human skeletal remains encountered at Lydgate Park (Morawski and Dega 2003). These burials date to the pre-Contact and early Historic Period. However, it has also been mentioned by Stanley B. Porteus (1962) that some of the burials may not be Hawaiian. He states that “about 2,000 Polynesians, mostly Gilbert Islanders” immigrated to the island for work in the late nineteenth century (Kuykendall 1967:127). “Those that did not die returned home—the rest were buried in the sand dunes alongside what is now the golf course near Kapaa, Kauai [Wailua Municipal Golf Course]” (Porteus 1962:159). SIHP Site 00103 was assessed as significant for information potential (Criterion d of the State and Criterion D National Register of Historic Places) and cultural value (Criterion e of the State Register of Historic Places).

Also documented within SIHP Site 00103 is SIHP Site 00356 (see Figure 11). This site is a subsurface cultural layer (with traditional artifacts) and three fire pit features. One of the fire pit features yielded a date range of AD 1440 to 1670 (Fager and Spear 2000). SIHP Site 00356 was assessed as significant for information potential (Criterion d of the State and Criterion D National Register of Historic Places).

#### **SIHP Site 50-30-08-00104**

SIHP Site 00104, Malae Heiau, or Malaeha'akoa Heiau, is situated on the west side of Kūhiō Highway and just south of the Wailua River (see Figure 11). It is said to have been built by Menehune and partially torn down by Queen Debora Kapule around 1830 (Dickey 1917:25). Kapule, having converted to Christianity, demolished the interior for use as a cattle pen (Dickey 1917:25). Thrum (1906b) offers the following description of the *heiau*:

The largest now of Kauai's list, is the heiau of Malae, in central Wailua, measuring 273 x 324 feet, with buttressed corners extending 13 feet, the only one of the kind known on the islands. Its high and substantial walls are in good condition, but its inner divisions and temple features were torn down by Deborah Kapule, the deserted Queen of Kaumualii, somewhere about 1830. A ledge about two feet high and some six feet wide is said to have extended all around its four walls (similar to the feature noted in Oahu's largest temple), described as the seating place of the people during ceremonies. The companion heiau of Malae was Poliahu, situated some little distance from it, further inland, but in plain sight of each other. It is also a walled heiau; of medium size, and in fair condition [Thrum 1906b:66].

This site is part of the Waialua Complex of Heiau, a National Historic Landmark. It was assessed as significant under Criteria B through E.

#### **SIHP Site 50-30-08-00105 and SIHP 00105A**

SIHP Site 00105, Hikinaakalā Heiau and Hau'ola, and SIHP Site 00105A, the Pae-ki'i-māhū-o-Wailua Petroglyphs (SIHP Site 00105A), are situated on the south side of the mouth of the Wailua River (see Figure 11). SIHP Sites 00105 and 00105A are part of the Waialua Complex of Heiau, a National Historic Landmark. It was assessed as significant under Criteria B through E.

Hikinaakalā can be translated as “the sunrise” or “the rising of the sun” (Kikuchi 1974:4; Pukui et al. 1974:45). Hau'ola is believed to be the ancient place name for the beach area and is also the name of *pu'uohonua* (place of refuge) north of the heiau (Yent 1995:34). According to Yent (1995:17), the rectangular foundation of the walls appears to remain in the same condition as when mapped by Bennett in 1931, with the exception of the northeast corner. The following site descriptions are from Thrum (1906a) and Bennett (1931):

The ruins of this heiau stand along the shore near the south side of the stream, 395 feet long, 56 feet at rear and 80 feet on the front. It shows three distinct divisions, paved; the inner section still in fair condition 120 feet in depth. E end and S. E. corner walls are 6 feet high and 11 feet thick, of heavy stones. Two large boulders stand near the middle near the division wall of this section. The outer or front section of 80 feet includes a width that runs back beyond the division wall [Thrum 1906a:41].

Today much of the stone has been removed, reducing the walls to bare outlines, and obliterating the paving entirely. The outer section is also destroyed. The stones remaining show the construction of the walls to have been that of placing large stone slabs on edge in a double row, 8 feet wide, and filling in between with smaller stones. The division between the front and the middle sections is now marked by a rough row of stone that extends 50 feet or more west of the line of the old wall. This is probably later work, an assumption substantiated by the finding of a stone, the surface of which was used for adz grinding as part of this wall though in a position impossible for use. The Kauai Historical Society has called this a place of refuge “Hauola” as well as a heiau [Bennett 1931:125–126].

The petroglyphs (SIHP Site 000105A) appear on a cluster of boulders situated at the mouth of Wailua River, and are often obscured by sand (see Figure 13). Yent (1995:17) reports

that the boulders have been mapped on three occasions: by Banks and Bishop Museum in 1949 (no report published), Kikuchi in 1973 (Kikuchi 1974), and Yent in 1991 (Yent 1991c). In 1973, Kikuchi recorded 35 petroglyphs, including human forms (stick figures and profile, outline forms), ovals, linear patterns, and spiral. Grinding surfaces, likely from polishing adzes, are also present, and some of the overlay the petroglyphs indicating that some of the ground surfaces post-date the rock art. Bulldozing has occurred at the mouth of the river since the 1940s, which has caused damage to the site (Yent 1995:17), and many petroglyphs recorded by Kikuchi in 1973 could not be relocated in 1991 (see Yent 1991c).

### **SIHP Site 50-30-08-00502**

Wailua Heiau Complex is listed on the Hawaii State Register of Historic Places and the National Register of Historic Places. It was designated a National Historic Landmark (NHL) in 1962. The NHL comprises four *heiau*—Malae (Malaeha'akoa; SIHP Site 00104), Poli'ahu (SIHP Site 00107), Holoholoku (Kalaekokamanu; SIHP Site 00106), and Hikina'akalā (SIHP Site 00105)—as well as Pohaku Ho'ohānau (Birthstones; SIHP Site 00106), the Bell Stone Site (SIHP Site 00335), Hua'ola (SIHP Site 00105), and Pae-ki'i-māhū-o-Wailua Petroglyphs (SIHP Site 00104A). The Wailua NHL is significant under National Register Criteria A, B, C and D for its size, quality, setting, historic association and information potential (Dunbar 1988).

### **SIHP Site 50-30-08-05012, Feature 5**

SIHP Site 05012 is a historic agricultural water transportation system comprising five features and three sub-features. These features represent a sample of the approximately 100 features the site is believed to comprise. Only Feature 5 is near the current project area (see Figure 13), which was described as follows:

Feature 5 was a ditch that descends in elevation from 226 to 81 ft. amsl and is 1280 m in length; it is 3.0 m wide (see Figure 6) (Figure 15). The ditch was curvilinear and was oriented northwest-southeast (136°/316°). The feature was U-shaped and was excavated along the base contour of the northeast side of Kālepa Ridge [Drennan 2008:35].

SIHP Site 05012 was assessed as significant for information yielded (Criterion d of the State and Criterion D National Register of Historic Places); no further work was recommended.

### **SIHP Site 50-30-08-05013**

SIHP Site 05013 consists of a pre-Contact surface lithic scatter with four loci and one outlier. Locus A and Locus B are near the current project area (see Figure 13). At Locus A, 111 artifacts were recorded, which covered a 313 m long by 242 m wide area on level terrain, beginning roughly 48 m west of Malae Heiau (SIHP Site 00104). It may be associated with Malae Heiau (SIHP Site 00104/00104A) and the Wailua Heiau Complex (SIHP Site 00502). Locus B was documented 249 m south of Malae Heiau and measured 200 m in an east-west direction. SIHP Site 05013 was assessed as significant for information potential (Criterion d of the State and Criterion D National Register of Historic Places); data recovery was recommended.

### **Wailua WWTP**

The Wailua WWTP was originally constructed in 1964 and was designed by Sunn, Low, Tom & Hara, Inc. Consulting Engineers. The original 1964 WWTP site plan is presented in Figure 13. The original site plan identifies five structures that are still present at the site. These structures include the rapid bloc basins, sludge drying beds, abandoned chlorine contact basin, control building, and boundary wall. One additional structure, the breakroom building, does not appear on the original 1964 site plan, but it does appear as existing on the subsequent 1976 WWTP

expansion plans. For the purposes of this analysis, it is assumed that the breakroom building was also constructed circa 1964. Therefore, there are six structures at the WWTP site that are greater than 50 years old. These structures are described in Table 2.

Since its original construction in 1964, the WWTP has undergone multiple phases of expansion and construction to meet increased demand for wastewater treatment and to comply with permitting requirements. The WWTP expansions have introduced a range of new structures and equipment at the WWTP site. An aerial image of the current WWTP site is shown in Figure 14 with the original structures called out. The original 1964 structures at the WWTP are utilitarian in nature and the multiple phases of expansion and modifications at the WWTP have altered the original site design. Therefore, the original structures fail to meet the criteria for significance and integrity that would make them eligible for the National Register of Historic Places.

#### **ANTICIPATED HISTORIC PROPERTIES IN THE PROJECT AREA**

Several archaeological sites were previously identified at or near the project area. Malae Heiau (SIHP Site 00104) and Hikinaakalā Heiau (SIHP Site 00105), part of the Wailua Complex of Heiaus NHL, are located over 1,000 feet north of Project Area A, and would not be affected by the proposed action.

SIHP Site 05012, a historic period ditch associated with Lihue Plantation, is located approximately 630 feet west of Project Area A and approximately 370 feet west of Project Area B and would not be affected by the proposed action (see Figure 11).

At the Wailua Municipal Golf Course, Project Area B is within or partially within the boundaries of SIHP Site 00103, which comprises at least 100 human burials documented within the coastal sand dunes south of the Wailua River.

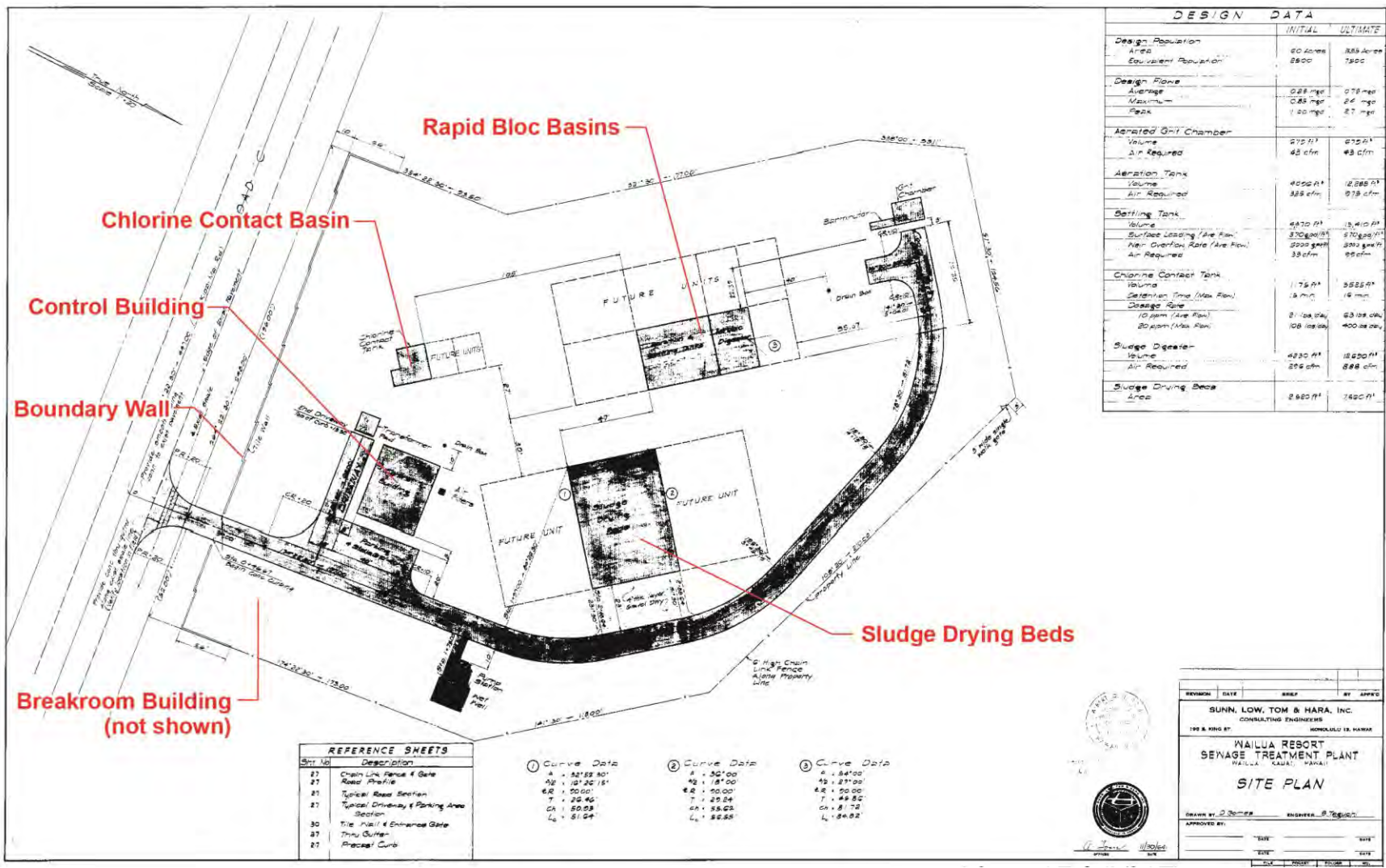



Figure 13. Wailua Wastewater Treatment Plant Site Plan, 1964.




Figure 14. Wailua Wastewater Treatment Plant, Current Site Layout.

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**


| Name<br>Date Constructed<br>Designer   | Description and Function  | Status and Impact<br>of Proposed<br>Action  | Photo   |
|--|---|---|---|
| <p>Rapid Bloc Basins</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers</p> | <p>The Rapid Bloc Basin (AKA: Aeration &amp; Settling Tanks and Aerobic Digester) is a series of open concrete tanks of rectangular form and relatively uniform size. The first two tanks are the aeration and settling tanks and measure 30'-4"x17'-6". The third tank is the aerobic digester and its dimensions are 29'-4"x18'-6". The tanks are partially subgrade and partially above grade. Three catwalks with 1 ½" galvanized steel pipe railing and stanchions traverse the top of the tanks. Two metal pipes run along the outer two catwalks. The Rapid Bloc Basins provided aeration of the wastewater to stabilize and further treat it.</p> | <p>Decommissioned (date unknown); Structure is not currently operable but will remain in place.</p> |  |




**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function   | Status and Impact<br>of Proposed<br>Action                | Photo   |
|---|--|---|---|
| <p>Sludge Drying Beds</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers</p> | <p>The Sludge Drying Beds are a series of three open concrete beds. The three parallel beds are approximately 60' long and 44'-8" wide, each bed about 14' wide separated by low interior walls. Beds are built partially subgrade with 2' walls extending above grade. The head of the structure is connected to the Aerobic Digester via a 6" sludge line. The beds are slightly sloping with a perforated metal drain pipe running down the middle of each bed and a redwood stop gate at the foot of each bed. A 9" layer of sand covers the surface of the sludge beds. Biosolids (sludge) are applied onto the surface of the sand to dry prior to disposal at the landfill.</p> | <p>Still in use;<br/>Structure to remain<br/>in place</p> |  |


**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function  | Status and Impact<br>of Proposed<br>Action   | Photo   |
|---|---|--|---|
| <p>Abandoned Chlorine Contact Basin</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers</p> | <p>The Chlorine Contact Basin (aka Chlorine Contact Tank) is a grouping of three open, reinforced concrete tanks of different sizes. The form of the basin is generally rectangular with dimensions of approximately 19'-2" x 18'. The tanks are about 8'-4" deep with a portion of the tank extending above grade and the majority below grade. A flow box is situated on the opposite end of the opening. A short staircase and a metal handrail allow for overhead visual monitoring of the basin. The Chlorine Contact Basin is used to provide contact time for effluent disinfection prior to disposal.</p> | <p>Decommissioned (1976). Replaced with new chlorine contact basin in a different location. Proposed demolition of 1964 basin to make way for Rotary Drum Thickener and new access road.</p> |  |


**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function   | Status and Impact<br>of Proposed<br>Action            | Photo   |
|---|--|---|---|
| <p>Breakroom Building</p> <p>Between 1964 and 1974</p> <p>No data on designer</p> | <p>The Breakroom Building is a single-story masonry structure with a flat roof and rectangular form. The dimensions of the structure are 42'x18'. The roof has an approximately 3' overhang on all sides. A large white frieze board with no decorative elements extends along the length of the exterior. Building corners have an alternating brick length pattern resembling quoining. There are four small fenestrations on the west façade with jalousie windows. The building interior contains a lunchroom, restroom, showers, and lockers for employees.</p> | <p>Still in use;<br/>Structure to remain in place</p> |  |

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer   | Description and Function  | Status and Impact<br>of Proposed<br>Action            | Photo   |
|--|---|---|---|
| <p>Control Building</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers &amp; Bradley &amp; Wong, Architects</p> | <p>The Control Building is a single-story masonry building with a rectangular layout. It has concrete block walls and a flat roof with a slightly raised central ridgeline and overhang. Overall dimensions are approximately 37' x 30'. The north side of the building has six narrow windows and follows a general pattern alternating between 4' wall sections with 2' wide windows. The remaining façades do not show a strict pattern. The interior of the building comprises space for the following rooms: blower room, chlorinator room, yard equipment storage, storage, toilet, and laboratory and office.</p> <p>The Control Building contains the computer SCADA controls and motor controls that operate the wastewater treatment plant.</p> | <p>Still in use;<br/>Structure to remain in place</p> |  |

**Table 2. Structures at Wailua Wastewater Treatment Plant that are greater than 50 years old.**

| Name<br>Date Constructed<br>Designer  | Description and Function  | Status and Impact<br>of Proposed<br>Action   | Photo   |
|---|---|--|---|
| <p>Boundary Wall</p> <p>1964</p> <p>Sunn, Low, Tom &amp; Hara, Inc., Engineers &amp; Bradley &amp; Wong, Architects</p> | <p>The boundary wall (aka concrete block fence) is a 6' high wall and extends approximately 245' along the south side of the property, parallel to Nalu Road. The wall wraps around the western boundary of the plant extending an additional 25'. It is constructed of concrete block with a cap tile and is organized as a series of sections or bays. Each bay steps down with the sloping terrain and is recessed in a stair step pattern. The boundary wall is painted white and functions as a buffer for the utility and to control access</p> | <p>Still in use; Proposed demolition and replacement with new wall to expand WWTP access footprint</p> |  |

## CULTURAL CONSULTATION

As part of the CIA, PCSI contacted entities and individuals on or around 28 June 2023 to solicit information about historic properties, cultural resources, traditional cultural properties, and traditional and customary practices potentially within the current project area (Table 3). In addition, a public notice was placed in the Office of Hawaiian Affairs Ka Wai Ola Newsletter (Appendix A) in March 2023. Furthermore, several entities commented on historic properties in response to an HRS 343 early consultation request by HHF in May of 2020.

**Table 3: List of Entities/Individuals Contacted**

| Name/Affiliation  | Sent Via                 | Response              | Summary Comment  |
|---|--------------------------|-----------------------|--|
| Dawn N. S. Chang<br>SHPO and Chairperson, DLNR  | email                    | None to Date<br>(NTD) |  |
| Alan Downer Administrator, SHPD;<br>Deputy State Historic Preservation<br>Officer     | email                    | NTD                   |  |
| Annelle Amaral, President<br>Association of Hawaiian Civic Clubs                      | USPS (return<br>receipt) | NTD                   |  |
| Gerald Ida, Chair<br>Kauai Historic Preservation<br>Commission, County of Kauai       | email                    | Yes                   | Office response<br>unrelated to<br>historic properties<br>or cultural<br>resources |
| Curt Cottrell, Administrator<br>Division of State Parks, DLNR                         | email                    | NTD                   |  |
| Dan Ahuna OHA, Kaua'i Island Rep  | email                    | NTD                   |  |
| Dennis Ragsdale, Advocate General<br>Order of Kamehameha I                            | email                    | NTD                   |  |
| Donna Kaliko Santos<br>Nā Kuleana o Kānaka 'Ōiwi                                      | email                    | NTD                   |  |
| Kamakana C. Ferreira, Lead<br>Compliance Specialist, OHA                              | email                    | NTD                   |  |
| Keith Yap, Chair<br>Kauai/Niihau Island Burial Council                                | USPS (return<br>receipt) | NTD                   |  |
| Kiersten Faulkner, Executive Director<br>Historic Hawai'i Foundation                  | email                    | NTD                   |  |
| Liberta Hussey Albao, President<br>Queen Debra Kapule Hawaiian Civic<br>Club          | email                    | NTD                   |  |
| Mililani B. Trask, Convenor<br>Na Koa Ikaika Ka Lahui Hawaii                          | email                    | NTD                   |  |
| Kūhiō Lewis, Executive Director<br>Council for Native Hawaiian<br>Advancement         | email                    | NTD                   |  |
| Noa Mau-Espirito<br>Na Mookupuna o Wailua   | email                    | NTD                   |  |
| Noelani Josselin, Cultural Practitioner   | email                    | NTD                   |  |
| Patrick T. Porter, Director<br>Department of Parks and Recreation,<br>County of Kauai | email                    | NTD                   |  |
| Rayne Regush, Chair<br>Wailua-Kapa'a Neighborhood<br>Association                      | email                    | Yes                   | Recommended an<br>AIS of project area  |

**Table 3: List of Entities/Individuals Contacted**

| <b>Name/Affiliation</b>   | <b>Sent Via</b>          | <b>Response</b> | <b>Summary Comment</b> |
|---|--------------------------|-----------------|------------------------|
| Taffi Wise, Executive Director<br>Kanu o ka 'Āina Learning 'Ohana<br>(KALO) | email                    | NTD             |                        |
| Billy Kaohelaui'i<br>Aha Moku Council Rep, Kaua'i                           | USPS (return<br>receipt) | NTD             |                        |
| Vincent Hinano Rodrigues, JD, Branch<br>Chief History and Culture, SHPD     | email                    | NTD             |                        |
| Kauanoë Hoomanawanui<br>Burial Sites Specialist (Kauai and<br>Niihau) SHPD  | email                    | NTD             |                        |
| David Buckley, Kauai Lead<br>Archaeologist, SHPD                            | email                    | NTD             |                        |
| Randy Wichman<br>Kauai Historical Society                                   | email                    | NTD             |                        |

To date, PCSI has received one response regarding cultural resources/historic properties, and one response from the Kaua'i County Planning Department through direct mailing. The latter response was regarding project information unrelated to cultural resources and subsequently followed up by HHF. The former was provided by the Wailua-Kapa'a Neighborhood Association and recommended undertaking an archaeological inventory survey (presumably with subsurface testing) within the project area (see Appendix B). There have been zero responses to the public notice placed in the Office of Hawaiian Affairs Ka Wai Ola Newsletter.

As part of HRS 343 early consultations for the project, the Kaua'i County Department of Planning, the Sierra Club, and the Wailua-Kapa'a Neighborhood Association made comments regarding historic properties or cultural resources. The Kaua'i County Department of Planning noted that it "will require an evaluation of the project relative to whether the project impacts any traditional and customary practices in the area;" although not specified, this language suggests undertaking a Ka Pa'akai analysis (see below). Both the Sierra Club and the Wailua-Kapa'a Neighborhood Association supported conducting archaeological monitoring during the proposed project.

### **SUMMARY AND ASSESSMENT**

The proposed project areas include two project areas. At Project Area A, the Wailua WWTP, ground-disturbing activities include construction of a new access road, a new headworks, and construction of a new Rotary Drum Thickener Platform. Project Area B involves the rehabilitation of the 10-inch force main connecting the Wailua WWTP to the Wailua Municipal Golf Course irrigation holding pond. The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining, which will limit the amount of excavation required.

Work conducted for this CIA included archival map and document research, a review of previous archaeological investigations conducted near the project area locales, as well as an effort to collect cultural information through community consultation. All work was carried out in accordance with HRS Chapter 6E, HAR Title 13 Subtitle 13, Chapter 275, and HRS 343. Background research indicates that Project Area A was formerly adjacent to, and likely at least partially within, a former sugarcane field of the Lihue Planation (see Figure 7). Prior to the sugar production era, two LCAs were present to the north of Project Area A, south of the Wailua River. Records indicate these LCAs consisted of house lots. Project Area B is situated on the coastal sand dune, which is the location of SIHP Site 00103, a traditional Hawaiian burial area.

Of the two project areas, only Project Area A includes existing structures that are greater than 50 years old and could be considered historic. Project Area A encompasses the WWTP and involves a range of improvements to maintain and upgrade existing plant processes. There are six structures located at the WWTP that are greater than 50 years old. Four of these structures (the rapid bloc basins, the sludge drying beds, the breakroom building, and the control building) would remain in place, and would not be affected by the proposed improvements. Two of these structures (the abandoned chlorine contact basin and the boundary wall) would be demolished to make room for the proposed improvements. However, neither of these structures is eligible for listing on the NRHP. Therefore, no effects to historic structures are expected at the WWTP.

Of the two project area locales, archaeological sites, including human burials, are more likely to be encountered at Project Area B where coral dune sands are present. Based on underlying soils (see Figure 5) and the land use history gleaned from a historical map of Lihue Planation (see Figure 7), there is low potential for encountering historic properties at Project Area A; nonetheless, the lack of archaeological research directly associated with the WWTP indicates that the subsurface cultural context is unknown. The rehabilitation of the existing recycled water force main (Project Area B) would be conducted in coral dune sands. Therefore, it would have the potential to impact subsurface archaeological sites.

### **KA PA‘AKAI ANALYSIS**

A further analytical framework for addressing the preservation and protection of cultural practices specific to Native Hawaiian communities resulted from a 2000 Hawaii Supreme Court ruling (in *Ka Pa‘akai O Ka‘Aina vs Land Use Com’n*. 94 Hawaii 31 (2001)). In its decision, the court established a three-part analytical approach to identify, assess impacts, and mitigate impacts to traditional and customary native Hawaiian rights associated with a proposed action. The three-part analysis, based primarily on archival research due to the lack of response during the consultation effort, is summarized below:

1. *The identity and scope of valued cultural, historical, or natural resources, including the extent to which traditional and customary native Hawaiian rights are exercised.*
  - a. One historic property (SIHP 00103) with multiple human remains and a cultural deposit is present within the proposed area.
2. *The extent to which those resources—including traditional and customary native Hawaiian rights—will be affected or impaired by the proposed action.*
  - a. The proposed project includes ground disturbing work within Site SIHP 00103, which includes human burials and subsurface cultural deposits. Although most of the ground disturbance will be within previously disturbed areas, there is the possibility that additional human remains and subsurface cultural deposits will be inadvertently discovered during the project.
3. *The feasible action, if any, to be taken by the agency to reasonably protect native Hawaiian rights if they are found to exist:*
  - a. The agency has taken two actions to reasonably protect native Hawaiian rights.
    - i. The project has undergone a series of redesign efforts to eliminate, reduce, or minimize ground disturbance in previously undisturbed areas (e.g., rehabilitating rather than replacing the force main in Area B subsurface and eliminating all work at the Wailua Driving range).
    - ii. The project will require archaeological monitoring during ground disturbance to ensure that any identified historic properties (including inadvertently discovered human remains) are treated in accordance with HAR 13-13-279 and HAR 13-13-300.



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**APPENDIX A:  
OHA KA WAI OLA PUBLIC NOTICE (MARCH 2023)**



CIA team is seeking to engage with cultural practitioners and other knowledgeable individuals who can provide information concerning cultural, historical, or natural resources that may be present within the project area for the purpose of completing a Ka Pa'akai Assessment. If interested in participating and sharing your mana'o, please email PCSI at haena@pcsihawaii.com or by calling PCSI at 808-546-5557.

Ka Wai Ola.

KWO Survey

## Cultural Impact Assessment and Ka Pa'akai assessment: Wailua, Kaua'i

Pacific Consulting Services, Inc. (PCSI), on behalf of the County of Kaua'i, is conducting a Cultural Impact Assessment (CIA) and Ka Pa'akai assessment in support of the proposed improvements to the Wailua Wastewater Treatment Plant at 4460 Nalu Road Wailua, Kaua'i 96746 (Tax Map Keys: (4) 3-9-006:019 & 027). The project also includes improvements to the ocean outfall diffusers and rehabilitation of the existing 10-inch force main that conveys R-2 recycled water from the Wailua WWTP to the irrigation holding pond at the Wailua Municipal Golf Course (Tax Map Keys: (4) 3-9-002:032 & 004). The CIA team is seeking to engage with cultural practitioners and other knowledgeable individuals who can provide information concerning cultural, historical, or natural resources that may be present within the project area for the purpose of completing a Ka Pa'akai Assessment. If interested in participating and sharing your mana'o, please email PCSI at wailua@pcsihawaii.com or by calling PCSI at 808-546-5557.

**TAGS** harbor sports limu island county coconut protocol Hawaii Island bay Honolulu conservation ohana energy construction marine life

Like 0



**APPENDIX B:  
CONSULTATION RESPONSE**



July 18, 2023

via email: [dennis@pcsihawaii.com](mailto:dennis@pcsihawaii.com)

Mr. Dennis Gosser, Senior Archaeologist  
Pacific Consulting Services, Inc.  
1130 North Nimitz Hwy, Suite C-300  
Honolulu, HI 96817

RE: Comments regarding historical and cultural information related to the County of Kaua'i Department of Public Works proposed project at the Wailua Wastewater Treatment Plant (WWTP), Wailua, Kaua'i 96746 (Tax Map Keys: [4] 3-9-006:019 & 027)

Aloha Mr. Gosser:

Mahalo for recently speaking with me by phone to answer questions, and for providing us the opportunity to comment on the project referenced above.

Wailua-Nui has a large prevalence of cultural resources, archaeological finds and burials. W-KNA strongly suggests that an Archaeological Inventory Survey (AIS) be prepared to help avoid potential problems in the event that iwi kupuna are found during construction. The goal is to avoid the unintentional discovery of burials and protecting burial sites from any alteration.

Taking into account significant historic finds such as Site 103 and its 66+ known burials throughout the dunes of Wailua Golf Course, and the project's close proximity to Hikina'akala Heiau and Malaeho'akoa Heiau warrants an AIS to minimize the potential for adverse impacts.

Your June 28, 2023 letter states: "the lack of archaeological research directly associated with the WWTP indicates that the subsurface cultural context is unknown." In other words, because the presence or absence of sites has not been previously identified within the project areas, there is some likelihood of discovery.

The letter also states: "Project Area B would be constructed in coral dune sands. Therefore, it would have the potential to impact subsurface archaeological sites." Although using an on-site archaeological monitor during ground disturbance is proposed, it is important to take steps to avoid "inadvertent discoveries" of iwi kupuna.

The shortcomings of Chapter 6E, HRS pertaining to burial site protection is that DLNR/SHPD has jurisdiction to make decisions on its own about whether iwi kupuna are to be preserved in place or relocated when considered "inadvertent finds" This undercuts the Burial Council's authority – if the State gets to decide, then Hawaiians are less able to exercise their cultural and spiritual responsibility to care for their iwi kupuna.

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An additional consideration is that the 10-inch force main was constructed in 1976 which coincides with the passage of Hawaii Revised Statutes (HRS) Chapter 6E Historic Preservation Program. Is there confidence that those new rules were strictly applied to this project?

As your letter states: “The force main will be rehabilitated through trenchless methods such as cured-in-place pipe or pipe slip lining, which will limit the amount of excavation required.” Nonetheless, using trenchless methods will still involve some ground disturbance and excavation.

To summarize, given the location and continued potential for discoveries along this coastal area, preparing an AIS is warranted to help avoid encountering subsurface archaeological resources during construction, even when ground disturbance may occur in previously disturbed soil. And, in the event that iwi kupuna are encountered during construction, we advocate that these NOT be identified as “unanticipated” burials.

Thank you again for the opportunity to comment.

A handwritten signature in black ink that reads "Rayne Regush". The signature is fluid and cursive, with a long horizontal stroke at the end.

Rayne Regush, Chair  
On behalf of the W-KNA Board of Directors

cc: David Buckley, SHPD Kauai Lead Archaeologist ([David.Buckley@hawaii.gov](mailto:David.Buckley@hawaii.gov))