FILE COPY

NOV 23 2019

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT. GOVERNOR
STATE OF HAWAII

WILLIAM J. AILA, JR
CHAIRMAN
HAWAIIAN HOMES COMMISSION

TYLER I. GOMES
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

November 7, 2019

Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

Subject: Proposed Waikupanaha Agricultural Lots Project, Waimānalo, O'ahu
Publication of the Draft Environmental Assessment and Anticipated Finding of No Significant Impact

The Hawai'i Department of Hawaiian Home Lands (DHHL) hereby requests publication of the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Proposed Waikupanaha Agricultural Lots Project in the next available edition of the Environmental Notice. The proposed project involves Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096 in Waimānalo Ahupua'a, Ko'olaupoko District, on the Island of O'ahu.

Simultaneous with this letter, we are submitting the electronic version of the OEQC Publication Form and a PDF formatted electronic copy of the DEA-AFONSI through the online submission platform.

If you have any questions, please call Darrell Ing of the Land Development Division at 620-9276, or via e-mail at darrell.h.ing@hawaii.gov.

Aloha,

William J. Aila Jr., Chairman
Hawaiian Homes Commission

Eisen, Thomas H.

From: webmaster@hawaii.gov
Sent: Monday, November 18, 2019 2:08 PM
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice

Action Name

Waikupanaha Agricultural Lots Project in Waimanalo

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

Ko'olaupoko, O'ahu

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

(1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Action type

Agency

Other required permits and approvals

Numerous - Permits and approvals are discussed in Chapter 5. Permits and Approvals of the Draft EA.

Proposing/determining agency

Department of Hawaiian Home Lands

Agency contact name

Darrell Ing

Agency contact email (for info about the action)

darrell.h.ing@hawaii.gov

Agency contact phone

(808) 620-9276

Agency address

P.O. Box 1879
Honolulu, HI 96805
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

The Limtiaco Consulting Group

Consultant contact name

Claire Oshiro

Consultant contact email

claire@tlcghawaii.com

Consultant contact phone

(808) 596-7790

Consultant address

1622 Kanakanui Street
Honolulu, HI 96817
United States
Map It

Action summary

The proposed development of Hawaiian Home Lands will allow the agency to award approximately 30 agricultural lots in Waimanalo. Each agricultural homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will affect several contiguous parcels located along Waikupanaha Street and will require onsite infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street.

The project site consists of several contiguous parcels that are located east of Waikupanaha Street. DHHL's parcels consist of partially improved land that are currently utilized for non-homesteading uses. There are buildings and structures associated with observed agricultural activity within the project site. Field observations and available land use information suggests that the project site has been altered by land-disturbing activities associated with agriculture, animal husbandry and a quarrying operation.

Reasons supporting determination

HRS 343 significance criteria is discussed in Chapter 6. Determination of the Draft EA.

Attached documents (signed agency letter & EA/EIS)

- DEA-DHHL-Waikupanaha_to-publish.pdf
- DHHL-letter.PDF

Action location map

- DHHL-Waikupanaha-SHP.zip

Authorized individual

Claire Oshiro

Authorization

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

Draft Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island, Hawaiʻi

Prepared For:

State of Hawaiʻi

Department of Hawaiian Home Lands

Prepared By:

THE LIMTIACO CONSULTING GROUP

CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 2019

(This page intentionally left blank.)

Draft Environmental Assessment

for the

PROPOSED WAIKUPANAHA AGRICULTURAL LOTS PROJECT IN WAIMĀNALO AHUPUAʻA, KOʻOLAUPOKO DISTRICT, OʻAHU ISLAND

Tax Map Key (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

This environmental document has been prepared pursuant to
Chapter 343, Hawaiʻi Revised Statutes

Prepared For:

State of Hawaiʻi
Department of Hawaiian Home Lands

Prepared By:

The Limtiaco Consulting Group
Civil Engineering and Environmental Consultants
1622 Kanakanui Street
Honolulu, Hawaiʻi 96817

November 2019

(This page intentionally left blank.)

TABLE OF CONTENTS

page

Table of Contents i
List of Figures ii
List of Appendices ii
List of Abbreviations iii
Project Summary v

1. Setting and Project Description 1-1
   1.1. Introduction and Background 1-1
   1.2. Project Need and Objectives 1-2
   1.3. Site Location and Description 1-5
   1.4. Historical Setting 1-6
   1.5. Technical Considerations 1-10
   1.6. Environmental Considerations 1-12
   1.7. Project Schedule and Cost 1-12
2. Description of Existing Environment, Project Impacts, and Mitigation 2-1
   2.1. Climate and Air Quality Considerations 2-1
   2.2. Topography, Geology and Soils 2-2
   2.3. Water Resources 2-6
   2.4. Solid Waste and Hazardous Materials 2-9
   2.5. Natural Hazards 2-11
   2.6. Floral and Faunal Resources 2-15
   2.7. Archaeological Resources 2-17
   2.8. Cultural Practices and Resources 2-19
   2.9. Visual Resources 2-21
   2.10. Noise 2-22
   2.11. Site Access, Circulation and Traffic 2-23
   2.12. Utilities (Water, Wastewater, Drainage) 2-26
   2.13. Power and Communications 2-29
   2.14. Socio-Economic Characteristics 2-30
   2.15. Public Services and Facilities 2-31
   2.16. Recreational Resources 2-31
3. Relationship to Plans, Policies, and Controls 3-1
   3.1. State Land Use District 3-1
   3.2. Hawaiʻi Coastal Zone Management Program 3-1
   3.3. Hawaiʻi State Plan 3-6
   3.4. Complete Streets Program 3-7
   3.5. County of Honolulu General Plan 3-7
   3.6. Koʻolau Poko Sustainable Communities Plan 3-9
   3.7. City and County of Honolulu Land Use Ordinance 3-13

TABLE OF CONTENTS (Continued)

page

3.8. City and County of Honolulu Building Permits 3-13
3.9. City and County of Honolulu Special Management Area Permit 3-14
4. Possible Alternatives 4-1
4.1. No-Action 4-1
4.2. Delayed Action 4-1
4.3. Agricultural Homesteads on Alternate Site 4-2
4.4. Residential Homesteads on Existing Site 4-2
4.5. Agricultural Homesteads on Existing Site (the Preferred Alternative) 4-3
5. Permits and Approvals 5-1
6. Determination 6-1
7. Public Agency Review and Consultation 7-1
7.1. Pre-Assessment Consultation 7-1
7.2. Draft EA Consultation 7-3
8. References 8-1

LIST OF FIGURES

Figure 1 Project Location and Vicinity Map 1-3
Figure 2 Land Use Districts 1-7
Figure 3 Zoning 1-8
Figure 4 Existing Topography and Soils 2-3
Figure 5 Flood Zones 2-13
Figure 6 Proposed Utility Improvements 2-27
Figure 7 Conceptual Site Layout 4-5

LIST OF APPENDICES

Appendix A Site Photographs
Appendix B Management Summary for the Archaeological Literature Review and Field Inspection Report
Appendix C Cultural Impact Assessment Report
Appendix D Phase I Environmental Site Assessment Report
Appendix E Biological Survey Report
Appendix F Flood Hazard Assessment Report and Sea Level Rise Viewer
Appendix G Traffic Impact Assessment Report
Appendix H Consultation and Comments

LIST OF ABBREVIATIONS

Abbreviation	Definition
AFNSI	Anticipated Finding of No Significant Impact
ASYA	Aquifer System Area
BMPs	Best Management Practices
BWS	City and County of Honolulu Board of Water Supply
CIA	cultural impact assessment
CSH	Cultural Surveys Hawaii
CTAHR	University of Hawaiʻi College of Tropical Agriculture and Human Resources
CZM	Coastal Zone Management
DAGS	State of Hawaiʻi Department of Accounting and General Services
DHHL	State of Hawaiʻi Department of Hawaiian Home Lands
DLNR	State of Hawaiʻi, Department of Land and Natural Resources
DLNR DFW	Department of Land and Natural Resources, Division of Forestry and Wildlife
DOH	State of Hawaiʻi, Department of Health
DPP	City and County of Honolulu, Department of Planning and Permitting
DTS	City and County of Honolulu, Department of TransportationServices
EA	Environmental Assessment
ETC	EnviroServices and Training Center, LLC
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HAR	Hawaiʻi Administrative Rules
HECO	Hawaiian Electric Company, Inc.
HRS	Hawaiʻi Revised Statutes
LBSP	land-based sources of pollution
LRFI	Literature Review and Field Inspection
LSB	Land Study Bureau (of the University of Hawaiʻi)
LUO	City and County of Honolulu Land Use Ordinance
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System

LIST OF ABBREVIATIONS (Continued)

Abbreviation	Definition
OEQC	Office of Environmental Quality Control
OP	State of Hawaiʻi, Office of Planning
OTS	Oʻahu Transit Services, Inc.
PVC	polyvinyl chloride
RECs	recognized environmental conditions
ROE	right-of-entry
SHPD	Department of Land and Natural Resources, Historic Preservation Division
SMA	Special Management Area
TIAR	Traffic Impact Assessment Report
TLCG	The Limtiaco Consulting Group
TMK	Tax Map Key
UIC	Underground Injection Control
WWTP	Wastewater Treatment Plant

PROJECT SUMMARY

Proposing/Determination Agency:	Hawai‘i Department of Hawaiian Home Lands (DHHL)
Contact:	Mr. Andrew Choy
Location:	Waimānalo Ahupua‘a, O‘ahu Island
Tax Map Key:	(1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Land Area:	Approximately 30 acres (for identified DHHL parcels) and approximately 2.7 acres (for rights-of-way along portions of Waikupanaha and Hihimanu Streets)
Recorded Fee Owner:	State of Hawai‘i
Existing Use:	Open (undeveloped), agriculture, equestrian activities
Proposed Use:	Subsistence Agricultural Homesteads for native Hawaiian beneficiaries
Community Plan Region:	Ko‘olaupoko District
Land Use Designations:	
State Land Use	Agriculture
Development Plan	Agriculture
County Zoning	AG-2 General Agriculture
Action Requested:	The Project will consolidate and re-subdivide several contiguous parcels located in Waimānalo in the Ko‘olaupoko District. The proposed development of Hawaiian Home Lands will allow the agency to award approximately 30 agricultural lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. The inconsistent width and alignment of Waikupanaha Street will be addressed as part of the Project because portions of the existing roadway encroach into DHHL’s parcels. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements.
Agency Determination:	Anticipated Finding of No Significant Impact (AFNSI)

(This page intentionally left blank.)

1. SETTING AND PROJECT DESCRIPTION

1.1. Introduction and Background

Certain public lands that have been set aside and placed under the jurisdiction of the Hawaiian Homes Commission as part of the Hawaiian Homes Commission Act of 1920 are "to enable native Hawaiians to return to their lands in order to fully support self-sufficiency for native Hawaiians and the self-determination of native Hawaiians in the administration of this Act, and the preservation of the values, traditions, and culture of native Hawaiians." The Department of Hawaiian Home Lands (DHHL) is committed to serving its beneficiaries and manages the Hawaiian Homes Lands Trust consisting of over 200,000 acres of land on the islands of Hawaiʻi, Maui, Molokaʻi, Lānaʻi, Oʻahu, and Kauaʻi. The mission of DHHL is primarily achieved through the award of 99-year residential, agricultural or pastoral homestead leases to waitlisted beneficiaries for an annual fee of one dollar. Beneficiaries must secure their own financing for residential construction, home improvements and agricultural activities on awarded land. DHHL also utilizes land in its inventory to generate revenue that supports the homesteading priority and improves the general welfare and conditions of native Hawaiians through educational, economic, political, social, cultural, and other programs.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for Subsistence Agricultural Homestead (SAH) lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and/or (2) actively cultivate food crops or raise small livestock on their homestead lot.

DHHL is proposing to consolidate and re-subdivide approximately 30 acres of its land in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island (see Figure 1). It is hereby noted that the use of "Koʻolaupoko" and "Koʻolau Poko" in this document generally reflect the conventions from referenced reports or studies. The proposed Waikupanaha Agricultural Lots Project (hereafter "the Project") will consolidate and re-subdivide several contiguous parcels identified as Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096. A cell phone tower and buildings and structures associated with observed agricultural and equestrian activities are within DHHL's parcels. Field observations and available land use information suggests that the project site has been altered by land-disturbing activities associated with agriculture, animal husbandry, and a quarrying operation. The Project will include the installation of on-site infrastructure and connection to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will be addressed as part of the Project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres. Completion of the Project will allow DHHL to award approximately 30 agricultural lots.

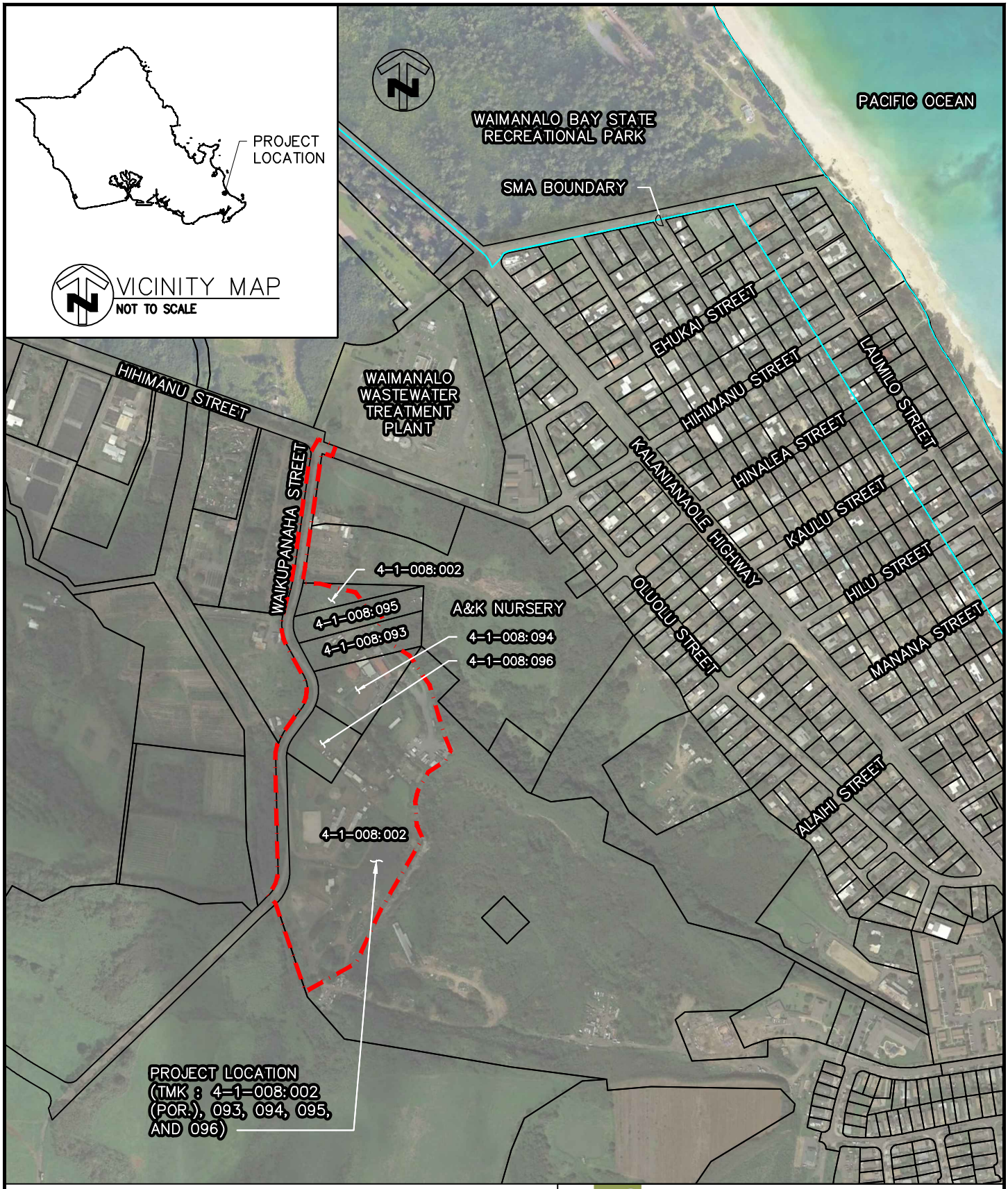
State of Hawaiʻi lands and funds will be utilized for the Project; therefore, the preparation of an Environmental Assessment (EA) pursuant to Chapter 343, Hawaiʻi Revised Statutes (HRS) and associated Title 11, Chapter 200.1, Hawaiʻi Administrative Rules (HAR) is required. This EA was prepared to examine potential project impacts and to provide for public participation as required and defined in the statutes. The project site is not located within the Special Management Area (SMA).

1.2. Project Need and Objectives

The planning and resource management efforts of DHHL are guided by its General Plan, Strategic Program Plans, Island Plans and Regional Plans. According to DHHL's Oʻahu Island Plan, 12,956 applicants were awaiting awards on Oʻahu as of February 2013: 9,639 beneficiaries had applied for residential leases and there were 3,317 applicants for agricultural leases. "Assuming the General Plan goal of 170 homestead awards per year can be achieved, then approximately 25% (3,029 applicants) of Oʻahu's 12,956 applicants can be served within the next 20 years" (PBR Hawaii and Associates, Inc., 2014). The waiting lists continue to grow, and DHHL's latest report shows 10,773 and 3,771 submitted applications for residential and agricultural leases on Oʻahu, respectively.

Lands on ridgelines or near cliffs, areas with no access, and Federally constrained areas such as critical habitats or wetlands are not available for homesteading. Approximately 8,154 acres or roughly 4 percent of DHHL's statewide landholdings are on Oʻahu and approximately 1,914 acres, which is roughly 23 percent of these lands, are within the Waimānalo Ahupuaʻa (Ibid.). Vast acreage in Waimānalo, however, includes land on steep slopes and natural drainage channels that are subject to environmental hazards such as rock falls and flooding. On Oʻahu, the developable homestead areas are constrained to approximately 720 acres due to environmental and infrastructure considerations (Ibid.). Land in DHHL's inventory that is considered suitable for new SAHs is further reduced to approximately 115 acres scattered within Waiʻanae, Waiāhole, and Waimānalo whereas the parcels within Nānākuli, Waiʻanae, Kapolei and Papakōlea totaling approximately 605 acres are designated for residential homesteading. In general, there is a high demand for homestead awards on Oʻahu whereas DHHL's landholdings are insufficient at this time to accomplish the goal of placing waitlisted beneficiaries on homesteads. Available land and the timing of funding resources affect the homesteading objectives that DHHL is striving to achieve.

The above-referenced plans were prepared before DHHL's administrative rules pertaining to subsistence agricultural homesteads were updated in 2017. DHHL has observed that the utilization of large agricultural lots awarded to beneficiaries is poor because many lessees are unable to conduct agricultural operations at a commercial scale. The Project represents one of DHHL's new endeavors to award smaller lots for subsistence agriculture.



LEGEND

- PROPERTY LINE
- PROJECT LIMITS
- SMA BOUNDARY

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots
Project Location and Vicinity Map

SCALE: 1"=600'

DATE: November 2019

FIGURE
1

(This page intentionally left blank.)

Since 1938, DHHL has awarded 799 residential homesteads, 45 undivided interest leases for residential homesteads in development, and 2 subsistence agricultural homesteads in Waimānalo (PBR Hawaii and Associates, Inc., 2014). The Project will allow DHHL to award approximately 30 agricultural lots to beneficiaries on the Agricultural Waitlist, which is consistent with the agency's mission. The project site in Waimānalo is within a rural area that continues to support agricultural endeavors.

1.3. Site Location and Description

The project site is located inland and approximately 0.5 miles from Waimānalo Bay (refer to Figure 1). Waikupanaha Street is a two-lane County roadway along the western boundary of DHHL's parcels. Homeless encampments were observed along the western side of the Waikupanaha Street right-of-way. Existing uses to the north, east and south of DHHL's parcels include a plant nursery, former rock quarry, and uncultivated land, respectively. Site photographs are included in Appendix A. There is no sewer service to DHHL's parcels according to the letter dated December 20, 2018 from the City and County of Honolulu, Department of Planning and Permitting (DPP). The existing Waimānalo Wastewater Treatment Plant (WWTP) located along Hihimanu Street is north of the project site. Adequate fire protection to DHHL's parcels is currently unavailable according to the letters dated December 20, 2018 and July 29, 2019 from the Board of Water Supply (BWS), which also state that the "nearest BWS fire hydrant is located approximately 1,400 linear feet away from the parcel along Hihimanu Street." The surrounding area has residential, agricultural and community uses including Waimānalo Bay State Recreation Area, Waimānalo homestead neighborhoods, Waimānalo Beach Park, Pope Elementary School, Hilltop Ranch, Waimānalo Research Station, Waimānalo District Park, and the Honolulu Polo Club.

The larger geographic area that contains the project site has experienced a long history of intensive land-disturbing activities including nineteenth and twentieth century sugarcane production, quarrying operations in the 1970s and 1980s, and more recent diversified agricultural use and animal husbandry for about 40 years. Hihimanu Street is identified as a "plantation railroad" on the 1916 Wall Map of Waimānalo. Both Hihimanu and Waikupanaha Streets are clearly visible roadways in the 1927 Waimānalo Coast Aerial Photograph. Quarrying operations occurred on the southeastern portion of the project site, which is characterized as an "ancient lithified sand dune" that was "extensively mined" (Guinther, et al., 2019).

Two building permits were issued by the County for DHHL's parcels: Permit No. 505321 was issued in February 2000 for electrical work and Permit No. 617292 was issued in September 2007 for restrooms (EnviroServices and Training Center, LLC., 2019). Development associated with observed agricultural uses and equestrian activities was observed within DHHL's parcels in 2018 and 2019 when site investigations were conducted.

The eastern portion of DHHL's parcels is developed for an existing cell phone tower. DHHL has issued month-to-month right-of-entry (ROE) permits for non-homesteading uses to Sports Turf Hawaii, Roy and June Pires, John and Leiala Cook (father and daughter), and Alan Silva. The ROE permits specify the types of uses that are allowed on the premises (e.g., stabling of horses and storage of trailers and equipment). No unspecified uses or sub-tenancy is allowed without written approval from DHHL.

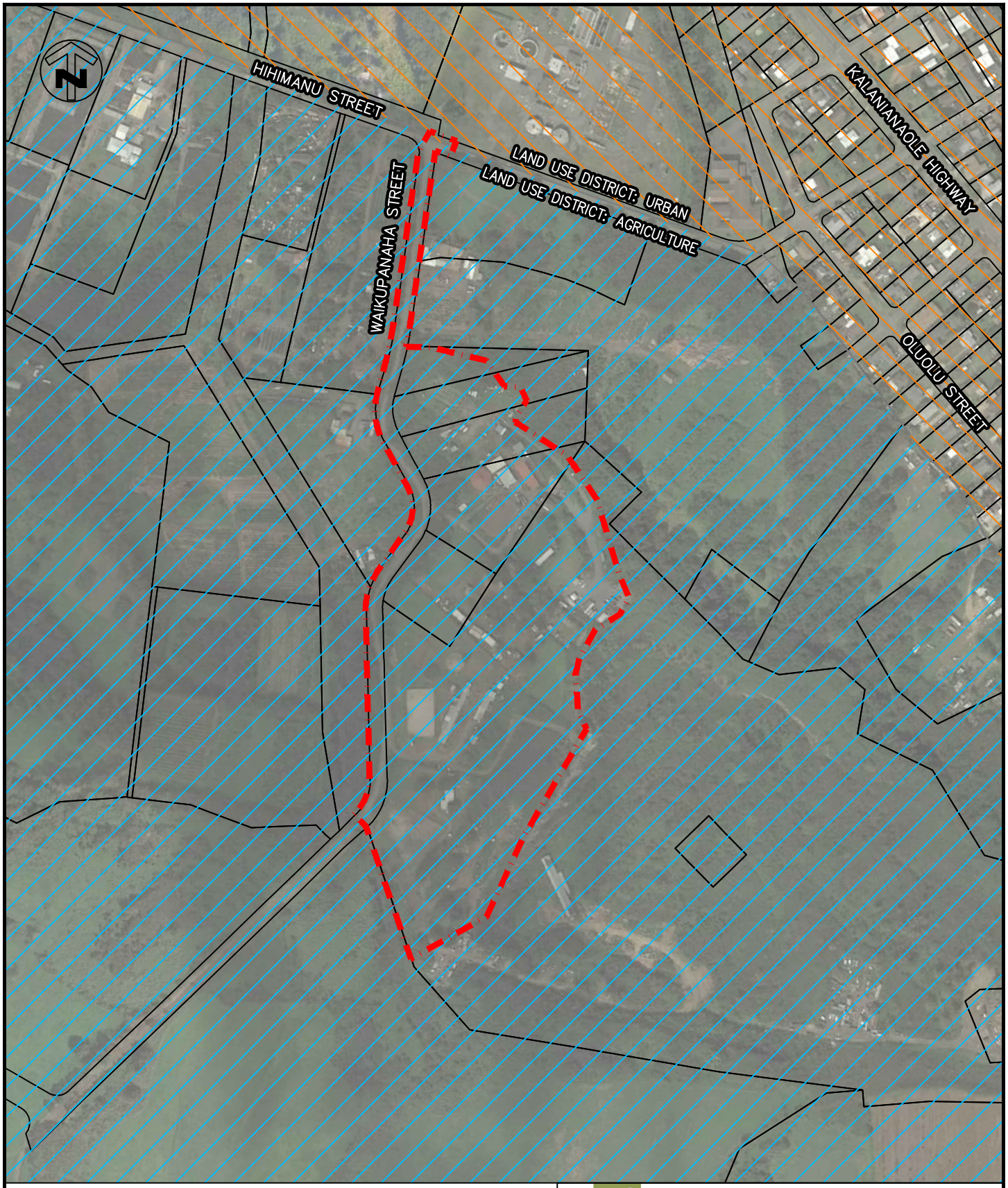
The State land use designation for the project site is Agriculture (refer to Figure 2). As shown in Figure 3, the County's zoning designation for the parcels under DHHL's jurisdiction is AG-2 General Agriculture District (minimum land area of three acres for major livestock production, and two acres for all other uses). The County's Land Use Ordinance (LUO) specifies a minimum width and depth of 150 feet for AG-2 lots. DHHL will consult with the County with regards to appropriate subdivision design standards that apply to the Project.

1.4. Historical Setting

Information for this section is summarized from the *Revised Archaeological Literature Review and Field Inspection for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu, TMKs: [1] 4-1-008:002 (por.) and 093-096* (July 2019) prepared by Cultural Surveys Hawaiʻi, Inc. (CSH). Appendix B contains the management summary from the draft report submitted to the Department of Land and Natural Resources, Historic Preservation Division (SHPD) for review on August 19, 2019. The report is expected to be available to the public in accordance with SHPD's protocols. SHPD maintains a library of electronic documents in addition to a physical library of correspondence, reports, plans, and relevant information.

The earliest Hawaiians who settled on the windward coast of Oʻahu maintained a sizable native population by utilizing the numerous streams and springs in the Koʻolaupoko area to sustain farming and by managing productive marine resources. The Waimānalo Ahupuaʻa is a relatively large land division area that that extends from the peaks of the Koʻolau Mountains to the coast of Waimānalo Bay. Available records suggest that the traditional Hawaiian population of Waimānalo engaged in wetland taro and sweet potato cultivation was clustered along Waimānalo Stream and its upper tributaries, and the population distributed within the central and southeastern coastal areas was utilizing marine resources. Waikupanaha is the name of a *mauka* or upland stream that reportedly supported taro, banana trees, and white ginger.

After the unification of the Hawaiian Kingdom, the Waimānalo Ahupuaʻa was retained by Kamehameha the Great as his own personal property and was later held by his sons Liholiho and Kauikeaouli (Kamehameha II and Kamehameha III). Thomas Cummins married the High Chiefess Kaumakaokane, a relative of Kamehameha I, and received a Royal Patent to an estate of Crown Lands in Waimānalo in 1842.



LEGEND

- PROPERTY LINE
- PROJECT LIMITS
- LUD URBAN
- LUD AGRICULTURAL

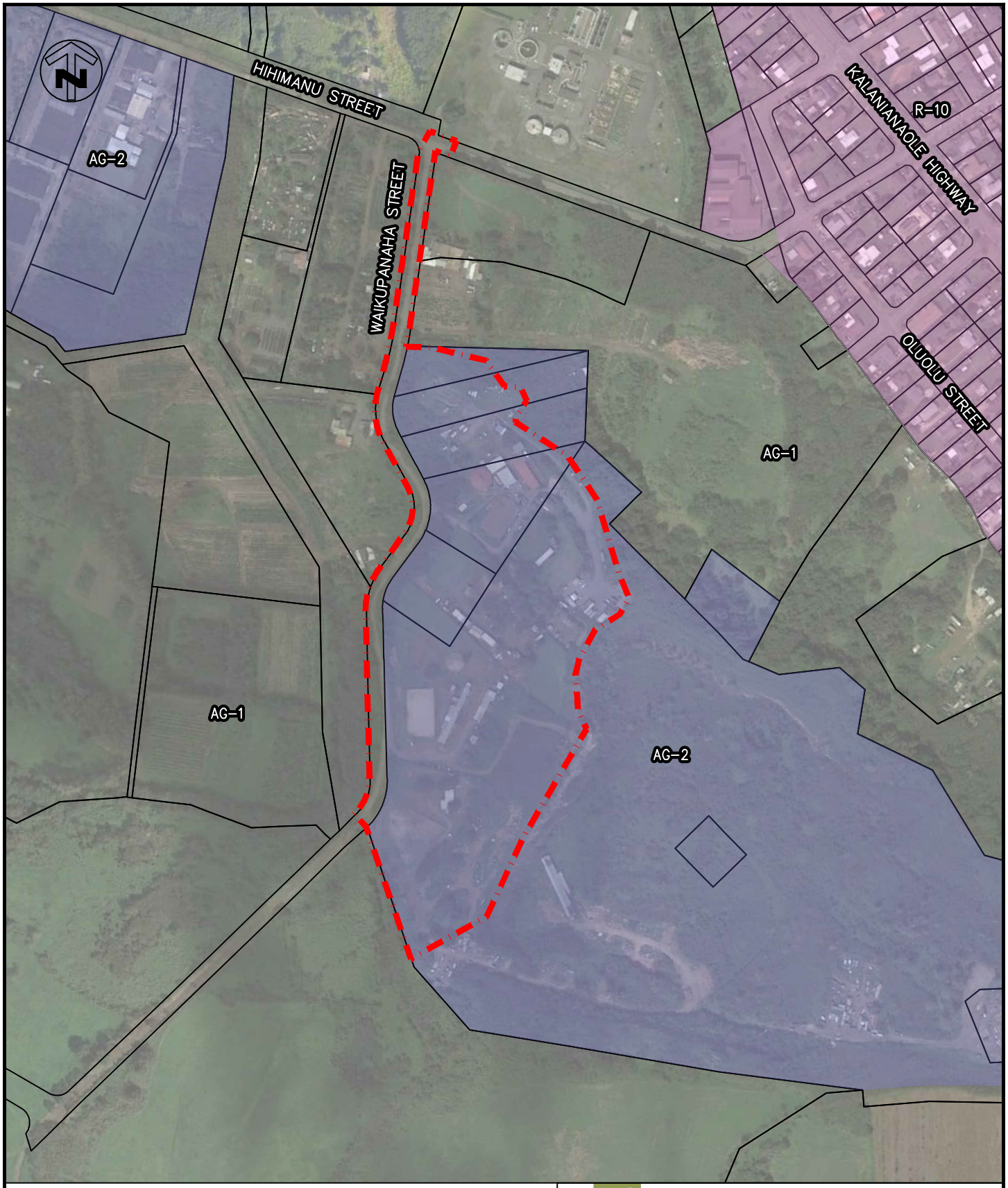
THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots
Land Use Districts

SCALE: 1'=400'

DATE: November 2019

FIGURE
2



LEGEND

PROPERTY LINE
PROJECT LIMITS
ZONE AG-1
ZONE AG-2
ZONE R-10

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots
Zoning

SCALE: 1'=400'

DATE: November 2019

FIGURE
3

The concepts of private land ownership were introduced to Hawaiian society beginning with the Organic Acts of 1845 and 1846. Land titles were awarded to the monarchy and *ali‘i* in 1848; commoners or native tenants received *kuleana* awards for individual parcels in 1850. Kamehameha III and Kamehameha IV sold and mortgaged Crown Lands during their reigns to settle debts. In 1850, the entire Waimānalo Ahupua‘a except for *kuleana* awards was leased to Cummins by Kamehameha III for a period of 50 years. Awarded *kuleana* land claims in Waimānalo were primarily along Waimānalo Stream and its upper tributaries whereas no *kuleana* awards were in the vicinity of the project site.

Thomas Cummins and his son, John A. Cummins, brought cattle and horse ranching to Waimānalo and bought approximately 200 acres of *kuleana* land. In 1880, John A. Cummins founded the Waimānalo Sugar Company and began construction of a sugar mill. As the plantation expanded, former ranch land was converted to cane fields, irrigation ditches and railroad lines were constructed, and other infrastructure was improved. By the 1920s, the area utilized for sugarcane cultivation extended from the floor of Waimānalo Valley to the base of the Ko‘olau Range. Waimānalo Sugar Company operated until the early twentieth century and sold its land to the Waimānalo Agricultural Development Company in 1947. The former sugarcane lands have since been utilized for diversified agriculture including chicken farms, a dairy, a piggery, papaya and flower farms, and agricultural research.

The U.S. military, which had established Waimānalo Military Reservation in 1917, changed its name to Bellows Field in 1933. The installation became a permanent military post in 1941 and was later renamed Bellows Air Force Base, then Bellows Air Force Station. At this time, Bellows Air Force Station is utilized for military training and recreation.

In the early 1900s, the Waimānalo Village residential area was established near the Waimānalo Sugar Company’s sugar mill since the intent was to provide housing for plantation workers and their families. Transportation to Waimānalo improved once Kalaniana‘ole Highway opened in 1924. The Waimānalo Beach Lots subdivision, which consisted of 266 lots on 90 acres of land, was established in 1925. Additional residential development has occurred in the Waimānalo Village, Waimānalo Beach Lots and Waimānalo Hawaiian Homestead subdivisions.

Historical usage pertaining to DHHL’s parcels including endeavors at the Cook Ranch to perpetuate Hawaiian traditions and utilize cultivated resources for cultural practices is documented in the cultural impact assessment (CIA) prepared by CSH. The CIA report is included in its entirety as Appendix C and summarized in Section 2.8 Cultural Practices and Resources. As noted previously, DHHL’s current permittees have ROE permits that specify the uses allowed on the premises; therefore, permittees must have written approval from DHHL for unspecified uses to be in compliance. Other site

usage concerns pertaining to past usage of DHHL's parcels is summarized in Section 2.4 Solid Waste and Hazardous Materials from the Phase I Environmental Site Assessment (ESA), which is included as Appendix D. Several activities within DHHL's parcels have ceased such as suspected illegal dumping, heavy equipment maintenance, and auto repair and disassembly. The descriptions of previous site usage as documented in the Phase I ESA report are based on approximately 7 to 28 years of shared knowledge and familiarity with the project site from permittees and other interviewees.

1.5. Technical Considerations

DHHL is proposing to consolidate and re-subdivide several contiguous parcels that encompass approximately 30 acres in total. Any areas determined to be unsuitable for development will not be awarded. The Project will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. Permanent site infrastructure installed during the earliest phase of the Project will be designed to comply with applicable regulatory standards that consider the health and safety of residents but are appropriate for a rural area. The Project is in a rural area with sparse development and there are no sidewalks, curb ramps, or crosswalks in the vicinity of the project site. Design elements and features of the Project are described below.

- Lot size. The Project is expected to create approximately 30 lots suitable for award to beneficiaries as a result of excluded areas, internal roadways and areas developed for storm water improvements. Each lot will be approximately 0.5 to 0.75 acres in size, which is reportedly sufficient to accommodate subsistence agriculture uses. The subsistence agriculture program permits but does not require lessees to construct a residence on the lot; therefore, basic utility infrastructure and site access from internal roadways will be provided to each lot. DHHL's lessees will be responsible for their own residential construction, home improvements and agricultural activities.
- Water systems. New underground lines that connect the project site to existing potable water infrastructure along Hihimanu Street will be installed along Waikupanaha Street and internal roadways. The proposed SAH lots will be served by separate water and fire protection infrastructure systems or a combined water and fire protection system. New water system infrastructure will comply with current County regulations. Agricultural irrigation uses at the project site have the potential to be served via separate systems such as the State's Waimānalo Irrigation System or the County's Waimānalo WWTP (once disinfection upgrades facilitate the production of R-1 quality reclaimed water, which represents the highest quality classification for recycled water in Hawaiʻi). DHHL will coordinate its Project with the State of Hawaiʻi Department of Agriculture and the City and County of Honolulu, Department of Environmental

Services (ENV) with regards to availability and possible connections. Projects that propose the use of dual water systems or the use of a non-potable water system in proximity to an existing drinking water system to meet irrigation or other needs must be carefully designed and operated to prevent the cross-connection of these systems and to prevent the possibility of backflow of water from the non-potable system to the drinking water system.

- Wastewater disposal. A new gravity sewer system that will convey wastewater from the project site to existing municipal sewer system infrastructure along Hihimanu Street will be installed along Waikupanaha Street and internal roadways. The proposed new gravity system will allow for wastewater treatment and disposal at the County's Waimānalo WWTP, which is north of the project site. The letter from ENV dated August 5, 2019 indicates that a new sewer line to the Waimānalo WWTP may be needed.
- Drainage infrastructure. New site drainage infrastructure including but not limited to drain inlets, manholes, culverts and infiltration basins will be installed along internal roadways and some areas within the project site. No injection wells are planned as part of the Project at this time. Any injection wells used for the subsurface disposal of storm water runoff is subject to State of Hawai'i, Department of Health (DOH) regulations and permitting under HAR Chapter 11-23 "Underground Injection Control." An Underground Injection Control (UIC) permit must be issued before any injection well operation occurs.
- Waikupanaha Street improvements. The Project provides the opportunity to address the inconsistent width and alignment of Waikupanaha Street. The design standards for rural roadways are expected to apply to the Project. New asphaltic concrete pavement and overhead utility lines may be included as part of the Project. The affected section of Waikupanaha Street is proposed to be paved to its intersection with Hihimanu Street. An internal roadway that provides access to homestead lots may also be paved. The Project will be designed to address the hydrology and drainage impacts to the County's roadways as required. Two new intersections along Waikupanaha Street are proposed. Improvements such as a wide shoulder or sidewalk along Waikupanaha Street would provide safer accommodations for pedestrians compared to existing conditions.

The Department of Accounting and General Services (DAGS) indicated in its letters to DHHL dated December 31, 2018 and July 16, 2019 that the Project does not impact any of its existing facilities in the area. Existing uses and activities by DHHL's current permittees who have month-to-month ROE permits will cease in order to prepare DHHL's parcels for long-term homesteading purposes. The permits were issued with the knowledge that the lands would eventually be used for homesteading instead of non-homesteading uses.

1.6. Environmental Considerations

The Project will utilize and improve land in DHHL's inventory that is considered suitable for agricultural homestead use. DHHL's commitment is to award SAH lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through agricultural opportunities that include but are not limited to non-traditional farming methods. The project site identified in this EA is within a designated agricultural district. The Project appears to be compatible with nearby agricultural, residential homestead and community uses.

No adverse impacts to water resources and biological resources are anticipated. Select areas within the project site appear to have recognized environmental conditions (RECs) due to past usage and activities within DHHL's parcels that have ceased. A basalt and mortar water conveyance feature at the intersection of Hihimanu and Waikupanaha Streets is potentially older than 50 years old, has been modified by more recent polyvinyl chloride (PVC) pipe, and is expected to remain in use. Existing cultivated resources are utilized by DHHL's permittees for Hawaiian traditions. There are no known historic properties within DHHL's parcels.

The installation of new utility infrastructure that allows for connections to existing municipal water and wastewater treatment facilities is proposed as part of the Project. Existing non-potable water systems for irrigation purposes may be utilized if connections to existing systems are available and feasible for implementation during the timeframe of the Project. The inconsistent width and alignment of Waikupanaha Street will be addressed as a result of the Project. Temporary lane closures are anticipated for the utility installations and connections. Construction activities associated with the Project would generate short-term effects such as fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services that would cease upon project completion. Anticipated short-term impacts will be mitigated to the extent practical with the use of appropriate construction techniques and Best Management Practices (BMPs).

1.7. Project Schedule and Cost

The environmental review process, which includes publication and public review of the EA, may be concluded in 2020 and coincide with the final design phase and acquisition of necessary permits and approvals for the Project. Construction may be authorized to begin by the end of calendar year 2020. Funding opportunities and constraints may result in project completion in phases for design and construction.

The timing and phasing of design and construction is expected to influence total project costs, which are estimated to be $18.2 million. Design fees and the costs associated with permits and approvals will be included in the estimate of project costs.

2. DESCRIPTION OF EXISTING ENVIRONMENT, PROJECT IMPACTS, AND MITIGATION

2.1. Climate and Air Quality Considerations

The climate throughout the State of Hawaiʻi is generally characterized by mild temperatures with low daily and monthly variability, moderate humidity, persistent trade winds, and abundant sunshine. The project site is on the windward side of the island of Oʻahu, which is characterized by mild temperatures and more abundant rainfall as compared to the leeward side of Oʻahu. Between 1969 and 2013, the recorded monthly average temperatures in Waimānalo ranged from 64 degrees to 85 degrees Fahrenheit and the wetter months of the year were November through March (Western Regional Climate Center, n.d.). The project site is within a region characterized by 33.1 to 48.0 inches of annual rainfall (Giambelluca, et. al, 2013). Trade winds in the project vicinity are generally from the northeast. Strong winds are known to occur in connection with storm systems that disrupt climatic patterns. Temperatures may be higher due to the combined effects of solar heating and high humidity.

The ambient air quality at the project site may be affected by nearby activities, such as automobile traffic along Waikupanaha Street. The project site is located in a rural area that is positively influenced by northeast trade winds that disperse emissions and other air quality pollutants. Prevailing northeast trade winds can circulate particulates between upland and downslope areas, carry emissions away from the project area and help to disperse airborne pollutants that would otherwise accumulate during calm conditions.

Impacts and Mitigation Measures

No measurable adverse effect on climatic conditions is anticipated from the Project; therefore, no mitigation is warranted or proposed.

Ambient air quality at the project site will be temporarily affected by construction-related vehicles, equipment and activities that would generate fugitive dust and emissions. The construction contractor will be responsible for complying with HAR, Chapter 11-60.1, “Air Pollution Control.” The contractor will be responsible for the implementation of erosion and dust control measures as necessary for compliance with the above-mentioned rules. Air pollution control measures may include and are not limited to the use of water wagons, sprinkler systems, and dust fences. After development and the award of leases, there will be periodic impacts from agricultural activities (e.g., soil preparation).

Construction equipment and vehicles shall be properly maintained in order to control vehicular emissions during the short-term construction period. In the long-term, nonpoint air quality impacts will occur from motor vehicles that travel

to and from the project site at intermittent intervals. No significant short-term or long-term impacts are anticipated from the Project because exhaust emissions of carbon monoxide and nitrogen oxide emissions would be intermittent and readily dissipated. Anticipated Waikupanaha Street improvements such as the paving of this roadway with asphaltic concrete may help to ameliorate fugitive dust emissions from vehicular travel.

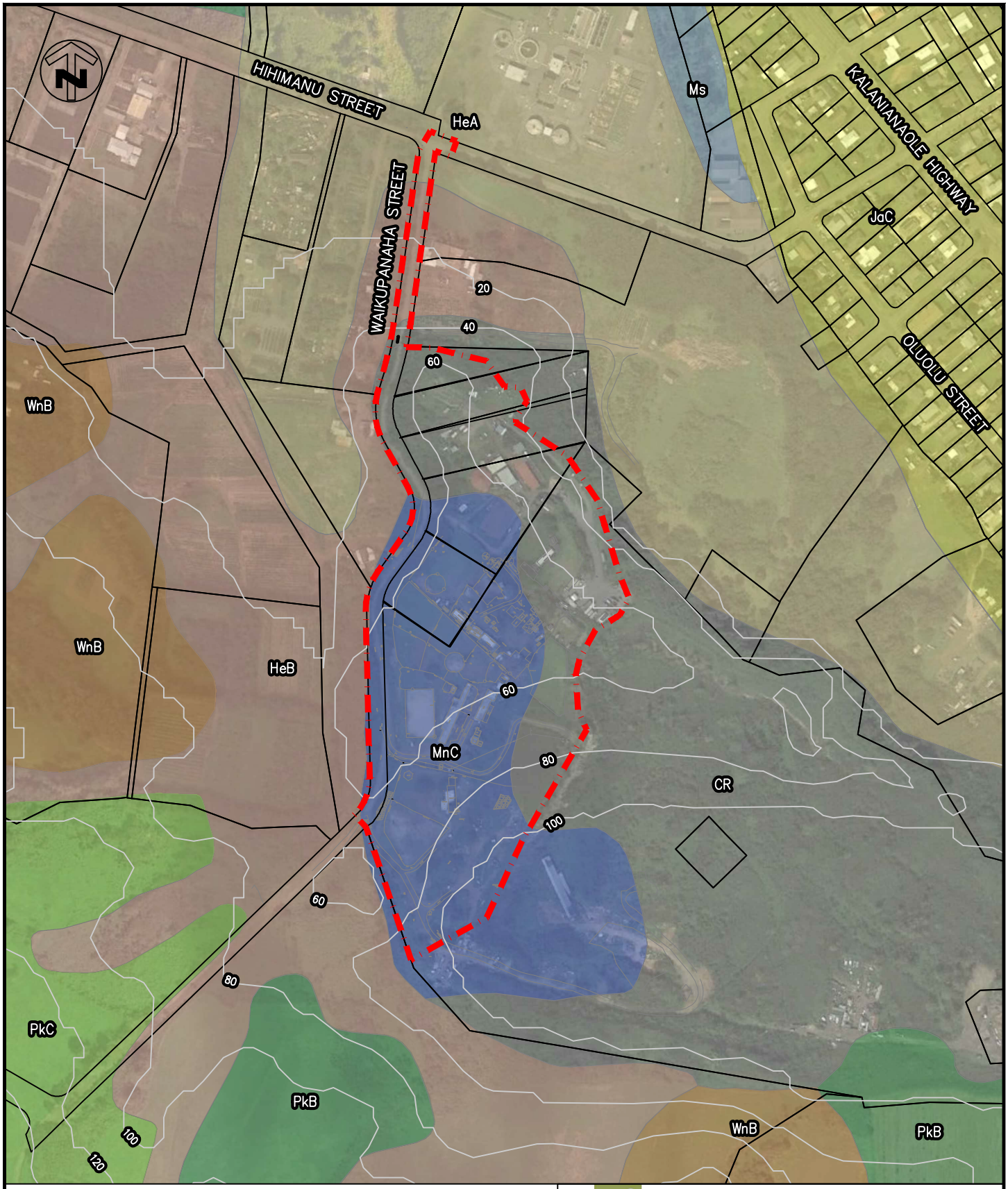
2.2. Topography, Geology and Soils

The topography for the project site ranges between roughly 15 to 100 feet above mean sea level and is depicted in Figure 2. DHHL's parcels consist of partially improved land, with a mix of unpaved roads, horse stables, limited areas of concrete pavement (e.g. platforms, walkways, etc.), and overgrown vegetation. There is a hardened dune of limestone material on the southeast part of the project site that was extensively mined. This natural feature extends along the east side of DHHL's parcels, wraps around the north end, and continues along the seaward or *makai* side of Waikupanaha Street (Guinther, et al., 2019).

According to the *Soil Survey of the Islands of Kaua'i, O'ahu, Mau'i, Moloka'i, and Lana'i, State of Hawai'i* (U.S. Department of Agriculture, Soil Conservation Service, 1972) and the available Web Soil Survey (U.S. Department of Agriculture, Natural Resources Conservation Service, 2017), the predominant soil type classifications found within DHHL's parcels are Coral outcrop (CR) and Mamala cobbly silty clay loam (MnC), 0 to 12 percent slopes. The mapped classifications that apply to Waikupanaha Street to its intersection with Hihimanu Street are MnC, CR, Haleiwa silty clay, 2 to 6 percent slopes (HeB), and Haleiwa silty clay, 0 to 2 percent slopes (HeA). The soil classifications that pertain to the project site are shown in Figure 2.

The CR classification consists of coral or cemented calcareous sand that is excessively drained with moderately high to high permeability and low runoff. The Mamala series classification consists of shallow, well-drained soils formed in alluvium and deposited over coral limestone and consolidated calcareous sand. For the MnC soil type, permeability is moderately low to high and runoff quality is medium. The erosion hazard for MnC soils is slight to moderate. Haleiwa soils are well-drained and occur on alluvial fans or in drainageways. For the HeB soil type, permeability is moderately high to high and runoff quality is low. The erosion hazard for HeB soils is slight. The HeA soil type has moderately high to high permeability and very low runoff quality. The erosion hazard for HeA soils is no more than slight.

From 1965 to 1972, the Land Study Bureau (LSB) of the University of Hawai'i developed a detailed classification system for the major Hawaiian Islands that was intended as a rating of agricultural productivity based on soil properties and productive capabilities. Lands in the highest productivity agricultural categories were classified with the "A" or "B" rating; there are no "A" or "B" lands within the project site.



LEGEND

- PROPERTY LINE
- PROJECT LIMITS
- CONTOURS
- SOIL CR
- SOIL HeA
- SOIL HeB
- SOIL MnC
- SOIL Ms
- SOIL JaC
- SOIL PkB
- SOIL PkC
- SOIL WnB

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots

Existing Topography and Soils

SCALE: 1'=400'

DATE: November 2019

FIGURE 4

(This page intentionally left blank.)

The Project will affect lands with the LSB "E" rating, which reflects the lowest productivity classification. Soils formed from coral have neutral to alkaline reactions and are high in calcium. Most of the soils have developed from volcanic material and under tropical conditions of high temperature and rainfall. These soils tend to be acidic and fertility levels are relatively low. Subsistence agriculture such as raising small animals or insects (e.g., beekeeping) is not necessarily dependent on soil quality. Farming could also involve innovative or non-traditional methods (e.g., hydroponics, aquaponics, urban greenhouses, etc.).

Impacts and Mitigation Measures

The Project would generally retain the overall topographic profile for most of the site and there are no obvious topographical features that would obstruct site preparation activities. Consequently, no mitigation is warranted or proposed with respect to topography.

The project site will be properly designed with respect to subsurface conditions and geotechnical concerns within the footprint of construction. Anticipated actions are expected to have no adverse impacts on the underlying geology and soils at the project site such that no mitigation is warranted or proposed.

Earth disturbing activities may create exposed areas and surface-generated sediment that may enter the groundwater if significant rainfall occurs during grading, which has the potential to impact surface water and marine resources. DHHL's contractor must follow State and County regulations regarding storm water runoff. Development-generated runoff is expected to be disposed of on site and not directed toward any adjacent properties. Graded areas affected by project actions will be stabilized and the Project will create more paved roadways within the site, which reduces the long-term potential for erosion and sediment transport. Mitigation that addresses sediment-laden runoff is discussed in Section 2.3, Water Resources.

The LSB "E" rating can be misunderstood with regards to productive land capability. Areas of uncultivated vegetation were observed within the project site during site investigations. Interviews with current permittees document the successful cultivation of several plant species within DHHL's parcels following intentional land alteration (see the discussions in Section 2.6. Floral and Faunal Resources and Section 2.8. Cultural Practices and Resources). Lessees who do require a specific soil characteristic for their agricultural endeavors may amend the soil to achieve desired outcomes.

2.3. Water Resources

The project site is within the Waimānalo Aquifer System Area (ASYA) and part of the Windward Aquifer Sector Area. The following descriptions that pertain to potable and non-potable (mostly for irrigation) water are excerpts from the *Koʻolau Poko Sustainable Communities Plan* that was adopted in August 2017.

> *Potable Water*
>
> *In 2015, the region consumed 13.4 million gallons per day (mgd) of potable water, approximately 4.0 mgd of which was imported from sources within the Koʻolau Loa region. The BWS projects future water demand based on population growth rather than number of dwellings. Therefore, while additional housing is expected to be built in Koʻolau Poko, notably by the Department of Hawaiian Home Lands (DHHL) in Waimānalo and Waiāhole, with the slight decline in projected population over the next couple of decades (as noted in Chapters 1 and 2) potable water demand in the region is expected to remain stable, especially when water conservation measures are implemented. No new source, storage, or transmission mains are planned in the region, but existing source, storage, and water mains must be repaired and replaced as needed.*
>
> *Irrigation Water*
>
> *In Waimānalo, the State provides water to farmers from the Maunawili Ditch, which was built by Waimānalo Sugar Company. Its source is high-level water tunnels, springs, and streams in Maunawili and Waimānalo Valley. The system delivers an average of about 0.75 mgd of water.*

The UIC line demarcates the boundary between non-drinking water aquifers and underground sources of drinking water. The project site is *mauka* or above the UIC line, which indicates that the underlying groundwater is considered a potential source of drinking water. Limited types of injection wells are allowed if DOH approval is obtained before any injection well construction commences and a UIC permit is issued before any injection well operation occurs. The letter dated December 18, 2018 from the Department of Health, Safe Drinking Water Branch states that injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting under HAR Chapter 11-23, titled "Underground Injection Control." As previously stated in Section 1.5 Technical Considerations, no injection wells are planned as part of the Project.

The project site contains no aquatic features including streams and wetlands (or marshes, swamps, bogs, etc.) that would be considered jurisdictional under the Clean Water Act (Guinther, et al., 2019). Waimānalo Bay is roughly 0.5 miles northeast from the project site. The nearest potentially jurisdictional water is Puha Stream, which is approximately 1.2 miles west of the project site and beyond Waikupanaha Street. The

remnants of a ditch that may have been used for irrigation are present in the vicinity of the northeast portion of the project site. Two man-made agricultural ditches supply the Waimānalo Irrigation System, which provides irrigation water to approximately 160 Waimānalo farms (Group 70 International, 2011). The Kailua Ditch is seaward or *makai* of Waikupanaha Street and the Maunawili Ditch is inland or *mauka* of Waikupanaha Street. The letter dated December 19, 2018 from the Department of Agriculture (DOA) indicates that the Waimānalo Irrigation System, which ends near the southwest corner of the project site, does not service DHHL's land. Storm run-off from the project site flows in the direction of the existing grade and naturally percolates into ground water since there is no municipal drainage service for DHHL's parcels.

Nonpoint source pollution from agricultural and urban activities including runoff containing nitrogen, phosphorus, and/or sediments is considered to be a threat to coastal ecosystems. DHHL's parcels are not known to be contributing any discharges of sediments or pollutants that are associated with sewage injection wells or defunct septic tanks.

Impacts and Mitigation Measures

Project actions are not expected to impact water resources, especially since no streams will be diverted and no new potable water sources will be developed. No significant impacts to surface water quality would occur because the project site is devoid of such resources including wetlands, perennial streams, or other sensitive riparian habitats. The long-term use of the homestead lots for subsistence agricultural endeavors is not anticipated to result in contamination of the underlying aquifer and groundwater sources in the Waimānalo ASYA.

The State of Hawai'i, Department of Land and Natural Resources, Division of Aquatic Resources (DAR) stated in its letter dated December 12, 2018 that it generally supports the Project with regards to providing subsistence property to beneficiaries. The letter also recommends the following measures with regards to concerns about sediment run-off and erosion, which may harm aquatic habitats:

> *DAR recommends that the project operators utilize erosion control and land-based sources of pollution (LBSP) barrier measures at all development sites where there is the opportunity for sediment discharge into nearby waters (e.g., any site where there will be excavation, grading, or sediment/pollutant producing activities). These measures could include many types of barriers (e.g., sediment barriers/bags, silt screens, environmental socks, petroleum absorption diapers, etc.) that limits the amount of sediment or LBSP (e.g., petroleum products, chemicals, debris, etc.) to the maximum extent practicable.*

> *Another good practice would be to keep all unearthed or loose soil covered by native vegetation (grass, shrubs and trees) to minimize rain and wind erosion.*
>
> *DAR recommends that the applicant take steps to plant native vegetation that actively retain surface storm-water run-off and sediment during precipitation events. Planting an effective vegetated buffer, down slope and between agricultural plots site will help capture soil and pollutants and absorb excess surface runoff from precipitation before they reach the shoreline.*

The plant species listed by DAR as effective native soil stabilizers with water and soil retention capabilities include beach vitex (*Vitex rotundifolia* or *pōhinahina*), beach dropseed (*Sporobolus virginicus* or *ʻakiʻaki*), oval-leaf clustervine (*Jaquemontia sandwicense* or *pāʻūohiʻiaka*) and beach morning glory (*Ipomoea pes-caprae* or *pōhuehue*). There are also many non-native species, especially spreading grasses (such as Bermuda) that may be maintained as vegetative berms and swales more effectively than the suggested native ground cover species (Guinther, et al., 2019). The University of Hawaiʻi, College of Tropical Agriculture and Human Resources may also have other plant species suggestions. The utilization of other types of barriers (e.g., wattles, silt screens, geotextile socks, petroleum absorptions pads, etc.) for erosion control and sediment capture may be necessary if the vegetative buffers cannot be established or maintained to achieve effectiveness.

A short-term and temporary impact of the Project may occur from the generation of sediment-laden surface runoff during earth-disturbing activities, especially if heavy rains coincide with the activity. A National Pollutant Discharge Elimination System (NPDES) Permit for discharges of pollutants, including stormwater runoff is required for the disturbance of one acre or more of total land area pursuant to HAR Title 11, Chapter 55, “Water Pollution Control” effective December 6, 2013. The construction contractor will be responsible for implementing a storm water management plan to minimize erosion and sediment loss at the project site in accordance with State and County regulations. Erosion control Best Management Practices will be used to mitigate stormwater runoff from entering the State waters.

The long-term impact of the Project is the creation of more impermeable surface area, which increases storm water runoff from the project site. The Project proposes to implement several measures to address the quantity and quality of stormwater generated at the project site. Measures include, but are not limited to, infiltration/sediment basins, grassed swales, injection wells, and the planting of native vegetation. Proposed stormwater mitigation will be in compliance with State and County regulations. Site infrastructure for the

homestead lots such as the installation of proper drainage features and swales may ultimately improve surface runoff and reduce nonpoint source pollution concerns as compared to existing conditions.

2.4. Solid Waste and Hazardous Materials

The Waimānalo Refuse Convenience Center is approximately 0.5 miles west of the project site. The disposal of commercial or farm refuse is not allowed at this facility, which accepts household generated self-haul waste material. The County continues to explore waste reduction strategies including composting and waste-to-energy facilities to avoid further landfill development. Waste recyclers divert recoverable material from the waste stream.

A contracted records review of public regulatory environmental databases was utilized in the determination by EnviroServices and Training Center, LLC (ETC) that there are no sites or facilities that have recognized environmental conditions (RECs) within a specific search radius from the project site (e.g., 0.3, 0.5 or 1.0 miles, depending on recommendations for each record). There are no notable concerns pertaining to adjoining properties located to the west and north of the project site that appear to be utilized for either farming, aggregate hauling, or plant nursery operations. Rock quarrying occurred in the past on adjoining property to the east whereas undeveloped land containing unmanaged vegetation is south of the project site. Homeless encampments that can become community concerns due to solid waste accumulation have been observed along Waikupanaha Street.

Visual inspections of the project site were completed by ETC on October 4, 2018 and May 22, 2019 as part of the Phase I Environmental Site Assessment (ESA) for DHHL. The following general observations are noted in the Phase I ESA report: the affected area contains “bare soil, gravel, and vegetation with limited areas of asphalt pavement (i.e. Waikupanaha Street) and concrete pavement (e.g. platforms, walkways, etc.) within select tenant spaces” (EnviroServices and Training Center, LLC., 2019). Select areas within DHHL’s parcels are developed with “horse corrals, stables, equestrian practice arenas, bird coops, storage sheds/trailers/containers, a large metal-frame gazebo, restrooms, etc.” and remaining areas “primarily consist of pasture, outdoor equipment storage, and unoccupied vegetated land” (Ibid.). During site reconnaissance, ETC observed the presence of solid waste (e.g., rusted automotive parts, scrap metal, storage trailers, etc.) commonly associated with automotive activities and three unlabeled 55-gallon drums containing unknown substances. There were no observable indications that any of the drums were releasing their contents onto ground surfaces, and “ETC was unable to determine whether a past release of hazardous substance or petroleum product from the three discovered drums had occurred” (Ibid.).

Sports Turf Hawaii, Na Lioʻo Waimānalo (the entity owned by June Pires), the Cook's Ranch, and Alan Silva had established operations within DHHL's parcels at the time of the inspections. DHHL's permittees and other interviewees described past usage from their knowledge and familiarity of the project site, which ranged from 7 to 28 years. ETC learned through interviews that illegal dumping of construction and/or demolition debris (e.g., aggregate, roofing materials, concrete with rebar, etc.) had occurred for many years on DHHL's land and solid waste is buried throughout DHHL's parcels. Other unlawful activities that have ceased include heavy equipment maintenance, parking and storage associated with a trucking business (i.e., Hiroshima Trucking), and vehicle disassembly, oil changes, tune-ups, etc. associated with suspected auto mechanics and "chop-shops." Interview findings also revealed that a large pit was excavated to purportedly dispose of the solid waste associated with a "chop-shop" and petroleum products and/or hazardous materials. The following information is noted from ETC's research effort that appear to support many interview findings:

> A 2008 aerial photograph appears to depict a sizeable area partially backfilled with dirt on the northwest corner of DHHL's land in the general vicinity of the reported pit.
>
> The lease agreement with Char Ranch, which operated the Manawale'a Riding Center, "was reportedly terminated by DHHL in or around 2013 due to violations associated with suspected illegal activities" (Ibid.).
>
> An incident of dumping was reported to the Hawaiʻi Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Office in May 2014 (Case No. 20140502-1250). Verification of the removal and disposal of three unknown containers was not found with the documentation for the incident; however, ETC found no evidence of the three containers during its visual inspection of DHHL's parcels.

ETC observed a remnant concrete platform but no other evidence of a previously observed release on the ground or "oil-staining, typically associated with vehicle maintenance and leaking equipment" in the area reportedly associated with the trucking business (Ibid.). No evidence was found during ETC's inspection of reported stockpiles or dumping of construction and/or demolition debris (e.g., aggregate, roofing materials, concrete with rebar, etc.) and petroleum products and/or hazardous materials (e.g., drums of used oil). No visual remnants of vent or fill pipes, dispensers, etc. that are typically associated with underground or above-ground storage tanks were observed during ETC's inspections.

As stated in the Phase I ESA, no evidence of any past releases associated with site usage for automotive activities, trucking businesses and/or suspect solid waste dumping was observed during the visual inspections; however, "ETC cannot dismiss

the possibility that residual contamination associated with these activities may exist" within the project site. The following excerpt from ETC's Phase I ESA identifies the following RECs that pertain to DHHL's land:

> *Contaminant impacts associated with a potential release from the three unlabeled 55-gallon drums containing unknown substances, located within the Cook's Ranch and former Char Ranch tenant spaces.*
>
> *The potential presence of residual contamination associated with past and prior usage of the Subject Property (e.g. auto mechanic, trucking activities, suspect solid waste dumping, etc.).*

Impacts and Mitigation Measures

As a result of the Project, the RECs from past usage are expected to be ameliorated by appropriate actions including but not limited to the proper removal and disposal of solid waste. Construction activities at the project site would temporarily increase the volume of solid waste such as excavated material that must be transported off-site for proper disposal. Waste material from construction will be collected and transported off-site by a commercial service provider for proper disposal. DHHL shall ensure that appropriate waste management and disposal practices are implemented by the construction contractor. In the long-term, each lessee will be responsible for solid waste disposal. DHHL will encourage green waste recycling to the extent possible. No adverse impacts are anticipated.

2.5. Natural Hazards

Natural hazards that pose potential island wide effects are tropical cyclones, earthquakes, floods and tsunami inundation. Sea level rise has the potential to threaten life and property in coastal and low elevation areas. Steep cliffs and areas containing a build-up of dry vegetation may be more susceptible to rockfalls and wildfires, respectively. In general, the exposure to natural hazards from unpredictable events is no greater at the project site than at other locations on O‘ahu. Rockfalls and wildfires on O‘ahu that have caused loss of life or damage to property were localized hazards. Many wildfires are caused by human actions of an intentional nature or as a result of negligence.

Many tropical cyclones have passed close enough to affect the State of Hawai‘i since the recording of such events began in the 1950s. Hurricane Iwa in 1982 and Hurricane Iniki in 1992 both brought destructive winds and torrential rains that resulted in significant property damage. Hurricane Iniki was connected to six deaths.

The most recent earthquakes to have statewide impacts occurred on October 15, 2006. The earthquakes, which occurred off the Kona coast of Hawai‘i, had magnitudes

of 6.7 and 6.0. The event caused property damage and triggered an island-wide electrical blackout on O‘ahu.

The project site covers multiple flood designations on the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency including Zones AE, XS, and X. Portions of Waikupanaha Street and Hihimanu Street are in Zone AE, which is a designation for inundation areas of high-risk. Zones XS and X refer to inundation areas of low-to-moderate risk that are outside the 0.2 percent annual chance (or 500-year) floods. Most of the project site is within Zone X (see Figure 3).

Tsunami Evacuation Zone maps for the State of Hawai‘i identify low lying areas where excavation is recommended since extensive damage to life and property may occur from seismic sea waves. The County’s Department of Emergency Management updated the tsunami evacuation zone maps in 2010 to incorporate a public safety buffer that provides better zone recognition. The project site is completely outside the Tsunami Evacuation Zone; however, the northern portion of the project site is within the Extreme Tsunami Evacuation Zone, which is a second zone that recognizes very large (magnitude 9+) earthquakes and resulting tsunami events.

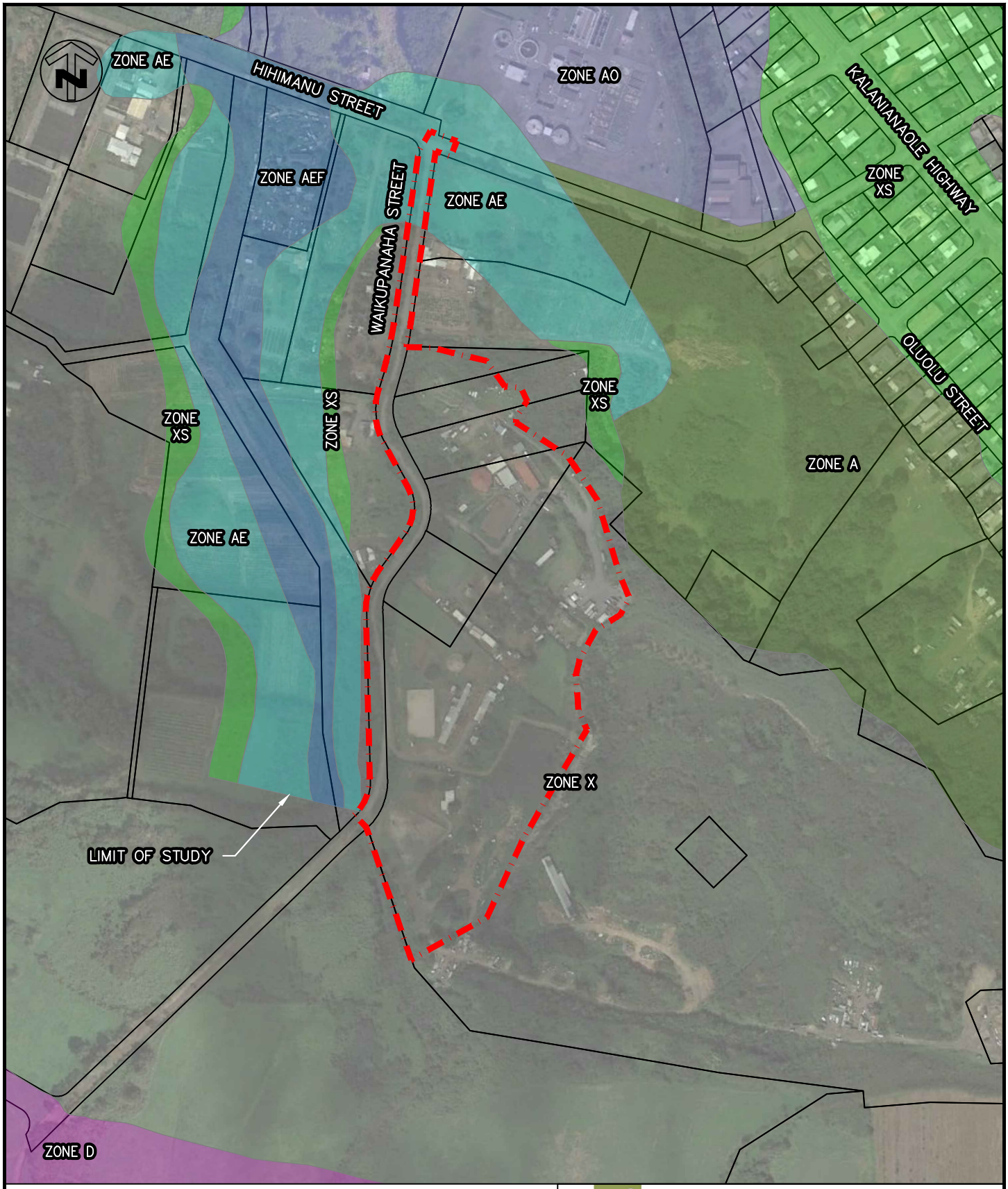
Climate change and sea level rise have the potential to increase the dangers from flooding and storms. The timeframe for experiencing the effects of various sea level rise scenarios is unknown and there are no sea level rise exposure areas within the project site in the 3.2 feet scenario as depicted in the Hawai‘i Sea Level Rise Viewer (Pacific Islands Ocean Observing System, 2018).

There are no apparent rockfall hazards in the vicinity of the project site and the Project excludes the development of areas containing cliffs or steep slopes. Threats from wildfires are unlikely but possible since there is abundant vegetation within DHHL’s parcels. Drought conditions and high winds could exacerbate the fire hazard.

Impacts and Mitigation Measures

The threats to humans and property from unpredictable natural events will always be present. Proposed activities at the project site would not affect the probable occurrence of naturally occurring hazards. Clearing and grubbing for the development of the subdivision, and subsequent use by DHHL’s lessees is expected to reduce the threat from wildfires. New utility infrastructure will be designed for regulatory compliance and are expected to be less vulnerable to the effects of sea level rise such as infiltration caused by tidal fluctuations that influence the groundwater table.

The Project is not expected to significantly increase risks to human health or property. No adverse impacts are anticipated to Pope Elementary School and



LEGEND

- PROPERTY LINE
- PROJECT LIMITS
- FLOOD ZONE X
- FLOOD ZONE XS
- FLOOD ZONE A
- FLOOD ZONE AE
- FLOOD ZONE AEF
- FLOOD ZONE AO
- FLOOD ZONE D

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots
Flood Zones

SCALE: 1'=400'

DATE: November 2019

FIGURE
5

(This page intentionally left blank.)

Waimānalo Elementary and Intermediate School, which are designated hurricane evacuation shelters. Similarly, no adverse impacts are anticipated to the County's ambulance service, which is provided from the Waimānalo Fire Station.

2.6. Floral and Faunal Resources

The project site is within a larger geographic area that has experienced a long history of significant land-disturbing activities including large-scale agriculture, livestock and ranching activities that altered the natural environment. The U.S. Fish and Wildlife Service in its letter dated December 14, 2018 noted the federally protected species that are most likely to occur within the vicinity of the project area and stated that "this list is not comprehensive and should only be used for general guidance." The agency's letter identified one mammal, three bird species, no insects and no plants:

Hawaiian hoary bat (*Lasirus cinereus semotus*) or *ʻōpeʻapeʻa*
Band-rumped storm-petrel (*Oceanodroma castro*) or *ʻakēʻakē*
Hawaiian petrel (*Pterodroma sandwichensis*) or *ʻuaʻu*
Newell's shearwater (*Puffinus auricularis newelli*) or *ʻaʻo*

No species of plants or animals currently proposed for listing or listed under either the federal or State of Hawaiʻi endangered species statutes were recorded by biologists from AECOS, Inc. during the survey of DHHL's parcels on October 4, 2018 and the survey of Waikupanaha Street on May 2, 2019. The Hawaiian short-eared owl (*Asio flammeus sandwichensis* or *pueo*) may forage in the area, the Hawaiian hoary bat (*Lasiurus cinereus semotus* or *ōpeʻapeʻa*) may roost in tall tree species, and seabirds including the Hawaiian petrel (*Pterodroma sandwichensis* or *ʻuaʻu*) and Newell's shearwater (*Puffinus auricularis newelli* or *ʻaʻo*) may fly over the area. The Oʻahu population of the Hawaiian short-eared owl is state-listed as endangered. The indigenous White Tern (*Gygis alba* or *manu o Kū*) occurs on Oʻahu and is state-listed as a threatened seabird but is not expected to occur in the project area. The biologists from AECOS, Inc. observed no seabird breeding colonies or nesting sites in the project area.

Aquatic features (e.g., streams and wetlands) and federally delineated critical habitat are not present in the survey area according to the biological survey report prepared by AECOS, Inc. (see Appendix E). The biologists from AECOS, Inc. characterize existing vegetation at the project site as highly variable due to current and past usage. There are ornamental species and weeds within and adjacent to existing equestrian facilities. The previously disturbed areas of the project site with no current human activity appear to contain no remnant native plant assemblages: the open areas are dominated by Guinea grass (*Megathyrsus maximus*) that excludes most other plants and other areas are covered by *koa haole* (*Leucaena leucocephala*) shrubland.

Guinea grass, *koa haole*, and ruderal verge vegetation are present along Waikupanaha Street to Hihimanu Street. Various agricultural parcels contain plantings of ornamental trees. Ruderal weeds, *koa haole* scrub and dense Guinea grass are present in the former limestone quarry area. There is *koa haole* scrub along Waikupanaha Street and shrubs of mock orange (*Murraya paniculata*) at the base of hardened limestone dunes that were mined when the quarry was operational. The suitable roosting areas for Hawaiian hoary bats are stands of ironwood (*Casuarina equisetifolia*) and gunpowder tree (*Trema orientalis*) that grow along the limestone cliff, tall and dense *koa haole* found at the base of the quarry, and other woody vegetation taller than 15 feet.

Impacts and Mitigation Measures

The Project is not expected to displace any federal or State of Hawai‘i listed species of plants or insects since the project site is devoid of these protected resources. Site preparation work such as clearing and grubbing is expected to involve the necessary removal of on-site vegetation including plants and trees that were planted and are cultivated by current permittees (see the discussion in Section 2.8 Cultural Practices and Resources). DHHL will consider implementing the following measures that would avoid or minimize adverse impacts to Hawaiian hoary bats, Hawaiian short-eared owls, and protected seabirds that were not detected during the biological survey but may frequent the project area:

Woody vegetation taller than 15 feet that may serve as potential bat roosts should not be removed during the bat pupping season between June 1 and September 15 since bat pups or female bats carrying pups may be less able to rapidly vacate a disturbed roost tree. The use of barbed wire to top fence lines should be avoided since this may entangle flying bats. The removal of tall trees found to be utilized by bats may be addressed by replanting similar-sized trees; however, this practice may be more easily implemented for agricultural endeavors such as a cultivated orchard. Existing tall trees may remain within the project site, to the extent possible.

A survey for Hawaiian short-eared owl ground-nesting activity should be undertaken immediately prior to the start of grading in locations that are undeveloped and without regular human activity. If a nest is discovered, no activity that could disturb nesting may proceed and DLNR must be notified.

Seabirds, especially fledglings, that may fly at night can become disoriented by night-time lighting sources including construction lights, residential lighting and street lights. No night time construction work is

anticipated. Outdoor lighting should be dark sky compliant, properly shielded and directed towards the ground. Other recommendations include the use of automatic motion sensor switches and timer controls that keep outdoor lights turned off when human activity is not occurring.

The letter dated December 21, 2018 from the Department of Land and Natural Resources, Division of Forestry and Wildlife (DFW) provides recommendations to encourage DHHL to consider agroforestry in its land use decisions and to share options for potential agroforestry uses with lessees. Growing agroforestry trees together with more traditional agricultural crops may increase tree canopy and carbon sequestration, improve soil health, and reduce harmful agricultural practices that can degrade the watershed. DFW's letter mentions its Forest Stewardship Program, which may require neighboring lessees to work together through an organization such as a homestead association since there is a minimum lot size requirement of five acres for participation in the program. Federal agroforestry programs may also be available for smaller lot sizes.

2.7. Archaeological Resources

The management summary from the LRFI report is included in Appendix C. The project site does not contain previously identified historic properties. Background research conducted by CSH suggests that the project area has experienced a long history of intensive land use and is unlikely to contain pre-Contact or early historic archaeological historic properties. Historic resources that may have been present in the project area prior to nineteenth and twentieth century land uses are likely to have been heavily disturbed or completely removed since "commercial sugarcane agriculture covered the entire project area by at least 1884" as suggested by some historic maps; however, other historic maps and aerial photographs suggest that the area "may have been less suited for commercial agriculture and may have been used only intermittently or not at all" (Shideler and McDermott, 2019). The project area has also been heavily disturbed "by animal husbandry activity and diversified agricultural in the last 40 years" (Ibid.). "Additionally, a substantial southeastern portion of the project area was part of 1970s and 1980s quarrying operations" (Ibid.).

The Hihimanu and Waikupanaha Street roadway alignments were established by the early twentieth century according to available reference documents. For example, the current alignment of Hihimanu Street is identified as a railroad on the 1916 Wall Map of Waimānalo and an accompanying notation appears to indicate that the route continues to the Makapuʻu lighthouse (Ibid.). In the 1927 Waimānalo Coast Aerial Photograph, Hihimanu Street appears to be a more traveled dirt road whereas Waikupanaha Street seems to be a plantation field road.

Field inspections of the project site were conducted by archaeologists from CSH on October 4, 2018 and June 3, 2019. The archaeologists observed current land uses, assessed the potential for remnants of past land use, and documented the general characteristics of the project area. Within DHHL's 30-acre area, CSH observed "one dry-stone stacked basalt wall feature that appears to be related to a modern driveway" and several limestone boulder features and bulldozer push piles that "appear to be associated with quarrying operations and roadway installation" (Ibid.). The features observed within DHHL's parcels appear to be less than 50 years old (Ibid.).

A basalt and mortar feature at the intersection of Hihimanu and Waikupanaha Streets is potentially older than 50 years old. The historic property is in-use for the purpose of conveying water under Hihimanu Street through a prefabricated concrete culvert with metal pipe grating, and is also modified by more recent PVC pipe that passes through the feature. "This historic property is potentially related to Hihimanu and Waikupanaha roadway construction in the first part of the twentieth century, or could be related to historic plantation irrigation" (Ibid.). Along the southern portion of Waikupnaha Street and near homeless encampments, the archaeologists observed many "stacked stone, dry masonry limestone and boulder alignments and terraces" and bulldozer push piles that appear to be less than 50 years old (Ibid). The stacked features and push piles may be the result of squatter activities or may be associated with "older quarrying activity from the 1970s and 1980s" (Ibid.).

Impacts and Mitigation Measures

There are no sites listed on the Federal or Hawai'i Register of Historic Places near or within the project site. This area of Waimānalo was intensively altered by past usage including long periods of commercial agriculture and a quarrying operation. Buildings and structures within DHHL's parcels that would be affected by the Project appear to be less than 50 years old. DHHL has requested concurrence from SHPD that a limited archaeological inventory survey (AIS) to document one likely archaeological historic property (i.e., the basalt and mortar water conveyance feature) is the appropriate action with regards to historic preservation review under HRS §6E-8 and HAR §13-275. The scope of the AIS would be determined through consultation with SHPD and may include documentation of numerous dry-stone masonry features that appear to be less than 50 years old. The water conveyance feature is in use and project actions are not expected to alter the function that it provides.

Unanticipated discoveries of historic resources may occur during the various phases of construction such as site preparation, roadway improvements and utility installations. DHHL shall require its contractor to immediately halt construction activities and notify SHPD in Kapolei in the event any unanticipated sites or remains such as bone or charcoal deposits, human burials, rock or coral alignments, and pavings or walls are encountered.

2.8. Cultural Practices and Resources

CSH conducted a cultural impact assessment (CIA) to help identify the potential impacts of the Project based on information about the cultural and historical background of Waimānalo (refer to Appendix C). In November 2018, CSH initiated its effort to consult knowledgeable parties including Native Hawaiian Organizations, agencies, and community members including descendants of the area. The CIA report documents the results of the research activities by CSH that involved outreach via letters, email, telephone calls and in-person contact. The community consultations including a group interview with Alu Like, Inc. were completed; however, CSH did not receive the approval of the interview summary by October 2019 from Alu Like, Inc. Of the 11 people that responded to outreach initiated by CSH, three (3) *kamaʻāina* (native born) and/or *kūpuna* (elders) who participated in formal interviews approved their interview summaries that are included in the CIA.

The descriptions of Waimānalo provided by Mr. and Mrs. Spencer include their fondness for areas once utilized for gathering that are no longer used by the family. The interview summary from the Cook ʻOhana provides the only accounts pertaining to DHHL's parcels and describes the endeavors of family members who maintain the ranch and contribute to the perpetuation of Hawaiian traditions such as *pāʻū*, *hula*, *mele*, *oli*, and *lei* making.

As noted in the CIA report, the effort to establish the Cook Ranch on 12 acres of DHHL land reportedly involved towing city buses that were abandoned on DHHL's parcels by a previous tenant and altering the condition of the land (e.g., clearing bushes, *koa* trees, and rocks). DHHL's land has been utilized by the Cook ʻOhana since 1991, and their activities include raising horses and cultivating numerous species of plants (Spencer and Hammatt, 2019). The Cook Ranch is currently situated on three (3) acres since DHHL divided the larger 12-acre area and issued separate ROE permits for smaller areas. Since 2003, Leiala Cook has been the president of The Hawaiʻi Paʻu Riders Equestrian Unit, which is the organization that was founded in 1981 by her parents, John and Lita Cook (Kato, 2014). The Hawaiʻi Paʻu Riders Equestrian Unit participates in numerous parades locally and nationally. Monthly meetings are held at the Cook Ranch to prepare for parades and there are workshops for riders who want to learn horsemanship. "The Cook Ranch also hosts numerous activities for the community including the awards ceremony for the Aloha Festival Parade which may attract up to 300 people" (Spencer and Hammatt, 2019).

Activities such as *lei* making and *paʻu* draping utilize numerous species of trees and plants including *kukui*, *ti* leaf, bougainvillea, *kaunaʻoa*, and sea grapes that were planted by Lita Cook, who was a professional *hula* dancer and *kumu hula* (*hula* teacher) with a *hālau* (school for *hula* instruction) in Waimānalo (Ibid.). The Cook ʻOhana also mentioned their cultivation of *noni* and dryland *taro*. A summary of the natural resource considerations pertaining to the mentioned species is below.

SUMMARY OF CULTIVATED NATURAL RESOURCE CONSIDERATIONS

Species	Status	Abundance During Surveys
kukui (*Aleurites moluccana*)	Pol	O
ti (*Cordyline fruticosa*)	Pol	O
bougainvillea (*Bougainvillea glabra*)	Orn	U ✓
kauna'oa (*Cuscuta sandwichiana*)	End	NONE
sea grapes (*Coccoloba uvifera*)	Orn	NONE
noni (*Morinda cirtifolia*)	Pol	O
taro (*Colocasia esculenta*)	Pol	NONE

Legend

End	Endemic; native only to a particular locality or region.
Pol	Early Polynesian introduction; canoe plant.
Orn	Ornamental; crop or landscape plant not established outside of cultivation.
U	Uncommon - several to a dozen plants observed.
O	Occasional - found regularly, but not abundant anywhere.
NONE	Specimens were not observed during the botanical surveys
✓	Species also recorded along Waikupanaha Street in May 2019

The biologist from AECOS, Inc. notes that the natural resources identified in the above summary are not rare or endangered. The *kauna'oa* is a hard to find endemic species whereas the naturalized varieties of this plant are commonly found in Waimānalo; the endemic and naturalized varieties of this plant have very similar flowers and grow upon a host plant. The six other species identified in the summary (i.e., *kukui*, *ti*, bougainvillea, sea grapes, *noni*, and *taro*) are reportedly easy to find within other areas of Waimānalo.

In December 2018 and September 2019, respectively, DHHL received written comments requesting the reconsideration of the Project for the purpose of allowing the Cook Ranch and Pires Ranch to continue for the foreseeable future. The written comments from Leiala Cook, Lawrence Delos Santos and the Ramos-Kia Tupua 'Ohana mention how these ranches contribute to the perpetuation of Hawaiian traditions including but not limited to *pā'ū* riding. The scarcity of available land for horsemanship practice with the *lei*, workshops and *lei* making (i.e., pastoral lots consisting of an acre or more) was a stated concern.

Impacts and Mitigation Measures

The Cook 'Ohana is opposed to the Project and do not want to be relocated from the area they have utilized for 28 years. Ms. Iwalani Lowea Kahalewai-Cook characterizes the Cook Ranch as a culturally significant place and believes the Project will disrupt the Cook 'Ohana's gathering practices and their perpetuation of Hawaiian traditions.

The efforts by current permittees to preserve and promulgate cultural practices is appreciated by DHHL. All of the ROE permits are subject to cancellation by DHHL at any time upon 30 days advance notice in writing to permittees. Surveyed applicants on the Oʻahu agriculture waitlist have indicated during the Oʻahu Island Plan process that their strong preference is to receive an agriculture award in Koʻolaupoko and Waimānalo in particular. The cessation of current activities on the premises including cultural practices is expected to be offset by the establishment of long-term homesteading by beneficiaries, which is a core mission for DHHL.

Natural resources utilized for cultural practices are reportedly common species that may be gathered from other locations since gathering activities for culturally important events can also involve going "all over the island to pick [flowers]" (Keola, 2018). The current permittees may relocate or replant the cultivated natural resources that they value prior to the commencement of site preparation activities associated with the Project, which would help to minimize or avoid the loss of these resources to them. Any remaining cultivated natural resources on the premises are expected to be cleared due to site preparation activities, and the loss of these resources may be offset as a result of the cultivation practices of beneficiaries who are awarded SAH lots.

DHHL shall require its contractor to inform construction workers and project personnel about the potential for encountering cultural finds including human remains or *iwi kūpuna* during construction activities. As previously mentioned in Section 2.7 Archaeological Resources, construction activities must be immediately halted in the event that any potential historic properties are identified. SHPD in Kapolei will be notified in the event of an inadvertent discovery of potential historic properties. SHPD and the Honolulu Police Department will be notified in the event of an inadvertent discovery of *iwi kupuna*, the area will be cordoned off, and a burial treatment plan will be completed. DHHL will consult with cultural and lineal descendants of the area to develop a reinterment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance of discovered *iwi kūpuna* and/or cultural finds.

2.9. Visual Resources

Waimānalo is a rural community that is characterized by low-density residential communities, small businesses and agricultural lots interspersed with green space. Dense vegetation and mature canopy trees provide the visual element of green space and help to obscure existing building elements and human activity. The area surrounding the project site has agricultural uses and low-density residential homesteads.

Impacts and Mitigation Measures

Completion of the Project, which will allow the award of SAH lots to beneficiaries, will not significantly alter the visual character of the Waimānalo area since subsistence agriculture is expected to be consistent with surrounding residential and agricultural land uses. Vegetated areas within the project site will be necessarily cleared for site preparation and the creation of roadways and utility infrastructure. The incorporation of agroforestry practices by beneficiaries in their subsistence agricultural endeavors has the potential to reintroduce trees and other plants that are appropriate for the Waimānalo area.

2.10. Noise

The project site is located in a rural community where the primary noise source is related to vehicular traffic along Kalaniana‘ole Highway and secondary roadways. In general, there is low background noise in the vicinity of the project site since there is low vehicular activity along Waikupanaha Street. Dense vegetation helps to reduce or buffer audible background noise emanating from the main arterial through Waimānalo during periods of increased human activity and travel such as in the morning and late afternoon. Intermittent noise from other sources such as the sirens at Waimānalo Fire Station also contribute to the background noise environment.

Impacts and Mitigation Measures

Audible noise from construction vehicles, heavy equipment and impact tools is expected to fluctuate during the various phases of construction. The mitigation of noisy activities to inaudible levels will not be practical in all cases due to the intensity and exterior nature of the work. The necessary removal of dense vegetation may allow more construction noise from site preparation and utility installation to emanate beyond the immediate vicinity of the work area. Construction noise is temporary in nature and will cease upon completion of the Project.

Project activities shall comply with the provisions of HAR Title 11, Chapter 46, “Community Noise Control.” The noise regulations require a noise permit if the noise level from construction activity is expected to exceed allowable levels stated in the Chapter 11-46 rules. It shall be the contractor’s responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment and to maintain noise levels within regulatory limits. If construction activities occur outside of the allowable timeframes designated for the noise permit (i.e., nighttime, Sunday, holiday) and exceed allowable noise levels, a noise variance must be obtained prior to commencement of construction activities, as required. The construction contractor will obtain the appropriate permit or approvals (e.g., Notice of Intent to Construct, Community Noise Permit, or Noise Variance). DHHL will ensure that the contractor

complies with all permit conditions. No night time construction work is anticipated.

Noise from human activity at the project site is expected to be similar to the sounds emanating from nearby areas. Landscaping within the homestead lots may help to reduce or buffer the sounds of human activities.

2.11. Site Access, Circulation and Traffic

Kalaniana‘ole Highway (State Route 72) is mostly an undivided, two-lane, urbanized principal arterial connecting Waimānalo to Kailua and to Makapu‘u with a posted speed limit of 25 to 35 miles per hour (mph). Residential structures, commercial buildings, public facilities (e.g., Waimānalo Fire Station, Waimānalo Public Library, Waimānalo Elementary and Intermediate School) and various community facilities (e.g., Waimānalo Health Center and St. George Church) are located along Kalaniana‘ole Highway. The lower speed segment of the highway begins before the Tinker Road entrance to Bellows Air Force Station and continues past a horse boarding facility to the perimeter of the Olomana Golf Club property.

Waikupanaha Street is a two-lane, two-way county-owned roadway that connects to Hihimanu Street, which is a two-lane county-owned roadway with a posted speed limit of 15 to 25 mph. These collector roadways fit the description of Rural Roads that often serve as farm roads, are owned and maintained by the County, and generally carry much less traffic as compared to highways. Waikupanaha and Hihimanu Streets provide vehicular access from inland areas to Kalaniana‘ole Highway. There are raised sidewalks along the north side of Hihimanu Street between Kakaina Street and Waimanalo District Park. There are no sidewalks along Waikupanaha Street.

The established Waikupanaha Street right-of-way is 40 feet. In some sections, the existing rural roadway is very narrow and encroaches into DHHL’s parcels. Road network improvements described in the Waimānalo Regional Plan were meant to extend and connect Ilauhole Street with Waikupanaha Street to provide an emergency evacuation route from existing homestead subdivisions in the tsunami inundation zone to inland areas. The Ilauhole Street extension and Waikupanaha Street improvements were proposed in 2006 and considered a priority; however, the funding that was appropriated in 2009 lapsed and subsequent attempts to fund all of the road network improvements were unsuccessful (Group 70 International, 2011). The Waikupanaha Street improvements that were proposed as phase 2 of the project included creating two lanes with an approximate right of way of 55 feet, paving, installation of sidewalks, drainage, sewer pipes, telecommunication lines and lighting (Ibid.).

The County provides bus services to the Waimānalo area via Kalaniana‘ole Highway. Bus stops are located along the east and west bound lanes of the highway. The closest bus stops to the project site are approximately 0.5 miles away at the

intersection of Hihimanu Street with Kalaniana‘ole Highway. Three bus routes provide service for the area from Kailua to Waimānalo:

> Route 57 connects Sea Life Park with Ala Moana via Waimānalo and Kailua from 4:50 a.m. to 11:40 p.m.;
>
> Route 69 (formerly Route 77) connects Waimānalo with downtown Honolulu via Kailua during the weekdays from 5:45 a.m. to 6:10 p.m.; and
>
> Route 89 connects Waimānalo with Kaneohe via Kailua during the weekdays from 5:45 to 6:45 a.m. and from 4:45 to 5:50 p.m.

Bicycle and pedestrian facilities near the project site are limited. There is an existing Bike Route along Kalaniana‘ole Highway but no special designation for bike traffic on Waikupanaha and Hihimanu Streets. The County’s 2012 O‘ahu Bike Plan and a Draft O‘ahu Bike Plan Update (2019) do not show planned improvements for non-motorized travel in the vicinity of the project site. Shared Roadway considerations whereby bicyclists use the same travel lanes as other traffic appear to be appropriate for Waikupanaha and Hihimanu Streets due to low speed limits and low volumes. The County’s Complete Streets Manual (2016) states that Rural Roads do not have to comply with the four-zone sidewalk system but there should be reasonably safe places for pedestrian travel.

Impacts and Mitigation Measures

A multi-modal transportation impact assessment (see Appendix G) was completed as recommended by the DTS in its letter dated December 20, 2018 and the State of Hawaii Department of Transportation (HDOT) in its letter dated January 3, 2019. The traffic impact analysis report (TIAR) prepared by SSFM International (2019) evaluates existing 2019 traffic conditions, assesses future (2022) changes for the study area and discusses impacts of the Project on the surrounding area. Traffic congestion and delay for the signalized intersection of Kalaniana‘ole Highway and Poalima Street is expected to remain the same without the Project during the AM and PM peak hours. Three stop-controlled intersections at Hihimanu Street and Poalima Street, Hihimanu Street and Waikupanaha Street, and Hihimanu Street and Kalaniana‘ole Highway are expected to continue functioning without significant delay and well under capacity. Traffic congestion and delay for the eastbound and westbound approaches to Kalaniana‘ole Highway from Hihimanu Street are expected to worsen without the Project during the PM peak hour.

The Project, which may be constructed in phases, is expected to attract more residents and visitors to the area. Two intersections along Waikupanaha Street will be constructed and are expected to have low volumes of traffic. DHHL’s

proposed subdivision "is expected to generate approximately 30 new trips in the AM peak hour (7 entering and 23 exiting) and 38 new trips in the PM peak hour (24 entering and 14 exiting)" (SSFM International, 2019). As indicated in the TIAR, the Project is expected to have a negligible effect on traffic during the weekday AM and PM peak hours. The Project is expected to increase average delay for the westbound approach to Kalaniana'ole Highway from Hihimanu Street during the PM peak hour.

Disruptions to vehicular, bicycle and pedestrian traffic during the various phases of construction will be intermittent and temporary in nature and any affected crossing should be maintained with the highest safety measures during construction. The bus routes, bus stops, and paratransit operations are not expected to be impacted by construction activities within the project site. Appropriate traffic control devices and warning signs will be installed and the traffic flow will be directed by construction personnel or by law enforcement personnel, when necessary. Temporary traffic lane closures are anticipated for utility installations and connections. No additional crosswalks in the study area are warranted as a result of the Project since "pedestrian traffic is not expected to meet the minimum pedestrian volume threshold of 20 pedestrians per hour in any one hour, or 60 pedestrians in any consecutive 4 hour period" (Ibid.).

The Project provides the opportunity to properly realign Waikupanaha Street within the County's right of way and to provide shoulders along Waikupanaha Street for safer pedestrian travel. The letters dated December 19 and 20, 2018 from the County's Department of Transportation Services (DTS) and the Department of Facility Maintenance, respectively, state that any damage or deficiencies caused by the construction of proposed improvements must be corrected to County standards, be accepted by the County and meet Americans with Disabilities Act (ADA) requirements. Access driveways to homestead lots will be designed and constructed to County standards. Proposed improvements will maintain the road network in this rural area, which has no sidewalks, curb ramps, or crosswalks. Improvements to Waikupanaha Street may include new asphaltic concrete pavement and the relocation of utility poles with overhead lines. The Project will be designed to address the hydrology and drainage impacts to the County's roadways as required.

A traffic management plan that addresses short-term impacts during construction will be submitted to DTS and DPP for review. DHHL's contractor will be required to implement Best Management Practice controls at the project site to prevent dirt and debris on County roadways. The contractor will obtain a street usage permit from DTS for construction-related work (e.g., project parking, transporting equipment, etc.) that may require the temporary closure of any traffic lane on a County street as recommended by the Honolulu Police

Department in its letter dated July 31, 2019. A recommendation from DTS in its letter dated December 20, 2018 is to transport construction materials and equipment during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize potential disruptions on local streets. DTS also recommended sharing the details and status of the Project with area representatives, the neighborhood board, area residents, businesses, emergency personnel (e.g., fire, ambulance and police) and Oʻahu Transit Services, Inc. (OTS) especially if there are anticipated impacts to the local street network.

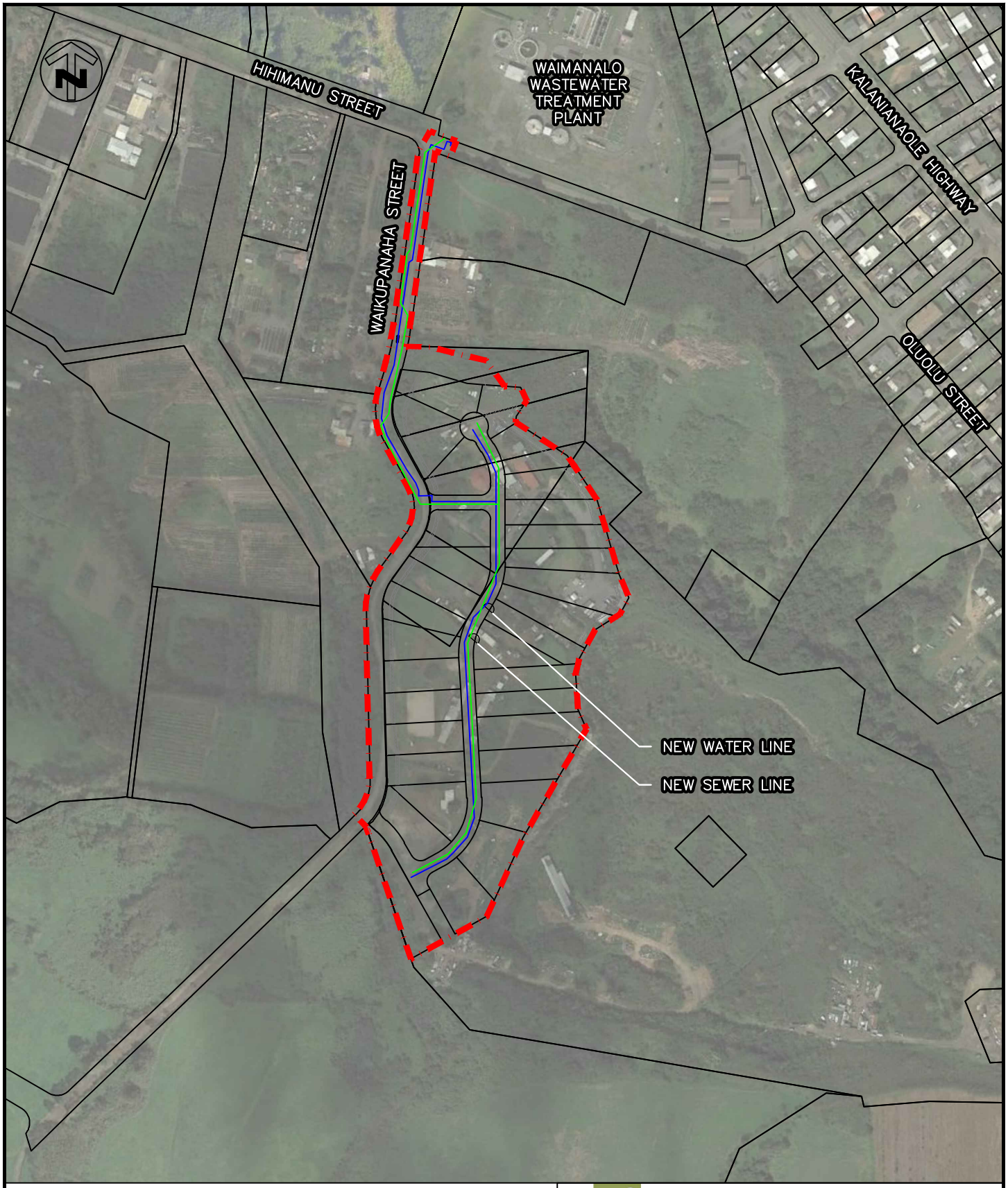
2.12. Utilities (Water, Wastewater, Drainage)

Existing utility infrastructure is primarily located along Hihimanu Street, which is north of the project site. Letters from County agencies indicate that there is no adequate fire protection and no sewer service at the project site at this time. The nearest BWS fire hydrant is located along Hihimanu Street and approximately 1,400 linear feet from the project site according to the letter dated December 20, 2018 from the Board of Water Supply (BWS). Underground lines along Hihimanu Street convey wastewater to the Waimānalo WWTP, which serves the windward coast of Oʻahu from Makapuʻu to Waimānalo. The Waimānalo WWTP is north of the project site along Hihimanu Street. There are no drainage facilities along Waikupanaha Street that retain or direct stormwater runoff.

Impacts and Mitigation Measures

A short-term and temporary impact of the project would occur from the generation of additional sediment-laden surface runoff during construction and demolition work. Appropriate erosion control BMPs will be used to minimize the amount of soil transported in stormwater runoff during construction activities. All construction activities will comply with applicable Federal, State and County regulations and rules for erosion control as previously discussed in Section 2.3 Water Resources.

Proposed utility improvements are shown in Figure 6. Connections and new underground lines installed along Waikupanaha Street and internal roadways may be necessary to extend potable water and fire protection service from the County's system to the project site. The civil drawings will be submitted to the BWS and Honolulu Fire Department for review and approval to ensure that County standards and on-site fire protection requirements are met. DHHL will consider a separate, non-potable water system for irrigation and coordinate with the State of Hawaiʻi Department of Agriculture with regards to extending necessary infrastructure to the project site from the State's Waimānalo Irrigation System.



LEGEND

PROPERTY LINE

PROJECT LIMITS

NEW WATER LINE

NEW SEWER LINE

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots
Proposed Utility Improvements

SCALE: 1'=400'

DATE: November 2019

FIGURE
6

(This page intentionally left blank.)

DHHL may consider extending necessary infrastructure to the SAH lots that would allow for the use of a separate recycled water system for non-potable purposes, such as landscape and agriculture irrigation. The County owns and operates the Waimānalo WWTP, and treatment upgrades (filtration and disinfection) are required to produce R-1 recycled water. At this time, it is not known if and when the treatment upgrades at the Waimānalo WWTP facility will occur. Future underground lines and connections for DHHL's parcels are expected to be discussed and coordinated in preparation of R-1 recycled water availability. Additionally, an agreement between the County and DHHL would be required to commit both agencies to long-term R-1 usage.

Connections and new underground lines installed along Waikupanaha Street and internal roadways are similarly needed to convey domestic wastewater to the County's Waimānalo WWTP. A new sewer connection is subject to review and approval by DPP. Wastewater from the Project will be conveyed via a gravity fed system to existing municipal treatment and disposal infrastructure.

A new internal roadway for the Project will increase impervious areas, thereby increasing stormwater runoff. The anticipated impact will be offset by the development of an on-site stormwater mitigation/drainage systems to address the quality and quantity of stormwater leaving the site. The site drainage plan must comply with applicable County drainage standards and requirements. Some of the measures being considered include, but are not limited to, infiltration/sediment basins, grassed swales, and vegetated berms utilizing native or non-native species. The Project does not intend to utilize new injection wells for storm water runoff that require DOH approval prior to the commencement of construction.

2.13. Power and Communications

The Hawaiian Electric Company, Inc. (HECO) provides electrical power in the project area. HECO requires continued access to any easements established for the maintenance of its facilities and has no objections to the Project according to correspondence on November 26, 2018. Hawaii Gas has no utility gas facilities in the project area according to its letter dated July 24, 2019.

Communication services are available from service providers such as Hawaiian Telcom, Sandwich Isles Communication, and Charter Communications (or Spectrum). Overhead communications lines are usually co-located on utility poles along Kalaniana‘ole Highway and established roadways. There is overhead Cable Television (CATV) infrastructure on utility poles that generally follow the alignments of Waikupanaha and Hihimanu Streets according to the information provided by Charter Communications on July 17, 2019. There is an existing cell tower on the eastern portion of DHHL's parcels.

Impacts and Mitigation Measures

Proposed construction activities have the potential to disrupt power, CATV and other communication systems but these effects are expected to be short-term and temporary. There are no anticipated long-term impacts associated with establishing new service connections. The Waikupanaha Street improvements described in Section 2.11 Site Access, Circulation and Traffic may include the relocation of utility poles with overhead lines. Service to DHHL's parcels will be coordinated with HECO, Charter Communications and other communication service providers since some services may be upgraded to accommodate the Project. No changes to the developed area that contains the existing cell tower are anticipated as a result of the Project.

2.14. Socio-Economic Characteristics

The estimate of the resident population on Oʻahu from the 2010 U.S. Census was 953,207 people, which represents 70 percent of the statewide population (PBR Hawaii and Associates, Inc., 2014). A comparison of the 2000 and 2010 resident population of the Koʻolaupoko area shows a decline of 2,835 people from 115,164 to 117,999 people (PlanPacific and Department of Planning and Permitting, 2017). The population decline in Koʻolaupoko is projected to continue through 2035 (Ibid.). The resident population of the rural community of Waimānalo as roughly covered by the boundaries of the Waimānalo Neighborhood Board No. 32 was estimated to be 11,141 people in 2010 (State of Hawaiʻi Department of Business, Economic Development and Tourism, 2019). The estimate of the resident population for Hawaiian Home Lands in Waimānalo was 3,073 people for the 2013 to 2017 period (Ibid.).

A small cluster of commercial and small business establishments are located near Waimānalo Village in the Rural Commercial Center of Waimānalo and along Kalanianaʻole Highway. Approximately 2,000 acres in Waimānalo are part of DHHL's land inventory (PBR Hawaii and Associates, Inc., 2014). There are residential Hawaiian Homestead subdivisions in the surrounding vicinity of the project site. DHHL's Oʻahu Applicants Beneficiary Study indicates that the average household size for Oʻahu (at 2.95) and for Koʻolaupoko (at 3.13) are smaller than the average household of 4.56 people for the Waimānalo Homestead community (Ibid.). The median household income for Oʻahu (at $70,093) and for Koʻolaupoko (at $85,088) are higher than the median household income of $68,594 for the Waimānalo Homestead community (Ibid.).

Impacts and Mitigation Measures

The Project is expected to insignificantly increase the resident population in Waimānalo. DHHL is striving to fulfill its mission by providing SAH lots to beneficiaries pursuant to its Administrative Rules. The various phases of construction will create short-term jobs for people in design and construction.

In the long-term, the Project is expected to insignificantly affect the socio-economic characteristics of Waimānalo.

2.15. Public Services and Facilities

Law enforcement is provided by the City and County of Honolulu, Honolulu Police Department. The nearest police station relative to the project area is the Kāneʻohe District Station in Kāneʻohe.

The County's fire protection services are provided by the Honolulu Fire Department. The Waimānalo Fire Station is located along Kalanianaʻole Highway and across from the Waimānalo Elementary and Intermediate School, which is a designated hurricane evacuation shelter. This shelter can accommodate persons with special health needs and caged household pets. Pope Elementary School is also an evacuation shelter.

The County's Emergency Medical Services Division provides ambulance service from the Waimānalo Fire Station. The nearest emergency care facility relative to the project area is Castle Medical Center in Kailua. The Waimānalo Health Center located along Kalanianaʻole Highway and across from the Waimānalo Elementary and Intermediate School is a non-profit Community Health Center that serves a federally-recognized area where residents have barriers to receiving health care.

Waimānalo is within the Kailua-Kalāheo Complex-Area, which is served by ten (10) elementary schools, three (3) intermediate schools and four (4) high schools. There are also several private schools in the region.

Impacts and Mitigation Measures

No significant adverse impacts to police, fire, medical, emergency shelter services or schools will occur from the Project.

2.16. Recreational Resources

The recreational resources in the project area are Waimānalo District Park, Bellows Field Beach Park, Waimānalo Bay Beach Park and Waimānalo Polo Field. Other opportunities for shared-use facilities (e.g., a high school with a football field, track or swimming pool) and non-profit recreation centers (e.g., a YMCA or YWCA) are not present within the rural community of Waimānalo.

Impacts and Mitigation Measures

The Project is expected to have no adverse impact on recreational facilities.

(This page intentionally left blank.)

3. RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

3.1. State Land Use District

The State Land Use Law (Chapter 205, HRS) is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare for Hawaii's people. All lands in the State are classified into four land use districts by the State of Hawaiʻi, Land Use Commission: Urban, Agricultural, Conservation, and Rural. Lands in the Agricultural District are intended for the cultivation of crops, aquaculture, raising livestock, wind energy facility, timber cultivation, agriculture-support activities (i.e., mills, employee quarters, etc.) and land with significant potential for agriculture uses. The project site is entirely located within the Agricultural District and the Project is consistent with the intent of this land classification (refer to Figure 2).

3.2. Hawaiʻi Coastal Zone Management Program

Hawaii's Coastal Zone Management (CZM) Program, established pursuant to the Hawaiʻi Coastal Zone Management Act (Chapter 205A, HRS, as amended), is administered by the State of Hawaiʻi, Office of Planning and provides for the beneficial use, protection, and development of the State's coastal zone. The CZM area consists of the entire State of Hawaiʻi since there is no point of land more than 30 miles from the ocean. The CZM Act involves a system of permits, including the Special Management Area (SMA) permit, to manage development within the coastal areas and encourage public participation. Any significant development within the SMA requires permit approval from the appropriate County. On the Island of Oʻahu, the SMA permit process is administered by DPP. The project site is outside the SMA and approximately 0.5 miles from the shoreline. No SMA permit is required for the Project, which supports several policies and objectives of the CZM from HRS Section 205A-2.

1. *Recreational Resources*

   <u>Objectives</u>. Provide coastal recreational opportunities accessible to the public.

   <u>Policies</u>. Improve coordination and funding of coastal recreational planning and management; and

   Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

   (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

   (ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

The Project is located away from the coast and is not within the SMA. Coastal water quality will be protected since appropriate erosion control BMPs will be used to minimize the amount of soil transported in stormwater runoff during construction activities.

2. *Historic Resources*

Objectives. Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies. Identify and analyze significant archaeological resources;

Maximize information retention through preservation of remains and artifacts or salvage operations; and

Support state goals for protection, restoration, interpretation, and display of historic resources.

According to the archaeological literature review and field inspection, there are no known historic resources on DHHL's parcels that would be endangered by the Project. Concurrence from SHPD to conduct a limited AIS of one likely archaeological historic property (i.e., the basalt and mortar water conveyance feature that has been modified by more recent PVC pipe) near the Waikupanaha/Hihimanu Street intersection was requested by DHHL and project actions are expected to maintain the function that the water conveyance feature provides. DHHL shall require its contractor to comply with all State and County rules and laws pertaining to historic preservation. Construction

activities will be halted and SHPD will be notified in the event any unanticipated archaeological or historic sites are encountered.

3. *Scenic and Open Space Resources*

Objectives. Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies. Identify valued scenic resources in the coastal zone management area;

Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

Encourage those developments that are not coastal dependent to locate in inland areas.

The Project is located inland and is not expected to diminish coastal scenic views areas or open space resources.

4. *Coastal Ecosystems*

Objectives. Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

Improve the technical basis for natural resource management;

Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

The Project is sited away from the shoreline and is not expected to disrupt or degrade coastal water ecosystems. No stream diversions or channelization would occur from the Project. DHHL's construction contractor will be responsible for implementing a storm water management plan and controlling runoff that can transport loose soil, excess nutrients and other pollutants. A NPDES permit will be required to ensure compliance with BMPs during construction.

5. *Economic Uses*

Objectives. Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies. Concentrate coastal dependent development in appropriate areas;

Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(i) Use of presently designated locations is not feasible;
(ii) Adverse environmental effects are minimized; and
(iii) The development is important to the State's economy.

The Project does not involve coastal development; therefore, the policies pertaining to coastal economic development do not apply.

6. *Coastal Hazards*

Objectives. Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;

Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

Prevent coastal flooding from inland projects.

Coastal hazards are not expected to be exacerbated by the Project, which is located inland and away from the coastline. The Project includes the installation of new on-site drainage systems that address the quality and quantity of stormwater leaving the site, which would help to reduce nonpoint source pollution into streams.

7. *Managing Development*

Objectives. Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and

Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

The Project does not impact or influence the development review process. The environmental review process includes opportunities for public participation and comments pertaining to a variety of issues and topics including coastal resources and hazards.

8. *Public Participation*

Objectives. Stimulate public awareness, education, and participation in coastal management.

Policies. Promote public involvement in coastal zone management processes;

Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

The environmental review process provides opportunities for public participation. DHHL has also sought feedback from its beneficiaries and will continue to address comments as part of the environmental review process.

9. *Beach Protection*

Objectives. Protect beaches for public use and recreation.

Policies. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

Minimize the construction of public erosion-protection structures seaward of the shoreline.

Public access to beach areas will not be affected by the Project, which is located inland and away from beaches and the shoreline. The Project does not involve the construction of erosion-protection structures seaward of the shoreline.

10. Marine Resources

Objectives. Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

The Project is located inland and does not involve the use or development of marine and coastal resources.

3.3. Hawaiʻi State Plan

The Hawaiʻi State Plan (Chapter 226, HRS) outlines broad goals, policies and objectives to serve as guidelines for the future growth and development of the State. The excerpts below are pertinent Hawaiʻi State Plan objectives, policies, and priority guidelines that pertain to DHHL's project. The project site includes DHHL land in Waimānalo, which is a region on Oʻahu that has an established Hawaiian community and supports agricultural endeavors.

§226-3 Overall theme. Hawaii's people, as both individuals and groups, generally accept and live by a number of principles or values which are an integral part of society. This concept is the unifying theme of the state plan. The following principles or values are established as the overall theme of the Hawaii state plan:

(1) Individual and family self-sufficiency refers to the rights of people to maintain as much self-reliance as possible. It is an expression of the value of independence, in other words, being able to freely pursue personal interests and goals. Self-sufficiency means that individuals

and families can express and maintain their own self-interest so long as that self-interest does not adversely affect the general welfare. Individual freedom and individual achievement are possible only by reason of other people in society, the institutions, arrangements and customs that they maintain, and the rights and responsibilities that they sanction.

(2) Social and economic mobility refers to the right of individuals to choose and to have the opportunities for choice available to them. It is a corollary to self-sufficiency. Social and economic mobility means that opportunities and incentives are available for people to seek out their own levels of social and economic fulfillment.

(3) Community or social well-being is a value that encompasses many things. In essence, it refers to healthy social, economic, and physical environments that benefit the community as a whole. A sense of social responsibility, of caring for others and for the well-being of our community and of participating in social and political life, are important aspects of this concept. It further implies the aloha spirit--attitudes of tolerance, respect, cooperation and unselfish giving, within which Hawaii's society can progress.

The overall theme of the Hawaiʻi State Plan is supported by the Project, which will provide native Hawaiian beneficiaries with more opportunities for self-sufficiency and self-reliance through subsistence agriculture.

3.4. Complete Streets Program

State and county transportation departments are required to adopt complete streets policies pursuant to Hawaiʻi State Act 54, Session Laws of Hawaiʻi 2009. All users of highways including pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities should be afforded convenient access and mobility. The Project is not expected to affect the Rural Road characteristics of Waikupanaha and Hihimanu Streets, which have low speed limits and low volumes of traffic. Shoulders installed along Waikupanaha Street as a result of the Project would contribute to safer pedestrian travel. Shared Roadway considerations for Waikupanaha and Hihimanu Streets would continue to be appropriate, whereby bicyclists use the same travel lanes as other traffic.

3.5. County of Honolulu General Plan

The County's *General Plan: Objectives and Policies* (1992 edition, amended in 2002) sets forth broad statements of social, economic, environmental, and design objectives and policies which are desired over the long-term. The 2017 revision of the General Plan was transmitted from DPP to the Planning Commission in February 2018, and transmitted from the Planning Commission to the Honolulu City Council for further

action on April 20, 2018. Thus, the following General Plan policies and objectives that pertain to the Project are from the amended 2002 version of the General Plan.

I. Population
Objective C: To establish a pattern of population distribution that will allow the people of Oahu to live and work in harmony.
Policy 3: Manage physical growth and development in the urban-fringe and rural areas so that:
(b) Their population densities are consistent with the character of development and environmental qualities desired for such areas.

II. Economic Activity
Objective C: To maintain the viability of agriculture on Oahu.
Policy 5: Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck farming, flower growing, aquaculture, livestock production, and other types of diversified agriculture.

III. Natural Environment
Objective A: To protect and preserve the natural environment.
Policy 1: Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.
Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation.

IV. Housing
Objective C: To provide the people of Oahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.
Policy 1: Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.

VII. Physical Development and Urban Design
Objective D: To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.
Policy 4: Maintain rural areas as areas which are intended to provide environments supportive of lifestyle choices which are dependent on the availability of land suitable for small to moderate size agricultural pursuits, a relatively open and scenic setting, and/or a small town, country atmosphere consisting of communities which are small in size, very low density and low rise in character, and may contain a mixture of uses.
Objective E: To create and maintain attractive, meaningful, and stimulating environments throughout O‘ahu.

Policy 5: Require new developments in stable, established communities and rural areas to be compatible with the existing communities and areas.

X. Culture and Recreation
Objective A: To foster the multiethnic culture of Hawaii.
Policy 4: Encourage the protection of the ethnic identities of the older communities of Oahu.

The Project is aligned with the County's General Plan and would create a Hawaiian homestead community that contributes to maintaining agricultural land in a rural area of Oʻahu for subsistence agriculture uses. The lands affected by the Project are designated to be used for the fulfillment of the Hawaiian Homes Commission Act, whereby these lands will be available for the native Hawaiian ethnic population as defined by the Act.

3.6. Koʻolau Poko Sustainable Communities Plan

Eight community-oriented plans for the County are intended to help guide government action and decision-making. The plans for six regions of Oʻahu have been designated as "Sustainable Communities Plans" to highlight the intent that these areas are not to be heavily developed, and that the existing communities and special qualities of each region should be sustained and improved. Each Development Plan and Sustainable Communities Plan implements the objectives and policies of the General Plan and serves as a guide for public policy, investment, and decision making within each respective region. Together with the General Plan, these documents guide population and land use growth over a 20- to 25-year time span.

The *Koʻolau Poko Sustainable Communities Plan* that was adopted in August 2017 emphasizes the protection of the region's agricultural lands, physical and biological resources, open space and view plans. The Plan states that the region "is expected to experience essentially no growth over the 25-year projection horizon" (PlanPacific and Department of Planning and Permitting, 2017). The Project is consistent with the stated policy for future land use and development in the region: maintain and promote small-scale agricultural uses in the mauka areas of Waimānalo and from Kahaluʻu north to Kualoa. The project site falls within a designated Agricultural Area according to the maps included in the Plan. The following excerpts pertain to the Project.

2. <u>The Vision for Koʻolau Poko's Future - Key Elements</u>

2.1.2 Preserve and promote open space and agricultural uses

The preservation, continuation, and potential expansion of agricultural land use provides jobs and economic activity; promotes food security; offers the choice of a rural lifestyle proximate to a major metropolitan area; and

maintains open space and a rural ambience in a section of the island that is famed for its natural beauty. In Koʻolau Poko, agricultural use is sustained by both commercially successful operations and subsistence or culturally-based farming.

2.1.7 Maintain the Community Growth Boundary to protect agricultural, open space, and natural resources.

The "rural" areas within the Community Growth Boundary consist of smaller, more dispersed, less intensively developed residential communities and towns than those of Koʻolau Poko's "urban fringe" areas; namely, the sections of Waimānalo, Kahaluʻu, Waiʻāhole and Waikāne in the State Urban District where there are clusters of parcels that are less than two acres in size occupied by dwellings or buildings used for community or commercial purposes other than agriculture. Development character is generally low-density, low-rise, small scale, and reflective of a "country" setting.

3. <u>Land Use Policies, Principles, and Guidelines</u>

3.4 AGRICULTURAL USE

3.4.1 Policies

Encourage agricultural use of small lots.

Adopt development and public works standards that are appropriate and cost effective for rural, agricultural areas.

Provide support infrastructure, services and facilities to foster and sustain agricultural operations.

Modify standards for public infrastructure in rural and agricultural areas in accord with the character and needs of such areas.

3.4.2 Guidelines

Adopt standards for roadway and other infrastructure design that are appropriate and intended for continued agricultural use rather than residential use.

Require the acknowledgement of agricultural standards in the subdivision process and in all deeds to lots.

3.5 RESIDENTIAL USE

The Community Growth Boundary is established to preserve open space and agricultural areas and contain the spread of development. Therefore, housing capacity in Koʻolau Poko will be increased only by:

- *Subdivision of larger residential lots into smaller parcels at various locations throughout the region*
- *Residential development on Marine Corps Base Hawai'i and lands under the jurisdiction of the Department of Hawaiian Homelands or the Office of Hawaiian Affairs.*

3.5.1 Policies

Protect the character of existing residential areas and enhance desirable residential amenities.

3.5.2 Guidelines

3.5.2.1 Rural Communities

Adopt development standards and design guidelines for residential-designated areas within the Community Growth Boundary in order to:

- *Allow relatively narrow roadway widths*
- *Allow the use of detention basins and grassed swales for stormwater drainage instead of concrete curbs and gutters*

3.6 COMMERCIAL AND INDUSTRIAL USES

3.6.1 Policies

3.6.5.1 Light Industrial and Extractive Industries

Policies pertaining to light industrial and extractive industries are as follows:

- *Promote a re-use plan for the quarry site in Waimanālo that supports the development of Hawaiian Home Lands residential lots and a neighborhood mini-park.*

4. Public Facilities and Infrastructure Policies and Guidelines

4.2 WATER SYSTEMS

4.2.3 Policies

Encourage all new development to install and use dual water systems.

4.2.4 Guidelines

Require installation of low-flush toilets, flow constrictors, and other water conserving devices in commercial and residential developments.

Use recycled (R-1 or R-2) water for the irrigation of golf courses, as well as for landscaping, and agricultural areas where this would not adversely affect potable groundwater supply or other aspects relating to public health.

Investigate the feasibility of small-scale rain catchment systems in agricultural areas to use for irrigation, groundwater recharge and filtering of stormwater runoff sediments.

Confirm that adequate potable and non-potable water is available prior to approval of new residential and commercial development.

4.3 WASTEWATER MANAGEMENT

4.3.3 Policies

Direct all wastewater produced within the Community Growth Boundary to municipal or military sewer service systems.

Use reclaimed water for irrigation and other uses, where feasible, in accordance with the Guidelines for the Treatment and Use of Recycled Water (May 15, 2002) by the State Department of Health and the No Pass Line established by the Board of Water Supply.

4.4 ELECTRICAL AND COMMUNICATIONS SYSTEMS

4.4.1 Policies

Place new utility distribution lines underground and implement a long-range program for systematically relocating existing overhead lines underground.

4.4.2 Guidelines

Co-locate communications and power equipment and devices with similar facilities in order to minimize the number of supporting structures and dispersal sites.

4.6 DRAINAGE SYSTEMS

4.6.1 Policies

Promote drainage system design that emphasizes control and minimization of non-point source pollution and the retention of storm water on-site and in wetlands.

View storm water as a potential irregular source of water that should be retained for recharge of the aquifer rather than quickly moved to coastal waters.

Select natural and man-made vegetated drainageways and retention basins as the preferred solution to drainage problems wherever they can promote

water recharge, help control non-source pollutants, and provide passive recreation benefits.

4.6.2 Guidelines

Emphasize retaining or detaining storm water for gradual release into the ground as the preferred strategy for management of storm water.

The Project is consistent with the stated elements of the vision for the Ko‘olaupoko region: maintaining the rural ambience and sustaining agricultural use for subsistence or culturally-based farming. DHHL will coordinate with the County to incorporate the goals and guidelines into its Project (e.g., the adoption of standards that are appropriate and cost effective for rural, agricultural areas) to the extent practicable.

3.7. City and County of Honolulu Land Use Ordinance

The County’s LUO (Chapter 21 of the ROH) regulates land use in accordance with adopted land use policies, including the General Plan and the Development/Sustainable Community Plans. The zoning for the project site is AG-2 General Agriculture District (minimum land area of three acres for major livestock production, and two acres for all other uses) and the minimum lot width and depth must be 150 feet. The letter dated December 20, 2018 from DPP to DHHL indicates that “DHHL has the authority to exempt its lands from regulation by the LUO.”

3.8. City and County of Honolulu Building Permits

Chapter 18 of the ROH consolidates the building, electrical and plumbing permits (including permits for the construction of sidewalks, curbs and driveways) into a single permit. Fees associated with building permit applications are assessed based on the value of the work to be performed. DHHL intends to submit permit applications to the County for approval, and to have County inspectors monitor the work. As indicated in Section 1.4 Site Description, State of Hawai‘i agencies may construct improvements without building permits.

§18-3.1 Required.

(a) Exceptions. A permit shall not be required for the types of work listed below. Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in violation of the provisions of the technical codes or any other laws or ordinances of this jurisdiction.

(13) Work performed for any state government agency, except where permits are specifically requested by the agency.

3.9. City and County of Honolulu Special Management Area Permit

As mentioned previously in Section 3.2 Hawaiʻi Coastal Zone Management Program, the SMA permit process for the Island of Oʻahu is administered by the DPP and acted upon by the Honolulu City Council pursuant to Chapter 25 of the ROH. The project site is approximately 0.5 miles from the shoreline and outside the SMA. No SMA permit is required for the Project.

4. POSSIBLE ALTERNATIVES

4.1. No-Action

The "No Action" alternative implies that DHHL's current practice of allowing its permittees (e.g., Sports Turf Hawaii, Roy and June Pires, John and Leiala Cook, and Alan Silva) to utilize DHHL's parcels for non-homesteading uses would continue based on the terms and conditions of issued ROE permits. The Cook 'Ohana, for example, endeavors to perpetuate the Hawaiian traditions of *pā'ū*, *hula*, *mele*, *oli*, and *lei* making through activities hosted at the Cook Ranch. There are cultivated natural resources within DHHL's parcels that are utilized for Hawaiian traditions such as *lei* making and *pa'u* draping. Several activities and current uses identified in Section 2.8 Cultural Practices and Resources appear to be inconsistent with the conditions of the ROE permit issued to permittees. As a result of no action at this time, the project site in Waimānalo may continue to be utilized for endeavors that do not directly meet DHHL's core function of enabling native Hawaiians to return to their lands.

No action would also imply that the concerns pertaining to past usage (e.g. suspected solid waste dumping, spills, and unlabeled 55-gallon drums containing unknown substances) within areas utilized by current and former tenants would not be ameliorated by appropriate actions at this time. The potential presence of residual contamination associated with past and prior usage would therefore remain for the foreseeable future. There would be no commitment of funding or capital improvement costs to prepare DHHL's parcels for long-term agricultural homesteads purposes for native Hawaiians. Furthermore, there would be no improvements to Waikupanaha Street and portions of this roadway would continue to encroach into DHHL's parcels. The no-action alternative would deny DHHL beneficiaries the opportunity for an agricultural lease award, and thus be contrary to the department's mission.

4.2. Delayed Action

A delayed action implies that a project of similar scope and size to the proposed action would occur at an unspecified future date. The environmental impacts resulting from a delayed action are generally expected to be the same as the proposed action so long as environmental conditions remain similar to the evaluated conditions described in this EA.

The development of agricultural homesteads for native Hawaiians at a later date may result in increased construction costs due to inflation, changes in economic conditions or the labor supply. In addition, building materials and labor costs tend to increase with time. A delayed action may therefore necessitate a greater funding commitment for improvements or a reduction in the scope and size of the project. The delayed action alternative would prolong the wait of DHHL beneficiaries desiring an agricultural lease award, and thus be contrary to the department's mission.

4.3. Agricultural Homesteads on Alternate Site

An alternative site on any land that is not already under the purview of DHHL would require negotiations to acquire in fee or through a land swap. As identified in the *O‘ahu Island Plan* (PBR Hawaii and Associates, Inc., 2014), approximately 2,600 acres of DHHL land on O‘ahu including about 1,430 acres in Waimānalo are unsuitable or unavailable for homesteading due to existing environmental conditions (e.g., steep slopes, rockfall hazards, flooding concerns, etc.) or conflicts with conservation and preservation objectives for wetlands, critical habitat and listed species habitat. These vast areas do not directly support homesteading, which is DHHL’s mission, and do not provide revenue generation in support of the mission; however, beneficiaries have expressed the desire to keep conservation lands in DHHL’s inventory. The absence of an acquisition process for DHHL with established review criterion suggests that there is low potential at this time for new land to be acquired in fee or through a land swap as an alternative homesteading site.

The project site represents a small portion of approximately 115 acres of DHHL land scattered within Wai‘anae, Waiāhole, and Waimānalo that are considered suitable for SAHs. The use of other DHHL land on O‘ahu for the development of agricultural homesteads for native Hawaiian beneficiaries would presumably require a similar environmental review process and the identification of appropriate mitigation. The investigation of DHHL land in Wai‘anae and Waiāhole implies that the agricultural homesteads would be developed at a later date and may result in increased construction costs due to delay as mentioned in Section 4.2 Delayed Action.

Other parcels of DHHL land in Waimānalo with suitable terrain characteristics that comprise at least 30 acres in size are undeveloped or further away from existing residential communities and established community facilities. A site with no existing utility infrastructure would involve additional cost and delay to install site infrastructure and more land disturbance for necessary access connections, which increases the impacts on the environment as compared to the proposed action. The options to site the proposed facility at another location is therefore possible but less desirable than the proposed action. Consequently, DHHL does not favor the development of agricultural homesteads at another site at this time.

4.4. Residential Homesteads on Existing Site

The development of residential homesteads on the project site implies that the number of available homesteads for applicants could be increased by providing smaller lots of 7,500 to 15,000 square feet (or 0.17 to 0.23 acres, respectively). There is a compelling reason to consider this alternative since there are nearly three times more applicants on the residential waitlist for O‘ahu as compared to the agricultural waitlist; however, there are environmental and social impacts to consider. For example, there would be a demand for higher-rated infrastructure systems (e.g., roads with curb and gutter,

storm drainage systems sized for more runoff, etc.) as a result of increasing impervious surfaces and the number of residents who will increase traffic in the project area.

Residential homesteads on the project site would represent a different vision from the depicted land use designations in DHHL's O'ahu Island Plan, which was developed with input from beneficiaries. A residential subdivision with the lot sizes generally allowed in R-7.5 to R-10 zoning would be inconsistent with the current AG-2 zoning designation. As noted previously in this EA, DHHL does have the authority to exempt its lands from the County's zoning district regulations.

Many of the considerations described for the delayed action alternative would apply if additional environmental studies are needed to assess a residential homestead community intended for many more people on the project site as compared to the proposed agricultural homestead. The traffic analysis and site drainage controls, for example, would need to be reevaluated and redesigned. There is also a potential that existing homestead residents who live in nearby communities would want additional community facilities at the project site or at a nearby location, which would require further investigation, analysis and design. Consequently, DHHL does not favor the development of residential homesteads on the project site at this time.

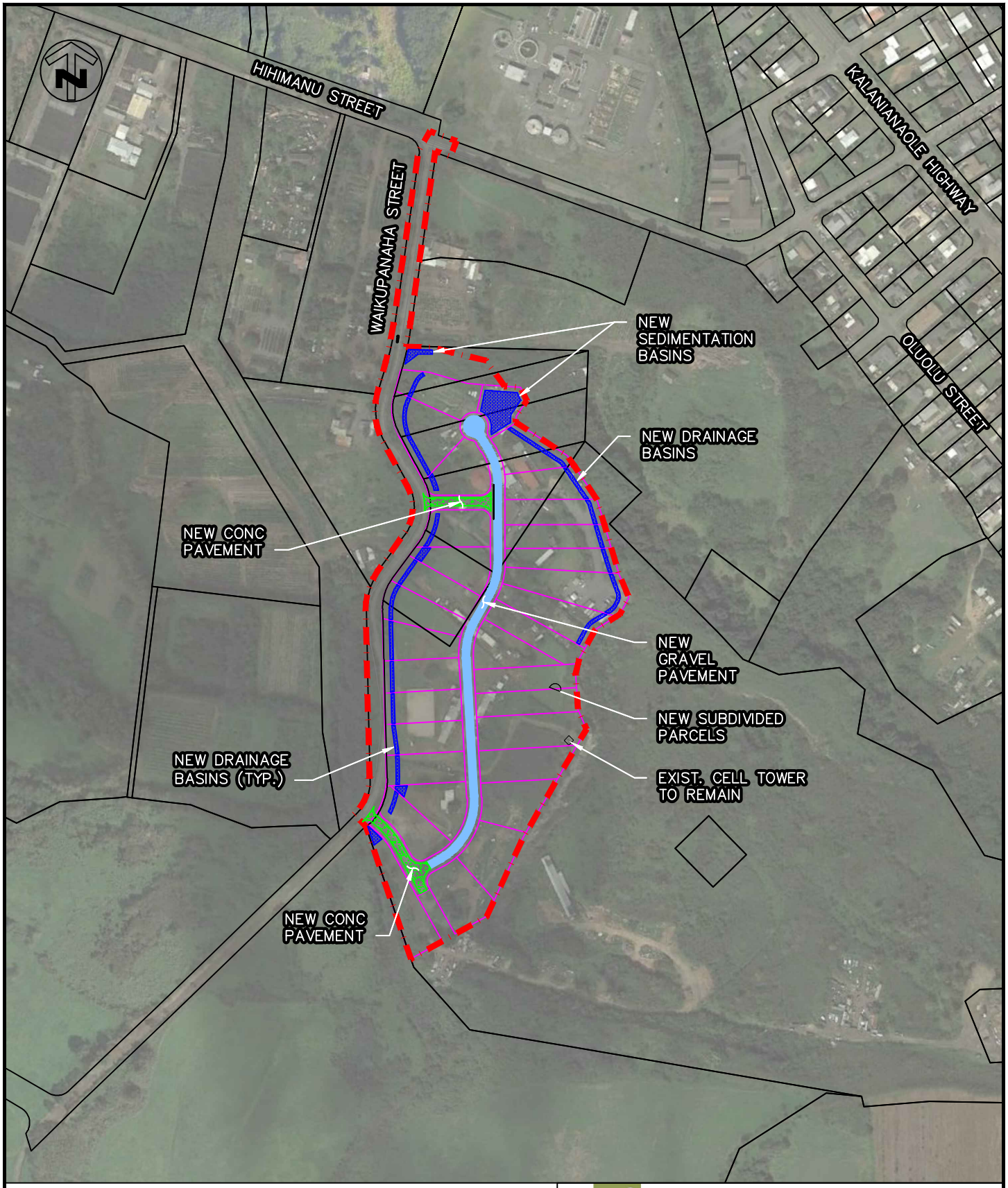
4.5. Agricultural Homesteads on Existing Site (the Preferred Alternative)

The development of agricultural homesteads for native Hawaiian beneficiaries would involve landform alterations and site work in a region that has vehicular access, utility infrastructure and a history of agricultural use. The anticipated visual impact from a developed subdivision where native Hawaiians beneficiaries may reside and actively cultivate subsistence agriculture is expected to be consistent with surrounding and nearby development in rural Waimānalo. The Project also provides the opportunity to improve and realign Waikupanaha Street to fall within the County's right of way since portions of the existing roadway encroach into DHHL's parcels.

The Project provides the opportunity to address reported concerns pertaining to past usage within areas utilized by current and former tenants. Residual contamination, if encountered during construction activities, would be ameliorated. Construction activities are expected to generate short-term environmental impacts such as fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services that would cease upon project completion. Proposed mitigation that addresses anticipated project impacts is identified in this EA.

The Project requires a necessary transition away from the use of DHHL's parcels for non-homesteading uses for the purpose of preparing DHHL's parcels for long-term agricultural homesteading. The proposed action addresses project objectives and represents a more prudent use of existing resources than other alternatives. The

development of agricultural homesteads according to the proposed conceptual site layout (see Figure 7) would allow the utilization of DHHL land in Waimānalo, which is a region on O‘ahu that has an established Hawaiian community and supports agricultural endeavors. Figure 7 depicts a configuration with 31 lots; however, DHHL may award less than 31 lots due to technical considerations (e.g., the feasibility of siting or sizing site drainage features to achieve required storm water retention). Completion of the Project represents the commitment by DHHL to enable native Hawaiians on the O‘ahu Island Agricultural Waitlist to return to their lands. For all of these reasons, DHHL has determined that the proposed action represents the preferred alternative.



LEGEND

- PROPERTY LINE
- PROJECT LIMITS
- NEW PROPERTY LINE
- NEW GRAVEL PAVEMENT
- NEW CONC PAVEMENT
- NEW DRAINAGE BASIN

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Engineering Services for
Waikupanaha Agricultural Lots
Conceptual Site Layout

SCALE: 1'=400'

DATE: November 2019

FIGURE
7

(This page intentionally left blank.)

5. PERMITS AND APPROVALS

Although exact permitting and approval requirements will be determined during the design phase, the following list contains permits and approvals that may be required for the Project:

State of Hawai‘i

- National Pollutant Discharge Elimination System Permit
- Community Noise Permit
- Community Noise Variance
- Non-Covered and/or Covered Source Permit (Air Quality)
- Lane Use Permit for Construction Work
- Oversized and Overweight Vehicles on State Highways Permit

City and County of Honolulu

- Building Permit
- Grubbing, Grading, and Stockpiling Permit
- Erosion Control Plan/Best Management Practices
- Permit to Work Within County Right-of-Way

(This page intentionally left blank.)

6. DETERMINATION

The Project is not likely to have a significant impact on the physical or human environment based on the analysis presented in this document. DHHL anticipates that the appropriate determination is a Finding of No Significant Impact (FONSI). The supporting rationale for this finding as established in HAR Title 11, Chapter 200.1, Section 12 is discussed below.

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;

The cultural resources identified by the CIA are not naturally-occurring, but cultivated. They are reportedly common species, which could be relocated prior to the commencement of site preparation activities. The beneficiaries who are awarded SAH lots may also engage in cultivation activities. DHHL's lessees will be informed of the potential for native plants and animals, primarily birds, to inhabit and pass through the property. The proper protocol for managing important species will be developed with lessees. DHHL will ensure that its contractor stops work and contacts SHPD immediately if any unanticipated buried archaeological or cultural resources are encountered during construction.

(2) *Curtails the range of beneficial uses of the environment;*

The Project represents the commitment by DHHL to enable native Hawaiians on the O'ahu Island Agricultural Waitlist to return to their lands. Completion of the Project ensures the beneficial use of DHHL-owned land that is in a strategic location for agricultural endeavors including subsistence agriculture.

(3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;

The Project is not in conflict with State Environmental Policy, inclusive of its individual policies, goals, and guidelines for population growth; natural resources; biological resources; transportation; energy; and culture, as discussed in the individual resource categories throughout this EA.

(4) Substantially affects the economic welfare, social welfare, and cultural practices of the community or State;

The Project does not substantially or negatively affect the economic or social welfare and cultural practices of the community or State. Short-term jobs for people in design and construction are expected to be created as a result of the Project. Completion of the subsistence agriculture homestead represents the commitment by DHHL to provide opportunities for native Hawaiian beneficiaries

to supplement their incomes with agricultural products grown on their lots and to possibly reside. The beneficiaries who are awarded SAH lots may engage in cultural practices that reflect and are not limited to Hawaiian traditions.

(5) Substantially affects public health;

Public health will not be adversely affected during the construction phases of DHHL's project. Short-term and temporary effects such as surface runoff, fugitive dust, noise, intermittent traffic, solid waste, and potential disruptions to utility services are expected to cease upon project completion. The implementation of construction BMPs will minimize temporary impacts. Completion of the Project would provide on-site infrastructure that is associated with the subsistence agricultural homestead.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities;

No secondary impacts such as population shifts are anticipated from the completion of the subsistence agricultural homestead, which is expected to provide approximately 30 lots for award to beneficiaries. Utility demands for potable water, wastewater disposal, solid waste disposal and power will be coordinated with the State, County or service provider and are expected to be insignificant due to the size and scope of the Project.

(7) Involves a substantial degradation of environmental quality;

The Project provides the opportunity to address reported concerns pertaining to past usage in areas utilized by current and former tenants if residual solid waste and contamination is encountered during construction. Proposed actions are not expected to degrade environmental quality. Environmental impacts that may occur during the various phases of construction will be mitigated through the implementation of construction BMPs, as appropriate. Appropriate mitigation measures have been identified throughout this EA so they may be implemented.

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;

The Project represents a long-term commitment by commitment by DHHL to enable native Hawaiians on the O‘ahu Island Agricultural Waitlist to engage in subsistence agriculture on their lands. The development of SAH lots in Waimānalo does not commit DHHL or others to additional related actions.

(9) Substantially affects a rare, threatened, or endangered species, or its habitat;

No species listed by the U.S. Fish and Wildlife Service or in the Endangered Species Act are expected to be significantly impacted by the Project. The project site does not contain habitat for proposed, candidate, or listed threatened or endangered species. DHHL will inform its lessees about the proper protocol for managing important species, primarily birds, that may inhabit and pass through the property.

(10) Detrimentally affects air or water quality or ambient noise levels;

Short-term impacts to air quality, water quality or ambient noise levels may occur during construction. The contractor shall be required to comply with all State or Federal air quality or water quality standards during construction. Likewise, lessees will not be permitted to conduct activities that would violate those standards. Environmental impacts will be mitigated through proper construction techniques and compliance with applicable DOH rules and regulations. The Project is not expected to negatively impact ambient air quality and background noise levels.

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

The project site is not situated within an environmentally sensitive area and is not anticipated to affect such areas. Permanent site infrastructure installed as part of the Project will be designed to comply with applicable regulatory standards that consider the health and safety of residents but are appropriate for a rural area. Drainage improvements will be designed to minimize the potential for localized flooding.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies; or

The Project will not obstruct or affect scenic vistas and view planes in the project area. Landscaping by DHHL's lessees may further reduce the visual impact of the SAH lots in Waimānalo.

(13) Requires substantial energy consumption.

The new agricultural activities and homes represent an insignificant increase in energy consumption since the Project will create approximately 30 lots for award to native Hawaiian beneficiaries.

(This page intentionally left blank.)

7. PUBLIC AGENCY REVIEW AND CONSULTATION

7.1. Pre-Assessment Consultation

The consulted agencies, organizations, and individuals are listed below. Twenty-nine (29) interested parties including government agencies provided formal correspondence in response to the pre-assessment consultation effort, as indicated by the ✓ below.

Federal Agencies

- ✓ U.S. Department of the Interior, Fish and Wildlife Service
- U.S. Department of Agriculture, National Resources Conservation Service
- Bellows Air Force Station

State of Hawai‘i

- ✓ Department of Accounting and General Services, Public Works Division
- ✓ Department of Agriculture, Office of the Chairperson
- Department of Land and Natural Resources
  - ✓ Commission on Water Resource Management
  - ✓ Division of Aquatic Resources
  - ✓ Division of Forestry and Wildlife
  - ✓ Engineering Division
  - ✓ Land Division
  - ✓ Office of Conservation and Coastal Lands
  - State Historic Preservation Division
- Department of Health
  - Environmental Health Administration
  - Clean Air Branch
  - Clean Water Branch
  - ✓ Safe Drinking Water Branch
  - ✓ Indoor and Radiological Health Branch
  - Solid and Hazardous Waste Branch
  - Office of Environmental Quality Control
- ✓ Department of Transportation
  - Statewide Transportation Planning Office
- Department of Business, Economic Development and Tourism
  - ✓ Office of Planning
- Department of Education
  - Windward Oahu District Office, Kailua-Kalaheo Complex Area
- Office of Hawaiian Affairs, Office of the Administrator

City and County of Honolulu

- ✓ Board of Water Supply
- ✓ Department of Planning and Permitting
- ✓ Department of Design and Construction
- ✓ Department of Environmental Services
- ✓ Department of Facility Maintenance
- ✓ Department of Parks and Recreation
- ✓ Department of Transportation Services
- Office of Climate Change, Sustainability and Resilience
- ✓ Fire Department
- ✓ Police Department
- Neighborhood Commission Office

Elected Officials

- District 25 Senator (Laura Thielen)
- District 51 Representative (Chris Lee)
- ✓ District 3 Councilmember (Ikaika Anderson)
- Waimanalo Neighborhood Board No. 32 Chairperson (Wilson Ho)

Utilities, Community Groups and Associations

- ✓ Hawaii Electric Company, Inc.
- ✓ Charter Communications
- Hawaiian Telcom
- ✓ The Gas Company, LLC (dba Hawaii Gas)
- Waimanalo Hawaiian Homes Association
- Hawaiian Civic Club of Waimanalo
- Kumuhau Community Association

Property Owners, Recorded Lessees and Other Interested Parties

- ✓ 4-1-008: 002
- 4-1-008: 008
- 4-1-008: 071
- 4-1-008: 072
- 4-1-008: 075
- 4-1-008: 079
- 4-1-008: 080
- 4-1-008: 093
- 4-1-008: 094
- 4-1-008: 095
- 4-1-008: 096

Property Owners, Recorded Lessees and Other Interested Parties (continued)

- 4-1-008: 100
- 4-1-008: 101
- 4-1-026: 006
- 4-1-026: 013
- 4-1-026: 021
- 4-1-026: 024
- ✓ L.D. Santos
- ✓ RKT Ohana

In addition to the request for public comments, there were several opportunities during the EA process to participate and provide input to DHHL with regards to its Project. DHHL surveyed the first 100 beneficiaries on the O‘ahu agriculture waitlist in February 2019. Information pertaining to the Project was shared on March 18, 2019 at the Hawaiian Homes Commission Meeting in Kapolei and at the Hawaiian Homes Commission Community Meeting in Waimānalo. Project information was also shared at a beneficiary meeting held in Waimānalo on November 14, 2019.

7.2. Draft EA Consultation

DHHL and and its EA consultant, The Limtiaco Consulting Group, will continue to coordinate and consult with governmental agencies during the EA process. The comments and responses will be published in the Final EA. Public comments received from organizations and interested parties during the 30-day statutorily-mandated comment period will also be responded to and published in the Final EA.

(This page intentionally left blank.)

8. REFERENCES

City and County of Honolulu, Department of Planning and Permitting. 1999. *Koʻolau Loa Sustainable Communities Plan*. October. Available from: http://www.honoluludpp.org/Planning/DevelopmentSustainableCommunitiesPlans/KoolauloaPlan.aspx.

City and County of Honolulu, Department of Planning and Permitting. 2018. *Honolulu Land Information System*. Accessed June 15, 2018. Available from: http://gis.hicentral.com/maps.html.

Department of Business, Economic Development and Tourism. 2019. *2018 The State of Hawaiʻi Databook: A Statistical Abstract.* Downloadable files. Available from http://dbedt.hawaii.gov/economic/databook/db2018/.

EnviroServices and Training Center, LLC. 2019. *Phase I Environmental Site Assessment for the Waikupanaha Agricultural lots, Waimanalo, Oahu, Hawaii*. Prepared for the Hawaii Department of Hawaiian Home Lands c/o The Limtiaco Consulting Group. August.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. *Online Rainfall Atlas of Hawaiʻi*. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1. Downloadable files. Available from http://rainfall.geography.hawaii.edu/.

Guinther, Eric, B. Luke and S. Burr, 2019. *Biological survey for Subsistence Agricultural Homesteads on lots TMK: 4-1-008: 002 (por.), 093, 094, 095, and 096 Waimānalo, Koʻolau Poko District, Oʻahu*. AECOS No. 1555B. May 8.

Hawaiʻi - National Flood Insurance Program. n.d. "Flood Hazard Assessment Tool." Accessed March 6, 2018. Available from http://gis.hawaiinfip.org/fhat/.

Hawaiʻi State Civil Defense. n.d. "Tsunami Evacuation Zone Mapping Tool". Accessed March 6, 2018. Available from http://www.scd.hawaii.gov/.

Kato, Nicole. 2014, December 24. "Leiala Cook." *Midweek*. Retrieved from http://www.midweek.com/leiala-cook/.

Keola, Cassidy. 2018, August 28. "*Quote Unquote: Meet the Aloha Festivals Floral Parade's Pāʻū Rider*." *Honolulu Magazine*. Retrieved from http://www.honolulumagazine.com/Honolulu-Magazine/August-2018/Faith-Kalamau-Returns-to-the-Aloha-Festivals-Floral-Parade-as-a-Pau-Rider/.

Pacific Islands Ocean Observing System. 2018. "Sea Level Rise: Hawai'i Sea Level Rise Viewer." Accessed June 15, 2018. Available from http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/.

PBR Hawai'i and Associates, Inc. 2014. *O'ahu Island Plan*. Prepared for the Department of Hawaiian Home Lands. Downloadable file. Available from http://dhhl.hawaii.gov/po/island-plans/.

State of Hawai'i, Department of Hawaiian Home Lands. 2019. *Application Wait List*. "Applicant Waiting List up to December 31, 2017." Downloadable files. Accessed November 1, 2019. Available from http://dhhl.hawaii.gov/applications/application-wait-list/.

State of Hawai'i, Department of Health, Safe Drinking Water Branch. 2017. "UIC Map Navigation Tool." Accessed June 15, 2018. Available from http://health.hawaii.gov/sdwb/underground-injection-control-program/.

State of Hawai'i, Department of Health, Clean Water Branch. 2018. *Water Quality Standards*. "Hawai'i Department of Health Water Quality Standards Map of the Island of O'ahu." Downloadable files. Available from http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/.

Townscape, Inc. 2018. *Draft Environmental Assessment for the Honomū Subsistence Agricultural Homestead Community*. Prepared for the State of Hawai'i Department of Hawaiian Home Lands. Downloadable file. Available from http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2018-10-08-HA-DEA-Honomu-Subsistence-Ag-Homestead-Community.pdf.

Shideler, David W. and Matt McDermott. 2019. *Revised Archaeological Literature Review and Field Inspection for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu, TMKs: [1] 4-1-008:002 (por.) and 093-096*. Prepared for The Limtiaco Consulting Group on behalf of the Department of Hawaiian Home Lands. July.

Spencer, Chantellee K. and Hallet H. Hammatt. 2019. *Draft Cultural Impact Assessment for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu, TMKs: [1] 4-1-008:002 (por.), and 093–096*. Prepared for The Limtiaco Consulting Group. August.

SSFM International. 2019. *Final Traffic Impact Analysis Report for DHHL Waikupanaha development Tax Map Key 4-1-008:002 (Por.), 093-096, Waimānalo, Island of Oʻahu*. Prepared for The Limtiaco Consulting Group and Department of Hawaiian Homelands. September.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2017. "Web Soil Survey." Survey Area Data: Version 10, October 3, 2017. Accessed March 6, 2018. Available from http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawaiʻi Agricultural Experiment Station. 1972. *Soil Survey of the Islands of Kauaʻi, Oʻahu, Mauʻi, Molokaʻi, and Lanaʻi, State of Hawaiʻi.* August.

(This page intentionally left blank.)

APPENDIX A

Site Photographs

(This page intentionally left blank.)

Photo #1
Overview of the inland project site, which consists of a partially developed area approximately 0.5 miles from Waimānalo Bay and south of existing residential neighborhoods (near center of photograph). The surrounding area to the east and south of the project site is undeveloped and there are existing agricultural uses to the west.

Photo #2
Overview of the project site looking southeast with Koʻolau Range in the distance.

Photo #3
Overview of the project site looking southwest with Koʻolau Range in the distance.

Photo #4
Overview of the project site looking northwest with the Waimānalo Wastewater Treatment Plant in the distance (near upper right corner of photograph).

Photo #5
Overview of the project site looking northeast with residential development and Waimānalo Bay in the distance.

Photo #6
Observed solid waste concerns from past usage within the northernmost area of the project site.

Photo #7
Overview of existing structures and uses within the northern portion of the project site.

Photo #8
Overview of existing equestrian facilities and a cell phone tower (upper right in photograph) within the central area of the project site.

Photo #9
Overview of existing conditions and uses within the central portion of project site.

Photo #10
Overview of existing equestrian facilities, storage uses and solid waste concerns including an abandoned steel-framed structure (near upper right corner of photograph) within the southern portion of the project site.

Photo #11
Overview of existing conditions within the southern area of the project site that was affected by quarrying activities.

Photo #12
Overview of existing conditions including an abandoned steel-framed structure (near upper left corner of photograph) within the southeastern portion of the project site that was affected by quarrying activities.

APPENDIX B

Management Summary for the Archaeological Literature Review and Field Inspection Report by Cultural Surveys Hawaii

(This page intentionally left blank.)

Revised
Archaeological Literature Review and Field Inspection for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu TMKs: [1] 4-1-008:002 (por.) and 093–096

Prepared for
The Limtiaco Consulting Group
on behalf of the
Department of Hawaiian Home Lands

Prepared by
David W. Shideler, M.A.,
and
Matt McDermott, M. A.

Cultural Surveys Hawaiʻi, Inc.
Kailua, Hawaiʻi
(Job Code: WAIMANALO 29)

July 2019
(Original February 2019)

Oʻahu Office
P.O. Box 1114
Kailua, Hawaiʻi 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1860 Main St.
Wailuku, Hawaiʻi 96793
Ph.: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Revised Archaeological Literature Review and Field Inspection for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu, TMKs: [1] 4-1-008:002 (por,) and 093–096 (Shideler and McDermott 2019)
Date	July 2019 (Original February 2019)
Project Number(s)	Cultural Surveys Hawaiʻi, Inc. (CSH) Job Code: WAIMANALO 29
Investigation Permit Number	CSH conducted the fieldwork under archaeological fieldwork permit number 18-15 and 19-07, issued by the Hawaiʻi State Historic Preservation Division (SHPD) per Hawaiʻi Administrative Rules (HAR) §13-282.
Agencies	SHPD; Department of Hawaiian Home Lands (DHHL); City and County of Honolulu (City), Department of Planning and Permitting (DPP)
Land Jurisdiction	DHHL, City
Project Proponent/Funding	DHHL
Project Location	The project area is in southeastern Oʻahu, in southeastern, *mauka* (inland) Waimānalo. It includes City Right-of-Way (ROW) at the intersection of Hihimanu and Waikupanaha Streets, the City ROW along Waikupanaha, south (*mauka*) of the Hihimanu/Waikupanaha intersection, and an approximately 30 acre DHHL-owned parcel to the east and southeast of Waikupanaha Street. The project area is on a portion of the 1999 Koko Head U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Area Acreage	In total approximately 32.7 acres including the 30 acres of DHHL property and 2.7 acres of City ROW along Hihimanu and Waikupanaha Streets.
Project Description	The proposed Waikupanaha Agricultural Lots Project will consolidate and re-subdivide the roughly 30-acre DHHL portion of the project area. The project will allow the DHHL to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. In 2017, DHHL updated its Administrative Rules to allow for Subsistence Agricultural Homesteads (SAH) of not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and cultivate subsistence agriculture on their lots, or (2) actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes. Existing conditions such as topography and drainage features will influence lot size. At this time, DHHL

	anticipates that the Waikupanaha subdivision will most likely consist of lots that are no more than one-acre in size. DHHL and their consultants will design the basic project infrastructure to comply with regulatory standards that consider the health and safety of residents, but that will be still appropriate for a rural area. Basic infrastructure design for the project is still pending, but will include construction/installation of basic infrastructure to support each lot with roadway access, water, sewer, and other utilities as appropriate. The project is the subdivision of the 30 acres into agricultural lots and the installation of basic infrastructure to support each lot (access roadways, utilities); the project does not include any subsequent development on the individual lots undertaken by DHHL’s Native Hawaiian beneficiaries. As part of the project DHHL will make improvements within the City’s ROW at the intersection of Hihimanu and Waikupanaha Streets, as well within the ROW of Waikupanaha Street. Improvements will potentially include asphaltic concrete (AC) paving, relocation and/or new overhead utility lines and poles, and possible grading and drainage improvements.
Historic Preservation Regulatory Context	DHHL is a Hawai‘i State agency and the DHHL lands that make up the project area are Hawai‘i State lands. Accordingly, DHHL’s subdivision of the project area into agricultural lots is a project requiring historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-275, as well as environmental review under HRS §343. Additional historic preservation review triggers include the project’s improvements within City-owned ROW along Hihimanu and Waikupana Streets, and the City DPP’s review and approval of the project’s construction permits. There is no federal funding or oversight that would trigger federal historic preservation or environmental review. CSH is preparing a companion cultural impact assessment (CIA) to further support the project’s environmental review under HRS §343.
Document Purpose	On 7 February 2019, in support of the project’s historic preservation review, DHHL submitted an earlier version of this LRFI to the SHPD, which was assigned Log no. 2019.00272. The earlier version’s project area was limited to the 30-acre DHHL property. This revised (July 2019) LRFI was prepared based on changes to the project area and project scope, which now include the improvements to the City ROW along Hihimanu and Waikupanaha Streets. This investigation—through detailed historical, cultural, and archaeological background research and a field inspection of the project area—assesses the likelihood that archaeological historic properties may

	be affected by the project and, based on findings, offers cultural resource management recommendations. This document is intended to facilitate the project’s planning and support the project’s State of Hawai‘i historic preservation and environmental review compliance. This investigation does not fulfill the requirements of an archaeological inventory survey investigation, per HAR §13-276, but will support consultation among DHHL, project stakeholders, and the SHPD. While there is no federal funding or oversight for the current subdivision project, possibly future individual Native Hawaiian beneficiaries may apply for federal grants to fund projects/undertakings on their lease land. While this investigation does not fulfill the requirements of federal historic preservation review (Section 106 of the National Historic Preservation Act), it may help support completion of Section 106 compliance for these future federally funded improvements/developments. This document may also help support any future State of Hawai‘i environmental or historic preservation review of individual beneficiaries’ development projects.
Field Inspection	The field inspection was completed 4 October 2018 and 3 June 2019 by CSH archaeologists Jesse Davis, B.A., and Jay Rapoza, B.A., under the general supervision of Matt McDermott, M.A.
Results	CSH’s background research shows no historic properties previously identified in this project area. Commercial sugarcane agriculture appears to have covered the entire project area by at least 1884 and appears to have continued in the project area for decades based on historic maps—although certain other historic maps and aerial photographs indicate that much of the project area, as a raised area of limestone or lithified dune, may have been less suited for commercial agriculture and may have been used only intermittently or not at all. Commercial sugarcane agriculture in the area was followed by animal husbandry activity and diversified agricultural in the last 40 years (including installation of corrals, pens, and roadways), which has much disturbed the project area. Additionally, a substantial southeastern portion of the project area was part of 1970s and 1980s quarrying operations. It is unlikely that any pre-Contact or early historic archaeological historic properties remain in the project area following this intensive land use. The 1916 Wall Map of Waimanalo shows the current alignment of Hihimanu Street labeled as the “plantation railroad” with further notation of this alignment as the “pipe line to the [Makapu‘u] lighthouse.” On the 1927 Waimanalo Coast Aerial Photograph, the alignments of both Hihimanu and Waikupanaha Streets are clearly visible, with Hihimanu having the appearance of a more traveled dirt road, while Waikupanaha appears more a plantation field road.

	During the field inspection of the 30-acre DHHL property, CSH observed one dry-stone stacked basalt wall feature that appears to be related to a modern driveway and does not appear to be older than 50 years. Several rough terraces, stone alignments, and what appear to be bull-dozer push piles of limestone boulders and cobbles were also observed, but these also appear to be less than 50 years old. The limestone boulder features and bulldozer push piles appear to be associated with quarrying operations and roadway installation that are less than 50 years old. During the field inspection of the approximately 2.7-acre Hihimanu and Waikupanaha Streets ROW, CSH observed what appears to be an in-use, basalt and mortar water conveyance feature at the intersection of Hihimanu and Waikupanaha Streets. It conveys water under Hihimanu Street though a prefabricated concrete culvert with metal pipe grating to strain the flow. Although the feature appears to be older than 50 years, it is modified by a more recent narrower diameter, c. 10-inch diameter, PVC pipe that passes through the feature and under Hihimanu Street. This historic property is potentially related to Hihimanu and Waikupanaha roadway construction in the first part of the twentieth century, or could be related to historic plantation irrigation. Additionally, in the southern (more *mauka*) portions of Waikupanaha Street, where there is a recent homeless encampment on the western side of the ROW, CSH observed a number of recent appearing stacked stone, dry masonry limestone boulder alignments and terraces—along with bulldozer push piles. These features do not appear to be older than 50 years and are likely the result of recent squatter occupation, which appears to be intermittent but ongoing, or older quarrying activity.
Recommendations	Based on the results of historic background research, the environmental setting, previous archaeological studies in the vicinity and their reported results, and the field inspection, the project area has been greatly affected by past nineteenth and twentieth century land use—including commercial agriculture, roadway construction, commercial quarrying, and latter animal husbandry and agriculture. Traditional Hawaiian archaeological historic properties that once existed in the project area have likely been heavily disturbed or completely removed by the last 130 years of intensive land use. CSH observed one likely archaeological historic property, the historic drainage or irrigation remnant at the intersection of Hihimanu and Waikupuanaha Streets. Additionally, several dry masonry boulder and cobble walls, terraces, and alignments were observed, although these do not appear to be older than 50 years. While this investigation focused primarily on archaeological historic properties, it did consider the current built environment. Based on field inspection and land use research, it does not appear that significant

	architectural historic properties are located in the project area because the standing buildings and structures appear to be less than 50 years old. Based on available information, including the observation of at least one archaeological historic property in the project area, CSH recommends a limited archaeological inventory survey (AIS) to support the project’s historic preservation review under HRS §6E-8 and HAR §13-275. The scope of the AIS should be worked out in consultation with the SHPD, but should focus on the documentation of the single archaeological historic property, and further documentation of the numerous dry-stone masonry features to confirm that these are not older than 50 years.

(This page intentionally left blank.)

APPENDIX C

Cultural Impact Assessment Report
by Cultural Surveys Hawaii

(This page intentionally left blank.)

Final
Cultural Impact Assessment for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu
TMKs: [1] 4-1-008:002 (por.), and 093–096

Prepared for
The Limtiaco Consulting Group

Prepared by
Chantellee Konohia Spencer, B.A.,
and
Hallet H. Hammatt, Ph.D.

Cultural Surveys Hawaiʻi, Inc.
Kailua, Hawaiʻi
(Job Code: WAIMANALO 30)

October 2019

Oʻahu Office
P.O. Box 1114
Kailua, Hawaiʻi 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1860 Main St.
Wailuku, Hawaiʻi 96793
Ph.: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Final Cultural Impact Assessment for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu, TMKs: [1] 4-1-008:002 (por.), and 093–096
Date	October 2019
Project Number(s)	Cultural Surveys Hawaiʻi, Inc. (CSH) Job Code: WAIMANALO 30
Agencies	State of Hawaiʻi, Department of Health, Office of Environmental Quality Control
Land Jurisdiction	Department of Hawaiian Home Lands (DHHL)
Project Proponent	DHHL
Project Location	The project area is located in southeastern Oʻahu, within *mauka* (inland) Waimānalo, on the east side of Waikupanaha Street, approximately 150 m south of Hīhīmanu Street and 350 m *mauka* of Kalanianaʻole Highway. The project area is depicted on a portion of the 1999 Koko Head U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The proposed Waikupanaha Agricultural Lots project will consolidate and re-subdivide the roughly 30-acre DHHL portion of the project area. The project will allow the DHHL to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. In 2017, DHHL updated its administrative rules to allow for Subsistence Agricultural Homesteads (SAH) of not more than 3 acres in size. The rules specify that lessees are required within three years to: 1) reside and cultivate subsistence agriculture on their lots, or 2) actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes. Existing conditions such as topography and drainage features will influence lot size. At this time, DHHL anticipates the Waikupanaha subdivision will most likely consist of lots that are no more than 1 acre in size. DHHL and their consultants will design the basic project infrastructure to comply with regulatory standards that consider the health and safety of residents, but that will still be appropriate for a rural area. Basic infrastructure design for the project is still pending, but will include construction/installation of basic infrastructure to support each lot with roadway access, water, sewer, and other utilities as appropriate. The project is the subdivision of the 30 acres into agricultural lots and the installation of basic infrastructure to support each lot (access roadways, utilities); the project does not include any subsequent

	development on the individual lots undertaken by DHHL's Native Hawaiian beneficiaries. As part of the project, DHHL will make improvements within the city's right-of-way (ROW) at the intersection of Hihimanu and Waikupanaha streets, as well within the ROW of Waikupanaha Street. Improvements will potentially include asphaltic concrete (AC) paving, relocation of and/or new overhead utility lines and poles, and possible grading and drainage improvements.
Project Acreage	Approximately 32.5 acres
Document Purpose	The purpose of this cultural impact assessment (CIA) is to comply with the State of Hawai‘i's environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the project's potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project's potential impacts on cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control's *Guidelines for Assessing Cultural Impacts*), which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance Criterion e, pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that "have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity" (HAR §13-275-6 and§13-284-6). The document will likely also support the project's historic preservation review under HRS §6E and HAR §13-275 and §13-284. The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS §6E-8 and HAR §13-284.
Results of Community Consultation	CSH attempted to contact 63 Native Hawaiian Organizations (NHOs), agencies, and community members. Of the 11 people that responded, three *kama‘āina* (native born) and/or *kūpuna* (elders) participated in formal interview for more in-depth contributions to the CIA. 1. Alu Like, Inc., Waimānalo Kūpuna Program 2. Cook ‘Ohana, Hawai‘i Pā‘ū Riders 3. Carter and Jamie Spencer, *Kama‘āina*
Results of Background Research	Background for this project yielded the following results (presented in approximately chronological order):

	1. Ko‘olaupoko, the traditional name for the *moku* (district) encompassing Waimānalo, translates literally as "the short windward" in contrast to the northern half of this coastline known as Ko‘olauloa, "the long windward." This may reflect the relative short distance from the sea to the great *pali* (cliffs) of the Ko‘olau Mountains, which seem to loom directly over much of this district. 2. Waimānalo, Puhā, and Muliwai‘ōlena are streams found in this *ahupua‘a* (ancient land division usually extending from the mountain to the sea). A *mauka* spring called Waikupanaha can also be found. Two companion springs, one *mauka*, Kupunakāne, and one *makai* (seaward) called Kupunawahine, were reported to cry out to each other in soft voices on sunny days (Sterling and Summers 1978:247). 3. Towering above the northern *mauka* section of Waimānalo Ahupua‘a are the peaks of Lanipō (dense) and Pu‘u o Kona (hill of leeward), while the peaks of Makapu‘u (hill beginning or bulging eye) and Pu‘u o Moloka‘i (hill of Moloka‘i) characterize the southern *makai* section. 4. At the time that Kamehameha became the sole ruler of O‘ahu, Moloka‘i, Lāna‘i, Hawai‘i, and Maui, he retained the *ahupua‘a* of Waimānalo as his own personal property when he divided the conquered lands of O‘ahu to his warrior chiefs and counselors (‘Ī‘ī 1959:69–70). His sons Liholiho and Kauikeaouli—Kamehameha II and Kamehameha III, respectively—inherited most of Waimānalo Ahupua‘a (Commissioner of Public Lands 1929:28). 5. As a result of the Kuleana Act of 1850, the *ahupua‘a* of Waimānalo was awarded to Victoria Kamāmalu and subject to the *kuleana* (Native Hawaiian land rights) claims of the commoners, and 113 *kuleana* land claims were awarded in Waimānalo (Barrère 1994; Kame‘eleihiwa 1992). No *kuleana* LCAs were located in the vicinity of the current project area. 6. Cattle and horse ranching in Waimānalo began with the marriage of Thomas Cummins and the High Chiefess Kaumakaokane, a relative of Kamehameha I, in 1828. Their marriage provided Cummins with connections to the throne, and he received a Royal Patent to an estate of Crown Lands in Waimānalo in 1842. In 1850, Kamehameha III leased 6,970 acres of land in Waimānalo to Cummins for a period of 50 years (Dorrance 1998), this acreage included the entire Waimānalo Ahupua‘a except for *kuleana* awards. 7. The introduction of livestock to Hawai‘i had an exceedingly negative impact on the natural environment and contributed to the demise of traditional Hawaiian life. The animals trampled the

	small scattered homesteads and stripped the land of native vegetation (Bryan 1915:226–227). In Waimānalo, ranching destroyed the *lo‘i kalo* (irrigated taro terraces) and the *kī* (ti; *Cordyline terminalis*) and *wauke* (paper mulberry; *Broussonetia papyrifera*) along their terraced banks, and larger trees died because their roots could not get enough moisture. 8. John A. Cummins saw the potential of sugar production at Waimānalo and in 1880 he organized the Waimanalo Sugar Company and began construction of a sugar mill. As the plantation grew, former ranch lands were converted to cane fields, new irrigation ditches and railroad lines were constructed, and improvements were made to the mill and Waimanalo Landing. 9. By the 1920s, plantation sugarcane fields stretched across the floor of Waimānalo Valley to the base of the Ko‘olau Range (Bartholomew and Associates 1959:14–15). Much of the project area, with the exception of the most *mauka* lands and gulch areas, was cultivated in cane. 10. The intense cultivation of sugar in Waimānalo led to diverse forms of agriculture that continue today. The Waimanalo Sugar Company sold its fee-simple land holdings and the remaining years of its lease of government-owned lands to the Waimanalo Agricultural Development Company in 1947. 11. In 1967, the L.W. Campos Ranch relocated from Kailua to Waimānalo, establishing an approximately 200-acre dairy farm. Campos Ranch was purchased by Foremost Dairies in 1969, which expanded by acquiring an additional approximately 140 acres for pasture. It was during this period that the dairy employee housing was erected. 12. The Waimānalo Military Reservation, including approximately 1,500 acres along the northern coastal portion of Waimānalo, was established in 1917. In 1933, it was renamed Bellows Field and consisted of an infantry and artillery training area, as well as a runway for the Air Corps. 13. The Kalaniana‘ole Highway opened in 1924 and greatly improved transportation to Waimānalo. Additional residential development occurred in the coastal portion of central Waimānalo with the establishment of Waimānalo Homestead by the Hawaiian Homes Commission in 1925. Qualified homesteaders, with 50% or more Hawaiian blood, were awarded residential lots located inland of Kalaniana‘ole Highway in the vicinity of Waimanalo Landing (Bartholomew and Associates 1959:16). 14. The *mauka* region of Waimānalo is characterized by diversified agricultural lots, which include plant nurseries, small-scale truck

	farms, and horse ranches and stables (DHHL 2011:17). The project area is currently occupied by horse ranches including Cook Ranch and Nā Lio o Waimānalo. 15. Residential communities are located both *mauka* and *makai* of Kalaniana‘ole Highway including parcels owned by the DHHL such as Waimānalo Villages, Kumuhau, Kaka‘ina, and Pine Tree Triangle (DHHL 2011:9). Small commercial businesses are centered along Kalaniana‘ole Highway, primarily in Waimānalo Town and the *makai* area between Waimānalo Bay State Recreation Area and Waimānalo Beach Park (DHHL 2011:17).
Impacts	Based on information gathered from the cultural and historical background and community consultation, CSH has identified the following potential impacts. 1. The Cook ‘Ohana is opposed to the Waikupanaha Agricultural Lots project. Cook Ranch is situated on a 3-acre parcel on Waikupanaha Street, located within the project area for the proposed Waikupanaha Agricultural Lots project. Cook Ranch is the home of the Hawai‘i Pa‘u Riders Equestrian Unit. To prepare for the numerous parades they participate in, locally and nationally, the unit holds monthly meetings at the ranch which include horsemanship practice, *hula* and *oli* practice, gathering of foliage and flowers for *lei*, and *lei* making workshops. The Cook Ranch also hosts numerous activities for the community including the awards ceremony for the Aloha Festival Parade which may attract up to 300 people. The Cook ‘Ohana do not want to be removed from the property where they have been perpetuating the Hawaiian traditions of *pā‘ū*, *hula*, *mele*, *oli*, and *lei* making since 1991. Ms. Leiala Cook stated, “we pray that we still be able to perpetuate and keep the culture alive on this ranch.” 2. Ms. Iwalani Lowea Kahalewai-Cook believes the proposed project will have an adverse impact on their traditional gathering practices. She believes Cook Ranch is a culturally significant place because of the kukui nuts which they use for draping the *pā‘ū*. She also recalled her grandmother, Lita Cook, planting “all these trees you see here.” Ms. Heavenly Cook also noted the numerous species of plants at Cook Ranch which they gather for making *lei* including ti leaf, bougainvillea, *kauna‘oa*, and sea grapes. Ms. Iwalani Lowea Kahalewai-Cook fears she will no longer have access to the *kukui* nuts and other native Hawaiian plants which her *‘ohana* uses for draping *pā‘ū* and making *leis*.

Recommendations	Based on information gathered from the cultural and historical background and community consultations, CSH makes the following preliminary recommendations. 1. Project construction workers and all other personnel involved in the construction and related activities of the project should be informed of the possibility of inadvertent cultural finds, including human remains. In the event that any potential historic properties are identified during construction activities, all activities will cease and the State Historic Preservation Division (SHPD) will be notified pursuant to HAR §13-280-3. In the event that *iwi kūpuna* (Native Hawaiian skeletal remains) are identified, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40. In addition, in the event of an inadvertent discovery of human remains, the completion of a burial treatment plan, in compliance with HAR §13-300 and HRS §6E-43, is recommended. 2. In the event that iwi kūpuna and/or cultural finds are encountered during construction, project proponents should consult with cultural and lineal descendants of the area to develop a reinterment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance.

Table of Contents

Management Summary i
Section 1 Introduction 1
1.1 Project Background 1
1.2 Document Purpose 1
1.3 Scope of Work 5
1.4 Environmental Setting 5
1.4.1 Natural Environment 5
1.4.2 *Ka Lepo* (Soil) 5
1.4.3 *Ka Makani* (Wind) 7
1.4.4 *Ka Ua* (Rain) 8
1.4.5 Built Environment 9
Section 2 Methods 10
2.1 Archival Research 10
2.2 Community Consultation 10
2.2.1 Scoping for Participants 10
2.2.2 “Talk Story” Sessions 10
2.2.3 Interview Completion 11
Section 3 *Ka‘ao* and *Mo‘olelo* (Legends and Stories) 12
3.1 *Ka‘ao* (Legends) 14
3.1.1 Hi‘iaka Travels to Waimānalo 14
3.1.2 Hi‘iaka and ‘Āpuakea 14
3.1.3 Puna‘aikoa‘e (Puna Tropic-Bird Eater) 15
3.1.4 Lonoikamakahiki 16
3.2 *Wahi Pana* (Legendary or Storied Places) 16
3.2.1 Place Names 17
3.2.2 Streams and Springs 17
3.2.3 Peaks and Hills 18
3.2.4 Offshore Islets 18
3.2.5 *Pōhaku* (Stones) 18
3.3 *‘Ōlelo No‘eau* (Hawaiian Proverbs) 19
3.3.1 *‘Ōlelo No‘eau* #503 19
3.3.2 *‘Ōlelo No‘eau* #550 20
3.3.3 *‘Ōlelo No‘eau* #1531 20
3.3.4 *‘Ōlelo No‘eau* #2285 20
3.4 *Oli* (Chants) 20
3.4.1 Chants from Hi‘iakaikapoliopele 20
3.5 *Mele* (Songs) 24
3.5.1 Hi‘iaka Reaches Makapu‘u 24
3.5.2 Waimānalo 25
3.5.3 Waimānalo ‘Āina Kaulana 27
Section 4 Traditional and Historical Accounts 28
4.1 Early Historic Period 28
4.1.1 Kamehameha’s Conquest of O‘ahu 28

4.2 The Māhele and the Kuleana Act 29
4.3 Mid- to Late 1800s 29
4.3.1 Ranching 29
4.3.2 Sugar Industry 33
4.4 1900s 33
4.4.1 Diversified Agriculture 33
4.4.2 Military Infrastructure 38
4.4.3 Residential Development 38
4.5 Contemporary Land Use 39

Section 5 Previous Archaeological Research 40

5.1 Inland Waimānalo 40
5.1.1 Pearson 1971 52
5.1.2 Davis 1977 (and 1978) 52
5.1.3 Cox 1978 52
5.1.4 Griffin and Yent 1979 52
5.1.5 State Parks In-House Contract Archaeological Team 1979 53
5.1.6 Yent and Griffin 1979 53
5.1.7 Lovelace and Ota 1980 53
5.1.8 Ota 1980 53
5.1.9 Neller 1981 53
5.1.10 Sue 1983 53
5.1.11 McMahon 1990 and Douglas and Pietrusewsky 1990 54
5.1.12 Dixon 1993 54
5.1.13 Sinoto 1993 54
5.1.14 Pantaleo 1993 54
5.1.15 Pantaleo 1994a 54
5.1.16 Pantaleo 1994b 54
5.1.17 Hammatt et al. 1999 55
5.1.18 UH Marine Option Program 1999 55
5.1.19 McGuire and Hammatt 2000 55
5.1.20 Drolet and Sinoto 2001 55
5.1.21 Perzinski et al. 2001 55
5.1.22 Sinoto 2001 55
5.1.23 Hammatt Shideler and Bush 2002 55
5.1.24 Ogg and Dega 2002 (and Dega 2000) 56
5.1.25 Perzinski et al. 2002 56
5.1.26 Hammatt et al. 2002, 2003 56
5.1.27 Cleghorn and Hamano 2003 56
5.1.28 Hammatt et al. 2003 56
5.1.29 Hammatt and Shideler 2006 57
5.1.30 McElroy 2008 57
5.1.31 Runyon et al. 2008 57
5.1.32 Simonson et al. 2008 57
5.1.33 Winburn and Desilets 2008 57
5.1.34 Moore et al. 2009 57
5.1.35 Hazlett and Hammatt 2010 58
5.1.36 Hunkin et al. 2010 58
5.1.37 McElroy 2010 58

5.1.38 McGerty and Spear 2010 58
5.1.39 Tulchin and McDermott 2010 58
5.1.40 Runyon et al. 2013 59
5.1.41 Byerly and O’Day 2015 59
5.1.42 Hammatt 2016 59
5.1.43 LaChance et al. 2016 59
5.1.44 CSH 2018 60
5.1.45 Yucha et al. 2018 60

Section 6 Community Consultation 61

6.1 Introduction 61
6.2 Community Contact Letter 61
6.3 Community Contact Table 66
6.4 *Kama‘āina* Interviews 83
6.4.1 Alu Like, Inc., Waimānalo Kūpuna Program 83
6.4.2 Cook ‘Ohana, Hawai‘i Pā‘ū Riders 83
6.4.3 Carter and Jamie Spencer 95
6.5 Summary of *Kama‘āina* Interviews 103

Section 7 Traditional Cultural Practices 111

7.1 Settlement and Habitation 111
7.2 Cultivation and Gathering 112
7.3 Marine Resources 113
7.4 Ranching 113
7.5 *Wahi Pana* and *Mo‘olelo* 114

Section 8 Summary and Recommendations 115

8.1 Results of Background Research 115
8.2 Results of Community Consultation 116
8.3 Impacts 117
8.4 Recommendations 117

Section 9 References Cited 119

List of Figures

Figure 1. Portion of the 1999 Koko Head USGS 7.5-minute topographic quadrangle showing the location of the project area....2
Figure 2. Tax Map Key (TMK) [1] 4-1-008 showing the project area (Hawai‘i TMK Service 2014)....3
Figure 3. Aerial photograph showing the location of the project area (Google Earth 2013)....4
Figure 4. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating soil types within and surrounding the project area (USDA SSURGO 2001)....6
Figure 5. Map showing known place names in the *ahupua‘a* of Waimānalo....13
Figure 6. USGS topographic map with Waimānalo LCAs; note the LCA parcels are located alongside Waimānalo Stream; the project area is also shown....30
Figure 7. 1884 Jackson map of the east coast of O‘ahu showing the project area....32
Figure 8. Waimanalo Sugar Company infrastructure with military development and coastal settlement in relation to the project area....34
Figure 9. Waimānalo Ditch System and Waimanalo Sugar Company infrastructure, as well as military and residential development, in and near the project area (USGS 1938)....35
Figure 10. Agricultural development, as well as military and residential development, at and near the project area in the 1950s (U.S. Army Mapping Service 1954)....36
Figure 11. Agricultural development, as well as military and residential development, at and near the project area in the 1970s (USGS 1978)....37
Figure 12. Location of previous archaeological studies in the vicinity of the project area....41
Figure 13. Previously identified historic properties in the vicinity of the project area (base map 1999 Koko Head USGS topographic quadrangle)....48
Figure 14. Community consultation letter page one....62
Figure 15. Community consulation letter page two....63
Figure 16. Revised community consultation letter....65
Figure 17. *Lei* for adorning horses (CSH 2019)....85
Figure 18. Hawai‘i Pa‘u Riders at Pasadena Rose Parade (CSH 2019)....88
Figure 19. Hawai‘i Pa‘u Riders (from left to right, Ms. Leiala Ka‘iulani Cook, Mr. Lawrence Delos Santos, Ms. Heavenly Mealani Cook-Kamakeeaina, and Ms. Ekini Lindsey) demonstrating *hula* (CSH 2019)....91
Figure 20. Map of DHHL Owned Parcels in Waimānalo (Department of Hawaiian Home Lands)....96
Figure 21. Mr. Spencer and his maternal grandmother (adopted mother), at the family home in Waimānalo....97
Figure 22. Mr. Spencer’s adopted father, Joseph Spencer, at their family home on horse named Billy Boy....97
Figure 23. Mr. Spencer (8 months old) and his cousin, Ashford. Note the sandy yard and coconut trees. The family home was just off the main highway, across from the beach....99
Figure 24. Mr. Spencer on horse with cousin Joseph and cousin Ashford....99
Figure 25. Mrs. Spencer’s maternal grandfather, Jeremiah Waiolama, in his front yard. Note Waimānalo post office trucks in the background....101
Figure 26. Numbered sites as identied by Mr. and Mrs. Spencer....104

Figure 27. Mr. Spencer and his father. Picture was taken in the front yard of the family home. Background is looking towards Waimānalo Beach Park....105
Figure 28. Susan Spencer, Mr. Spencer’s grandmother/adopted mother....105
Figure 29. Mr. Spencer on horse Kunia....106
Figure 30. Mr. Spencer (2 years old) and mother in driveway....106
Figure 31. Mr. Spencer and his dad with their mule....107
Figure 32. Mr. Spencer (age 10) and his father at the top of the Ko‘olau mountain. From this point you can see almost all of Waimānalo; they are directly above their home on Bell Street....107
Figure 33. Mr. and Mrs. Spencer with their first daughter at Mrs. Spencer’s family property....108
Figure 34. Mrs. Spencer and her Aunty walking home from the store across the street....108
Figure 35. Little league baseball game at Waimānalo Beach Park....109
Figure 36. Picture of Mrs. Spencer’s oldest sister at grandparent’s house. Note Waimānalo Post Office in the background....109

List of Tables

Table 1. Previous archaeological investigations near the project area....42
Table 2. Previously identified historic properties near the project area....49
Table 3. Community Contact Table....66
Table 4. Traditional colors and flowers of Hawaiian Islands....89
Table 5. Decription of sites explained by Mr. and Mrs. Spencer....102

Section 1 Introduction

1.1 Project Background

At the request of The Limtiaco Consulting Group, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this cultural impact assessment for the Waikupanaha Agricultural Lots project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu, TMK: [1] 4-1-008:002 (por.), and 093–096. The project area is located in southeastern O‘ahu, within *mauka* (inland) Waimānalo, along Waikupanaha Street from the origin on Hīhīmanu Street and 350 m *mauka* of Kalaniana‘ole Highway. The project area is depicted on a portion of the 1999 Koko Head U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), a tax map plat (Figure 2), and a 2013 aerial photograph (Figure 3).

The proposed Waikupanaha Agricultural Lots project will consolidate and re-subdivide the project site, which encompasses approximately 30 acres. The project will allow the Department of Hawaiian Home Lands (DHHL) to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities.

In 2017, DHHL updated its administrative rules to allow for Subsistence Agricultural Homesteads (SAH) of not more than 3 acres in size. The rules specify that lessees are required within three years to: 1) reside and cultivate subsistence agriculture on their lots, or 2) actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes. Existing conditions such as topography and drainage features will influence lot size. At this time, DHHL anticipates that the Waikupanaha subdivision will most likely consist of lots that are no more than 1 acre in size.

DHHL and their consultants will design the basic project infrastructure to comply with regulatory standards that consider the health and safety of residents, but that will still be appropriate for a rural area. Basic infrastructure design for the project is still pending, but will include construction/installation of basic infrastructure to support each lot with roadway access, water, sewer, and other utilities as appropriate.

The project entails subdividing the existing acreage into agricultural lots and the installation of basic infrastructure to support each lot (access, utilities); the project does not include any subsequent development on the individual lots undertaken by DHHL’s Native Hawaiian beneficiaries.

As part of the project, DHHL will make improvements within the city’s right-of-way (ROW) at the intersection of Hīhīmanu and Waikupanaha streets, as well as within the ROW of Waikupanaha Street. Improvements will potentially include asphaltic concrete (AC) paving, relocation and/or new overhead utility lines and poles, and possible grading and drainage improvements.

1.2 Document Purpose

The purpose of this CIA is to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the project’s potential effect on cultural beliefs, practices, and resources. Through document research and

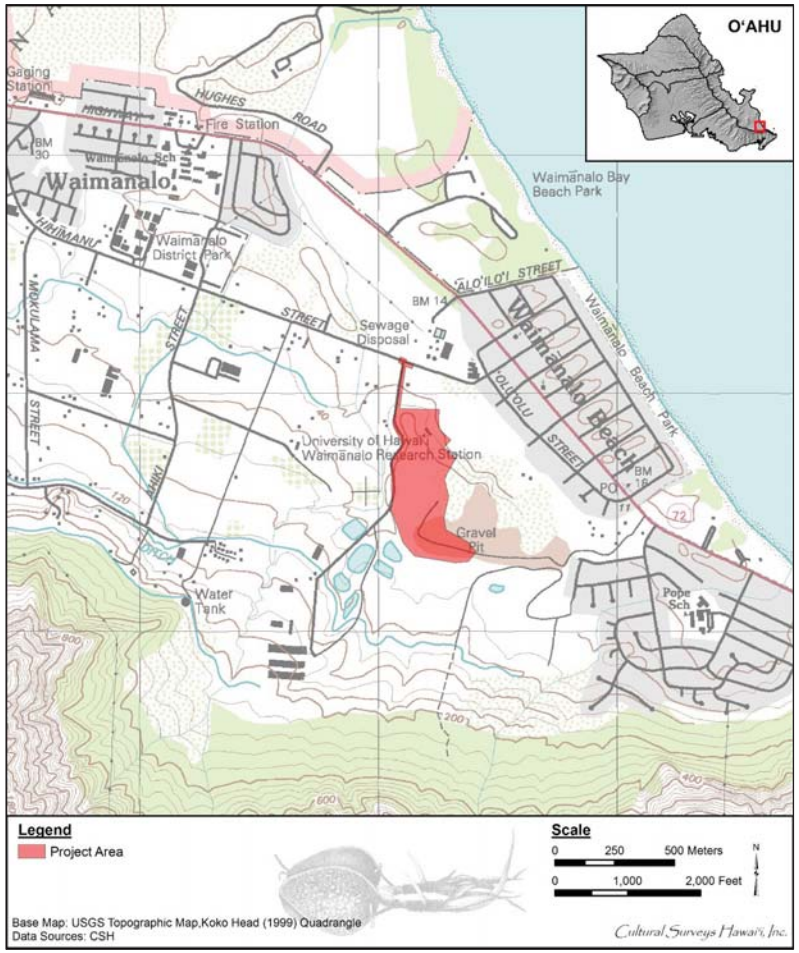


Figure 1. Portion of the 1999 Koko Head USGS 7.5-minute topographic quadrangle showing the location of the project area

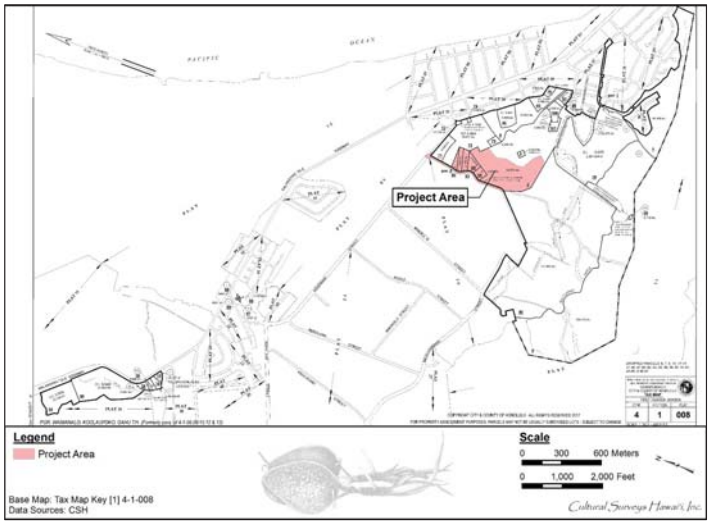


Figure 2. Tax Map Key (TMK) [1] 4-1-008 showing the project area (Hawai‘i TMK Service 2014)

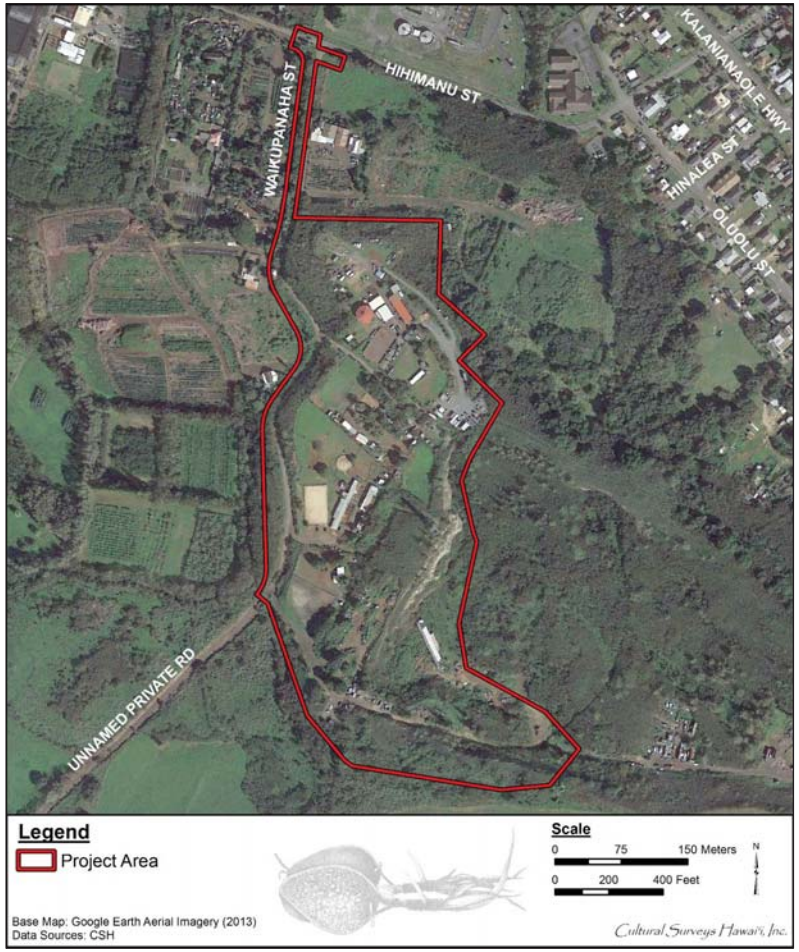


Figure 3. Aerial photograph showing the location of the project area (Google Earth 2013)

cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts on cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control’s *Guidelines for Assessing Cultural Impacts*), which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance Criterion e, pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that “have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity” (HAR §13-275-6 and §13-284-6). The document will likely also support the project’s historic preservation review under HRS §6E and HAR §13-275 and §13-284. The document is intended to support the project’s environmental review and may also serve to support the project’s historic preservation review under HRS §6E-8 and HAR §13-284.

1.3 Scope of Work

The scope of work for this CIA includes the following:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.
2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices in or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 Natural Environment

Waimānalo is a relatively large *ahupua‘a* that extends from the peaks of the Ko‘olau Mountains to the coast of Waimānalo Bay. The project area is located in an area that was once fields of sugarcane. The nearest perennial stream is Waimānalo Stream, located approximately 3 km to the northwest.

1.4.2 *Ka Lepo* (Soil)

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area’s soils consist of Coral outcrop (CR) and Mamala stony silty clay loam, 0 to 12% slopes (MnC), Haleiwa silty clay, 0 to 2% slopes (HeA), and 2 to 6% slopes (HeB). Figure 4 illustrates the various soil sediments within the vicinty of the project area.

Soils of the Coral outcrop (CR) series are described as follows:

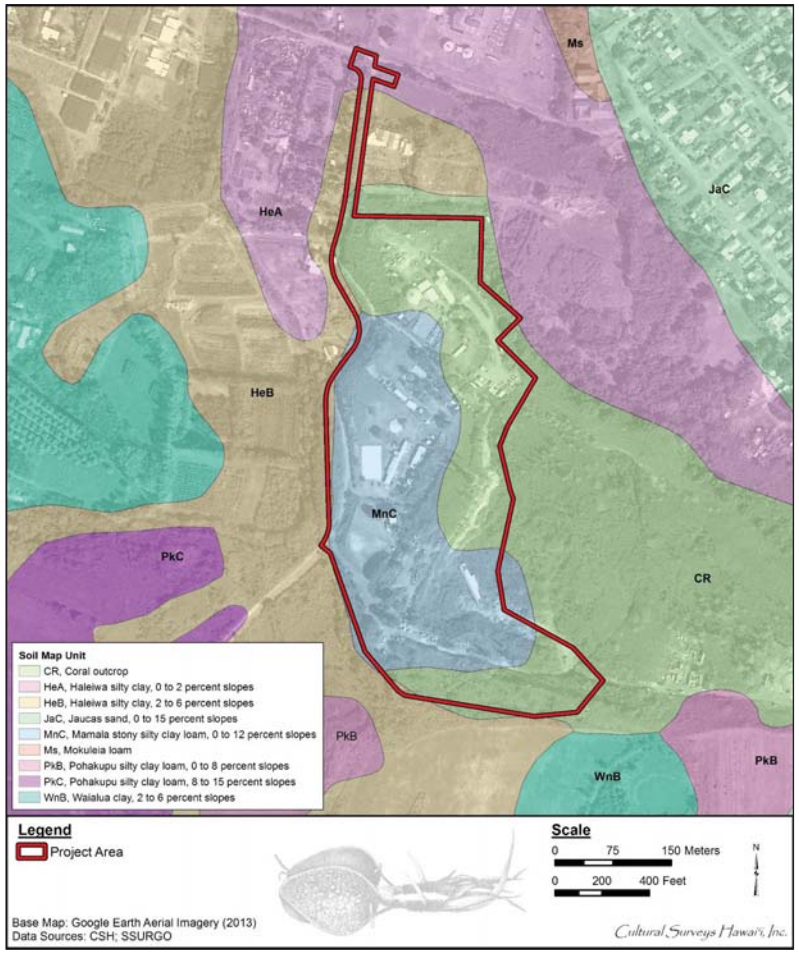


Figure 4. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating soil types within and surrounding the project area (USDA SSURGO 2001)

> Coral outcrop (CR) consists of coral or cemented calcareous sand on the island of Oahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small area of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands. Elevations range from sea level to approximately 100 feet. The annual rainfall amounts to 10 to 40 inches. [Foote et al. 1972:29]

Soils of the Mamala series are described as follows:

> This series consists of shallow, well-drained soils along the coastal plains on the islands of Oahu and Kauai. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. They are nearly level to moderately sloping. Elevations range from nearly sea level to 100 feet on Oahu but extend to 18 to 25 inches, most of which occurs between November and April. [Foote et al. 1972:93]

Soils of the Haleiwa series are described as follows:

> This series consists of well-drained soils on fans and in drainageways along the coastal plains. These soils are on the islands of Oahu and Molokai. They developed in alluvium derived from basic igneous material. They are nearly level to strongly sloping. Elevations range from sea level to 250 feet. The annual rainfall amounts to 30 to 60 inches, most of which occurs between November and April. [Foote et al. 1972:33]

1.4.3 *Ka Makani* (Wind)

Makani is the Hawaiian word for wind. *The Wind Gourd of La‘amaomao* tells the story of Pāka‘a and his son Kuāpāka‘a, descendants of the wind goddess La‘amaomao. They are able to control the winds of Hawai‘i which are contained in a gourd and may be called forth by chanting their names. Pāka‘a’s chant traces the winds of O‘ahu in the *moku* of Ko‘olaupoko. These are presented in Pāka‘a’s chant as follows:

He Kiliua ko Waikane,	Kiliua is of Waikāne,
He Mololani ko Kuaahoe,	Mololani is of Kua‘a‘ohe,
He Ulumano ko Kaneohe,	Ulumano is of Kāne‘ohe,
No Kaholoakeahole ka makani,	The wind is for Kaholoakeāhole,
Puahiohio uka o Nuuanu,	Puahiohio is the upland wind of Nu‘uanu,
He Malanai ko Kailua,	Malanai is of Kailua,
Pae i Waimanalo ka limu-li-puupuu,	Limu-li-pu‘upu‘u comes ashore at Waimānalo,
He Alopali ko Pahonu,	‘Alopali is of Pāhonu,
A Makapuu, huli ka makani,	At Makapu‘u the winds turn,
Huli na Kona, huli na Koolau...	The Kona winds turn, the Ko‘olau winds turn
[Nakuina 1902:57]	[Nakuina 1992:51]

1.4.4 *Ka Ua* (Rain)

It was a customary and necessary tradition to grant a name for each type of rain. Rains were named to show their action toward plants or the supposed effects on people or their possessions (Pukui and Elbert 1986:361). Though there is no specific rain for the *ahupua‘a* of Waimānalo, there are many rains associated with the *moku* of Ko‘olaupoko. Hā‘ao, Mololani, and Nāulu are the rains associated with places nearest to Waimānalo.

1.4.4.1 Ka Ua Hā‘ao

The Hā‘ao rain, most popular in the *moku* of Ka‘ū in Hawai‘i, is mentioned in a *mele* (song) that speaks of a woman named Lea. Lea is the name of the goddess of canoe makers and also the name of a fish god who “stands on Wailea (“Water of Lea”) Point between Ka‘ōhao in Kailua and Waimānalo” (Akana and Gonzalez 2015:28).

> *E nanā iho ana i Waipu‘ilani*
>
> *E noho iho ana i Ka‘anaokāhinahina*
>
> *Eia au i ka ua a ka Hā‘ao*
>
> *I walea ai i ke kui pua ‘āhihi*
>
> *He lei no Lea, wahine i ke kuahiwi*
>
> Gazing down on Waipu‘ilani
>
> Residing there at Ka‘anaokāhinahina
>
> Here am I in the Hā‘ao rain
>
> Delightedly stringing lehua ‘āhihi blossoms
>
> As a lei for Lea, woman of the mountain
>
> [Akana and Gonzalez 2015:27–28]

1.4.4.2 Ka Ua Mololani

The Mololani rain of Ko‘olaupoko, also the name of a wind and crater in Kāne‘ohe (Akana and Gonzalez 2015:177), is mentioned in the following *mele kanikau* (lament).

> *Ku‘u kane mai ka ua Mololani*
>
> *E hehi mai ana iā Olomana me Ahiki*
>
> My dear husband from the Mololani rain
>
> Treading on Olomana and Ahiki
>
> [Akana and Gonzalez 2015:179]

Also mentioned in the *mele kanikau* are the two peaks, Olomana and Ahiki, in the neighboring *ahupua‘a* of Kailua. Ahiki is the peak nearest to Waimānalo.

> We looked up at Olomana peak that was named for a noted Oahu chief of long ago. Beside it stands Ahiki, another peak, that was named for a favorite of Olomana, who was konohiki over his ponds, Kaelepulu and Kawainui, and over his lands.

The third peak, Paku‘i, was named for the keeper of the ponds in the time of Olomana. These men were mentioned in the legend of Makalai [Aiona in Sterling and Summers 1978:234].

1.4.4.3 Ka Ua Nāulu

Lastly, the Nāulu rain is mentioned in a *mele inoa* (name chant) for Kaumakaokane. The *mele* mentions Pu‘uokona which is a *pu‘u* (hill) that is accesible through the Kuli‘ou‘ou Ridge, Kuli‘ou‘ou is an *‘ili* (smaller land division within an *ahupua‘a*) in Waimānalo.

‘O Pu‘uokona kai kupu kele i ka makani

Kupu kela ke po‘o wai a ka Nāulu

Pu‘uokona rises high in the wind

The water source of the Nāulu grows profusely

[Akana and Gonzalez 2015:197]

1.4.5 Built Environment

The project area is approximately 200 m inland (southwest) of the ‘Olu‘olu Street suburban residences and is approximately 300 m inland of Kalaniana‘ole Highway, the major vehicular artery through Waimānalo. Nineteenth and twentieth century sugarcane production cleared all native growth within the project area. A quarrying operation mined the southwestern portion of the project area in the 1970s and 1980s. In the last 40 years much of the area has been reworked for agriculture, corrals, sheds, and roadways. These current buildings and structures are visible in Figure 3.

Section 2 Methods

2.1 Archival Research

Research centers on Hawaiian *ka‘ao* (legends), *wahi pana* (storied places), *‘ōlelo no‘eau* (Hawaiian proverbs), *oli* (chants), *mele* (songs), traditional *mo‘olelo* (stories), traditional subsistence and gathering methods, ritual and ceremonial practices, and more. Background research focuses on land transformation, development, and population changes beginning with the early post-Contact era to the present day.

Cultural documents, primary and secondary cultural and historical sources, previous archaeological reports, historic maps, and photographs were reviewed for information pertaining to the study area. Research was primarily conducted at the CSH library. Other archives and libraries including the Hawai‘i State Archives, the Bishop Museum Archives, the University of Hawai‘i at Mānoa’s Hamilton Library, Ulukau, The Hawaiian Electronic Library (Ulukau.org 2014), the State Historic Preservation Division (SHPD) library, the State of Hawai‘i Land Survey Division, the Hawaiian Historical Society, and the Hawaiian Mission Houses Historic Site and Archives are also repositories where CSH cultural researchers gather information. Information on Land Commission Awards (LCAs) were accessed via Waihona ‘Aina Corporation’s Māhele database (Waihona ‘Aina 2000), the Office of Hawaiian Affairs (OHA) Papakilo Database (Office of Hawaiian Affairs 2015), and the Ava Konohiki Ancestral Visions of ‘Āina website (Ava Konohiki 2015).

2.2 Community Consultation

2.2.1 Scoping for Participants

We begin our consultation efforts by utilizing our previous contact list to facilitate the interview process. We then review an in-house database of *kūpuna*, *kama‘āina*, cultural practitioners, lineal and cultural descendants, Native Hawaiian Organizations (NHOs; includes Hawaiian Civic Clubs and those listed on the Department of Interior’s NHO list), and community groups. We also contact agencies such as SHPD, OHA, and the appropriate Island Burial Council where the proposed project is located for their response on the project and to identify lineal and cultural descendants, individuals and/or NHO with cultural expertise and/or knowledge of the study area. CSH is also open to referrals and new contacts.

2.2.2 “Talk Story” Sessions

Prior to the interview, CSH cultural researchers explain the role of a CIA, how the consent process works, the project purpose, the intent of the study, and how their *‘ike* (knowledge) and *mana‘o* (thought, opinion) will be used in the report. The interviewee is given an Authorization and Release Form to read and sign.

“Talk Story” sessions range from the formal (e.g., sit down and *kūkā* [consultation, discussion] in the participant’s place of choice over set interview questions) to the informal (e.g., hiking to cultural sites near the study area and asking questions based on findings during the field outing). In some cases, interviews are recorded and transcribed later.

CSH also conducts group interviews, which range in size. Group interviews usually begin with set, formal questions. As the group interview progresses, questions are based on interviewees' answers. Group interviews are always transcribed and notes are taken. Recorded interviews assist the cultural researcher in 1) conveying accurate information for interview summaries, 2) reducing misinterpretation, and 3) adding missing details to *mo‘olelo*.

CSH seeks *kōkua* (assistance) and guidance in identifying past and current traditional cultural practices of the study area. Those aspects include general history of the *ahupua‘a*; past and present land use of the study area; knowledge of cultural sites (for example, *wahi pana*, archaeological sites, and burials); knowledge of traditional gathering practices (past and present) within the study area; cultural associations (*ka‘ao* and *mo‘olelo*); referrals; and any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the study area.

2.2.3 Interview Completion

After an interview, CSH cultural researchers transcribe and create an interview summary based on information provided by the interviewee. Cultural researchers give a copy of the transcription and interview summary to the interviewee for review and ask that they make any necessary edits. Once the interviewee has made those edits, we incorporate their *‘ike* and *mana‘o* into the report. When the draft report is submitted to the client, cultural researchers then prepare a finalized packet of the participant's transcription, interview summary, and any photos that were taken during the interview. We also include a thank you card and honoraria. This is for the interviewee's records.

It is important that CSH cultural researchers cultivate and maintain community relationships. The CIA report may be completed, but CSH researchers continuously keep in touch with the community and interviewees throughout the year—such as checking in to say hello via email or by phone, volunteering with past interviewees on community service projects, and sending holiday cards to them and their *‘ohana* (family). CSH researchers feel this is an important component to building relationships and being part of an *‘ohana* and community.

"*I ulu no ka lālā i ke kumu*—the branches grow because of the trunk," is an *‘ōlelo no‘eau* (#1261) shared by Mary Kawena Pukui with the simple explanation: "Without our ancestors we would not be here" (Pukui 1983:137). As cultural researchers, we often lose our *kūpuna* but we do not lose their wisdom and words. We routinely check obituaries and gather information from other informants if we have lost our *kūpuna*. CSH makes it a point to reach out to the *‘ohana* of our fallen *kūpuna* and pay our respects including sending all past transcriptions, interview summaries, and photos for families to have on file for genealogical and historical reference.

Section 3 *Ka‘ao* and *Mo‘olelo* (Legends and Stories)

Hawaiian storytellers of old were greatly honored; they were a major source of entertainment and their stories contained teachings while interweaving elements of Hawaiian lifestyles, genealogy, history, relationships, arts, and the natural environment (Pukui and Green 1995:IX). According to Pukui and Green (1995), storytelling is better heard rather than read for much becomes lost in the transfer from the spoken to the written word and *ka‘ao* are often full of *kaona* or double meanings.

Ka‘ao are defined by Pukui and Elbert as a "legend, tale […], romance, [and/or], fiction" (Pukui and Elbert 1986:108). *Ka‘ao* may be thought of as oral literature or legends, often fictional or mythic in origin, and have been "consciously composed to tickle the fancy rather than to inform the mind as to supposed events" (Beckwith 1970:1). Conversely, Pukui and Elbert define *mo‘olelo* as a "story, tale, myth, history, [and/or] tradition" (Pukui and Elbert 1986:254). The *mo‘olelo* are generally traditional stories about the gods, historic figures or stories that cover historic events and locate the events with known places. *Mo‘olelo* are often intimately connected to a tangible place or space.

In differentiating *ka‘ao* and *mo‘olelo* it may be useful to think of *ka‘ao* as expressly delving into the *wao akua* (realm of the gods), discussing the exploits of *akua* (gods) in a primordial time. However, it is also necessary to note there are exceptions, and not all *ka‘ao* discuss gods of an ancient past. *Mo‘olelo* on the other hand, reference a host of characters from *ali‘i* (royalty), to *akua* and *kupua* (supernatural beings), to finally *maka‘āinana* (commoners), and discuss their varied and complex interactions within the *wao kānaka* (realm of man). Beckwith elaborates, "In reality, the distinction between ka‘ao as fiction and mo‘olelo as fact cannot be pressed too closely. It is rather in the intention than in the fact" (Beckwith 1970:1). Thus, a so-called *mo‘olelo*, which may be enlivened by fantastic adventures of *kupua*, "nevertheless corresponds with the Hawaiian view of the relation between nature and man" (Beckwith 1970:1).

Both *ka‘ao* and *mo‘olelo* provide important insight into a specific geographical area, adding to a rich fabric of traditional knowledge. The preservation and passing on of these stories through oration remains a highly valued tradition. Additionally, oral traditions associated with the study area communicate the intrinsic value and meaning of a place, specifically its meaning to both *kama‘āina* as well as others who also value that place.

The following section presents traditional accounts of ancient Hawaiians living in the vicinity of the project area. Many relate an age of mythical characters whose epic adventures inadvertently lead to the Hawaiian race of *ali‘i* and *maka‘āinana*. The *ka‘ao* in and around the project area shared below are some of the oldest Hawaiian stories that have survived; they still speak to the characteristics and environment of the area and its people. Figure 5 highlights place names from the few *mo‘olelo* mentioned below. The project area is also highlighted in relation to these place names.

Traditional accounts present some generally recurring themes about Waimānalo. The themes include the scarcity of water except for small springs and Waimānalo Stream; the abundance of food crops along Waimānalo Stream; the good fishing resources and broad reef of the ocean fronting Waimānalo; and the somewhat isolated nature of Waimānalo, especially in terms of land routes, but with a sandy beach frontage allowing easy access by sea.

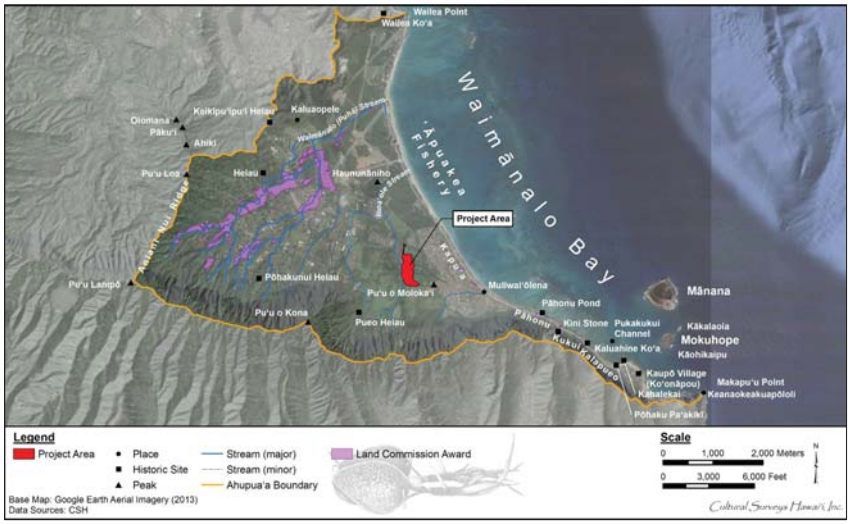


Figure 5. Map showing known place names in the *ahupua'a* of Waimānalo

3.1 *Ka'ao* (Legends)

3.1.1 Hi'iaka Travels to Waimānalo

An example of the mythological references to Waimānalo, occurs in the Pele and Hi'iaka epic published by Nathaniel B. Emerson. In this particular section of the story, Hi'iaka leaves Moloka'i by way of canoe captained by two men. They land at Makapu'u where Hi'iaka questions whether to continue her journey of the island through Ko'olau or the Kona side of the island. She decides on the Ko'olau route as she would have the opportunity to catch a glimpse of her Pele family "whose ghosts still clung to the dead volcanic cones and headlands which stood as relics of their bygone activities, and where they eked out a miserable existence. The region was thickly strewn with these skeleton forms" (Emerson 1915:87).

Emerson's (1915:89) account goes on regarding Waimānalo as a barren land where fish was its only sustenance. Since the land was unproductive, residents from long ago resorted to trading fish for produce.

3.1.2 Hi'iaka and 'Āpuakea

Continuing on their journey, Hi'iaka and her companions approach Kailua where they come across Muliwai'ōlena and her daughter, 'Āpuakeanui. The story is told as follows:

> They went ahead and arrived at Kailua, where a woman saw them traveling, and noticed the glowing beauty of Hi'iaka, like the arching brilliance of the morning sun.
>
> But this woman did not recognize that this was Hi'iaka traveling along. As she saw this amazing beauty moving on her way, she said to her daughter, 'Āpuakeanui, the foremost beauty of Kailua, "Say! These women coming this way are extraordinarily lovely. One of them, though, surpasses the others. Your comeliness and charm are just like that woman's."
>
> Hi'iaka heard this woman's words to her daughter, and she offered up this chant.
>
> 'Āpuakeanui, woman of beauty
>
> Whose loveliness is held up in comparison
>
> And it is excellent
>
> Fine indeed.
>
> Truly, this young woman, 'Āpuakeanui, was one of Kailua's finest. She was perhaps the foremost beauty among the girls of that entire district; however, her good looks could not be rated against those of Hi'iaka, for what the girl's mother said was true: the beauty of Hi'iaka was like the brilliance of the morning sun.
>
> [Ho'oulumāhiehie 2008a:137]

A fuller account is given in a rendition of this same story in the Hawaiian language newspaper *Ka Leo o Ka Lāhui.* The story continues on after Hi'iaka presents her chant:

> Hi'iaka overheard the words of the woman to her daughter and she uttered this chant:

O ‘Āpuakea-nui, you beautiful woman,

Comparisons have been made of your charms,

You are beautiful, beautiful indeed.

Muliwaiolena then called out to Hi‘iaka and her friend, ‘Come in, eat and drink and when you are full then continue on your long journey.’ But the travelers did not accept as they did not like the embarrassing comparison that had been made between themselves and the young girl, ‘Āpuakea.

As the travelers went off Muliwaiolena suddenly fell dead. Shortly afterwards ‘Āpuakea died. . . [*Ka Leo o Ka Lāhui,* 14 and 15 March 1893]

Another story of ‘Āpuakea cited by Sterling and Summers (1978) sets its location in the village of Kapu‘a, the same area as the Muliwai‘ōlena Stream:

> When Kauholokahiki, sister of Kanehunamoku, came ashore from Ulukaa she landed at Ulupau in Mokapu. There she built a shrine on which to lay her offerings, and there she was found by some women who went to gather sea weeds on the shore and made friends with her. The native women admired the beauty of the stranger who was covered only by a skirt of green pahapaha sea weeds. One of the women removed her own body covering and draped it around the hips of the stranger and invited her to her home. Her beauty glowed like a light in the house and many people came with gifts of tapas, skirts, dogs, hogs and poi. One day the chief Ilauhoe took Kauholokahiki, the stranger, to be his wife. She was so beautiful that even the palms of her hands were lovely. When the chief Ilauhoe married her, the chief wanted her to go bathing with him but she answered, ‘I am kapu and can bathe in no other water unless you go yourself and fetch my bathing water from Muliwaiolena.’ The husband said, ‘It may be in Kahiki and is too far. We do not know where this water is.’ She replied, ‘If you love me, O Chief, go yourself for my bathing water that I mentioned. It is in Waimanalo, at Kapua, a village belonging to the chief Lupe. It is the stream with the yellow water that runs quietly. That is the one.’ The chief ran at once with a container and in no time he dipped up the water and returned. It was indeed yellowish color and that was the first time that it was known that this was Muliwaiolena. It is there to this day . . . [Uaua 1870 in Sterling and Summers 1978:248]

3.1.3 Puna‘aikoa‘e (Puna Tropic-Bird Eater)

In this story, Puna‘aikoa‘e was a chief of O‘ahu who married a goddess of Moloka‘i, Kalamainu‘u (also called Kihawahine). Though their initial meeting was full of desire, upon marrying he was kept captive on Moloka‘i and lived in a cave with his wife. The story continues on to describe Puna‘aikoa‘e’s successful return to O‘ahu and his reunion with his former wife, Walinu‘u. The reference to Waimānalo is described below:

> Once in traveling around with several of his fellows they arrived at Waimanalo, from Waikiki, at a time when the rolling of the surf at a certain surfing place there

> was very attractive, and so the chief and his companions swam out to share in the sport. [Thrum 1923:185]

3.1.4 Lonoikamakahiki

In a canoe paddling race, Lonoikamakahiki is able to win the island of O‘ahu from the ruling chief Kakuhihewa in part through a stratagem of paddling to Kailua inside of the Waimānalo reef (Fornander 1917:300–302).

> After the bets had been made, Lonoikamakahiki said to Kakuhihewa: ‘You had better go on ahead.’ When Lauahuimihaku and his companion heard of Lonoikamakahiki ask of Kakuhihewa to proceed on ahead, they urged Kakuhihewa to order the rowers to go ahead. The order was therefore given and they started off.
>
> After Kakuhihewa and his companions had started Lonoikamakahiki ordered his rowers to partake of some food. The men then took some food. By this time Kakuhihewa and his companions were almost out of sight. When they finished their meal Lonoikamakahiki ordered his rowers, Kaiehu and Kapahi, to row away. At the order, the men began to row taking the Koolauloa way and by way of Kona and on in toward Waimanalo. After going for some time Kakuhihewa and his men laid to and awaited for the approach of Lonoikamakahiki, thinking that when they came up nearer they would then make land.
>
> While they were waiting, Lonoikamakahiki, on the other hand, was coming inside of the Waimanalo reef and was almost at Kailua. When Lonoikamakahiki and his men were about to get to the landing place Kakuhihewa for the first time caught sight of them, so he said to Lauahuimihaku and his companion: ‘I want you two to look and see what double canoe that is that is entering the landing place.’ Lauahuimihaku and his companion then looked and said: ‘That canoe is Lonoikamakahiki’s. We are beaten.’ Kakuhihewa then said to Lauahuimihaku and his companion: ‘Where did they come from?’ Lauahuimihaku and his companion replied: ‘They must have come by way of Koolau, then by way of Waianae and Kona.’ Kakuhihewa said: ‘I thought you said that we were to win this race; but here it is we are beaten. You two are indeed strange. Here the whole of the island is gone, all through your advice, which I have always obeyed. Now my kingdom is lost to Lonoikamakahiki.’ [Fornander 1917:300]

3.2 *Wahi Pana* (Legendary or Storied Places)

Wahi pana are legendary or storied places of an area. These legendary or storied places may include a variety of natural or human-made structures. Oftentimes dating to the pre-Contact period, most *wahi pana* are in some way connected to a particular *mo‘olelo*, however, a *wahi pana* may exist without a connection to any particular story. Davianna McGregor outlines the types of natural and human-made structures that may constitute *wahi pana*:

> Natural places have mana, and are sacred because of the presence of the gods, the akua, and the ancestral guardian spirits, the ‘aumakua. Human-made structures for the Hawaiian religion and family religious practices are also sacred. These structures and places include temples, and shrines, or heiau, for war, peace,

> agriculture, fishing, healing, and the like; pu‘uhonua, places of refuge and sanctuaries for healing and rebirth; agricultural sites and sites of food production such as the lo‘i pond fields and terraces slopes, ‘auwai irrigation ditches, and the fishponds; and special function sites such as trails, salt pans, holua slides, quarries, petroglyphs, gaming sites, and canoe landings. [McGregor 1996:22]

As McGregor makes clear, *wahi pana* can refer to natural geographic locations such as streams, peaks, rock formations, ridges, offshore islands and reefs, or they can refer to Hawaiian land divisions such as *ahupua‘a* or *‘ili*, and man-made structures such as fishponds. In this way, the *wahi pana* of Waimānalo tangibly link the *kama‘āina* of Waimānalo to their past. It is common for places and landscape features to have multiple names, some of which may only be known to certain *‘ohana* or even certain individuals within an *‘ohana*, and many have been lost, forgotten or kept secret through time. Place names also convey *kaona* and *huna* (secret) information that may even have political or subversive undertones. Before the introduction of writing to the Hawaiian Islands, cultural information was exclusively preserved and perpetuated orally. Hawaiians gave names to literally everything in their environment, including individual garden plots and *‘auwai* (waterway or ditch), house sites, intangible phenomena such as meteorological and atmospheric effects, *pōhaku* (rock, stone), *pūnāwai* (freshwater springs), and many others. According to Landgraf (1994), Hawaiian *wahi pana* “physically and poetically describes an area while revealing its historical or legendary significance” (Landgraf 1994:v).

3.2.1 Place Names

The primary source for place names in this section come from Sterling and Summers’ (1978) *Sites of O‘ahu* book. In places where information cannot be found on a certain historic site, Lloyd Soehren’s (2010) online database is used. The Soehren database includes place name meanings from the definitive book on Hawaiian place names, *Place Names of Hawaii* (Pukui et al. 1974). In cases where Pukui et al. (1974) do not provide a translation, Soehren often suggests a meaning for simple names from the *Hawaiian Dictionary* (Pukui and Elbert 1986).

Ko‘olaupoko, the traditional name for the *moku* encompassing Waimānalo, translates literally as “the short windward” in contrast to the northern half of this coastline known as Ko‘olauloa, “the long windward.” This may reflect the relative short distance from the sea to the great *pali* of the Ko‘olau Mountains, which seem to loom directly over much of this district.

3.2.2 Streams and Springs

Several streams flow through the *ahupua‘a* of Waimānalo. Waimānalo Stream likely contributed some water for the mostly spring-fed irrigated lowland agricultural terraces (Handy and Handy 1972:458). Puhā Stream (a hollow) is another flow of water where Hawaiians once practiced the sport of *pu‘e wai* (agitated water). They dug an opening 20 feet (ft) wide through the sand that dammed the stream near the ocean. The water flowed out at a speed of 30 knots to meet the incoming waves, and the players were tossed around in the agitated water (Landgraf 1994:148). A small stream named Muliwai‘ōlena (turmeric river or yellow river) was the location of a two-day battle between an *ali‘i* from Moloka‘i named Ka‘eo and O‘ahu forces during which Ka‘eo’s foreign gunner, Mare Amara, shot the O‘ahu commander (Fornander 1878:2:262).

In addition to these streams, Waimānalo once contained numerous springs. A *mauka* spring called Waikupanaha supported taro, banana trees, and white ginger (Charles Alona 1939, Oahu

Place Names ms., in Sterling and Summers 1978:246). A *mauka* spring, Kupunakāne, and a *makai* spring, Kupunawahine, were reported to cry out to each other in soft feminine voices on sunny days (*Hoku o Hawaii* 1930 in Sterling and Summers 1978:247).

3.2.3 Peaks and Hills

The mountainous sections of the *ahupua‘a* of Waimānalo contain *wahi pana* connected to the stunning landscape of the *pali*, with towering *pu‘u* (peaks) over the sheer cliff rock faces overlooking the upland forests, as well as smaller hills toward the coast. Towering above the northern *mauka* section of Waimānalo Ahupua‘a are the peaks of Lanipō and Pu‘u o Kona, while the peaks of Makapu‘u and Pu‘u o Moloka‘i characterize the southern *makai* section. People from Moloka‘i came to this latter hill near the coast to live until they eventually married into the residents of Waimānalo (Landgraf 1994:150). The name of a section of cliffs in Waimānalo—Kaulanaaka‘iole (the resting place of the rat; Landgraf 1994:154)—derives from Pikoiaka‘alalā, a famous archer who saw a rat on the cliffs and shot at it (Landgraf 1994:154).

Kalāwehekohe (The day of opening the vagina), a hill in the *mauka* region of the valley, was named after the location where a young chiefess lost her virginity to young chief (Charles Alona 1939, Oahu Place Names ms. in Sterling and Summers 1978:245). Hawaiians gathered *‘awa* (kava, *Piper methysticum*) that grew on another hill by the cliffs called Kaupokuhale (Charles Alona 1939, Oahu Place Names ms. in Sterling and Summers 1978:245). A hill toward the coast called Haununāhino (binding the teeth) was once a famous place of refuge for those losing a battle, as all the *ali‘i* recognized its sacredness (McAllister 1933:191). Pu‘ukiloi‘a (hill [for] observing fish), a hill along the coast, was used to sight schools of fish and signal to the canoes where to surround the fish with a net (Charles Alona 1939, Oahu Place Names ms. in Sterling and Summers 1978:244).

3.2.4 Offshore Islets

The islands of Mānana (known as Rabbit Island), Kāohikaipu (to restrain the container), and Mokuhope (island behind), as well as a rock called Kākalaioa (gray knickers), are located across from Ko‘onāpou. Two *ko‘a* (fishing shrines) on Mānana were for *āholehole* (young stage of the *āhole* or Hawaiian flagtail) and *moi* (threadfish) (Landgraf 1994:160). Ko‘onāpou, also called Kaupō, was a fishing village at the present-day Sea Life Park and Kaupō Beach Park. The area contained a *heiau* (pre-Christian place of worship), a *ko‘a*, lava tubes, and many habitation sites (Landgraf 1994:158; McAllister 1933:194–195).

3.2.5 *Pōhaku* (Stones)

Several culturally significant *pōhaku* are located in Waimānalo. A natural shrine called Wailea (Water of Lea) on the ridge dividing the *ahupua‘a* of Waimānalo from Kailua was devoted to Lea, the name of a goddess of canoe builders (Pukui et al. 1974:115) as well as a fish god that marked the best fishing grounds (Landgraf 1994:138). A *ko‘a* at Kaluahine (Site 22) was most likely destroyed (Sterling and Summers 1978:251). Pōhaku Pa‘akikī (unyielding stone; Landgraf 1994:156) is located in the water near the ancient village of Ko‘onāpou and is partially raised 2 ft high on a pile of stones (Landgraf 1994:156). Another *pōhaku* named Kini near Pāhonu Pond was connected to a fish god and attracted such fish as *akule* (big-eyed scad fish) and *‘ō‘io* (ladyfish, bonefish) (Charles Alona 1939, Oahu Place Names ms. in Sterling and Summers 1978:250). A

pōhaku is rooted at the edge of a cliff on a ridge of Makapu‘u overlooking the ocean which Becket and Singer (1999:162) suggest is a Pōhakuokāne (stone of Kāne).

3.3 *‘Ōlelo No‘eau* (Hawaiian Proverbs)

Hawaiian knowledge was shared by way of oral histories. Indeed, one’s *leo* (voice) is oftentimes presented as *ho‘okupu* (“to cause growth,” a gift given to convey appreciation, to strengthen bonds); the high valuation of the spoken word underscores the importance of the oral tradition (in this case, Hawaiian sayings or expressions), and its ability to impart traditional Hawaiian “aesthetic, historic, and educational values” (Pukui 1983:vii). Thus, in many ways these expressions may be understood as inspiring growth within reader or between speaker and listener:

> They reveal with each new reading ever deeper layers of meaning, giving understanding not only of Hawai‘i and its people but of all humanity. Since the sayings carry the immediacy of the spoken word, considered to be the highest form of cultural expression in old Hawai‘i, they bring us closer to the everyday thoughts and lives of the Hawaiians who created them. Taken together, the sayings offer a basis for an understanding of the essence and origins of traditional Hawaiian values. The sayings may be categorized, in Western terms, as proverbs, aphorisms, didactic adages, jokes, riddles, epithets, lines from chants, etc., and they present a variety of literary techniques such as metaphor, analogy, allegory, personification, irony, pun, and repetition. It is worth noting, however, that the sayings were spoken, and that their meanings and purposes should not be assessed by the Western concepts of literary types and techniques. [Pukui 1983:vii]

Simply, *‘ōlelo no‘eau* may be understood as proverbs. The Webster dictionary notes it as “a phrase which is often repeated; especially, a sentence which briefly and forcibly expresses some practical truth, or the result of experience and observation.” It is a pithy or short form of folk wisdom. Pukui equates proverbs as a treasury of Hawaiian expressions (Pukui 1995:xii). Oftentimes within these Hawaiian expressions or proverbs are references to places. This section draws from the collection of author and historian Mary Kawena Pukui and her knowledge of Hawaiian proverbs describing *‘āina* (land), chiefs, plants, and places. The following proverbs concerning Waimānalo and neighboring *‘ili* and *ahupua‘a* come from Mary Kawena Pukui’s *‘Ōlelo No‘eau* (Pukui 1983).

3.3.1 *‘Ōlelo No‘eau* #503

The following *‘ōlelo no‘eau* describes Kamehameha and his entourage on a visit to Kailua, O‘ahu.

> *Hawai‘i palu lā‘ī.*
>
> Ti-leaf lickers of Hawai‘i.
>
> This saying originated after Kamehameha conquered the island of O‘ahu. The people of Kailua, O‘ahu, gave a great feast for him, not expecting him to bring such a crowd of people. The first to arrive ate up the meat, so the second group had to be content with licking and nibbling at the bits of meat that adhered to the ti leaves. In derision, the people of O‘ahu called them ‘ti-leaf lickers.’ [Pukui 1983:60]

3.3.2 *‘Ōlelo No‘eau* #550

The following *‘ōlelo no‘eau* references the typical weather of Ko‘olau.

> *He au Ko‘olau aku ia.*
>
> That is Ko‘olau weather.
>
> The Ko‘olau, or windward, side of an island is often storm-beaten. This expression was first used in a chant to Hi‘iaka by Wahine‘oma‘o, who pleaded with her not to let her wrath lead to destruction. Later used as a warning that headstrong willfulness leads to distress. [Pukui 1983:64]

3.3.3 *‘Ōlelo No‘eau* #1531

The following *‘ōlelo no‘eau* speaks of Makapu‘u.

> *Ka pali nānā uhu ka‘i o Makapu‘u.*
>
> The sea surround Makapu‘u Point, O‘ahu, is the favorite haunt of the *uhu* (parrotfish). [Pukui 1983:165]

3.3.4 *‘Ōlelo No‘eau* #2285

The following *‘ōlelo no‘eau* describes the Ko‘olau mountains.

> *Nā pali hāuliuli o ke Ko‘olau.*
>
> The dark hills of Ko‘olau.
>
> The hills and cliffs of the windward side of O‘ahu are always dark and beautiful with trees and shrubs. [Pukui 1983:249]

3.4 *Oli* (Chants)

3.4.1 Chants from Hi‘iakaikapoliopele

3.4.1.1 Hi‘iaka’s Introduction to Mālei

In continuation to Section 3.1.1, Hi‘iaka and her companions continue through Waimānalo where they come across a woman named Mālei. Hi‘iaka offers this *oli* as an announcement for her arrival:

> *‘O au, e hele i nā lae ‘ino o Ko‘olau*
>
> *I nā lae makakai o Moeau*
>
> *Hele ka wahine ‘au hula‘ana o nā pali*
>
> *Nānāuhu ka‘i o Makapu‘u*
>
> *He i‘a ‘ai na Mālei*
>
> *Na ka wahine e noho ana i ka ulu a ka makani*
>
> *I Ko‘olau ke ola i ka huaka‘i malihini*
>
> *Kānaenae i ka lau weuweu*
>
> *Ola ia ka pua mau‘u*

E Mālei ē

Aloha mai

E uē kāua.

Translation:

I shall travel the stormy headlands of Ko‘olau

The sea-washed capes of Moeau Point

The woman who traverses the sea cliffs goes on

Guarding the parading uhu of Makapu‘u

A delectable fish for Mālei

The woman who dwells where the wind gusts

Ko‘olau holds salvation for the visitor’s quest

Offering chants of praise to the humble herbage

Surviving on the blossoms of the grasses

O Mālei

Offer your welcome

Let us share our tears

[Ho‘oulumāhiehie 2008b:144-145; Ho‘oulumāhiehie 2008a:136]

3.4.1.2 Hi‘iaka meets Ka‘anahau

Continuing on their journey through Waimānalo, Hi‘iaka and her companions are warmly greeted by a charming man named Ka‘anahau. He prepares for Hi‘iaka, as she requested, her favorite dish, cooked *lū‘au* (taro leaf). He is completely taken away by her beauty and wishes to fulfill her desires. Hi‘iaka presents this *oli* to him:

Kū a‘e Ahiki

Noho iho Pāku‘i

Hiki mai kō aloha

Kono i ku‘u waimaka

E hanini ē

E uē au ē

Translation:

Ahiki rises on high

While Pāku‘i sits below

Your affection comes to me

Inviting my tears to fall

To flow down, ah

To make me weep

[Ho‘oulumāhiehie 2008b:149; Ho‘oulumāhiehie 2008a:141]

3.4.1.3 Hi‘iaka Rests at Mahinui

After leaving the house of Ka‘anahau, Hi‘iaka and her entourage reach Kapoa where they climb up a steep ridge between Kailua and Kāne‘ohe before reaching Mahinui (Ho‘oulumāhiehie 2008a:144). Hi‘iaka turns to face the direction of Ka‘anahau’s place and remembers their night together. She composes these two chants in her loving remembrance of Ka‘anahau:

Ku‘u kāne i ka uhu ka‘i o Makapu‘u

Huki i luna ka lae ‘o Kalā‘au

Aloha ia pali makua ‘ole o laila

I laila au, ‘ike i ka nani a ke aloha

Aloha ku‘u kāne.

Translation:

My dear man of the parading uhu of Makapu‘u

Where Kalā‘au Point draws itself up

Beloved is the orphaned cliff of that place

Fore there I witnessed the wonder of love

Farewell my dear man.

[Ho‘oulumāhiehie 2008b:153; Ho‘oulumāhiehie 2008a:144]

Her second chant composed for Ka‘anahau is as follows:

Ku‘u kāne mai ke kai haku nu‘a o Ko‘olau

Me he kapa kea ala ka ‘ale i ka moana

Ka po‘o o ke kai i nā moku manu

Kū ke ‘ehu a ke kai i ke kula o Ka‘a‘awa

Ku‘u kāne mai ka uka anu o Kailua

‘Elua nō kāua i ka makemake like

Eia nō au ke noho aku nei

Ke kau aku nei ka ‘ōnohi iā ‘oe ā

He kāne ‘oe i ka lau ‘ai a ke aloha

Aloha mai, a hele a‘e au.

Translation:

My beloved man of the heaped breakers of Ko‘olau’s sea

Where the ocean billows are like a white blanket

The sea crashes upon the bird islets

And the spray spreads to the plains at Ka‘a‘awa

My dear man from the cold uplands of Kailua

We two shared our desires

Here am I, dwelling afar

My thoughts fixed upon you, ah

You are a man with an abundant sustenance of love

Bid me farewell, for on I go.

[Ho‘oulumāhiehie 2008b:153; Ho‘oulumāhiehie 2008a:144–145]

3.4.1.4 Hi‘iaka Chants for Ka‘anahau and Pele

Before her chanting and reminiscing seized, she offered one last *oli* but this one spoke of her sister, Pele. This chant references the peak of Mahinui and the shrine of Wailea.

Ku‘u kāne i ke ala pili o Mahinui

Mai ka ua kapua‘i kanaka i Pālāwai

Ka ua o Kailua i kai ē

Makani a‘ela ma ke kōā o Wailea

He le‘ale‘a maka wale nō kā ma waho

Aia nō ka ‘ino i loko

Ua noho lili wale a ‘ena me ku‘u akua

Ua ‘ena ‘oe i kahi hakina ‘ai o ke ala hele

I hele mai ho‘i au i kō makemake

A hili hewa ka‘u mānai i ‘ane‘i

Ua hili au iā ia, a hewa au lā

Hewa i ka ipo ahi pāpala a ke hoa

Ku‘u hoa a‘u i ‘ano‘i aku ai

A he mau makemake lua nō ē

Translation:

My man of the clinging path of Mahinui

From the rain of Pālāwai that follows like footsteps

The rain of Kailua by the sea

Wind blows through the pass of Wailea

There is a display of pleasure outside

The wickedness is within

My beloved goddess harbors jealousy that blazes

You are angry at a scrap found on the road

That I tread so as to fulfill your wishes

My needle has strayed here

I strayed with him, and I erred

Erred with a loer, a friend whose passion flamed

The friend that I came to desire

And the desires were mutual indeed, ah.

[Ho‘oulumāhiehie 2008b:154; Ho‘oulumāhiehie 2008a:145]

3.5 *Mele* (Songs)

3.5.1 Hi‘iaka Reaches Makapu‘u

This *mele* was composed by Hi‘iaka upon their initial arrival to Waimānalo as they neared the landing of Makapu‘u. From the ocean they could see Ulumawao, a hill near Makapu‘u. In the version of Hi‘iakaikapoliopele by Ho‘oulumāhiehie (2008b:145), the hill is called Ulamawao.

Ku‘u kane i ka pali kauhuhu,

Kahi o Makapu‘u (a) huki i ka lani

Ka Lae o Ka-laau, (b)

Kela pali Makua-ole (c) olaila:

Anu ka ua i ka pali o Ulu-ma-wao, (d) e;

E mao wale ana I ka lani kela pali:

Ku‘i, ha-ina i ke kai.

I ke kai ho‘i ke Akua,

A pololi a moe au, e-e!

Ku‘u la pololi, a ola i kou aloha:

Ina‘i pu me ka waimaka, e-e!

A e u‘wè kaua, e-e!

(a) Maka-pu‘u, a headland at the eastern extremity of Oahu, on which a lighthouse of the first class has been established within three years.

(b) Lae o Ka-laau, the south-western cape of Moloka‘i, on which is a lighthouse of the first class.

(c) *Makua-ole,* literally, fatherless or parentless; seemingly a reference to the lonely inhospitable character of the place.

(d) *Ulu-ma-wao,* a hill in the same region as Maka-pu‘u point. The name is said to mean a place having a very thin soil.

Translation:

O fellow mine on the stair-like cliff,

Where Maka-pu‘u climbs to the sky,

Companioned by Cape-of-the-woods,

That fatherless bluff over yonder:

Cold cheer rain on Ulu-ma-wao;

That lone steep faints away in the sky,

While Ocean pounds and breaks at its base--

The sea is the home of the gods.

I lay in swoon from hunger

What time I awoke from love’s dream,

Love, salt with brine of our tears.

Let us mingle our tears.

[Emerson 1915:86–87]

3.5.2 Waimānalo

This *mele,* translated by Mary Kawena Pukui, was composed by a man named “Figgs” which was the pen name of King David Kalākaua (Huapala n.d.).

Ia‘u i hali‘a ai i ka moe

A kāhelahela i ku‘u kino

‘Oni ana ho‘oipo a ho‘ohau‘oli

I ka ninihi a ka Māluakele

Hui:

Na ke aloha i hānai mai

I ku‘u lā pōloli ho‘i

Nā ke aloha i ho‘onui mai

I ka manawa ‘ono wai ho‘i

Ia‘u i ho‘ola‘i ai i ka moe

Hiki ana ka ‘ōnohi i ku‘u maka

E hapahāpai ana la e lana ka mana‘o

E hui ka ‘ōpua me ka lā

‘O ku‘u ipo milo wai a ka lā

‘O ka ‘awa ‘ili lena a ka manu

Mai mauna ‘oe i ka lihi wai pa‘a

O kūli‘u ku‘e hau ka mana‘o

Ua la‘i ka nahele o Kalāhiku la

Kula Kapule hei a ka manu

Ho‘ohāili mai ana o ‘Alihiwai

I po‘i waikea na ka hau

Translation:

A thought came while I dozed

My body spread out

Moving, wooing and bringing happiness

As the Māluakele went gently by

Chorus:

It was love that fed me

In my days of hunger

It was love so generously given

At the time of thirst

While I reposed in sleep

A vision passed before my eyes

Just lifting my thoughts

Joining the clouds and the sun

My sweetheart like a whirlpool in the sunlight

The yellow skinned awa of the birds

Do not waste the ice

While thoughts penetrate and linger

Tranquil forest of Kalāhikula

The source, Kapule, where birds are snared

Causes memories to stir of ‘Alihiwai

A white lid for the snow

[Huapala n.d.]

3.5.3 Waimānalo ‘Āina Kaulana

This *mele* describes the beauty of Waimānalo and honors Prince Jonah Kūhiō Kalaniana‘ole. He was responsible for spearheading the passage of the Hawaiian Homes Commission Act. In response to the rapidly increasing number of Native Hawaiian deaths, this Act would provide Native Hawaiians with land to live and prosper. A large portion of Waimānalo is designated as *‘āina ho‘opulapula* or homestead land.

Uluwehi Waimānalo ‘āina ho‘opulapula
Ipu ia like ala ona pua like ‘ole
Ho‘okahi pu‘uwai ho‘okahi mana‘o
‘Āina aloha o ka lehulehu
Hanohano no ‘oe e Kalaniana‘ole
Ho‘oko kauoha ‘oe nā ka hana pololei
Ha‘awi ka mae ma‘i e ia Waimānalo
Kokua like mai na mana Kahikolu
Kū kilakila nā home u‘i
Me ke kokua a nā mana lani
Ha‘ina kēia mele no Waimānalo
‘Āina ho‘opulapula no Kalaniana‘ole

Translation:

Lush, Waimānalo, homestead land
Its fragrant flowers, incomparable
One heart, one thought
Land of love for the population
You are the glory of Kalaniana‘ole
You fulfilled the trust with righteous deeds
Waimānalo gives health
Help and power comes from Trinity
Standing strong, the stalwart homes
With help from the heavenly powers
Tell this song of Waimānalo
Homestead land of Prince Kalaniana‘ole
[Huapala n.d]

Section 4 Traditional and Historical Accounts

4.1 Early Historic Period

Waimānalo was a frequent point of arrival and departure in late pre-Contact and early post-Contact times as in the following account of the loss of O‘ahu sovereignty:

> When King Kahekili of Maui heard of the death of the priest, Kaopulupulu, by Kahahana (a chief appointed by Kahekili to govern Oahu), he sent some of his men thither by canoe, who landed at Waimānalo, Ko‘olau, where as spies, they learned from the people respecting Kaopulupulu and his death, with that of his son; therefore they returned and told the King the truth of these reports, at which the affection of Kahekili welled up for the dead priest, and he condemned the King he had established. Coming with an army from Maui, he landed at Waikīkī without meeting Kahahana, and took back the government of O‘ahu under his own kingship. The chiefs and people of O‘ahu all joined under Kahekili for Kahahana had been a chief of wrong-doing. . . [Thrum 1907:212-213]

4.1.1 Kamehameha’s Conquest of O‘ahu

During Kamehameha’s conquest of O‘ahu, part of his fleet landed near Makapu‘u and then joined with Kamehameha’s other forces, finally conquering O‘ahu. Prior to the invasion, Kamehameha sent a messenger to Kahekili:

> Ki‘kane, Kamehameha’s messenger to Kahekili, threw down two *maika* stones, this stone (the white) brings life through farming and fishing, rearing men, and providing them with food; this other stone (the black) brings war. Let the reader ponder the meaning of this answer. Kahekili asked, Is Kamehameha coming to O‘ahu to fight? ‘Yes’ answered Ki-Kane. What harbor will he choose? It was Kiko‘o’s counsel to make Waimanalo the harbor and battle site. ‘It is too low there to cast sling stones to reach the heights. It is good only for food and fish. . . [Kamakau 1961:250 in Silva 1981 A-16]

The final stage of Kamehameha’s campaign took place at the Nu‘uanu Pali during the battle of Kaleleka‘anae, which means “leaping *‘anae* (mullet)” and refers to the way many O‘ahu armies and some of their families chose to or were forced to jump to their deaths from the *nuku* (mountain pass) of the steep *pali* rather than accept defeat from the warriors of Kamehameha (James 2004). After this battle at the Nu‘uanu Pali, Kamehameha became the sole ruler of O‘ahu, Moloka‘i, Lāna‘i, Hawai‘i, and Maui (Kamakau 1992:172–173). He retained the *ahupua‘a* of Waimānalo as his own personal property when he divided the conquered lands of O‘ahu to reward his warrior chiefs and counselors (‘Ī‘ī 1959:69–70). His sons Liholiho and Kauikeaouli—Kamehameha II and Kamehameha III, respectively—inherited most of Waimānalo Ahupua‘a (Commissioner of Public Lands 1929:28). Kauikeaouli, “inherited” Waimānalo “to be the private lands of his Majesty Kamehameha III, to have and to hold to himself, his heirs and successors, forever; and said lands shall be regulated and disposed of according to his Royal will and pleasure, subject only to the rights of tenants” (Commissioner of Public Lands 1929:28).

4.2 The Māhele and the Kuleana Act

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—that introduced private property into Hawaiian society. In 1848, the Crown and the *ali‘i* received their land titles. *Kuleana* awards to commoners for individual parcels within the *ahupua‘a* were subsequently granted in 1850. The Crown Lands were considered the private lands of the monarch, and many lands were sold or mortgaged during the reigns of Kamehameha III and IV to settle debts to foreigners. To end this practice, the Crown Lands were made inalienable in 1865, and their dispensation was regulated by a Board of Commissioners of Crown Lands, which effectively put them under the administrative control of foreign-born residents (Kame‘eleihiwa 1992:310). Before the passage of the Act of January 3, 1865, which made Crown Lands inalienable, Kamehameha III and his successors did as they pleased with the Crown Lands, selling, leasing, and mortgaging them at will (Chinen 1958:27).

In 1850, the Privy Council passed resolutions that would affirm the rights of the commoners or native tenants. To apply for fee-simple title to their lands, native tenants were required to file their claim with the Land Commission within the specified time period of February 1846 and 14 February 1848. The Kuleana Act of 1850 confirmed and protected the rights of native tenants. Under this act, the claimant was required to have two witnesses who could testify they knew the claimant and the boundaries of the land, knew that the claimant had lived on the land for a minimum of two years, and knew that no one had challenged the claim. The land also had to be surveyed.

Not everyone who was eligible to apply for *kuleana* lands did so and, likewise, not all claims were awarded. Some claimants failed to follow through and come before the Land Commission, some did not produce two witnesses, and some did not get their land surveyed. Out of the potential 2,500,000 acres of Crown and Government Lands, less than 30,000 acres of land were awarded to the Native-Hawaiian tenants (Chinen 1958:31).

Among the first written descriptions of Waimānalo Ahupua‘a by Hawaiians are the testimonies recorded during the 1840s and 1850s in documents associated with LCAs and awardees of the Māhele. As a result of the Kuleana Act of 1850, the *ahupua‘a* of Waimānalo was awarded to Victoria Kamāmalu and subject to the *kuleana* claims of the commoners, and 113 *kuleana* land claims were awarded in Waimānalo (Barrère 1994; Kame‘eleihiwa 1992). Nearly all of these LCAs clustered along Waimānalo Stream and its upper tributaries with a focus on wetland taro and sweet potato cultivation, as well as the central and southeastern coastal areas with a focus on marine resources (Waihona ‘Aina 2000). No *kuleana* LCAs were located in the vicinity of the current project area (Figure 6).

4.3 Mid- to Late 1800s

4.3.1 Ranching

In 1828, an Englishman, Thomas Cummins, arrived in Hawai‘i. Soon after his arrival, he married the High Chiefess Kaumakaokane, who was related to Kamehameha I. This marriage provided Cummins with connections to the throne. Cummins received a Royal Patent to an estate of crown lands in Waimānalo in 1842 (Dorrance 1998:19) and in 1850 Kamehameha III leased 970 acres, spanning “from Popo‘oka‘ala point to the hills of Ka‘iwa and Ka‘akaupu of the Ko‘olau district” to Thomas Cummins (Williams 1996:155).

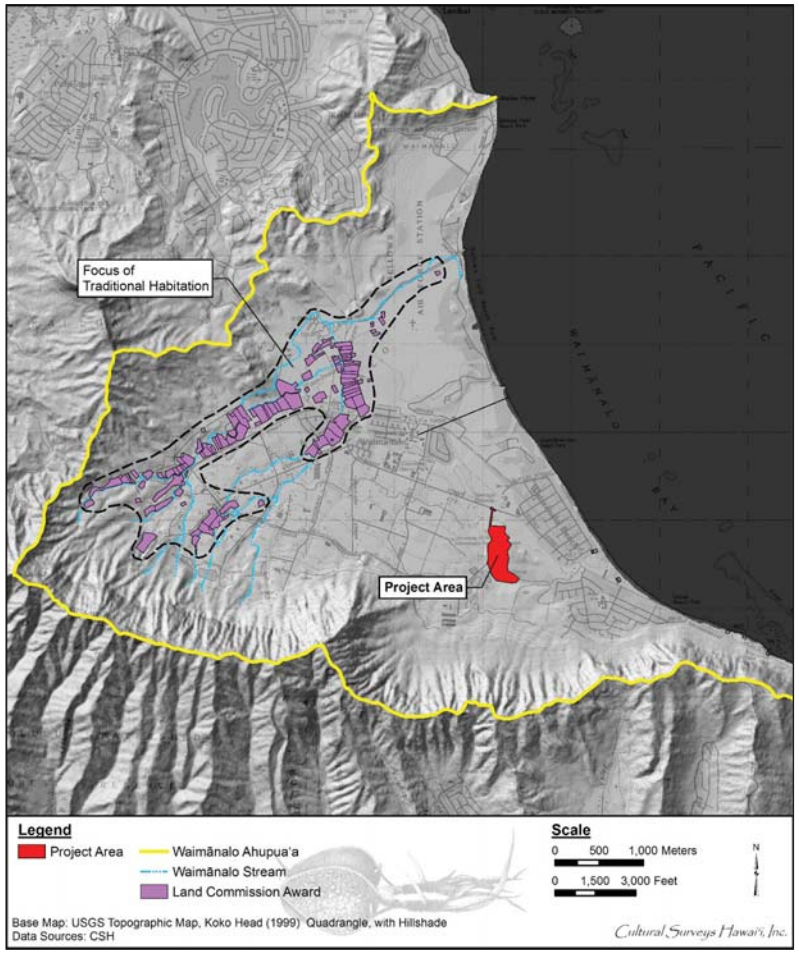


Figure 6. USGS topographic map with Waimānalo LCAs; note the LCA parcels are located alongside Waimānalo Stream; the project area is also shown

Thomas Cummins and his son, John A. Cummins turned Waimānalo into a large cattle and horse ranch. They also constructed a landing at Waimānalo Bay as access to the area, from Honolulu prior to the construction of the Nu‘uanu Pali road, was primarily by sea (Condé and Best 1973:364). The landing was approximately 1,100 m east of the east end of the project area (Figure 7). A railroad line was also laid to connect the landing to the Cummins Estate for Kamehameha V (Thomas 1983:77).

> Kamehameha V often visited the [Cummins’] plantation. When he grew too heavy to make the trip over the Pali on horseback, he is said to have acquired a small steamboat to transport him around the southern tip of Oahu to Waimanalo. A railroad track was laid to carry the rotund monarch from the landing to the Cummins home. [Thomas 1983:77]

The Cummins family later bought about 200 acres of *kuleana* lands. By the early 1870s, Chinese rice farmers were using some of these lands under agreement with John A. Cummins (Bartholomew and Associates 1959:14).

The Cummins Estate, “Mauna Rose” was known for its lavish parties, commonly hosting the Kamehamehas, King Kalākaua, Queen Lili‘uokalani, and American, British, and Russian naval officers visiting O‘ahu (*Honolulu Star-Bulletin* 22 June 1935:9 in Silva 1981:A-22). Following a celebration at the Cummins’ Estate, Lili‘uokalani composed “Aloha Oe” in memory of a Hawaiian couple she saw saying goodbye as she was traveling up the Maunawili Ridge toward the Pali (Bartholomew and Associates 1959:13–14).

The introduction of livestock to Hawai‘i had an exceedingly negative impact on the natural environment and contributed to the demise of traditional Hawaiian life. The absence of walls and fences to contain the vast herds of cattle, sheep, and horses resulted in the animals trampling the small scattered homesteads and stripping the land of native vegetation. In 1915, William A. Bryan discussed the relationship between cattle and the natural environment of Hawai‘i:

> Since the coming of the whites there have been many causes . . . that have been at work bringing about a change in the natural conditions. Chief among the disturbing elements, however, have been the cattle. As early as 1815 they were recognized as a serious menace to the native forests. Roaming at will through the forests they and other animals, as goats and pigs, have done untold damage, and brought about conditions that have been most serious in many places. [Bryan 1915:226–227]

The damage to the natural landscape in Waimānalo caused by the development of the Cummins Ranch ca. 1847 is described in the following account:

> At the time, it seemed that the valley was filled with breadfruit, mountain apples, *kukui* and coconut trees. There were taro patches, with banks covered with *ti* and *wauke* plants. Grass houses occupied the dry lands, a hundred of them here and sweet potatoes and sugar cane were much grown. It was a great help toward their livelihood. . . . The whole *ahupua‘a* of Waimānalo was leased to white men except the native *kuleana* and because the cattle wandered over them, they were compelled to build fences for protection. The taro patches that were neatly built in the time when chiefs ruled over the people and the land, were broken up. The sugar cane, *ti* and *wauke* plants were destroyed. The big trees that grew in those days, died

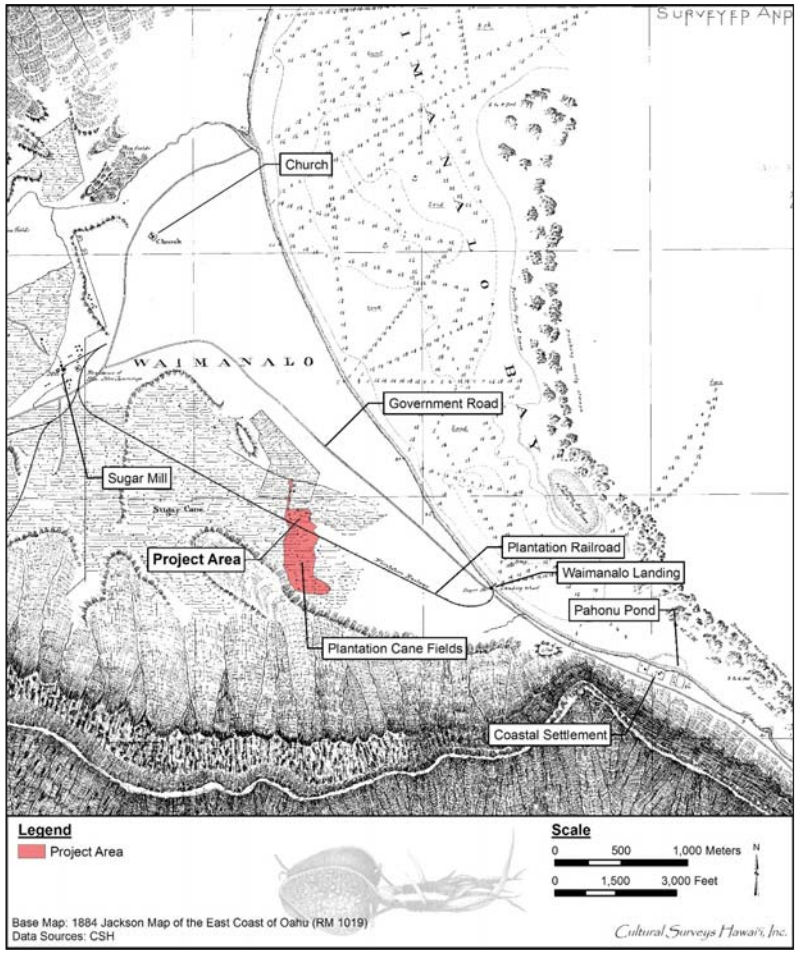


Figure 7. 1884 Jackson map of the east coast of O‘ahu showing the project area

because the roots could not get moisture. The valley became a place for animals. [*Kuokoa*, 26 October 1906 in Sterling and Summers 1973:244]

4.3.2 Sugar Industry

In 1876, the Hawaiian Kingdom entered into a Reciprocity Treaty with the United States. This allowed the growing sugar industry a free market and the potential for great profits. John A. Cummins saw the potential of sugar production at Waimānalo and in 1880 he organized the Waimanalo Sugar Company and began construction of a sugar mill. In 1890, John A. Cummins renegotiated his father’s original lease on the Waimānalo lands for an additional 30 years and sublet the lands to the Waimanalo Sugar Company. The Waimanalo Sugar Company continued to buy sugar from Chinese farmers until the turn of the twentieth century when the plantation began to do most of its own cultivation. As the plantation grew, former ranch lands were converted to cane fields, new irrigation ditches and railroad lines were constructed, and improvements were made to the mill and Waimanalo Landing (Figure 8). By the 1920s, plantation sugarcane fields stretched across the floor of Waimānalo Valley to the base of the Ko‘olau Range (Bartholomew and Associates 1959:14–15). Much of the project area, with the exception of the most *mauka* lands and gulch areas, was cultivated in cane.

The rapid development of the Waimānalo sugarcane lands in the latter part of the nineteenth century required intense irrigation from three sources. Water from springs, tunnels, and streams in neighboring Maunawili Valley, Kawainui Swamp in Kailua, and a swampy area near the mouth of Waimānalo Stream, called Waimānalo Lagoon, flowed to the Waimānalo cane fields through a vast system of flumes, ditches, and tunnels collectively called the Waimānalo Ditch System (State Inventory of Historic Places [SIHP] # 50-80-15-4042, Neller 1981) (Figure 9). Until the cessation of the Waimanalo Sugar Company in 1947, water from these sources flowed to reservoirs through the Kailua Ditch, the Maunawili Ditch, and the Pump Ditch, respectively (Bartholomew and Associates 1959:17). The Waimānalo Ditch System was determined eligible for inclusion on the National Register of Historic Places in 1981 (Kelly and Nakamura 1981), but is not currently listed on either the State or National Register of Historic Places.

4.4 1900s

4.4.1 Diversified Agriculture

The intense cultivation of sugar in Waimānalo led to diverse forms of agriculture that continue today (Figure 10 and Figure 11). The Waimanalo Sugar Company sold its fee-simple land holdings and the remaining years of its lease of government-owned lands to the Waimanalo Agricultural Development Company in 1947. The Waimanalo Agricultural Development Company then sublet 1- to 20-acre farm lots and up to 150-acre pastoral lots to individual farmers in Waimānalo Valley for intensive diversified agriculture. Following the expiration of the agricultural leases in 1953, the Territorial Government began selling approximately 9-acre agricultural parcels in the central valley, known as the Waimānalo Farm Lots subdivision. Seven chicken farms, one dairy, one piggery, and papaya and flower farms were established in the Farm Lots area. Portions of the former plantation irrigation system, with some modifications, continued to be used to provide water to the Farm Lots (Bartholomew and Associates 1959:17)

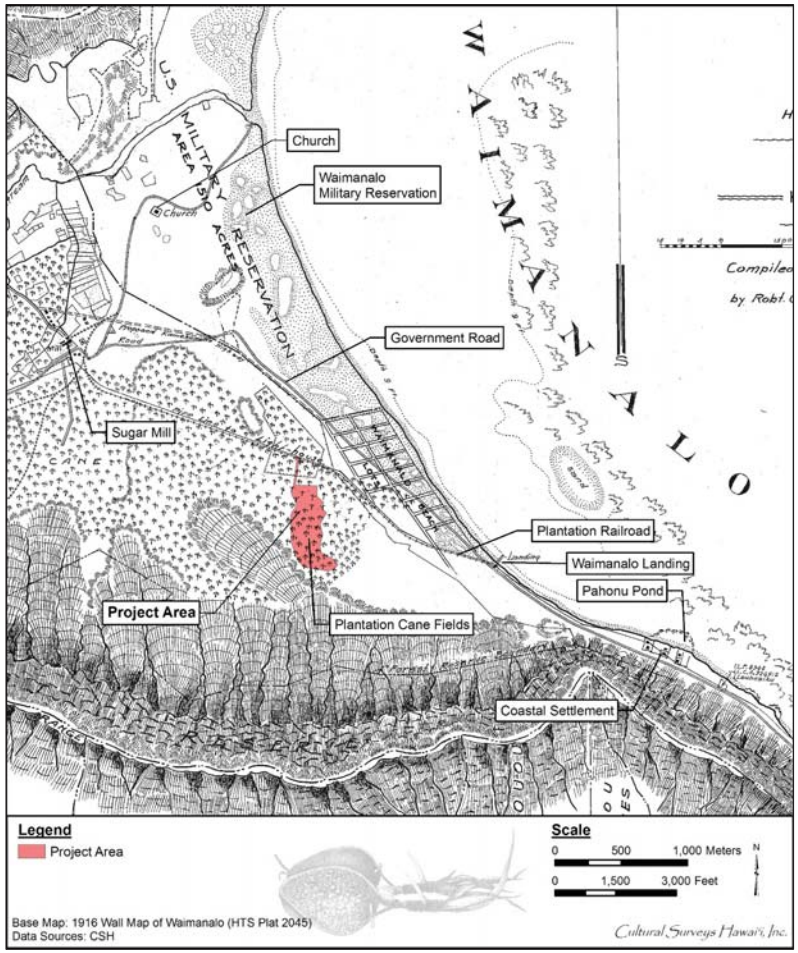


Figure 8. Waimanalo Sugar Company infrastructure with military development and coastal settlement in relation to the project area

Figure 9. Waimānalo Ditch System and Waimanalo Sugar Company infrastructure, as well as military and residential development, in and near the project area (USGS 1938)

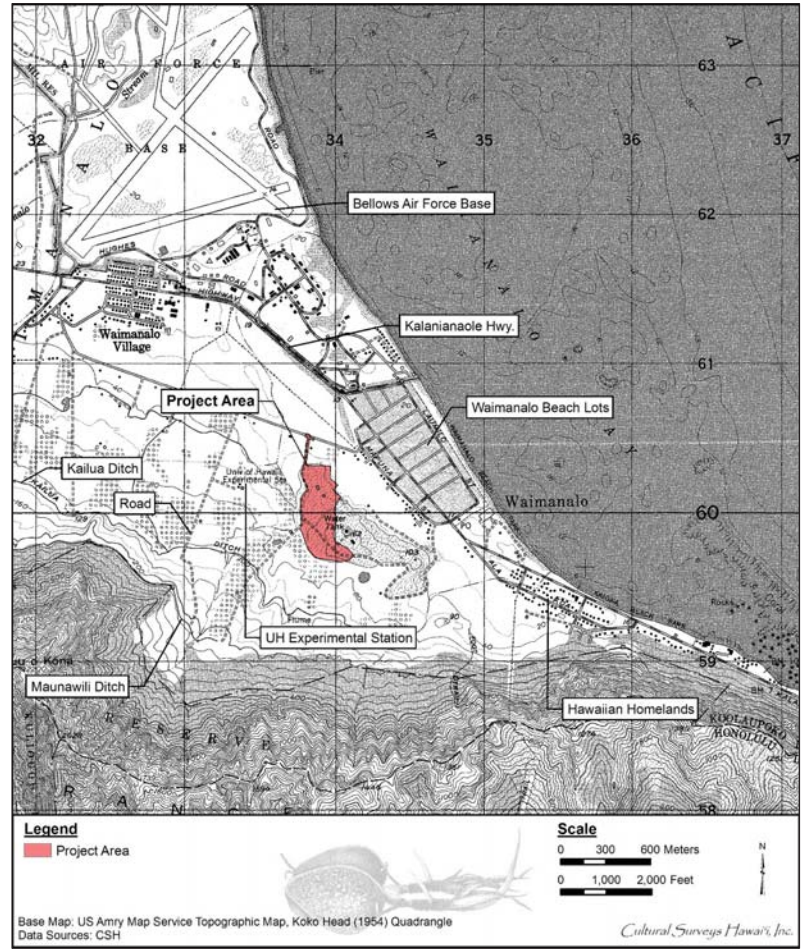


Figure 10. Agricultural development, as well as military and residential development, at and near the project area in the 1950s (U.S. Army Mapping Service 1954)

Figure 11. Agricultural development, as well as military and residential development, at and near the project area in the 1970s (USGS 1978)

The University of Hawai‘i (UH) established an approximately 30-acre agricultural research farm, known as the Waimānalo Agricultural Experiment Station, in the central valley *mauka* of the current project area in 1950 (see Figure 10). Research conducted at the experiment station provided local farmers with scientific knowledge about crops and agricultural practices to improve agricultural production in Hawai‘i. The Waimānalo Agricultural Experiment Station was later expanded to approximately 130 acres (Krauss 2003).

In 1967, the L.W. Campos Ranch relocated from Kailua to Waimānalo, establishing an approximately 200-acre dairy farm. Campos Ranch was purchased by Foremost Dairies in 1969, which expanded by acquiring an additional approximately 140 acres for pasture (see Figure 11). It was during this period that the dairy employee housing was erected. In 1984, the dairy sub-leased an approximately 21-acre parcel to Universal Synergetics (Unisyn). Unisyn was established to research and develop a commercial anaerobic digestion technology for manure and organic waste conversion into agricultural products or other farm products. Unisyn developed a full-scale facility and began converting biomass such as trees, grasses, agricultural wastes, animal manures, ocean plants, garbage, and other wet organic wastes into renewable resources, such as soil amendments, irrigation water, heat, steam, electricity, or liquid or gas fuels for transportation (e.g., ethanol) (State Department of Business, Economic Development and Tourism, Energy Division 1998 in Hammatt et al. 1999:10–11). In 1997, the dairy was acquired by Meadow Gold Dairies, which ceased operations in 2001 (UH 2001).

4.4.2 Military Infrastructure

The Waimānalo Military Reservation, including approximately 1,500 acres along the northern coastal portion of Waimānalo, was established in 1917 (see Figure 8). In 1933, it was renamed Bellows Field and consisted of an infantry and artillery training area, as well as a runway for the Air Corps. With the onset of World War II, accelerated development occurred at Bellows Field, which became a permanent military post in 1941. Following World War II, activity at Bellows Field declined, with much of the area only being used for military recreational purposes and as an emergency landing field. Bellows Field was subsequently renamed Bellows Air Force Base, and later, Bellows Air Force Station. In 1956, an Air Force communications facility was constructed, with extensive antennae installations (Bartholomew and Associates 1959:16). Bellows Air Force Station continues to be used for military training and recreational purposes.

4.4.3 Residential Development

The primary residential area in Waimānalo in the early 1900s was located in the vicinity of the Waimānalo Sugar Company’s sugar mill (see Figure 8). Here, the Waimānalo Village was established as housing for plantation workers and their families. In 1925, the first large-scale sale of Waimānalo lands to the public occurred with the establishment of the Waimānalo Beach Lots subdivision (see Figure 9). The subdivision, located just south of the Waimānalo Military Reservation, included 266 lots on 90 acres of land. The Kalaniana‘ole Highway opened in 1924 and greatly improved transportation to Waimānalo. Additional residential development occurred in the coastal portion of central Waimānalo with the establishment of Waimānalo Homestead by the Hawaiian Homes Commission in 1925. Qualified homesteaders, with 50% or more Hawaiian blood, were awarded residential lots located inland of Kalaniana‘ole Highway in the vicinity of Waimanalo Landing (Bartholomew and Associates 1959:16) (see Figure 10). Additional

residential development has since occurred in the Waimānalo Village, Waimānalo Beach Lots, and Waimānalo Hawaiian Homestead subdivisions.

4.5 Contemporary Land Use

The *mauka* region of Waimānalo is characterized by diversified agricultural lots which include plant nurseries, small-scale truck farms, and horse ranches and stables (DHHL 2011:17). The project area is currently occupied by horse ranches including Cook Ranch and Na Lio O Waimānalo. Residential communities are located both *mauka* and *makai* of Kalaniana‘ole Highway including parcels owned by the DHHL such as Waimānalo Villages, Kumuhau, Kaka‘ina, and Pine Tree Triangle (DHHL 2011:9). Small commercial businesses are centered along Kalaniana‘ole Highway, primarily in Waimānalo Town and the *makai* area between Waimānalo Bay State Recreation Area and Waimānalo Beach Park (DHHL 2011:17). A large portion of the *makai* region of Waimānalo is occupied by the Bellows Air Force Station which continues to be used for military training and recreational purposes. Other recreational activities include horse riding and equestrian facilities such as Town & Country Stables and Waimānalo Polo Club and numerous beach parks along the shore including Bellows Field Beach Park, Waimānalo Bay Beach Park, Waimānalo Beach Park, Kaiona Beach Park, Kaupō Beach Park, and Makapu‘u Beach Park (DHHL 2011:27).

Section 5 Previous Archaeological Research

Waimānalo is distinguished as being the place of one of the earliest archaeological investigations in the Hawaiian Islands. In 1879, Mr. Otto Finsch reported on human burials in sand deposits and associated artifacts in an area which is now Bellows Air Force Station (BAFS) (Finsch 1879). The BAFS has been the major focus of archaeological research in Waimānalo and is one of the most extensively studied areas on O‘ahu. Beginning in the 1960s, numerous archaeological reconnaissance, inventory survey, and monitoring projects have taken place, most in conjunction with military construction activity. Human burials, lithic scatters, soil features, and/or occupation layers have been found almost everywhere archaeological investigations have taken place.

Possibly the most important find at Bellows Air Force Station occurred in dune deposits adjacent to the mouth of Waimānalo Stream, designated SIHP # 50-80-15-4852-1 (a.k.a. Bellows Dune Site O18). SIHP # -4852-1 consists of stratified cultural deposits containing human burials, fire pits, and post molds (Cordy and Tuggle 1976; Pearson et al. 1971). Based on artifact typology and radiocarbon analysis, the Bellows Dune Site O18 is considered as one of the earliest occupation sites in Hawai‘i (Tuggle 1997:102). The actual date range of occupation of this site is under dispute. This is due to various factors that have made radiocarbon dating results for the site unreliable (Tuggle 1997:48). The first radiocarbon dates placed the earliest occupation at around AD 300-400 (Tuggle et al. 1978); however, Tuggle has since suggested a date range of AD 800-1000 is a more accurate period for the earliest occupation at SIHP # -4852-1 (Tuggle 1997:48). Much of the research since this discovery of early Bellows Dune occupation has focused on attempting to connect other archaeological finds in more inland areas of Bellows to this early Polynesian settlement.

Several archaeological studies have been conducted in the vicinity of the project area. The locations of previous archaeological studies in the vicinity of the current project area are indicated on Figure 12 and are summarized in Table 1. Previously identified historic properties in the vicinity are indicated on Figure 13 and are summarized in Table 2. Previous archaeological studies in the vicinity are discussed further below.

5.1 Inland Waimānalo

McAllister (1933:191) recorded three *heiau* at inland Waimānalo: Site 380, Keikipu‘ipu‘i Heiau on the line dividing Kailua and Waimānalo; Site 381, an unnamed *heiau* on the Waimanalo side of Olomana; and Site 382 a *heiau* on the land known as Pōhakunui. These are all understood as well northwest of the present project area.

An additional *heiau*, recorded by Sterling and Summers as “Site 24” (1978:247), was originally identified by Bartholomew and Associates (1959: Plate 2) as Pueo Heiau, and was described as a large structure measuring approximately 39.62 by 33.53 m (130 by 110 ft), with the northwest wall of the site remaining in fairly good condition (Drolet and Sinoto 2001:16). The Pueo Heiau is also listed by Thrum’s *Hawaiian Annual* (1933), and identified as a *heiau* in Waimānalo, but no other features or “particulars” are listed (Anonymous 1933:138). As Tulchin and McDermott (2010) note, Pueo Heiau (SIHP # -1031) currently consists of the remnants of a *heiau*, and was “relocated approximately 180 m southeast from its original plotting on a 1959 Bishop Museum map [Sterling and Summers 1978:257]” (Tulchin and McDermott 2010:32). Pueo Heiau is approximately 1.0 km southwest of the Waikupanaha Agricultural Lots Project area (see Figure 13).

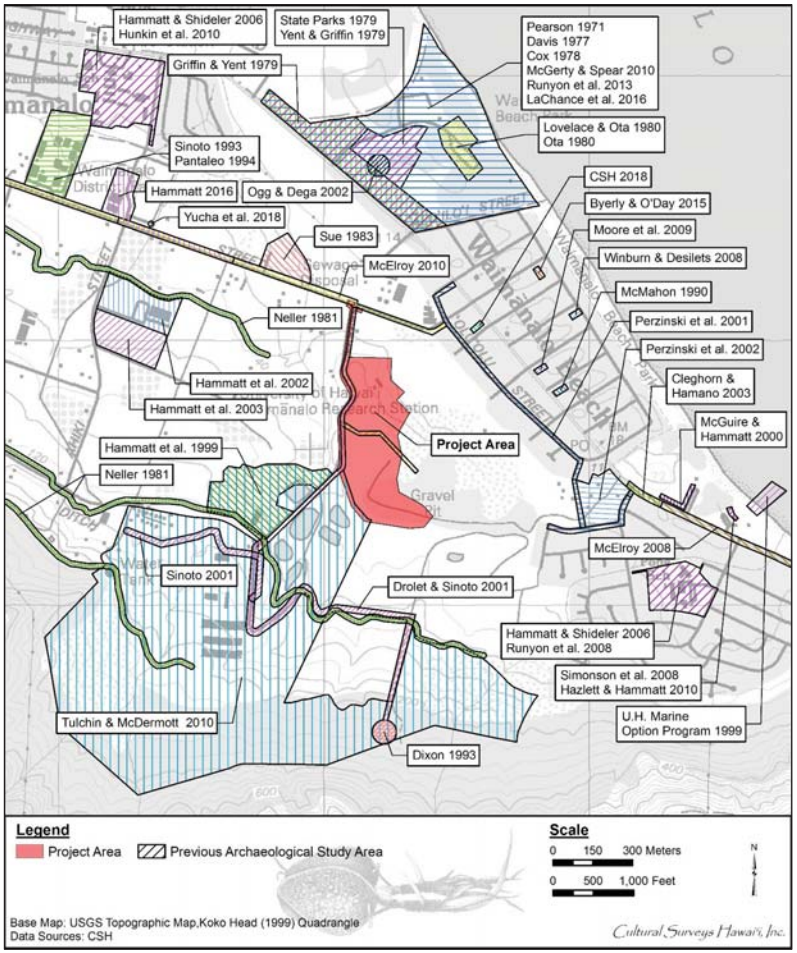


Figure 12. Location of previous archaeological studies in the vicinity of the project area

Table 1. Previous archaeological investigations near the project area

Reference	Nature of Study	Location	Results (SIHP # 50-80-15****)
McAllister 1933	Island-wide survey	O‘ahu	Identified three *heiau* (Sites 380, 381, and 382), a *pu‘uhonua* (Site 383), a fishpond (Site 383a), and abandoned coastal village (Site 384) in Waimānalo; none of these is near present project area
Pearson 1971	Archaeological reconnaissance survey	Waimānalo Bay State Recreation Area	Four-page account documenting two areas of possible archaeological interest; would become SIHP #s -512, a cultural deposit, and -513, two burials left in situ; no maps
Davis 1977	Phase I subsurface survey	Waimānalo Bay State Recreation Area	Took 195 cores at 177 stations; all cores sterile; two test excavations placed at SIHP # -512 and further work recommended; three test excavations placed at SIHP # -513 location, but burials could not be confirmed
Cox 1978	Archaeological monitoring	Waimānalo Bay State Recreation Area, fence, water, electrical, and sewer lines	Absence of finds in indicated vicinity of SIHP # - 513; burial discovered and a separate human mandible left in situ
Griffin and Yent 1979	Archaeological subsurface investigation	Waimānalo Bay State Recreation Area	No cultural resources identified in 48 test cores along Kalaniana‘ole Hwy
State Parks 1979	Archaeological monitoring and subsurface investigation	Waimānalo Bay State Recreation Area	Two small pit features noted during bulldozing in project area
Yent and Griffin 1979	Account of previously bulldozed area	Waimānalo Bay State Recreation Area, 250 ft wide next to hwy	Unauthorized bulldozing by Air Force in project area; no cultural remains identified
Lovelace and Ota 1980	Archaeological test coring report	Waimānalo Bay State Recreation Area	Excavated 14 cores in central/*makai* portion of park; no cultural deposits identified
Ota 1980	Archaeological monitoring	Waimānalo Bay State Recreation Area	No cultural remains identified
Neller 1981	Photographic study	Waimanalo Sugar Co. irrigation system	Photographic survey of former Waimanalo Sugar Co.’s irrigation system (SIHP # -4042)

Reference	Nature of Study	Location	Results (SIHP # 50-80-15****)
Sue 1983	Archaeological reconnaissance survey	Solid waste collection site at Waimānalo, TMK: [1] 4-1-009:266	No archaeological sites identified within surveyed area; no subsurface cultural deposits seen in bulldozed areas examined
McMahon 1990	Report of a DLNR burial removal	41-042 Manana St, *makai* of Kalaniana‘ole Hwy, Waimānalo, TMK: [1] 4-1-005:027	Human bones (SIHP # -4118) encountered during construction project for a wall; during removal of remains, no pit feature or deposit observed; flexed position of burial suggested traditional Hawaiian interment
Dixon 1993	Archaeological reconnaissance survey	BWS well sites including a Waimanalo Well III location at 360 ft elevation and its access road	No historic properties identified
Sinoto 1993	Archaeological surface assessment	12.4-acre Hawaii Job Corps Center in Waimānalo	No significant surface remains or other indications of past cultural activities identified
Pantaleo 1994a	Archaeological monitoring	12.4-acre Hawaii Job Corps Center in Waimānalo	No cultural remains or deposits identified
Pantaleo 1994b	Archaeological monitoring	12.4-acre Hawaii Job Corps Center in Waimānalo	No cultural remains or deposits identified
Hammatt et al. 1999	Archaeological inventory survey	Unisyn Biowaste Technology Facility	No historic properties identified
UH Marine Option Program 1999	Underwater survey	Waimanalo Landing	Documents machinery, pilings, and various pieces of loading equipment
McGuire and Hammatt 2000	Archaeological monitoring	Waimānalo Beach Park	No cultural materials or historic properties identified

Reference	Nature of Study	Location	Results (SIHP # 50-80-15****)
Drolet and Sinoto 2001	Archaeological inventory survey	Board of Water Supply Waimanalo Well III	SIHP # -4042, Waimanalo Irrigation System, consists of three features, most notably Kailua Ditch, with two other features consisting of Maunawili Ditch System and Waimānalo Pump Ditch System; remnant earthen railroad berm documented in study area; two stacked stone features (SIHP # -5876) observed in *mauka* portion of study area and interpreted as historic clearing mounds associated with agricultural pursuits of plantation workers
Perzinski et al. 2001	Archaeological monitoring	Roadways *mauka* of Kalaniana‘ole Hwy and Waimanalo Beach Lots subdivision	No historic properties identified
Sinoto 2001	Addendum archaeological inventory survey	New preferred transmission route for BWS Waimanalo Well III project, TMK: [1] 4-1-008:080	Addendum to original inventory survey completed in August 1999 and revised in February 2001 of a previously preferred route; no surface or exposed subsurface cultural remains encountered
Hammatt et al. 2002	Archaeological inventory survey	USDA Fruit Fly Production Facility	A plantation-era irrigation ditch, known as Tai-Lee Ditch (SIHP # -6427) identified along *makai* edge of study area
Ogg and Dega 2002	Archaeological testing and sampling report	“Sherwood Forest” (Waimanalo Bay) State Park	No cultural remains identified during removal of two underground storage tanks
Perzinski et al. 2002	Archaeological monitoring	*Kūpuna* housing project, *mauka* of Kalaniana‘ole Hwy	Three human burials and a cultural layer (SIHP # -5939) identified within Jaucas sand
Cleghorn and Hamano 2003	Archaeological monitoring	Sandwich Isles Communications Rural Fiber Optic Ductlines project, TMKs: [1] 4-1-037:001–003	One historic property identified consisting of a small charcoal pit and historic road bed (SIHP # -6518); assessed as not significant

Reference	Nature of Study	Location	Results (SIHP # 50-80-15****)
Hammatt et al. 2003	Addendum archaeological inventory survey	41-698 Ahiki St, Waimānalo, TMK: 4-1-026: por. 001	Approx. 9-acre parcel addressed; addendum to Hammatt et al. 2002 AIS study that originally addressed adjacent 6-acre project area immediately *makai*; no sites of any kind identified within project area
Hammatt and Shideler 2006	Archaeological literature review and field inspection	Blanche Pope Elementary School, Waimānalo	Archaeological monitoring program recommended because of presence of three burials and a cultural layer at a site 500 m NW of school
McElroy 2008	Archaeological monitoring	Kalaniana‘ole Hwy ROW, Sandy Beach Park to Waimānalo Beach Park	Eight isolated artifacts (pre- and post-Contact) throughout project corridor; one historic property identified: a disturbed cultural layer, SIHP # -6696, temporary use marine exploitation site
Runyon et al. 2008	Archaeological monitoring	Blanche Pope Elementary School, Waimānalo	No cultural materials or historic properties identified
Simonson et al. 2008	Archaeological inventory survey	Waimānalo Beach Park	One site near coast, NW of project area; SIHP # -7042, a pre-Contact subsurface cultural layer
Winburn and Desilets 2008	Archaeological assessment (archaeological inventory survey scope of work with no finds)	41-932 Laumilo St, Waimānalo, TMK: [1] 4-1-006:012	Archaeological investigation included excavation of four backhoe test trenches within areas to be affected; no evidence of traditional Hawaiian or early historic cultural deposition
Moore et al. 2009	Archaeological assessment	Property bounded by Kalaniana‘ole Hwy on its SW side and Hilu St on its NW side in Waimānalo, TMK: [1] 4-1-005:035	Four mechanically excavated backhoe trenches and four manually excavated shovel test pits; no historic properties identified
Hazlett and Hammatt 2010	Archaeological monitoring	Waimānalo Beach Park	Only sparse cultural material observed (disarticulated animal bone, a soda bottle, and two pit features)

Reference	Nature of Study	Location	Results (SIHP # 50-80-15****)
Hunkin et al. 2010	Archaeological monitoring	Waimānalo Elementary and Intermediate School, TMK: [1] 4-1-009:012	No historic properties identified during monitoring fieldwork; historic artifacts containing diagnostic attributes recovered from imported fill stratum, containing relative dates that coincide with modern (ca. 1950) renovation of school campus
McElroy 2010	Archaeological monitoring	‘Olu‘olu to Mekia St, Waimānalo	No cultural material or subsurface deposits identified
McGerty and Spear 2010	Summary of archaeological projects	Waimānalo Bay Beach Park	Summary of previous archaeological studies in Waimānalo Bay Beach Park area
Tulchin and McDermott 2010	Literature review and field inspection	CTAHR Waimānalo Experiment Station	Documented 12 historic properties, comprising 82 archaeological features; previously identified properties included SIHP #s -1031 (Pueo Heiau), -5876 (two stacked stone platforms), and -4042 (Waimānalo Ditch System); additional historic properties included post-Contact water control features, numerous mounds and terraces of indeterminate age, and pre-Contact Hawaiian habitation (or possible ceremonial structure) and agricultural terraces
Runyon et al. 2013	Archaeological inventory survey	Waimānalo Bay Beach Park Wastewater Reconstruction, TMK: [1] 4-1-015:015 por.	One historic property identified: SIHP # -7418, heavily disturbed buried A horizon likely associated with military use in 1940-1950s; two isolated and disarticulated human bones also identified
Byerly and O’Day 2015	Archaeological assessment	41-20 Hīhīmanu St, TMK: [1] 4-1-006:057	Backhoe testing of 100% of construction footprint to maximum depth of 1.7 m below ground surface; no evidence of archaeological historic properties
Hammatt 2016	Archaeological monitoring	Waimānalo District Park, TMK: [1] 4-1-009:264 and Hīhīmanu St	No historic properties identified

Reference	Nature of Study	Location	Results (SIHP # 50-80-15****)
LaChance et al. 2016	Archaeological monitoring	Waimānalo Bay Beach Park Wastewater Reconstruction, TMK: [1] 4-1-015:015 por.	No historic properties or human remains identified
CSH 2018	Native American Graves Protection and Repatriation Act Plan of Action	DHHL Loa Family Residence, Waimānalo	Codifies preservation in place of burial at house lot south of intersection of Kalaniana‘ole Hwy and Hīhīmanu St
Yucha et al. 2018	Archaeological evaluation and archaeological monitoring plan	Waimānalo District Park, TMK: [1] 4-1-009:264	No further archaeological work recommended for Waimānalo District Park siren location

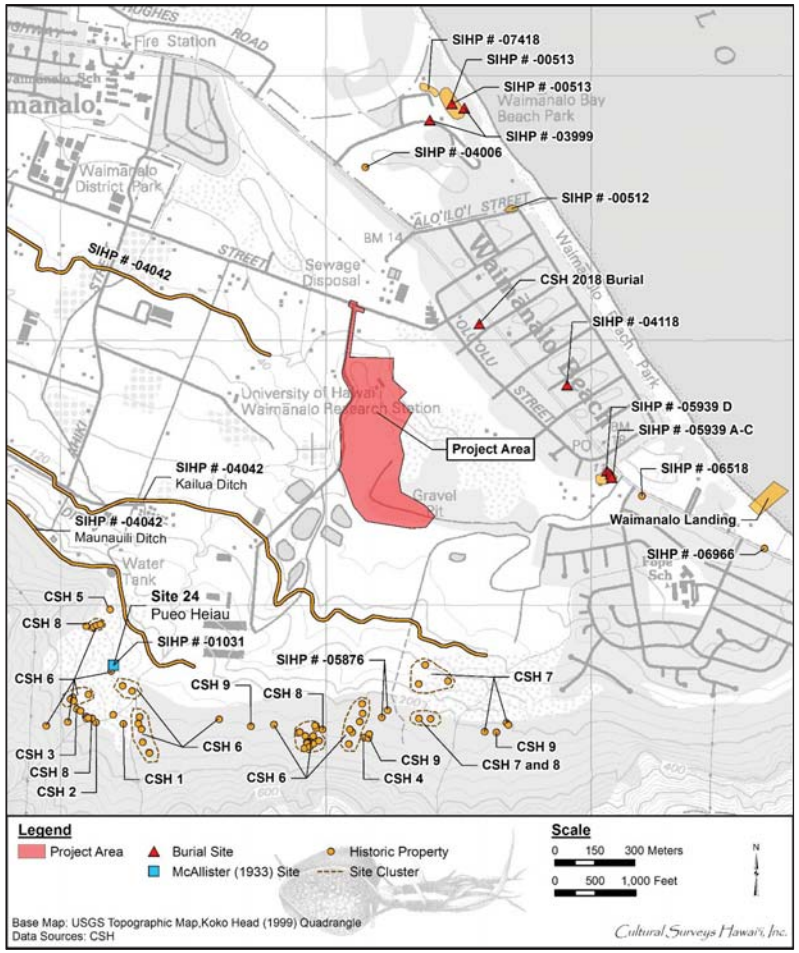


Figure 13. Previously identified historic properties in the vicinity of the project area (base map 1999 Koko Head USGS topographic quadrangle)

Table 2. Previously identified historic properties near the project area

SIHP # 50-80-15-	Description	Comment	Source
Site 24	Pueo Heiau	Remnants of a *heiau*	Thrum 1933, Anonymous 1933
512	Cultural deposit	Stratified deposit with midden and artifacts	Pearson 1971, Davis 1977 and 1978, Cox 1978
513	Burials (human)	Associated with two human burials in a dune in vicinity of Old Officers' Club, left in place; described in Pearson 1971 and an additional burial described in Cox 1978	Pearson 1971, Davis 1977 and 1978, Cox 1978
1031	Heiau ("Pueo Heiau")	Consisted of two parallel stacked stone walls, running in a NW-SE direction, joined at NW end by mounded basalt boulder and cobble ramp, and terminating at SE end at edge of a steep drainage; structures observed at SIHP # -1031 form a partially enclosed level soil area that abuts edge of a stream; two main parallel walls of SIHP # -1031 are bi-faced and constructed of stacked basalt boulders, 5-7 courses high; walls measure roughly 10 m long, 1.5 m wide, and 1.5 m high	Sterling and Summers 1978: 257, Tulchin and McDermott 2010:32, 37
3999	Burials (human)	SIHP # seemingly assigned at a later date for single, complete human flexed burial of an adult	Cox 1978
4006	Pit features	SIHP # seemingly assigned at a later date for two adjacent small pits, one apparently a fire pit	State Parks 1979
4042	Waimanalo Ditch System	Waimanalo Ditch System determined eligible for listing on National Register of Historic Places in 1981 (Kelly and Nakamura 1981), but currently not listed on either State or National Register	Kelly and Nakamura 1981, Drolet and Sinoto 2001, Tulchin and McDermott 2010:37–40
4118	Burial (human)	Burial at 41-042 Manana St, *makai* of Kalaniana‘ole Hwy	McMahon 1990, Douglas and Pietrusewsky 1990

SIHP # 50-80-15-	Description	Comment	Source
5876	Platforms	Two stacked-stone platforms	Drolet and Sinoto 2001, Tulchin and McDermott 2010:40–44
5939 A-C	Burials (human)	Three human burials encountered during construction of *kūpuna* housing project, *mauka* of Kalaniana‘ole Hwy	Perzinski et al. 2002
5939 D	Subsurface cultural layer	Cultural layer encountered during construction activities within Jaucas sand	Perzinski et al. 2002
6518	Small charcoal pit and historic road bed	Identified as one historic property during archaeological monitoring for Fiber Optic Ductlines project and assessed as not significant	Cleghorn and Hamano 2003
6966	Cultural layer	Disturbed cultural layer (note McElroy 2008 uses both final SIHP #s -6696 and -6966 for this site; -6966 believed to be correct)	McElroy 2008
7418	Buried A horizon	Heavily disturbed buried A horizon associated with military use in 1940-1950s at Waimānalo Bay Beach Park	Runyon et al. 2013
CSH 1	Terraces	Series of terraces situated within shallow drainage, at elevation of 300 ft AMSL that likely has agricultural function	Tulchin and McDermott 2010:44–46
CSH 2	Platform and wall	Consists of stacked stone platform and wall situated along banks of a drainage, at elevation of 330 ft that likely has agricultural function	Tulchin and McDermott 2010:47
CSH 3	Platform and mounds	Consists of large stone platform (Feature A) with a cluster of mounds (Feature B) in immediate vicinity	Tulchin and McDermott 2010:47
CSH 4	Terraces	Consists of two terraces at elevation of 280 ft with indications of agricultural and burial functions	Tulchin and McDermott 2010:53
CSH 5	Enclosure	Large oval-shaped enclosure encompassing soil swale; enclosure constructed of stacked basalt boulders and cobbles, two to six courses high; enclosure measures approx. 35 m long and 20 m wide with wall heights ranging from 0.30 m to 1.2 m	Tulchin and McDermott 2010:58

SIHP # 50-80-15-	Description	Comment	Source
CSH 6	Platforms and mounds	Fifty platforms and/or mounds consisting of well-constructed rectangular structures free-standing and faced on all sides; function uncertain	Tulchin and McDermott 2010:58
CSH 7	Mounds	Seven mounds, likely agricultural clearing mounds	Tulchin and McDermott 2010:62
CSH 8	Walls	Five well-constructed bi-faced stacked wall segments possibly associated with water control	Tulchin and McDermott 2010:62
CSH 9	Terraces	Four terraces constructed of stacked basalt boulders and cobbles, two to four courses high, and situated cross slope	Tulchin and McDermott 2010:64
Waimanalo Landing	Remains of a former wharf	Underwater survey of remains of Waimanalo Landing, in near-shore waters of Waimānalo Beach Park identified remains of pier, machinery, pilings, loading equipment, and various other material remains	UH Marine Option Program 1999
CSH 2018 Burial	Burial (human)	Skeleton of complete, articulated, partially flexed (in partial fetal position) individual	CSH 2018

5.1.1 Pearson 1971

Richard Pearson (1971) took a university class on a field exercise to the Waimānalo Bay Beach Park for a survey. Two features were found exposed on the eroding sand dunes, a cultural layer with shell midden and basalt flakes, designated SIHP # -512, and two human burials in a dune in the vicinity of the Old Officers’ Club, designated SIHP # -513. The burials were left in place.

5.1.2 Davis 1977 (and 1978)

Bertell Davis (1977 and 1978) of the Archaeological Research Center Hawaii conducted a testing investigation for the project area only in areas for proposed construction. A primary concern of the project was to relocate SIHP #s -512 and -513, first identified by Pearson in 1971. SIHP # -513, the location of the burial and isolated mandible, could not be confirmed, but coring at SIHP # -512 identified a stratified deposit with midden and artifacts. One hundred ninety-five cores were drilled at 177 stations. Thirteen cores were drilled near SIHP # -512, but cultural material was found in only two of the cores. These two cores had a 6-cm-thick stratum of gray sand with charcoal flecks and organic debris; rusted metal was also present.

5.1.3 Cox 1978

David Cox (1978) of the Archaeological Research Center Hawaii reported on archaeological monitoring of fence line, water line, electrical line, sewer line, and other park development activities. He starts by noting the prior identification of two pre-Contact sites (SIHP #s -512 and -513). Archaeological monitoring took place in October and November 1977. The study notes the absence of evidence of SIHP # -513 making the site boundary more definite by showing where it was not present.

A human burial was encountered with the location information as follows:

> Approximately 150 meters *mauka* of the assumed location of Site 513, a single human burial was located. The burial was in the east face of the trench for the 2” sewer force main serving restroom #1, midway between the existing 6” waterline, and the point of turn in line, or 150 meters south of restroom #1 along the sewer line. [Cox 1978:3]

The older adult was “reinterred in the same location” with engineers flagging tape within 15 cm of the surface and some iron reinforcing bar.

A mandible of another individual was located in the spoils pile along the beachfront 6-inch water main and was reburied in the approximate location of the find “at 130 cm in depth, 135 m southeast of the 6-inch TEE serving restroom #1 area.

The only other cultural material reported was a worked bone artifact—possibly a fishhook blank excavated while looking for the remainder of Burial #2. No map is supplied and thus find locations are not altogether clear.

5.1.4 Griffin and Yent 1979

Agnes Griffin and Martha Yent (1979) of the Division of State Parks wrote a memo to the SHPD on 23 August 1979 regarding a subsurface coring project at the park, conducted in June 1979, before proposed vegetation clearing in an area adjacent to Kalaniana‘ole Highway. Forty-

eight holes were hand-augured in two lines parallel to the highway. No cultural deposits were noted in any of the cores.

5.1.5 State Parks In-House Contract Archaeological Team 1979

Between 9 October 1979 and 1 November 1979, the State Parks Division monitored and excavated tests in the *mauka* and central portions of the park before proposed vegetation clearance (State Parks In-House Contract Archaeological Team 1979). They also monitored the excavation of five large trenches, which were used to bury cut vegetation, wrecked cars, and assorted trash generated during the vegetation clearance project. During the bulldozing for one of these trenches, two pit features were exposed. The soil from these two isolated, small pits was screened; they contained thin ash lenses, fire-cracked rock, and two marine shell fragments. The features were not given a feature or site designation, and they were completely excavated, so there were no in situ remains.

5.1.6 Yent and Griffin 1979

Martha Yent and Agnes Griffin (1979) of the Division of State Parks wrote a memo to the SHPD on 10 October 1979 reporting on unauthorized bulldozing in the park conducted by the U.S. Air Force in August 1979. This bulldozing took place on both sides of the entrance road. Vegetation was cleared, the upper 6 inches of soil was graded, and the soil and vegetation was pushed into piles. The archaeologists mapped the bulldozed area, but no other field work was conducted at this time.

5.1.7 Lovelace and Ota 1980

On 23 July 1980, George Lovelace and Jason Ota (1980) of the State Parks Division sent a memo to the SHPD reporting on a subsurface coring project in the park conducted on 17–18 July 1980. The project preceeded construction of a new parking lot *makai* of the existing parking lot. Fourteen cores were excavated. No cultural deposits were found.

5.1.8 Ota 1980

On 4 December 1980, Jason Ota (1980) of the State Parks Division reported on archaeological monitoring conducted on 1 December 1980, for the grubbing of a proposed parking area. This was the second phase of work for the parking area (see Lovelace and Ota 1980, above), and consisted of monitoring the vegetation clearance. No cultural material, except recent trash, was noted in the bulldozer scoops.

5.1.9 Neller 1981

Earl Neller (1981) produced a photo survey report of the Waimanalo Ditch System. Maps are included but there is minimal text.

5.1.10 Sue 1983

Roy Sue, then State Parks Administrator, documented an archaeological reconnaissance survey of a solid waste collection site at Waimānalo (TMK: [1] 4-1-009:266). State Parks archaeologists Martha Yent and Jason Ota conducted an archaeological reconnaissance survey of the solid waste collection site. No archaeological sites were located within the surveyed area and no subsurface cultural deposits were seen in the bulldozed areas examined.

5.1.11 McMahon 1990 and Douglas and Pietrusewsky 1990

Nancy McMahon, then staff archaeologist with the Department of Land and Natural Resources Historic Preservation Program, prepared a report (McMahon 1990) for a burial (SIHP # -4118) removal at 41-042 Manana Street, *makai* of Kalaniana‘ole Highway, Waimānalo, (TMK: [1] 4-1-005:027). The human bones were encountered during a construction project for a wall. During removal of the remains, no pit feature or deposit was observed. The flexed position of the burial suggested a traditional Hawaiian interment. A companion osteological report (Douglas and Pietrusewsky 1990) described the find as the nearly complete remains of a female aged 45-50 years. They note, “The left half of the mandible of an immature dog was found by the construction workers. Its exact association is not known” (Douglas and Pietrusewsky 1990:3). The osteological study relates that “Following analysis these remains are to be returned to the property owners for reinterment” (Douglas and Pietrusewsky 1990:5), but the specifics of reinterment are not known.

5.1.12 Dixon 1993

The Anthropology Department, Bernice Pauahi Bishop Museum (Dixon 1993) produced an archaeological reconnaissance report addressing five Board of Water Supply Wells on O‘ahu including a Waimanalo Well III location at 360-ft elevation and its access road. The study reports that “The Waimanalo III well site, on the other hand, has not been impacted by urban or commercial agricultural development, but does appear to have deforested and partially graded, both by historic ranching and more recent powerline construction” (Dixon 1993:13).

5.1.13 Sinoto 1993

Aki Sinoto Consulting (Sinoto and Pantaleo 1994) conducted an archaeological surface assessment of a 12.4-acre Hawaii Job Corps Center in Waimānalo located on the *makai* side of Hīhīmanu Street, behind the Waimānalo Elementary and Intermediate School. No significant surface remains or other indications of past cultural activities were encountered.

5.1.14 Pantaleo 1993

Jeffrey Pantaleo Consultants (Pantaleo 1993), working with Aki Sinoto Consulting, wrote a one-page account of observations at a footing trench at the Hawaii Job Corps Center in Waimānalo. A 50-m trench 0.9 m deep was examined. Only one stratigraphic layer was observed. No cultural remains or deposits were identified during the inspection.

5.1.15 Pantaleo 1994a

Jeffrey Pantaleo Consultants (Pantaleo 10 January 1994), working with Aki Sinoto Consulting, wrote a two-page account of observations at footing trenches at the Hawaii Job Corps Center in Waimānalo. No cultural remains or deposits were identified during the inspection.

5.1.16 Pantaleo 1994b

Jeffrey Pantaleo Consultants (Pantaleo 11 April 1994), working with Aki Sinoto Consulting, wrote a two-page account of observations at sewer line trenches and an access road at the Hawaii Job Corps Center in Waimānalo. No cultural remains or deposits were identified during the inspection.

5.1.17 Hammatt et al. 1999

CSH (Hammatt et al. 1999) conducted an archaeological inventory survey (AIS) of the 21.25-acre Unisyn Biowaste Technology Property at Waimānalo (TMK: [1] 4-1-026:004). No prehistoric archaeological features were identified. The existing ground conditions show overwhelming evidence of former sugarcane cultivation (and coffee plantings in one small plot) with dramatic modification of the land surface in all areas except the steepest slopes.

5.1.18 UH Marine Option Program 1999

The University of Hawai‘i Marine Option Program (1999) conducted an underwater survey of the remains of Waimanalo Landing in the nearshore waters of Waimānalo Beach Park. The remains of the pier, machinery, pilings, loading equipment, and various other material remains were observed, though no SIHP number was assigned to the site area.

5.1.19 McGuire and Hammatt 2000

McGuire and Hammatt (2000) conducted archaeological monitoring during the installation of light poles at a ball-field at Waimānalo Beach Park. No cultural material was observed.

5.1.20 Drolet and Sinoto 2001

Aki Sinoto Consulting (Drolet and Sinoto, 2001) conducted an AIS for a BWS Waimanalo Well III (TMKs: [1] 4-1-008:005, 079, and 080). The project area consisted of the well production facility located at the foot of the Ko‘olau Range and the preferred corridor for the transmission pipeline ROW located between the well site and Hīhīwai Street. Three areas of significance and one possible remnant of a historic railroad were found within the project area. Of the three, one was previously recorded; the Kailua Ditch, a part of the Waimanalo Irrigation System (SIHP # -4042). Two stacked stone structures (designated SIHP # -5876 Features 1 and 2) located near the well facility were previously unknown and underwent mapping and other documentation. The railroad berm was considered to lack integrity and to be no longer significant.

5.1.21 Perzinski et al. 2001

CSH conducted archaeological monitoring of the installation of fiber optic cable lines along roadways *mauka* of Kalaniana‘ole Highway and the Waimānalo Beach Lots subdivision (Perzinski et al. 2001). No historic properties were identified.

5.1.22 Sinoto 2001

Aki Sinoto Consulting (Sinoto 2001) produced a brief addendum AIS for a new preferred transmission route for a BWS Waimanalo Well III project (TMK: [1] 4-1-008:080.) The survey was an addendum to the original inventory survey of a previously preferred route completed in August 1999 and revised in February 2001. No surface or exposed subsurface cultural remains were encountered during the survey. Subsurface testing was not regarded as warranted.

5.1.23 Hammatt Shideler and Bush 2002

CSH (Hammatt et al. 2002) conducted an AIS of a 6-acre parcel in support of modifications to the USDA Hawai‘i Fruit Fly Production Facility at Waimānalo (TMK: [1] 4-1-026:001 por.). No sites of any kind were identified within their project area per se. No traditional Hawaiian archaeological features were observed within their project area nor are any known from the general vicinity. The seaward or north edge of their project area, however, was demarcated by a ditch

understood as the Tai-Lee Ditch associated with the individual of that name and the Chinese sugarcane growing period of 1876-1900. This Tai-Lee Ditch is a historic property designated as SIHP # -6427. Much of the ditch is earthen without improvements, although portions are lined with concrete and some water diversion and engineering constructions are present.

5.1.24 Ogg and Dega 2002 (and Dega 2000)

In 2002, archaeologists from Scientific Consultant Services conducted archaeological subsurface testing during the removal of two underground storage tanks (USTs) in the park (Dega 2000; Ogg and Dega 2002). The USTs had been interred in the ground around 1942 as a gasoline supply. Thirteen trenches were excavated, but no cultural remains were noted.

5.1.25 Perzinski et al. 2002

CSH conducted archaeological monitoring during the construction of a *kūpuna* housing project, *mauka* of Kalaniana‘ole Highway (Perzinski et al. 2002). Three human burials and a cultural layer designated as SIHP # -5939 were encountered during construction activities within Jaucas sand. The cultural layer was discontinuous and not observed within the *mauka* portion of the project area. Additionally, the cultural layer appears to be associated with the historic era (ca. post-1870s to 1950s); observed disturbance within the cultural layer was believed to represent plantation-era activity in the project area. Due to heavy disturbance within the project area, it was difficult to determine if the cultural layer was also possibly associated with pre-Contact or early post-Contact occupation. No distinct burial pits were observed and “none of the burials were recovered *in situ,* though they all appeared to have been associated with the cultural layer” (Perzinski et al 2002:28). Two individuals were determined to be adults, with “Burial #1” representing an “adult, male individual based on dentition, narrow subpubic angle and sciatic notch” (Perzinski et al. 2002:28); sex or age was not given for the third individual.

5.1.26 Hammatt et al. 2002, 2003

CSH conducted an AIS of the USDA Fruit Fly Production Facility, within the University of Hawai‘i Agricultural Experiment Station (Hammatt et al. 2002). The study area was formerly under sugarcane cultivation. No historic properties were identified within the study area. However, a plantation-era irrigation ditch, known as the Tai-Lee Ditch (SIHP # -6427), was observed along the *makai* edge of the study area. CSH subsequently conducted an addendum to the inventory survey for a planned expansion of the facility (Hammatt et al. 2003).

5.1.27 Cleghorn and Hamano 2003

Pacific Legacy conducted archaeological monitoring for the Sandwich Isles Communications Rural Fiber Optic Ductlines project (TMKs: [1] 4-1-037:001–003). One historic property was identified consisting of a small charcoal pit and historic road bed (SIHP # -6518) and assessed as not significant.

5.1.28 Hammatt et al. 2003

CSH (Hammatt et al. 2003) produced an addendum to an AIS addressing an approximately 9-acre parcel at 41-698 Ahiki Street in support of expansion of the USDA Hawai‘i Fruit Fly Production Facility, at Waimānalo (TMK: [1] 4-1-026: Por. 001). This was an addendum to the Hammatt et al. 2002 AIS study that originally addressed an adjacent 6-acre project area immediately *makai*. No sites of any kind were identified within the 2003 project area.

5.1.29 Hammatt and Shideler 2006

CSH performed a literature review and field inspection (Hammatt and Shideler 2006) at six Department of Education (DOE) schools, including Blanche Pope Elementary in Waimānalo, in support of wastewater improvement projects at the schools. An archaeological monitoring program was recommended for the wastewater improvement project because of the presence of three human burials and a cultural layer at a site 500 m to the northwest of the school.

5.1.30 McElroy 2008

Garcia and Associates (GANDA) completed archaeological monitoring (McElroy 2008) of the construction and installation of new fiber optic duct lines in the Kalaniana‘ole Highway ROW from Sandy Beach Park, along the southeast shore of O‘ahu, to Waimānalo Beach Park. Eight isolated artifacts were collected throughout the project corridor and included a basalt canoe breaker, a triangular stone, four glass bottles, and two shells with possible drilled holes. A disturbed cultural layer was identified near Muliwai‘ōlena Stream in Waimānalo and was designated SIHP # 6696. SIHP # -6696 contained pre- and post-Contact cultural material as well as modern material and was interpreted as a temporary use marine exploitation area.

5.1.31 Runyon et al. 2008

CSH conducted archaeological monitoring of a wastewater improvement project at Blanche Pope Elementary in Waimānalo. Archaeological monitoring was carried out following the completion of a literature review and field inspection (Hammatt and Shideler 2006). No cultural materials were observed, and no historic properties were identified.

5.1.32 Simonson et al. 2008

CSH conducted an AIS (Simonson et al. 2008) at Waimānalo Beach Park for reconstruction of a wastewater system. A pre-Contact subsurface cultural layer containing midden (marine shell, sea urchin, faunal bone, coral and mammal bone), fire-cracked rock, charcoal deposits, and lithic debitage (basalt flakes) was identified and designated SIHP # -7042.

5.1.33 Winburn and Desilets 2008

Garcia & Associates (Winburn and Desilets 2008) produced an archaeological assessment report (AIS scope of work with no finds) for a septic upgrade and house addition at a residence at 41-932 Laumilo Street, Waimānalo (TMK: [1] 4-1-006:012). The archaeological investigation included excavation of four backhoe test trenches within the areas to be affected. There was no evidence of traditional Hawaiian or early historic cultural deposition.

5.1.34 Moore et al. 2009

Archaeological Consultants of the Pacific, Inc. (Moore et al. 2009) conducted an archaeological assessment for a property bounded by Kalaniana‘ole Highway on its southwestern side, Hilu Street on its northwestern side, and private residences to the southeast and northeast in Waimānalo (TMK: [1] 4-1-005:035). The work included four mechanically excavated backhoe trenches and four manually excavated shovel test pits. No historic properties were identified.

5.1.35 Hazlett and Hammatt 2010

During archaeological monitoring at the Waimānalo Beach Park for reconstruction of a wastewater system project (Hazlett and Hammatt 2010), only sparse cultural material was observed (disarticulated animal bone, a soda bottle, and two pit features).

5.1.36 Hunkin et al. 2010

CSH (Hunkin et al. 2010) conducted archaeological monitoring for the reconstruction of wastewater systems at Waimānalo Elementary and Intermediate School (TMK: [1] 4-1-009:012). Excavations included extensive trenching (depths ranging to approximately 2 mbs); pit excavations for cesspools and pump stations (approximately 2 mbs); and probing activities to very shallow depths (<1 mbs) to locate existing utilities. Approximately 670 m of trenching was conducted. No historic properties were identified during the monitoring fieldwork. Historic artifacts containing diagnostic attributes were recovered from an imported fill stratum, containing relative dates that coincide with the modern (ca. 1950) renovation of the school campus.

5.1.37 McElroy 2010

Garcia & Associates (McElroy 2010) conducted archaeological monitoring for a Sandwich Isles Communications fiber optic duct lines project on ‘Olu‘olu to Mekia Street in Waimānalo. The total length of the trenching was 3.64 km. No cultural material or subsurface deposits were encountered.

5.1.38 McGerty and Spear 2010

Scientific Consultant Services (McGerty and Spear 2010) produced a summary of previous archaeological studies conducted in Waimānalo Bay Beach Park (TMK: [1] 4-1-015:015). The purpose of this summary was to determine the extent of previous archaeological research at the park, review the results of that research, and make recommendations concerning future archaeological work as the Waimānalo Bay Beach Park Master Plan is put into place.

5.1.39 Tulchin and McDermott 2010

CSH conducted a literature review and field inspection of the approximately 280-acre CTAHR Waimānalo Experiment Station located in the southeastern portion of Waimānalo Valley (Tulchin and McDermott 2010). Twelve historic properties, comprising 82 archaeological features, were identified during the field inspection. Three of the documented historic properties, SIHP #s -1031 (Pueo Heiau), -5876 (two stacked stone platforms), and -4042 (the Kailua Ditch, a component of the former Waimanalo Sugar Company’s irrigation system) were previously identified during prior archaeological studies conducted within their project area (Bartholomew and Associates 1959; Drolet and Sinoto 2001; McAllister 1933; Sterling and Summers 1978). Additional historic properties identified during the pedestrian inspection included post-Contact water control features, numerous mounds and terraces of indeterminate age, and pre-Contact Hawaiian habitation (or possible ceremonial structure as determined by the size, construction style, and feature types observed) and agricultural terraces. A majority of the observed historic properties were situated within a relatively undeveloped strip of land fronting the Ko‘olau Mountain range (i.e., the *mauka* portion of their project area). The relative absence of historic properties within the *makai* portion of their project area was attributed to extensive historic and modern land modifications associated with sugar cultivation and dairy farming.

5.1.40 Runyon et al. 2013

CSH (Runyon et al. 2013) conducted an AIS for a Waimānalo Bay Beach Park wastewater reconstruction project (TMK: [1] 4-1-015:015 por.) One historic property was identified during this investigation: SIHP # -7418, a heavily disturbed buried A horizon likely associated with military use in the 1940-1950s. Two isolated and disarticulated human bones identified in imported sand fill—hence lacking cultural context—are understood as not constituting a historic property or part of a historic property, but are nevertheless significant under Criterion e.

5.1.41 Byerly and O'Day 2015

Garcia & Associates (Byerly and O'Day 2015) conducted an archaeological assessment for construction of a residential swimming pool at 41-20 Hīhīmanu Street (TMK: [1] 4-1-006:057). Fieldwork consisted of backhoe testing 100% of the construction footprint to a maximum depth of 1.7 m below ground surface. There was no evidence of archaeological historic properties.

5.1.42 Hammatt 2016

CSH (Hammatt 2016) conducted archaeological monitoring for the Waimānalo District Park Sewer Improvements project (TMK: [1] 4-1-009:264 and Hīhīmanu Street). The project involved the installation of a new sewer system at Waimānalo District Park including the replacement of three existing cesspools with three pump stations; the installation of 1-1/4-inch and 1-1/2-inch sewer lines leading from the pump stations to Hīhīmanu Street; and the installation of an 8-inch gravity sewer line along the *makai* side of Hīhīmanu Street connecting the pump station lines to an existing sewer manhole at Nonokio Street. No historic properties were identified. It was concluded that:

> The absence of cultural deposits may be attributed to the decades of ground disturbance (i.e., alternating episodes of soil tilling and crop planting) that occurred within the project area due to historic agricultural activities associated with the Waimānalo Sugar Company, as well as from modern disturbances associated with the development of Waimānalo District Park. [Hammatt 2016:ii]

5.1.43 LaChance et al. 2016

CSH (LaChance et al. 2016) conducted archaeological monitoring for a Waimānalo Bay Beach Park Wastewater Reconstruction project (TMK: [1] 4-1-015:015 por.). The proposed project involved the reconstruction of the park's wastewater system. Ground disturbance included installation of subsurface sewer lines, electrical conduits, entrance and exit pits for pipe slip-lining, open trenching for sewer line installation, demolition and removal of old system components (pre-loader tanks, pump stations, cesspools, etc.), and installation of new system components. No historic properties or human remains were encountered during archaeological monitoring of construction activities. A potential buried A horizon was observed near the caretaker's house but was only distinguished by gray staining in the Jaucas sand, and it contained no cultural indicators such as charcoal or midden. This potential A horizon is interpreted as being modern and as not correlating with the buried A horizon (SIHP # -7418) identified during the project's AIS (Runyon et al. 2013).

5.1.44 CSH 2018

CSH produced a Native American Graves Protection and Repatriation Act Plan of Action addressing a burial found on a Department of Hawaiian Home Lands Loa Family Residence Redevelopment project south of the intersection of Kalaniana‘ole Highway and Hīhīmanu Street in Waimānalo The Plan of Action codifies preservation in place of the skeleton of a complete, articulated, partially flexed (in partial fetal position) individual at a house lot.

5.1.45 Yucha et al. 2018

CSH (Yucha et al. 2018) produced an archaeological evaluation and archaeological monitoring plan for the State Department of Defense Emergency Siren Modernization Program addressing 14 locations on O‘ahu. This study addressed a proposed siren location at Waimānalo District Park, (TMK: [1] 4-1-009:264) to be located quite close to an existing siren. No further archaeological work was recommended for the Waimānalo District Park siren location.

Section 6 Community Consultation

6.1 Introduction

Throughout the course of this assessment, an effort was made to contact and consult with Native Hawaiian Organizations (NHOs), agencies, and community members including descendants of the area, in order to identify individuals with cultural expertise/and or knowledge of the *ahupua‘a* of Waimānalo. CSH initiated its outreach effort in November 2018 through letters, email, telephone calls, and in-person contact. CSH completed the community consultation in July 2019.

6.2 Community Contact Letter

Letters (Figure 14 and Figure 15) along with a map and aerial photograph of the project area were mailed with the following text.

> At the request of The Limtiaco Consulting Group and on behalf of the Department of Hawaiian Homelands (DHHL), Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a cultural impact assessment (CIA) for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu, TMKs: [1] 4-1-008:002 (por.), 093, 094, 095, 096. The project area is located immediately east of Waikupanaha Street. The project area is depicted on the 1999 Koko Head U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle and a 2013 Google Earth aerial photograph.
>
> The proposed Waikupanaha Agricultural Lots Project will consolidate and re-subdivide the project site, which encompasses approximately 30 acres. The project will allow the DHHL to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. These agricultural lots or Subsistence Agricultural Homesteads (SAH) will be used specifically for agriculture, but Native Hawaiian beneficiaries will have the option of constructing housing on the lots.
>
> In 2017, DHHL updated its administrative rules to allow for SAHs of not more than 3 acres in size. The rules specify that lessees are required within three years to: 1) reside and cultivate subsistence agriculture on their lots, or 2) actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes. Lot sizes and configurations will be determined after consultation with Native Hawaiian beneficiaries and the general public; lots will also be influenced by existing conditions such as topography and drainage features. Infrastructure design will depend on lot sizes and discussions with appropriate state and county agencies. At this time, DHHL anticipates that the Waikupanaha subdivision will most likely consist of lots no more than 1 acre in size. Infrastructure for the project will be designed to comply with regulatory standards that consider the health and safety of residents but are appropriate for a rural area.

Cultural Surveys Hawai‘i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

P.O. Box 1114 Kailua, Hawai‘i 96734 Ph: (808) 262-9972 Fax: (808) 262-4950

Job code: WAIMANALO 30 ktanaka@culturalsurveys.com bbeauchan@culturalsurveys.com www.culturalsurveys.com

November 2018

Aloha,

At the request of The Limtiaco Consulting Group and on behalf of the Department of Hawaiian Homelands (DHHL), Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a cultural impact assessment (CIA) for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu, TMKs: [1] 4-1-008:002 (por.), 093, 094, 095, 096. The project area is located immediately east of Waikupanaha Street. The project area is depicted on the 1999 Koko Head U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle and a 2013 Google Earth aerial photograph (Figure 1 and Figure 2).

The proposed Waikupanaha Agricultural Lots Project will consolidate and re-subdivide the project site, which encompasses approximately 30 acres. The project will allow the DHHL to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. These agricultural lots or Subsistence Agricultural Homesteads (SAH) will be used specifically for agriculture, but Native Hawaiian beneficiaries will have the option of constructing housing on the lots.

In 2017, DHHL updated its administrative rules to allow for SAHs of not more than 3 acres in size. The rules specify that lessees are required within three years to: 1) reside and cultivate subsistence agriculture on their lots, or 2) actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes. Lot sizes and configurations will be determined after consultation with Native Hawaiian beneficiaries and the general public; lots will also be influenced by existing conditions such as topography and drainage features. Infrastructure design will depend on lot sizes and discussions with appropriate state and county agencies. At this time, DHHL anticipates that the Waikupanaha subdivision will most likely consist of lots no more than 1 acre in size. Infrastructure for the project will be designed to comply with regulatory standards that consider the health and safety of residents but are appropriate for a rural area.

The purpose of this CIA is to gather information about the project area and its surroundings through research and interviews with individuals knowledgeable about this area in order to assess potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the planned project. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- **General history as well as present and past land use of the project area**
- **Knowledge of cultural sites that may be impacted by future development of the project area—for example, historic and archaeological sites, as well as burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**

Figure 14. Community consultation letter page one

WAIMANALO 30 – CIA for the Waikupanaha Agricultural Lots Project

Page 2

- **Cultural associations of the project area, such as *mo‘olelo* and traditional uses.**
- **Referrals of *kūpuna* or elders and *kama‘āina* who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua‘a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.**

In advance, we appreciate your assistance in our research effort. If you are interested in participating in this study, please contact Kellen Tanaka at ktanaka@culturalsurveys.com or Brittany Beauchan at bbeauchan@culturalsurveys.com. We are also available by phone at (808) 262-9972.

Mahalo nui loa,

Kellen Tanaka
Cultural Researcher

And

Brittany Beauchan
Cultural Researcher

Figure 15. Community consulation letter page two

The purpose of this CIA is to gather information about the project area and its surroundings through research and interviews with individuals knowledgeable about this area in order to assess potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the planned project. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- General history as well as present and past land use of the project area
- Knowledge of cultural sites that may be impacted by future development of the project area—for example, historic and archaeological sites, as well as burials.
- Knowledge of traditional gathering practices in the project area, both past and ongoing.
- Cultural associations of the project area, such as *mo‘olelo* and traditional uses.
- Referrals of *kūpuna* or elders and *kama‘āina* who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua‘a* lands.
- Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.

In May 2019, CSH was notified about a change to the project area, which include improvents along Waikupanaha Street, extending along the eastern edge of the original project area to its intersection with Hihimanu Street. Revised letters (Figure 16) along with a map and aerial photograph of the project area were mailed with the following revised text.

In 2018, Cultural Surveys Hawai‘i (CSH) at the request of The Limtiaco Consulting Group, and on behalf of the Department of Hawaiian Homelands (DHHL), reached out to the Waimānalo community regarding a cultural impact assessment (CIA) for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu, TMKs: [1] 4-1-008:002 (por.), 093, 094, 095, 096. If you will remember from past consultation, the purpose of the proposed Waikupanaha Agricultural Lots project is to consolidate and re-subdivide the project site, which encompasses approximately 30 acres, to allow the DHHL to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. These agricultural lots or Subsistence Agricultural Homesteads (SAH) will be used specifically for agriculture, but Native Hawaiian beneficiaries will have the option of constructing housing on the lots. We would once again like to thank the community for their assistance and for sharing their valuable *mana‘o* on this project.

Recently, CSH was notified of a change to the project area, which will be expanded to include improvements along Waikupanaha Street, extending along the eastern edge of the original project area to its intersection with Hihimanu Street. This change to the project area is depicted in the attached figures (please refer to Figure 1 and Figure 2 noting “Original Project Area” and Figure 3 and Figure 4 noting

Cultural Surveys Hawai‘i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

P.O. Box 1114 Kailua, Hawai‘i 96734 Ph: (808) 262-9972 Fax: (808) 262-4950

Job code: WAIMANALO 30 ktanaka@culturalsurveys.com www.culturalsurveys.com

June 2019

Aloha,

In 2018, Cultural Surveys Hawai‘i (CSH) at the request of The Limtiaco Consulting Group, and on behalf of the Department of Hawaiian Homelands (DHHL), reached out to the Waimānalo community regarding a cultural impact assessment (CIA) for the Waikupanaha Agricultural Lots Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu, TMKs: [1] 4-1-008:002 (por.), 093, 094, 095, 096. If you will remember from past consultation, the purpose of the proposed Waikupanaha Agricultural Lots project is to consolidate and re-subdivide the project site, which encompasses approximately 30 acres, to allow the DHHL to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. These agricultural lots or Subsistence Agricultural Homesteads (SAH) will be used specifically for agriculture, but Native Hawaiian beneficiaries will have the option of constructing housing on the lots. We would once again like to thank the community for their assistance and for sharing their valuable *mana‘o* on this project.

Recently, CSH was notified of a change to the project area, which will be expanded to include improvements along Waikupanaha Street, extending along the eastern edge of the original project area to its intersection with Hihimanu Street. This change to the project area is depicted in the attached figures (please refer to Figure 1 and Figure 2 noting “Original Project Area” and Figure 3 and Figure 4 noting “Revised Project Area”). While the original project area included approximately 30 acres, with the additions along the rights-of-way of Waikupanaha and Hihimanu Streets, the project area is now approximately 32.5 acres. These street rights-of-way improvements will generally consist of asphalt-concrete pavement, relocated and/or new overhead utility lines and poles, and possible grading and drainage improvements. Needed improvements will not extend beyond the existing Waikupanaha and Hihimanu Streets rights-of-way or into any other parcels not owned by DHHL.

We would like to inform you of these changes and kindly ask again for your *kokua* and guidance in this matter. Please contact us by telephone or email if your *mana‘o* has changed or been affected by the changes to the project area and the project description. Please do not hesitate to contact Kellen Tanaka at ktanaka@culturalsurveys.com or by phone at (808) 262-9972 with any questions or additional *mana‘o*.

Me ka ha‘aha‘a,

Kellen Tanaka
Cultural Researcher

Figure 16. Revised community consultation letter

“Revised Project Area”). While the original project area included approximately 30 acres, with the additions along the rights-of-way of Waikupanaha and Hihimanu Streets, the project area is now approximately 32.5 acres. These street rights-of-way improvements will generally consist of asphalt-concrete pavement, relocated and/or new overhead utility lines and poles, and possible grading and drainage improvements. Needed improvements will not extend beyond the existing Waikupanaha and Hihimanu Streets rights-of-way or into any other parcels not owned by DHHL.

In most cases, two or three attempts were made to contact individuals, organizations, and agencies. Community outreach letters were sent to 63 individuals or groups, 11 responded, and three of these *kama‘āina* and/or *kūpuna* met with CSH for more in-depth interviews. The results of the community consultation process are presented in Table 3.

6.3 Community Contact Table

Table 3 contains the names, affiliations, dates of contact, and comments from NHOs, individuals, organizations, and agencies contacted for this project. results are presented below in alphabetical order.

Table 3. Community Contact Table

Name	Affiliation	Comment
Ace Farm		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Aikau, Clyde	Aikau Pure Hawaiian Surf Academy, Waikiki Stakeholder	Letter and figures sent via USPS 13 November 2018 Mail Returned 19 November 2018
Ailā, William	Deputy to the Chair, Department of Hawaiian Home Lands	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Akamai Landscape Nursery		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018

Name	Affiliation	Comment
		Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Aloha Pond Plants		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Amaral, Beverly	Ko‘olaupoko District Representative, O‘ahu Island Burial Council (OIBC)	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Ms. Amaral replied via email 15 November 2018: Will get right on it! CSH replied via email 16 November 2018: *Mahalo for your quick response. We look forward to hearing from you.* Revised letter and figures sent via email 7 June 2019 Ms. Amaral replied via email 7 June 2019: *I am forwarding your email to Hina and others on the OIBC Committee*
Aquino, Kamakana	Waimanalo Hawaiian Homes Association	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Cook, Leala	Hawai‘i Pa‘u Riders	Ms. Cook contacted DHHL via email on 20 December 2018: Letter and figures sent via email 13 February 2019 Revised letter and figures sent via email 7 June 2019 Interview summary sent for review and approval on 24 July 2019

Name	Affiliation	Comment
		Ms. Cook approved summary 28 August 2019
Crabbe, Kamana‘opono	Chief Executive Officer, Office of Hawaiian Affairs	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Delos Santos, Lawrence	Hawai‘i Pa‘u Riders	Mr. Delos Santos contacted DHHL via email on 20 December 2018 Letter and figures sent via email 13 February 2019 Mr. Delos Santos replied via email 26 February 2019: *I would gladly converse with you or Kellen about the cultural practices at the Cook’s Ranch.* CSH replied via email 27 February 2019: *Mahalo for getting back in touch with us. We look forward to meeting you and discussing the cultural practices that occur at Cook’s Ranch. Is there perhaps a time and date that would work best for you? We are flexible and available to meet on weekends as well.* Revised letter and figures sent via email 7 June 2019 Interview summary sent for review and approval on 24 July 2019
Durston, Bill	Leilani Nursery, Inc.	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Feiteira, Blossom	President, Association of Hawaiians for Homestead Lands	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018

Name	Affiliation	Comment
		Email returned 15 November 2018 Mail returned 18 November 2018
Frankie’s Nursery		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Fukui, Iris	Contemporary Landscaping	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Hamachi, Grant	Hamachi Farm	Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Hanawahine, Roxanne	Na Ohana o Puaoi a me Hanawahine (NHO)	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Hewett, Alice P.	President, Ko‘olaupoko Hawaiian Civic Club	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Lisa Moala replied on behalf of the Ko‘olaupoko Hawaiian Civic Club
Galea‘i, Noe	President, Waimanalo Health Center	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018

Name	Affiliation	Comment
		Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Geobunga		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Glenn’s Flowers & Plants		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November 2018 Revised letter and figures sent via USPS 6 June 2019
Hawaiian Sunshine Nursery		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Hilo, Regina	Burial Sites Specialist, SHPD	Letter and figures sent via email 15 November 2018 Ms. Hilo forwarded letter and figures to Ms. Beverly Amaral and Hinaleimona Wong-Kalu via email 16 November 2018: *Attached is an invitation to consult and/or provide kokua/guidance to the project proponents regarding a cultural impact assessment for the Waikupanaha Ag. Lots in Waimanalo. The agency lead is DHHL.* *Please let me know if you have any questions. Recommendations may be provided to the CSH’s CIA Staff (CC’d on this email).*

Name	Affiliation	Comment
		Revised letter and figures sent via email 7 June 2019
Ho, Wilson Kekoa	Chair, Waimanalo Neighborhood Board No. 32	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Ho-Lastimosa, Ilima	God’s Country Waimanalo (NHO)	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Kalima, Kalani	*Kama‘āina* and fisherman of Waimanalo	Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Kanahele, Dennis “Bumpy”	Aloha First (NHO)	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Kassebeer, Louana	Waimanalo Health Center, Community Ourteach & Education Worker	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019

Name	Affiliation	Comment
Kawauchi Nursery		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Keeno, Kaleo	Lahui Kaka‘ikahi (NHO)	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
KK Poultry	Fresh Egg Production	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November 2018 Letter and figures sent via USPS 14 January 2019
Koa, Maynard “Beanie”	Pelekikena, Hawaiian Civic Club of Waimanalo	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019 Revised letter and figures sent via email 7 June 2019
Koba’s Nursery, Inc.		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019

Name	Affiliation	Comment
Ko‘olaupoko Hawaiian Civic Club		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018
Kukea-Schultz, Kanekoa	Executive Director, Kako‘o ‘Oiwi	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Landscape Hawaii		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Lee, Chris	Representive, House District 51	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Loa, Geraldine	*Kama‘āina* of Waimanalo; Department of Hawaiian Homelands	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Luthy, Tamara	Ethnographer, SHPD	Ms. Luthy contact CSH via email 13 June 2019: *My name is Tamara Luthy and I am the new Ethnographer*

Name	Affiliation	Comment
		with the State Historic Preservation Division. Thank you for the opportunity to offer comment on the proposed Cultural Impact Assessment for the Waikupanaha Agricultural Lots Project, TMKs:[1] 4-1-008:003 (por.), 093, 094, 095, and 096. I received this request on June 10, 2019. We ultimately defer to the Office for Environmental Quality Control (OEQC), who will officially accept or reject your CIA[1]*, but we do appreciate your courtesy in offering SHPD a chance to offer comment on this early draft of your CIA.* *. . . I am presently unable to comment on the scope of your interviews with the community without knowing more about who you interviewed, how many people were involved, or what questions you asked them. As a courtesy, I have compiled a list of people involved in Native Hawaiian Organizations (NHOs) recognized by the Department of the Interior, in addition to a few other local people who may have some information relevant to your project, but out of respect for their privacy I don't want to disclose their contact info until they express a positive interest in participating. However, I did forward your contact info and a brief description of the project to everyone on my list, so perhaps some may reach out to you directly. I also recommend that you place an ad in the Honolulu Star Advertiser to notify community members about their opportunity to*

[1] Staff at the State of Hawai‘i, Department of Health, Office of Environmental Quality Control (OEQC) confirmed in September 2019 that OEQC does not make determinations about the acceptability of CIAs. OEQC's responsibilities pertain to the facilitation of Hawai‘i's system of environmental review whereas proposing agencies are responsible for preparing environmental review documents, reviewing the document, and submitting the document to OEQC for publication in a periodic bulletin, now called *The Environmental Notice*.

Name	Affiliation	Comment
		participate in your Cultural Impact Assessment. *As far as traditional and ongoing gathering practices, the best way to assess this is to go out into the community around the project area and ask people. Culture lives in the hearts and practices of living people. This is very important information for a CIA, so please do ensure that you go to the area in question and seek out local people who may know more than we can at SHPD, since I don't live in Waimanalo. I highly recommend that you go talk story with nearby local nurseries too if you want more information about gathering and/or native plant species in the area. You may also want to check the book Anne Kapulani Landgraf's "Na Wahi Pana o Koolau Poko: Legendary Places of Koolau Poko" for historic pictures of sacred sites in Waimanalo and beyond.* *According to our ArcGIS maps, the Pueo Heiau, which is listed on the State Register of Historic Places, is roughly ¾ of a mile from the project area. It seems prudent to research this heiau since it is fairly near the area and may have bearing on the cultural history of the area. Two other nearby archaeological sites are on the coast near Waimanalo Bay, both about half a mile from the project area. I didn't see any archaeological sites within the project area, but that doesn't mean that something won't be uncovered, though it seems somewhat unlikely. I did not see any known burials near the project area in our ArcGIS, but that does not mean that there aren't any that may become inadvertent discoveries. Additionally, not all of our data has been entered into the GIS, so it is*

Name	Affiliation	Comment
		possible that perhaps some known burials are within the project boundaries. I could not find information on any previous AIS conducted in the exact same TMKs as the project area, but we invite you to come to the library to view the several AISs from nearby projects for more information.
Malama, Charlani	*Kama‘āina*	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Malu‘Olu Ranch		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Revised letter and figures sent via email 7 June 2019
MEA Pacific Traders		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November Mail returned 19 November 2018
Migita, Clifford	Waimanalo Agricultural Association	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Shannon replied on behalf of Waimanalo Agricultural Association on 27 February 2019: *Reaching out to you on behalf of WAA to ask whether you would be willing to come to our Waimanalo Ag Assn meeting in March to share more about this project and perhaps get feedback from some of our members?*

Name	Affiliation	Comment
		Would this be possible CSH replied via email 27 February 2019: *Mahalo for responding to us. Just let us know the time and place. We look forward to meeting with you and discussing the project.* Revised letter and figures sent via email 7 June 2019 Shannon replied on behalf of the Waimanalo Agricultural Association on 30 June 2019: *Would you like to come to our next meeting to explain the differences?* *Just looking at the map may not help our members understand the differences?* *Thank you for reaching out.* CSH replied via email 3 July 2019: *Mahalo for your response. When is the next meeting? We look forward to discussing the changes to the project with you.* Mark Fukui replied on behalf of Waimanalo Agricultural Association via email 8 July 2019: *The meeting will be this Thursday 7pm at The Plant Place, . . .* CSH gave a short presentation at the Waimanalo Agricultural Association meeting on 11 July 2019
Milo Nursery/Kanu Farms		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Ms. Machado (Kanu Farms) replied via email 17 November 2018: *Thank you for writing. I got and read studied your mailing today. As a 10 year resident of the Agricultural lots in Waimanalo I do not have much cultural information on them. Most of us farmers just put our heads down and work these properties, rarely leaving. I know that some of the*

Name	Affiliation	Comment
		friends I have made back here may have more information than I do. The only thing I have to offer is to check with the three or four friends who have been here long term and see what information I can glean. *My only personal experience is with the Hawaiian Homes lot directly across from our property. It is a 10 acre property that was abandoned after Rodney Fukui, who was a well known nurseryman died. Now there are various groups of locals using drugs, partying and dumping over there. We have called Hawaiian Homes a couple of times about this and they came out once and hung up a sign . . .* Revised letter and figures sent via email 7 June 2019
Moala, Lisa	Alu Like, Inc	Ms. Moala replied on behalf of the Ko‘olaupoko Hawaiian Civic Club via telephone and email on 19 November 2018: *My name is Lisa and I am the program specialist for ALU LIKE, Inc. Waimanalo Kupuna program. There will be approx. 20+ native Hawaiian Kupuna that would be interested in your cultural impact assessment. Could you speak a little on what you do and what are the plans in the Waimanalo area.* CSH scheduled an interview for 29 November 2018 Interview summary sent for review and approval on 1 March 2019 Ms. Moala replied via email 6 March 2019: *I have submitted the summary to Kupuna. They are in the process of signing off and or correcting what they may have said. Two of the kupuna have already mentioned they were not the ones that made a certain quote. The Kaiama's don't always attend the*

Name	Affiliation	Comment
		program so I might not be able to get their signatures. Hopefully, I can get the paperwork back to you soon. Interview summary sent for review and approval on 7 June 2019 Interview summary sent for review and approval on 5 July 2019 Interview summary sent for review and approval on 24 July 2019 CSH spoke with Ms. Moala in person 2 October 2019: *Ms. Moala stated that she is reviewing the summary with each kupuna individually to get their approval.* CSH did not receive approval in the time allotted.
Mulkern Family	Mulkern Landscaping	Letter and figures sent via USPS 13 November 2018 Mr. Mulkern replied via telephone 20 November 2018 Revised letter and figures sent via USPS 6 June 2019 Mail returned 11 June 2019
Nalo Farms		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November 2018 Letter and figures sent via USPS 14 January 2019
Newman, Gordon and Cora	The Yard Guy LLC	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Mail returned 25 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Nicholson, Audry	Ladybug Plants, LLC	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018

Name	Affiliation	Comment
		Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Oceanside Landscaping		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Email returned 15 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Ms. Kelly Griffin contacted CSH via phone on 7 February 2019: *She received a survey letter for Oceanside Lnadscaping, but they've moved to Texas and are no longer in Waimanalo*.
Ornellas Boarding Stables		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Peahi, Apela	Peahi Ohana (NHO)	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Sharon's Plants		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019

Name	Affiliation	Comment
Solis, Kaahiki	Cultural Historian, SHPD	Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Spencer, Carter and Jamie	*Kama‘āina*	Interview conducted on 16 March 2019 Summary approved 28 August 2019
Stone, Jaynie I.	Hui Kaleleiki Ohana	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
The Plant Place		Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Thielen, Laura	Senator, District 25	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Eliza Wilcox replied on behalf of Senator Thielen on 27 November 2018: *Thank you for the letter regarding the CIA of Waikupanaha Agricultural Lots. Senator Laura Thielen is very interested in the progress and results of this study and would like to be included on the updates.* Revised letter and figures sent via email 7 June 2019
Tsuruda, Alvin	Waihale Products	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018

Name	Affiliation	Comment
		Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Vinzant, Ken and Lisa	Olomana Tropicals	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Waimanalo Hawaiian Civic Club	Referred by DHHL	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via USPS 14 December 2018 Letter and figures sent via USPS 14 January 2019 Revised letter and figures sent via USPS 6 June 2019
Waimanalo Hawaiian Homes Association	Referred by DHHL	Letter and figures sent via USPS 13 November 2018
Wilson, Scot	Plant Hawaii	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Wong-Kalu, Hinaleimoana	Chair, O‘ahu Island Burial Council	Letter and figures sent via USPS 13 November 2018 Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019
Yamashita Nursery		Letter and figures sent via USPS 13 November 2018

Name	Affiliation	Comment
		Letter and figures sent via email 15 November 2018 Letter and figures sent via email 14 January 2019 Revised letter and figures sent via email 7 June 2019

6.4 *Kama‘āina* Interviews

The authors and researchers of this report extend our deep appreciation to everyone who took time to speak and share their *mana‘o* and *‘ike* with CSH whether in the interviews or brief consultations. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and in no way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

6.4.1 Alu Like, Inc., Waimānalo Kūpuna Program

CSH researchers were contacted by Lisa Moala, program specialist for Alu Like, Inc., Waimānalo Kūpuna program, on behalf of the Ko‘olaupoko Hawaiian Civic Club on 19 November 2018. Ms. Moala invited CSH to meet with a group of *kūpuna* at the Alu Like Waimānalo Kupuna Hale on 29 November 2018 to discuss the Waikupanaha Agricultural Lots project. After a brief introduction from CSH explaining the proposed project to the entire group, the group was divided into three smaller groups to help facilitate conversation. Each group was shown maps of the project area, however, the interview also sought information regarding the cultural landscape of the *ahupua‘a* of Waimānalo and occasionally the entire *moku* of Ko‘olaupoko. A summary of the group interview was sent to Alu Like, Inc. for review and approval on 1 March 2019, 7 June 2019, 5 July 2019, and 24 July 2019. CSH is did not receive approval of the interview summary in the time alotted.

6.4.2 Cook ‘Ohana, Hawai‘i Pā‘ū Riders

On 17 March 2019, Cultural Surveys Hawai‘i (CSH) met with the Cook ‘Ohana at the Cook Ranch in Waimānalo to discuss the Waikupanaha Agricultural Lots project and to share their *‘ike* of the tradition of *pā‘ū* riding. Present at the meeting was Mr. John Manuhoa Cook, Ms. Leiala Ka‘iulani Cook, Ms. Heavenly Mealani Cook-Kamakeeaina, Ms. Iwalani Lowea Kahalewai-Cook, Mr. Manuhoa Alika Kahalewai-Cook, Mr. Lawrence Delos Santos, Mr. Philip Neal, Ms. Bonnie Neal, Ms. Ekini Lindsey, Ms. Pinky Keanu, Mr. Dallas Cabinatan, Ms. Kary Takemoto, Ms. Debbie Hopkins, and Ms. Gilda Miyashiro.

Pā‘ū riders are *wahine* (women) who ride horses wearing long, colorful skirts known as *pā‘ū*. Pukui and Elbert (1984:294) define *pā‘ū* as a "woman's skirt, sarong; skirt worn by women horseback riders." The *pā‘ū* consists of "yards of colored material fashioned into a flowing culotte-style skirt worn over the clothing" (Cowan-Smith and Stone 1988:96). Ms. Leiala Ka‘iulani Cook discussed the history of *pā‘ū* riding:

> So, *pā‘ū* riding started in the late 1800s, as our *ali‘i* used to go to royal balls and while they're riding astride on horses and galloping to the royal balls they would

> wear the beautiful *holokū* [a loose, seamed dress with a yoke and usually with a train] and ball gowns. So, in order for it to not get dirty because of the dust while riding a horseback, they would wear a tapa cloth *pā‘ū* to cover. It's more of a covering that would cover the beautiful ball gowns. And once they get to the ball, it would come off them. . .

A *pā‘ū* rider's costume consists of the *pā‘ū*, which is secured to the rider using six *kukui* (candlenut, *Aleurites moluccana*) nuts. The rider also wears a *kīhei* (shawl, cape) which is draped over their head. The costume is completed with *lei* (necklace of flowers, leaves, shells, ivory, feathers, or paper, given as a symbol of affection) adorning both the rider and the horse (Figure 17).

> Twelve yards of fabric are wrapped around the waist, brought forward through the legs, and pulled tight. The *pā‘ū* is draped to give a culotte effect with a seat in back and an apron in front, held in place only by *kukui* nuts, around which the material has been twisted and tucked into the waistband. Two yards of fabric are draped over the head, forming a *kīhei*, or poncho. A *lei* draped over one shoulder and a head *lei* complete the outfit. [Cowan-Smith and Stone 1987:n.p.]

In the 1800s, *pā‘ū* were often made of fabrics easily obtainable at plantation stores which included plain cotton, calico, or heavy sailcloth (Cowan-Smith and Stone 1987:97). Ms. Cook discussed how *pā‘ū* costumes have become more elaborate over the years noting the different fabrics often used by modern *pā‘ū* riders. She also noted how the floral *lei* which adorn the *pā‘ū* rider and her horse have also become much more elaborate over time, ". . . it would just be a *maile* [*Alyxia olivaeformis*] *lei* over the horse, and then plumeria, and then carnation to an elaborate horse *lei* that we make today as well."

Ms. Cook is the President of the Hawai‘i Pa‘u Riders Equestrian Unit. She is the daughter of Mr. John Manuhoa Cook and the late Lita Lowea Cook. Mr. Cook, a descendant of a longtime Waimānalo family, grew up around horses. Mr. Cook also grew familiar with horses as a Diamond Head Stable boy. Ms. Cook recalled, "my dad, from a little boy he was a Diamond Head Stable boy. So, he always was with horses, and raised with horses. So, he loved horses. That was his lifestyle."

Ms. Cook's mother, the late Lita Lowea Cook, was born on Kaua‘i. She was raised on Kipu Kai Ranch where she learned horsemanship with her grandfather, Robert Keuma Sr., a great Paniolo of Kipu Kai Ranch. She learned the traditions of *pā‘ū* and *lei* making from Nalani Sheldon, former commissioner of the King Kamehameha Day Parade. Ms. Leiala Cook described Mr. Sheldon's method of teaching:

> So, if you don't do the *lei* correctly, you have to take the whole *lei* apart, we do it again. So always like the first *lei* she made, she had to do it three times, all the way to the *lei* draping, you know, the *pā‘ū* draping, how to adorn the *lei* on you, as well as the horse.

Ms. Cook noted that her mother was also a professional *hula* dancer and *kumu hula* (*hula* teacher).

> She had a *hālau* [school for *hula* instruction] here in Waimānalo with 100 students. She taught from little *keiki* [children], little babies, to *kūpuna* [elders]. Everybody

Figure 17. *Lei* for adorning horses (CSH 2019)

> here in Waimānalo learned from my mother and that's why a lot of people till today, they still remember my mom as being their *kumu hula*.

The Cook ‘Ohana has been at the Cook Ranch since 1991. Cook Ranch is situated on a 3-acre parcel on Waikupanaha Street located within the project area for the proposed Waikupanaha Agricultural Lots project. Originally the ranch consisted of 12 acres of ranch land before the Department of Hawaiian Home Lands (DHHL) divided the property into four ranches. Ms. Cook discussed the reason her father chose the location of Cook Ranch.

> So, with my dad, he had two places he could select to have the ranch. It was either by the [Waimānalo] polo field, right across from McDonalds or this area. So he chose this area cause by the polo field it always floods. When it's raining, it floods really bad. So, being up ground it's much safer for us and for the horses, as well.

She stated that the area consisted of bushes, *koa* [*Acacia koa*] trees, and rocks, which needed to be cleared prior to building the ranch. She also mentioned there were abandoned city buses which had been left on the property by the previous occupant. She recalled the hard work and money that her parents put in while building the ranch.

> So my dad had built this ranch. This was all trees, all bushes, *na koa* trees, everything. . . my parents put in a lot of money bringing bulldozers, trucks. You know they had city buses here and they had to pay tow trucks to tow the city buses on the property. So, my parents worked really hard to build this ranch and what it has become.

Ms. Iwalani Lowea Kahalewai-Cook is the niece of Leiala Cook and eldest granddaughter of John and Lita Cook. Born in 1984, she remembers coming to Cook Ranch as a child and helping her grandparents build the ranch. She recalled gathering and collecting with her grandmother. She noted that her grandmother planted "all these trees you see here."

> They're native Hawaiian trees, like the *kukui* nut . . . she planted *noni* [Indian mulberry, *Morinda citrifolia*], she planted anything we needed, foliage, the *kukui* nut leaves to put into the *leis*, you know, so we would have it here. . . and then we plant the ti [*Cordyline fruticose*] leaves, we plant, you know, what we can up here.

She believes Cook Ranch is a culturally significant place because of the *kukui* nuts which they use for draping the *pā‘ū*. Ms. Kahalewai-Cook added,

> Cause I don't know where else we can really gather. You know what I mean. So, it's very important that we need this place for that too. Because of that. And I thank my grandma for planting it.

Ms. Heavenly Mealani Cook-Kamakeeaina, daughter of Leiala Cook and granddaughter of John and Lita Cook, agreed, noting that ". . . we have all these *kukui* nut trees, all these foliage, all these leaves for our *lei*, for our *lei* making, it comes from here." She noted the numerous species of plants at Cook Ranch which they gather for making *lei*.

> The ti leaf, the bougainvillea [paper flower, *Bougainvillea* spp.], we had *kauna‘oa* growing, we also had sea grapes [*Coccoloba uvifera*] you use for Moloka‘i, we had all these plants that we all helped as an *‘ohana* [family] come and grow, and

> prosper, live off the land, had dry *kalo* [taro, *Colocasia esculenta*] growing over here.

She noted the difficulty in growing crops at Cook Ranch due to the nature of the soil which consists of Coral outcrop (CR). Coral outcrop is comprised of coral or cemented calcareous sand (Foote et al. 1972:29).

> . . . because this is coral, you know coral and it's hard to grow things here. And a lot of people told our *‘ohana*, ‘You cannot grow up here.’ It's the love that you put into the *‘āina* [land], it's the respect that you feel with the *‘āina* you set foot on. So, I always was raised to respect the land you walk on, to respect the people that come and go.

Mr. John Cook and Lita Cook have been perpetuating the tradition of *pā‘ū* riding since the 1970s. In 1982, they founded the Hawai‘i Pa‘u Riders Equestrian Unit after Governor George Ariyoshi asked them to represent Hawai‘i in New York at the Madison Square Garden Horse Show and Veterans Day parade (Midweek 2015). Over the years, the unit has participated in numerous local parades including the King Kamehameha Day Parade, the Prince Kūhiō Parade, the Aloha Festival Floral Parade, the Waimānalo Christmas Parade, the Kāne‘ohe Christmas Parade, and the ‘Ewa Beach Christmas Parade. The unit has also participated in numerous parades on the mainland including the Pasadena Rose Parade (Figure 18), the Portland Oregon Rose Parade, and the Texas Rodeo Parade. Ms. Cook stated,

> My parents had been in 35 mainland parades and they been in, like I said, New York, Oregon, Seattle, Arizona, Las Vegas, Wyoming, Wisconsin, California, numerous parades, 35 mainland parades . . . which they truly represented Hawai‘i very well.

She also recalled her parents travelling to Europe to represent Hawai‘i in Belgium:

> Another thing, Carole Kai had asked them in 1981 to go to Belgium . . . to represent Hawai‘i which my parents had done that. And they took flowers from here and as well as *pā‘ū* outfits and attire and they dressed some Paris ladies up there, taught them how to do *lei* making, taught them *lei* draping, as well as put them on the horse and they rode in a Father Damien parade there in Belgium. . .

Ms. Lita Cook was also known as “the Queen of the Pā‘ū Riders” (Honolulu Advertiser 2003). Since 1982, she and her husband chaired the equestrian events for the Aloha Festival, the “largest Hawaiian cultural celebration in the United States” (Aloha Festivals 2019a). The mission of Aloha Festivals is “to foster the Aloha Spirit through the perpetuation of the Hawaiian culture and the celebration of the diverse customs and traditions of Hawaii” (Aloha Festivals 2019a). The Aloha Festival hosts numerous events including the annual floral parade that features “a colorful procession of female and male pau riders, floats covered with Hawaiian flowers, Hawaiian music, hula halau and local marching bands” (Aloha Festival 2019b). Following her mother's passing, Ms. Cook took on the *kuleana* (responsibility) of Equestrian Chairperson for the Aloha Festivals. As Chair, she is “in charge of [the] Aloha Week festival for all the *pā‘ū* riders.”

A *pā‘ū* riding procession is led by a Pā‘ū Queen. She is followed by Pā‘ū Princesses who represent each of the main Hawaiian Islands by wearing the island's traditional color and flower.

Figure 18. Hawai‘i Pa‘u Riders at Pasadena Rose Parade (CSH 2019)

Table 4 lists the ten Hawaiian Islands and their traditional colors and flowers. Ms. Ekini Lindsey stated that after being awarded an island to represent, the riders must learn about the island.

> So, each of us, of course, have to know our island, the color, the flower, and then we go up and do like a five minute speech and something in hand to give them of that island represented. Like Moloka‘i, the *kukui*, the use of it, the historical tradition. . . . As well as being awarded the island, but going to the island and being honored to go to Ni‘ihau. Going to Nihoa, going to all the other islands that a lot of people don’t go to. Like Kaho‘olawe, going there and just feeling all the *mana* [spiritual power] that comes from that. A lot of us do experience a lot of their islands that they’re awarded to do ‘cause of the parade

Ms. Cook also noted that “every island had a different style of *pā‘ū* draping.” She stated, . . . in the olden days for Waimea, they used to use the rope and there was no *kukui* nut, it was just the rope. And then, Moloka‘i, I believe they just use four *kukui* nuts, as to now, we normally use six *kukui* nuts.

Table 4. Traditional colors and flowers of Hawaiian Islands

Island	Island Color	Island Flower
Hawai‘i	Red	Lehua (Metrosideros Macropus, M. collina subsp. polymorpha)
Maui	Pink	Lokelani (rose, Rosa damascena)
Lāna‘i	Orange	Kauna‘oa (dodder, Cuscuta sandwichiana)
Kaho‘olawe	Grey	Hinahina (heliotrope, Heliotropium anomalum var. argentea)
Moloka‘i	Green	Kukui (candlenut, Aleurites moluccana)
O‘ahu	Gold	‘Ilima (Sida fallax)
Kaua‘i	Orange	Mokihana (Melicope anisata)
Ni‘ihau	Brown	Pūpū (white shell lei)
Molokini	Coral	Limu (seaweed)
Nihoa	Teal green	Palm seed
		[Aloha Festivals 2018]

Each island’s Pā‘ū Unit consists of a Pā‘ū Princess, a banner page, female attendants, male escorts and outriders (marshals), and Mālama ‘Āina Helpers (“pooper scoopers”). The Pā‘ū Princess is the “Unit Leader and Coordinator of the Pā‘ū Unit.” During the parade, the Pā‘ū Princess will ride in “a regal manner, acknowledging applause” with hand gestures. The Pā‘ū Princess wears a *pā‘ū* and *kīpola* [wrapper] in the traditional color of the island she is representing. The banner page holds the Unit Banner that displays the unit’s name and the name of the island represented. Female attendants also wear *pā‘ū* and *kīpola*. During the parade, they “smile and acknowledge applause with a slight, dignified bow of their heads.” Male escorts and outriders are “responsible for the safety and well-being of all unit members.” They assist the Princess, banner page, and attendants in “mounting the horse, checking saddles, stirrups and leis.” A Lead Escort rides with “a lead rope in case of an emergency.” Mālama ‘Āina Helpers follow the unit and clean up after the horses during the parade (Aloha Festivals 2018).

In addition to the tradition of *pā‘ū* riding, the Hawai‘i Pa‘u Riders also perpetuate other Hawaiian traditions including *hula*, *mele*, and *oli* (Figure 19). Ms. Cook highlighted the diversity and interconnectedness of their cultural practices, sharing, “It’s all about perpetuating the culture and showing them the uniqueness and the beauty that we have as Hawaiians.”

Ms. Cook continues to pass on the traditions and cultural practices she learned from both of her parents at Cook Ranch to her *‘ohana*, as well as the whole community. Ms. Gilda Miyashiro described the first time she came to Cook Ranch with her daughter, Lois Miyashiro Tong, and learned to make *lei* with Aunty Lita.

> . . . But I learned from when I stepped on this ground, I knew it was filled with love. The kind of love that cannot place in a book, no one can teach you. It’s you yourself, how you accept it or not accept it, but her [Lita Cook] graciousness, that’s what I like the most. She was humble, vivacious, thoughtful, kind, all the beautiful words that you can describe a human being. That was Lita. She also let me learn from her how to do the *leis*, and we make *leis* to decorate the hats . . .

Ms. Kary Takemoto also recalled learning to be a *pā‘ū* rider at Cook Ranch. She added that “you don’t have to be Hawaiian to learn,” noting her Japanese ancestry. She has been riding horses for six years; recently, she rode in her first two mainland parades as Hawai‘i Pa‘u Rider. She stated, “You know I learned so much . . . you’re gonna look beautiful but it’s a lot of learning to look beautiful. And then, when you get there, you know, to give everybody your *Aloha* [love].”Mr. Lawrence Delos Santos, a member of the Hawai‘i Pa‘u Riders, also noted that since joining the unit he has learned a lot about the Hawaiian culture including the history of *pā‘ū*, the Hawaiian language, *hula*, and native Hawaiian plants.

Ms. Lindsey noted,

> So lot of the parades that they participate . . . they’re given a segment to actually go down into the arena wherever they’re at and they dance their *hula*, but before they do their *hula*, they do their *oli* and they do all the introductions regarding who they are and what they will be doing cause a lot of the mainlanders don’t know who they are.

She added that the *hula* and *mele* they perform are chosen based on the place the unit is travelling to or the costume they will be wearing: “. . . we choose a *mele* for the place that we’re going or just the attire of what we’re wearing. . . it’s not just *hula* that encompasses, it’s also the music, the *hula*, the arts of *lei* making, the *oli* itself, as well. We incorporate all that.”

Mr. Dallas Cabinatan also noted that when the unit is invited to participate in an event on the mainland, they present gifts from Hawai‘i to their hosts. He stated, “. . . they also make gifts from Hawai‘i and they present it too. They can present like 30 gifts when we travel. . . It’s all from the group. It’s spreading the Aloha, yeah.”

The Hawaii Pa‘u Riders demonstrated the ways they engage in practice and manifest Hawaiian culture through a recitation of “Ke Kau Aloha (Oli Mahalo).” The offering of this *oli* is an important part of traditional protocol and is utilized to express gratitude and appreciation:

Figure 19. Hawai‘i Pa‘u Riders (from left to right, Ms. Leiala Ka‘iulani Cook, Mr. Lawrence Delos Santos, Ms. Heavenly Mealani Cook-Kamakeeaina, and Ms. Ekini Lindsey) demonstrating *hula* (CSH 2019)

Ke Kau Aloha (Oli Mahalo)

Ke kau aloha wale Mai la ka ua, e

Ke mauna o ka haliu Ku i

I Ku au aloha me ka mahalo

Aloha aloha e

Cook Ranch is the home of the Hawai‘i Pa‘u Riders Equestrian Unit. The unit holds monthly meetings at the ranch to prepare for the numerous parades they participate in, locally and nationally. Preparation for these events, which begins months in advance, involves horsemanship practice, *hula* and *oli* practice, gathering of foliage and flowers for *lei*, and *lei* making workshops.

> . . . we have numerous meetings here, we have numerous *pā‘ū* workshops here, meaning *pā‘ū* draping, *lei* making, horsemanship, *hula*, *oli*, *lei* making, we do it all here and every year. . . we teach new *pā‘ū* riders how to become *pā‘ū* riders. We do *lei* making, *pā‘ū* draping, we do a lot activities to involve the community and to teach the next generation because it’s slowly dying.

Ms. Cook discussed the many aspects involved in participating in a parade on the mainland.

> . . . how the *lei* gonna get to the mainland, horses, making sure they can take *pā‘ū*, can take the horse *lei*, so the ranches there got to prepare one year in advance to make the horse get *ma‘a* [accustomed] to that before we get there as well. . . That’s why we have monthly meetings here. Monthly meetings for preparation for mainland parades, meetings and *hula* practices, you know, and workshops on how to get on the horse, *lei* making workshop, how to know how to make your own horse *lei*.

Monthly meetings also include fundraisers that help the unit cover the expenses associated with participating in events on the mainland which may include renting a horse, fabric for costumes, and flowers for *lei*. Mr. Delos Santos stated that “some stuffs is donated but a lot comes out of our pocket, to up keep or even just feed the horse.” Ms. Bonnie Neal noted,

> We support ourselves. We do the fundraising, families chip in, send stuff like donations. So, that alone, you know, is a big deal, right there, ok, cause one trip to the mainland could be five grand. Easy peasy. You know. Going all out, gonna buy flowers instead of falling through bushes like me. . .

The Hawai‘i Pa‘u Riders are also supported by corporate sponsors including Hawaiian Airlines who assist the unit in shipping the *lei*, costumes, and gifts when they travel to the mainland. Ms. Cook mentioned that the Hawai‘i Pa‘u Riders will be working with Canon on an upcoming fundraiser.

> Next month we have a big fundraiser at Hawai‘i Railroad . . . Canon is sponsoring us and what we’re doing is we’re having families come ride the train and we’ll have our equestrian marshals all dressed up. They’re gonna hold up the train. They’re gonna take pictures. After that, we’re gonna do *pā‘ū* draping workshop and they’re gonna use Canon’s camera and take pictures and learn how to use the equipment.

Mr. Delos Santos stated that, in an effort to achieve sustainability, the Cook Ranch could grow crops in a portion of the ranch to offset the costs of feeding the horses.

> . . . I know you guys wanted this place to be more sustainable. We talked about it. Of course, the cost of feeding horses is really expensive. Coming from Moloka‘i, home of the farmers, they teach you how to grow things, become a farmer. I have a green thumb. . . The idea came about . . . why don’t we use some of this land to grow and offset the cost of feeding the horses. That’s just an idea that we could grow crops or even vegetables for the community, what not, and offset the costs.

Cook Ranch hosts horsemanship workshops where riders are taught how to handle a horse. Ms. Debbie Hopkins, a Hawai‘i Pa‘u Rider, stated that she “had never been on a horse or been near a horse” before coming to Cook Ranch. She recalled learning to ride on Rio, the late Lita Cook’s horse. Ms. Neal mentioned that her husband, Mr. Philip Neal, who was originally from Waimea, Hawai‘i, also taught horsemanship at Cook Ranch. Ms. Cook-Kamakeeaina discussed the amount of land needed to raise horses and teach horsemanship: “One horse needs more than an acre. And we have horses that we teach because you have to teach men, women and it’s eight riders per unit and that’s not even the court and the queen’s unit.”

Ms. Cook stated that before a horse can participate in a parade, they need to be “bomb proof,” referring to the horses’ ability to maintain their composure. The horse must not be startled by loud noises or other distractions when they are amongst the public. She noted they must also be trained to be “able to take the *pā‘ū*, able to take the *lei*.” Ms. Cook-Kamakeeaina added that stallions (male horse) are not permitted in parades since stallions are known to be more aggressive. She added that all the horses at Cook Ranch are either mares (female horse) or gelded (castrated) male horses.

Ms. Cook mentioned that horses who are in need of a home are always welcome at Cook Ranch.

> So, even when people’s horses get flood down there, they ask me if they can bring their horses and stable them up here. And me, I’m always here to help everyone, whenever a horse needs a home, they’re always welcome. We always open our doors here. All the time.

The Cook Ranch also hosts numerous activities for the community. Ms. Cook mentioned that the awards ceremony for the Aloha Festival Parade is held at Cook Ranch. She noted that “all the units come with their families and *keiki* . . . it’s a potluck thing, we give out the awards and everyone just have a good time after their hard work.” Ms. Cook-Kamakeeaina noted that the ceremony may attract up to 300 people.

Ms. Neal stated that “the actual community here in Waimānalo area always looking forward to the events. . .” Ms. Kahalewai-Cook added,

> . . . we never forget where we come from, we always look back to our community, we always participate in the Waimānalo Christmas Parade, our fundraisers we do out there and it’s a give and take. They respect us, we respect them. We give back to them, we give back to everyone else. We help, you know, the community as much as we can whether it’s polo openings, whether it’s Linda Lingle, the community was holding for her, governors. We try to do it all.

Ms. Cook-Kamakeeaina recalled visiting Cook Ranch as a student with Kamehameha Schools where they would “learn about horses, about how to ride, how to dance *hula*, how to maintain animals.”

The group also mentioned Aunty Cyndi Pa who has her own *pā‘ū* riding unit based in Seattle, Washington. Originally from Kaua‘i, Aunty Cyndi learned the tradition of *pā‘ū* riding from John and Lita Cook. Her unit, the Colors of Hawai‘i Kau Lio Pa‘u Riders, participates in eight parades every year across Washington State. Ms. Cook-Kamakeeaina recalled travelling to Seattle in April 2016 to assist the Kau Lio Pa‘u Riders when they participated in four parades in one day. She held workshops teaching *pā‘ū* draping while Mr. Delos Santos assisted with saddles and draping. She stated,

> Even though I’m younger and there were a lot of older people and I was taught to listen to my elders but they gave me the same or even more respect because the knowledge of *pā‘ū* I knew. So I was able to pass that on and teach them how to properly drape everyone. I was doing workshops with them, teaching them a lot of Hawaiian protocols and he [Lawrence] was able to help saddle and drape . . .

Ms. Pinky Keanu has lived in Waimānalo for 17 years. She is a lessee of the DHHL. Her maternal grandfather was a *paniolo* (cowboy) at Parker Ranch on the island of Hawai‘i before coming to O‘ahu where he worked at the slaughterhouse on Middle Street. Ms. Keanu teaches horsemanship. She has donated and volunteered with the Therapeutic Horsemanship of Hawai‘i for 25 years. She also assists the Hawai‘i Pa‘u Riders as part of the ground crew. “I am the best ground crew that I can be and always there. . . As far as what I can do, as far as contributing to them, foliage, they name it. I’m there with a truck load.”

Ms. Keanu discussed the lack of pastoral land on the island of O‘ahu. She recalled signing up with the DHHL for pastoral land on O‘ahu at the age of 18 but “O‘ahu wasn’t giving out land at that time.” She believes the DHHL should be awarding fewer agricultural lots and more pastoral lots.

> And, so people who sign up for homestead, you’re allowed to get an agricultural lot, you’re also allowed to get a pastoral lot. I don’t know how many people are on pastoral [waitlist] but they’re not dishing it out. . . But, again, they’re not dishing out pastoral but they’re taking it away. So, where else are they gonna give it to us. They’re probably gonna give it to us right on a hillside . . . I never knew that my horse could actually stand on a hill which is what they try to do with a lot of Hawaiians. They put us up in the mountains when you have something prime like this lot taken away. So stuff like this needs to be perpetuated. More needs to given out. Less agriculture.

The Cook ‘Ohana is opposed to the Waikupanaha Agricultural Lots project. They do not want to be removed from the property where they have been perpetuating the Hawaiian traditions of *pā‘ū*, *hula*, *mele*, *oli*, and *lei* making for 28 years. Ms. Cook-Kamakeeaina emphasized the importance of the ranch to the Hawai‘i Pa‘u Riders. She noted that “you need land for horses,” adding that “in order to do workshops and *lei* making and perpetuating horsemanship with the *lei*, you gonna need an acre.” She asked, “How are you gonna do that without that land?” She continued,

> And this is our meeting area, this is where we make all our meetings. So, without this land, without this acreage, without where we are, there could be no Hawai‘i Pa‘u Riders and that’s taking away a lot of our passions, our love for what we do away from us. A lot of generations to come is losing that knowledge because where are they gonna learn it? This is where they learn it. Right here, right where you are, right where we’re sitting, it comes right here.

She hopes to continue to perpetuate the traditions she learned from her *‘ohana* at Cook Ranch.

> And I wanted something to pass on to me so I can continue the perpetuation cause I do it all, I dance *hula*, I play *‘ukulele* [instrument brought to Hawai‘i by the Portuguese in 1879], piano, I learned everything from my family, *‘ōlelo* Hawai‘i [Hawaiian language], *lei* making, how to be a beautiful horseback rider, a *pā‘ū* rider. Was learned here and all that knowledge needs to be passed on to all these children.

Ms. Kahalewai-Cook believes the proposed project will have an adverse impact on their traditional gathering practices. She fears she will no longer have access to the *kukui* nuts and other native Hawaiian plants the *‘ohana* uses for draping *pā‘ū* and making *leis*.

Ms. Cook also expressed her concerns regarding the future of Cook Ranch. She stated “we pray that we still be able to perpetuate and keep the culture alive on this ranch.”

6.4.3 Carter and Jamie Spencer

On 16 March 2019, CSH interviewed Carter and Jamie Spencer at their home in ‘Āinaloa, Hawai‘i. Mr. and Mrs. Spencer have both lived on Hawai‘i Island for nearly 40 years but met as teenagers in Waimānalo. Mr. Spencer was born, raised, and lived in Waimānalo until relocating later to Hawai‘i. Mrs. Spencer lived at a few places on O‘ahu though always had a lineal connection to Waimānalo. In her teens, she was permanently residing in Waimānalo when she met Mr. Spencer.

Mr. Spencer was raised in the “homestead” of Waimānalo, referring to a Department of Hawaiian Home Lands homestead property. The establishment of DHHL began with the passage of the Hawaiian Homes Commission Act, set in motion by Prince Jonah Kūhiō Kalaniana‘ole.

> In response to a dwindling native Hawaiian population, Prince Kūhiō convinced Congress to create a rehabilitation program for Hawaiians. In 1921, with the enactment of the Hawaiian Homes Commission Act, the United States set aside approximately 200,000 acres of land to establish a permanent homeland for native Hawaiians. [Department of Hawaiian Home Lands 2008]

Jonah Kūhiō was determined to serve his people and his promotion of the homestead program would allow Hawaiians the opportunity to elevate themselves and their communities. DHHL owns a number of parcels in Waimānalo (Figure 20). Mr. and Mrs. Spencer’s family’s homes were in the residential parcels of the Waimānalo Villages. Mr. Spencer lived on DHHL property near Kaiona Beach Park and Mrs. Spencer lived with her maternal grandparents on their DHHL property near Waimānalo Beach Park.

As an infant. Mr. Spencer was adopted by his maternal grandparents, Joseph and Susan Spencer (Figure 21 and Figure 22). They had a small farm on their one-acre property and kept horses, pigs,

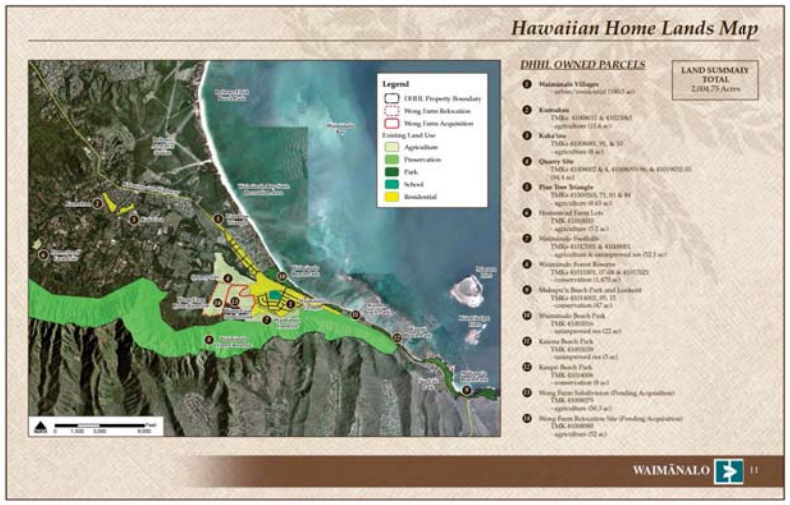


Figure 20. Map of DHHL Owned Parcels in Waimānalo (Department of Hawaiian Home Lands)

Figure 21. Mr. Spencer and his maternal grandmother (adopted mother), at the family home in Waimānalo

Figure 22. Mr. Spencer’s adopted father, Joseph Spencer, at their family home on horse named Billy Boy

cows, chickens, pigeons, and dogs. The horses, pigs,cows, and chickens were often bred and sold off as another source of income. Mr. Spencer’s father was a heavy equipment operator. He would operate dozers, backhoes, excavators, in addition to being a mechanic and farmer. Mr. Spencer’s mother was a registered nurse at the mental hospital in Kane‘ohe. She later transferred to the Nu‘uanu old folks home until she retired.

The responsibility of maintaining the farm fell on Mr. Spencer regardless of his young age. Around the time that he was in 5th grade, he would wake up before sunrise and collect slop with his father to feed the animals. They would pick up from restaurants in Kaimukī, and Kapahulu, They also had contracts with Love’s Bakery and Leonard’s Bakery in Kapahulu, and Meadow Gold Dairy. They would be able to pick up cases of milk, juice, cottage cheese and yogurt from Meadow Gold Dairy that they would feed the pigs. The cases they received were still in sellable condition and they would often give to family and friends. The slop would be dumped onto the tailgate where they used a hand crank to push the slop further into the bed of the truck. It was Mr. Spencer’s *kuleana* to cook the slop and feed the animals. The firewood was gathered from Hawai‘i Kai that was usually *kiawe* Regarding the cooking of the slop, he explained that sometimes trash would be mixed in (napkins, paper, etc.,) so it was cooked as a way to sterilize it before feeding the animals. This *kuleana* was done all before he left for school in the morning. After his school day ended at Blanche Pope Elementary, Mr. Spencer would head straight home and continue his chores, most times ignoring invitations to go out and play, saying, “that’s just the way it was…my dad was strict.”

Mr. Spencer really grew a liking to animals and though his father was strict, he remembers some fun times on the farm. He and his cousins (Figure 23 and Figure 24), on the rare occasions when they would visit, would take turns riding pigs to see who could hold on the longest. On some days he would release his flock of homing pigeons and they’d circle above before flying out and over to Sandy Beach. Eventually, they’d fly home and return to their coop.

Both Mr. and Mrs. Spencer attended Blanche Pope Elementary, a school built on homestead land in 1965. The school was named in honor of Della Blanche Romick Pope, the wife of Wills Thomas Pope; Superintendent of Public Instruction in Hawai‘i from 1910-1913 (Blanche Pope Elementary Newsletter 2016). Mrs. Pope founded the first parent-teacher association and greatly contributed to the public school system in Hawai‘i (Blanche Pope Elementary Newsletter 2016).

After Blanche Pope, Mr. Spencer was enrolled at Olomana School which served as a mild detention facility for at-risk youth. He finished his schooling there and graduated in 1980. After his father passed away, soon after the animals were sold and the house torn down and rebuilt between 1977 and 1978.

For Mrs. Spencer, early family hardship placed her in a foster home and at eight years-old she was put in the care of her maternal grandparents, Jeremiah and Anita Waiolama. Her grandfather, originally from Hawai‘i Island, worked for Hawai‘i Electric and picked guavas part-time at a nearby farm in Waimānalo. Her grandmother made an appearance in the famous Kodak Hula Show in Waikīkī. She lived with them until she was 17 years-old at their home on Kalaniana‘ole Highway. The one thing that remains memorialized for Mrs. Spencer was the concept of family. Her grandparents’ home was the core of family gatherings where everyone met and shared in good times and great company. She shared, “that house was never without babies”.

Figure 23. Mr. Spencer (8 months old) and his cousin, Ashford. Note the sandy yard and coconut trees. The family home was just off the main highway, across from the beach.

Figure 24. Mr. Spencer on horse with cousin Joseph and cousin Ashford.

Waimānalo was home to many popular, local musicians. Even Mrs. Spencer‘s grandmother was a musician. She could play the *ukulele*, auto harp, guitar, organ, and Japanese koto. The location of the Waiolama house, just off Kalaniana‘ole Highway made it easy for passing cars to see family gatherings in the front yard. “Tūtū Man”, Mrs. Spencer‘s grandfather (Figure 25), would always sit out in the yard under the shade of coconut trees. He planted five along the front yard, one for each of his daughters. Mrs. Spencer remembers local musicians would stop by to play music. Gabby “Pops” Pahinui would stop by with his sons Bla, Peter, Cyril, and Phil. He lived just a few houses away from Mr. Spencer. Once she remembered local artist Melveen Leed walked in, gave her *aloha*, and started singing.

Mrs. Spencer’s grandparents taught her how to cook and she learned best by watching. When they would get *‘ō‘io* (bonefish; *Albula vulpes*), her grandma would prepare it by cutting off the tail and running a rolling pin over the fish. The tender meat would come out the tail and mixed with sweet onion, green onion, tomatoes and *pa‘akai* (sea salt) then eaten. In doing it this way, Mrs. Spencer explained you didn’t need to worry about bones. She hasn’t eaten *‘ō‘io* in that style in years. Most times, it was Mrs. Spencer’s uncle that would gather fish for the family on the “sandy side of the beach park” at the end of Pu‘uone street. Mrs. Spencer also remembers eating *aku* (bonito; *Katsuwonus pelamis*), her favorite fish. Her grandparent’s would eat *aku palu* a kind of relish made from scrap pieces of *aku*; diced up and salted. Hawaiian people were not wasteful and would eat everything, she explained. They rarely gathered *aku* but found it more convenient to purchase from Mel’s Market; for any fish that wasn’t caught, it was a sure thing that it was available at Mel’s Market. The market has long since closed and in its place is a McDonald’s.

Another dish that she learned to make was squid *lū‘au*. The squid was caught just off-shore in the reef near Mr. Spencer’s childhood home and the *lū‘au* (taro leaf) was bought from Mel’s Market. Mrs. Spencer learned from her grandma how to clean *lū‘au* which, in turn, she taught her children how to do the same. She explanied that if the *lū‘au* is not cleaned properly or cooked for a certain amount of time, it will cause an uncomfortable itch in the throat.

In addition to what her *Tūtū* taught her about cleaning *lū‘au,* Mrs. Spencer’s mother-in-law taught her to add in baking soda as another layer of sterilization. She also remembers *poi* being sold for only $1.35/lb and was thick, high-quality *poi.* She would have to mix in alot of water to get the *poi* to a smooth, favorable texture. Mrs. Spencer explained that they never really ate anything “fancy”, following along the lines of the *‘ōlelo no‘eau,* “*‘Ai i ka mea loa‘a*”, simply meaning, eating what is available at hand. When she got older, it was Mr. Spencer’s side of the family that taught her how to make *laulau,* a native dish of meat or fish wrapped in *lū‘au* and bundled in ti leaf. Fried fish and *poi* was a favorite dish at her grandparents’ house.

As far as leisure went, Mrs. Spencer mentioned that her uncles would enter the bodysurfing competition at Makapu‘u Beach where she and her cousins would go and watch. She remembers swimming anywhere along the coast of Waimānalo from Bellows to Makapu‘u Beach, they enjoyed the waters. Mr. Spencer, as a teenager, once paddled for Waimānalo Canoe Club and at practice they would paddle from Waimānalo around to Lanikai, leave the canoe there, and catch a ride back with their coach, a Mr. Manuel Kupahu, who lived by Mel’s Market. He laughed while explaining that they would have to run back from Waimānalo Beach Park to Lanikai! As a teenager, Mr. Spencer would spend time in the hills behind his house at the foot of the Ko‘olau Mountains. He explained that he would walk from the hills behind his house over to Shriner’s (at

Figure 25. Mrs. Spencer’s maternal grandfather, Jeremiah Waiolama, in his front yard. Note Waimānalo post office trucks in the background

Kaiona Beach Park) where there lived a man who raised horses. He would let his horses and cows roam freely and they would travel as far as Blanche Pope School, eating shrubs along the way. Just a few years ago, Mr. Spencer held services for his biological mother at Kaiona Beach Park where her ashes were scattered in the waters of Waimānalo. Mrs. Spencer mentioned Ham’s Flat, a place just at the foot of the Ko‘olau’s where people would ride dirt bikes.

The current 7-11 and gas station next to Waimānalo Beach Park used to be Lum’s Drive Inn. A 70s styled diner that served milkshakes, cheeseburgers, and soda pop. Mrs. Spencer described that there were pool tables there too and was a spot where people would hang out. The locally-owned diner also sold Hawaiian dishes and *pipi kaula* that Mrs. Spencer remembers was “so *‘ono*!”. There was even a small condiment stand with onions, chili pepper water (a local favorite), and *pa‘akai*. The Lum family, Mrs. Spencer recalls, lived in the “beachlot area” which referred to all beachfront houses *makai* of Kalaniana‘ole Highway. When the drive-inn closed down, it was taken over by “Chino’s”, another locally-owned eatery that sold favored Hawaiian dishes, and then finally 7-11. Her mother worked at the “old” laundromat (once behind Waimānalo Post Office) and so did Mr. Spencer’s mother at one time. The spot called now called “Ono Steak and Shrimp Shack” used to be a bakery and Keneke’s, known for its red and white checkerboard building, was once Nani’s Drive Inn, another place that Mr. Spencer’s mother worked. The old fire station used to be behind where 711 is now but the fire station has been relocated next to St. George Church across of Waimānalo Elementary School. Mrs. Spencer’s mother worked briefly at Bellows but also worked 10 years at an egg farm in Waimānalo. She worked in the “Candle Room”, where she explained a light was used to see the contents of an egg to check for blood, double yolk, or baby chicks! She would check every egg and separate out the bad ones. The floor was lined with newspaper so after each work day, the paper was gathered and thrown out which helped to keep the workspace clean. Her grandmother retired from Bellows after 25 years as a caretaker.

Figure 26 highlights areas where Mr. and Mrs. Spencer had the most cherished memories. The sites pointed out by Mr. and Mrs. Spencer are explained below in the following is numbered below:

Table 5. Decription of sites explained by Mr. and Mrs. Spencer

Site 1	Kaiona Beach Park where Mr. Spencer’s biological mother’s ashes were scattered
Site 2	Property across of Kaiona Beach Park (Shriner’s) where Mr. Spencer would follow horses and cows along the foothills of the Ko‘olau Mountains
Site 3	Mr. Spencer’s childhood property on Bell Street.
Site 4	Reef where Mrs. Spencer’s uncle would dive for *he‘e*
Site 5	“Lonely Pine” where Mrs. Spencer’s mother’s ashes were scattered.
Site 6	The childhood home of Mrs. Spencer’s father, James Palama.
Site 7	Blance Pope Elementary
Site 8	The 7-11 Property that was once Lum’s Drive-In then Chino’s
Site 9	Keneke’s Drive-In once known as Nani’s Drive-In
Site 10	Old laundromat behind the Waimānalo Post Office

Site 11	Waimānalo Post Office
Site 12	Mrs. Spencer’s grandparents’ property on Kalaniana‘ole Avenue
Site 13	Pu’u One street home where Mrs. Spencer lived with her mother after moving out of her grandparents’ home.
Site 14	Where Mrs. Spencer’s uncle would fish for *‘ō‘io*
Site 15	Old location of Mel’s Market, now McDonalds
Site 16	St. George Church where Mrs. Spencer’s grandmother would attend church service
Site 17	Mrs. Spencer is not entirely sure of location, but this is possibly the Tasaka guava farm where her grandfather worked

Mr. and Mrs. Spencer have been living on Hawai‘i Island for nearly 40 years now with their five daughters and ten grandchildren and believe the idea of DHHL is beneficial to all Hawaiians. They feel strongly that Hawaiian families, especially those in Waimānalo, are entitled to the proposed parcels and it should not be granted to *‘ohana* with no connection to the area. Moreover, Mr. Spencer voiced that Waimānalo is becoming too developed and in places where you would see familiar faces, now there are strangers. They both explained that “Waimānalo doesn’t feel the same” as it did when they were growing up. There used to be a sense of security within the community where it truly felt like home, but for the years they’ve spent away, they can see how much has changed whenever they return to visit.

6.5 Summary of *Kama‘āina* Interviews

Based on reviewed and approved interview summaries of the Cook ‘Ohana and Mrs. And Mrs. Spencer, the following is a synthesis of findings within Waimānalo Ahupua‘a.

The Cook ‘Ohana has been at the Cook Ranch, which is situated on a 3-acre parcel on Waikupanaha Street. Ms. Leiala Ka‘iulani Cook, president of the Hawai‘i Pā‘ū Riders Equestrian Unit and daughter of Mr. John Manuhoa Cook and Lita Lowea Cook, stated that the area consisted of bushes, *koa* trees, and rocks which needed to be cleared prior to building the ranch. Ms. Iwalani Lowea Kahalewai-Cook, niece of Leiala Cook and eldest granddaughter of John and Lita Cook, remembers coming to Cook Ranch as a child and helping her grandparents build the ranch. She noted that her grandmother planted “all these trees you see here” including the *kukui* nuts which they use for draping the *pā‘ū*. Ms. Heavenly Mealani Cook-Kamakeeaina, daughter of Leiala Cook and granddaughter of John and Lita Cook, also noted the numerous species of plants at Cook Ranch which they gather for making *lei* including ti leaf, bougainvillea, *kauna‘oa*, and sea grapes.

Cook Ranch is the home of the Hawai‘i Pā‘ū Riders Equestrian Unit. The unit holds monthly meetings at the ranch to prepare for the numerous parades they participate in, locally and nationally, including horsemanship practice, *hula* and *oli* practice, gathering of foliage and flowers for *lei*, and *lei* making workshops. The Cook Ranch also hosts numerous activities for the community including the awards ceremony for the Aloha Festival Parade which may attract up to 300 people. Ms. Cook-Kamakeeaina also recalled visiting Cook Ranch as a student with Kamehameha Schools where they would “learn about horses, about how to ride, how to dance *hula*, how to maintain animals.”

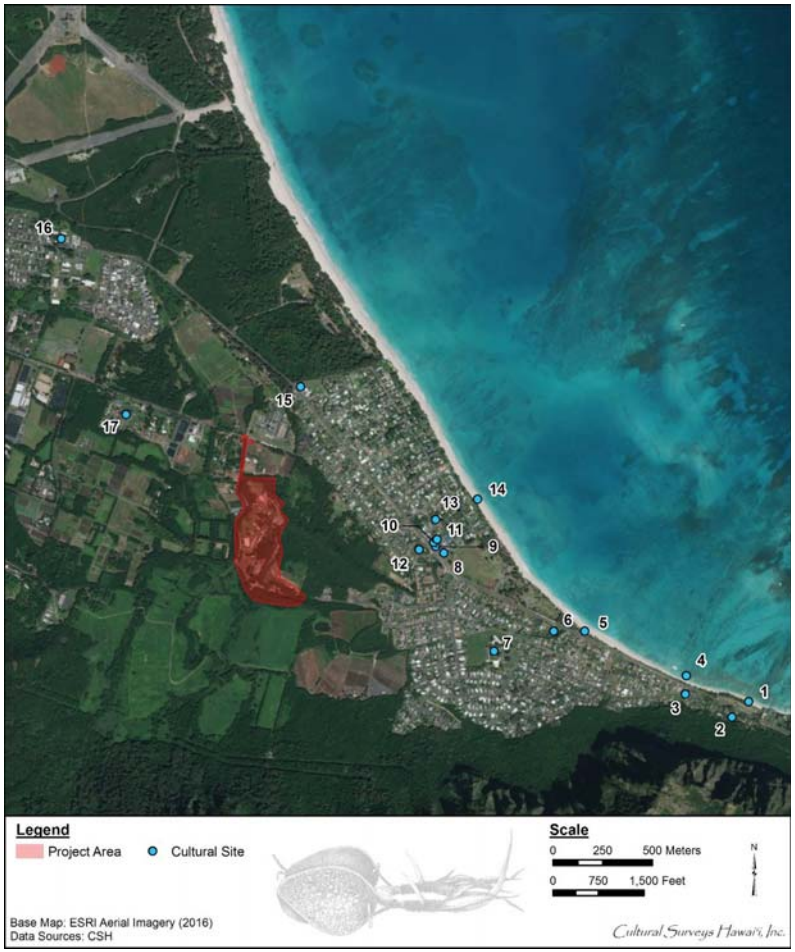


Figure 26. Numbered sites as identied by Mr. and Mrs. Spencer

Figure 27. Mr. Spencer and his father. Picture was taken in the front yard of the family home. Background is looking towards Waimānalo Beach Park.

Figure 28. Susan Spencer, Mr. Spencer’s grandmother/adopted mother

Figure 29. Mr. Spencer on horse Kunia

Figure 30. Mr. Spencer (2 years old) and mother in driveway

Figure 31. Mr. Spencer and his dad with their mule

Figure 32. Mr. Spencer (age 10) and his father at the top of the Ko‘olau mountain. From this point you can see almost all of Waimānalo; they are directly above their home on Bell Street.

Figure 33. Mr. and Mrs. Spencer with their first daughter at Mrs. Spencer’s family property

Figure 34. Mrs. Spencer and her Aunty walking home from the store across the street

Figure 35. Little league baseball game at Waimānalo Beach Park

Figure 36. Picture of Mrs. Spencer’s oldest sister at grandparent’s house. Note Waimānalo Post Office in the background.

Mr. and Mrs. Spencer were both raised in Waimānalo and their families have always maintained a lineal connection to this place. Though they have lived on Hawai’i Island for nearly 40 years, in remembering their younger years in Waimānalo, they cherish most the concept of community that was genuinely felt in Waimānalo. In the natural progress of time, older generations have passed and areas once utilized for gathering are no longer used by the family. Likewise, businesses that Mr. and Mrs. Spencer were once familiar with, are now long gone. In their absence from Waimānalo, many changes took place but their memories of the safe community from their childhood will remain dear to them.

Section 7 Traditional Cultural Practices

Timothy R. Pauketat succinctly describes the importance of traditions, especially in regards to the active manifestation of one’s culture or aspects thereof. According to Pauketat,

> People have always had traditions, practiced traditions, resisted traditions, or created traditions . . . Power, plurality, and human agency are all a part of how traditions come about. Traditions do not simply exist without people and their struggles involved every step of the way. [Pauketat 2001:1]

It is understood that traditional practices are developed within the group, in this case, within the Hawaiian culture. These traditions are meant to mark or represent aspects of Hawaiian culture that have been practiced since ancient times. As with most human constructs, traditions are evolving and prone to change, resulting from multiple influences including modernization as well as other cultures. It is well known that within Hawai‘i, a “broader ‘local’ multicultural perspective exists” (Kawelu 2015:3).While this “local” multicultural culture is deservedly celebrated, it must be noted that it often comes into contact with “traditional Hawaiian culture.” This contact between cultures and traditions has undoubtedly resulted in numerous cultural entanglements. These cultural entanglements have prompted questions regarding the legitimacy of newly evolved traditional practices. The influences of “local” culture are well noted throughout this section, and understood to represent survival or “the active sense of presence, the continuance of native stories, not a mere reaction, or a survivable name. Native survivance stories are renunciations of dominance, tragedy and victimry” (Vizenor 1999:vii). Acknowledgement of these “local” influences helps to inform nuanced understandings of entanglement and of a “living [Hawaiian] contemporary culture” (Kawelu 2015:3). This section strives to articulate traditional Hawaiian cultural practices practiced within the *ahupua‘a* in ancient times, and the aspects of these traditional practices that continue to be practiced today; however, this section also challenges “tropes of authenticity” (Cipolla 2013) and acknowledges the multicultural influences and entanglements that may “change” or “create” a tradition.

This section integrates information from Sections 3–6 in examining cultural resources and practices identified within or in proximity of the project area and in the broader context of the encompassing Waimānalo landscape.

7.1 Settlement and Habitation

The early settlers of the Hawaiian archipelago would have been attracted to the windward *moku* of Ko‘olaupoko on O‘ahu, especially the specific *ahupua‘a* of Waimānalo, with its coral reefs, bays, and inlets for fishing, dense basalt dikes for the production of stone adzes and other tools, and amphitheatre-like basins and broad alluvial floodplains that contained fertile soils, permanently flowing streams, and high rainfall for the cultivation of crops (Kirch 1985:69). Archaeological sites along the windward coast of O‘ahu, from the *ahupua‘a* of Kāne‘ohe to Waimānalo, contain some of the earliest documented Hawaiian settlements (Allen 1987:265; Kirch 1985:69–80). Subsurface cultural layers indicative of cooking and eating activities (e.g., marine shell midden, fire-cracked rock, charcoal deposits, and lithic debitage) were recently identified a short distance inland from the sand dunes at Bellows (Desilets and Dye 2002; Dye 1998; Jones and Hammatt 2005; Perzinski et al. 2002; Simonson et al. 2008; Tuggle 1997).

Following the Kuleana Act of 1850, the *ahupua‘a* of Waimānalo was awarded to Victoria Kamāmalu and subject to the *kuleana* claims of the commoners. Of the 113 *kuleana* land claims awarded in Waimānalo (Barrère 1994; Kame‘eleihiwa 1992), nearly all of them were concentrated along Waimānalo Stream and its upper tributaries with a focus on wetland taro and sweet potato cultivation, as well as the central and southeastern coastal areas with a focus on marine resources (Waihona ‘Aina 2000). No *kuleana* LCAs were located in the vicinity of the current project area.

Waimānalo was also a favorite vacation spot for the *ali‘i*, who were often hosted at the Cummins Estate, which was known for its lavish parties from the times of Kamehameha III through Kalākaua. Queen Lili‘uokalani composed the *mele* “Aloha ‘Oe” following a celebration at the Cummins home when she saw a Hawaiian couple saying goodbye as she was traveling up the Maunawili Ridge toward the Pali (Bartholomew and Associates 1959:13–14).

7.2 Cultivation and Gathering

The nearest perennial stream is Waimānalo Stream, located approximately 3 km to the northwest of the project area. Waimānalo Stream likely supplied water for the mostly spring-fed irrigated lowland agricultural terraces (Handy and Handy 1972:458).

The project area is located in an area that was once fields of sugarcane. In 1876, the establishment of the Reciprocity Treaty between the Hawaiian Kingdom and the United States provided Hawai‘i’s growing sugar industry with a free market and the potential for great profits. In 1880, John A. Cummins organized the Waimanalo Sugar Company, initially purchasing sugar from Chinese farmers until the plantation began cultivating its own sugar. As the plantation grew, former ranch lands were converted to cane fields, new irrigation ditches and railroad lines were constructed, and improvements were made to the mill and Waimanalo Landing. By the 1920s, the cultivation of sugarcane stretched across the floor of Waimānalo Valley to the base of the Ko‘olau Range (Bartholomew and Associates 1959:14–15) including a majority of the project area. Historic maps and images depict the extent of the sugar fields in Waimānalo.

The expansion of the Waimānalo sugarcane fields in the latter part of the nineteenth century required intensive irrigation. Irrigation for the Waimānalo cane fields was provided by the Waimānalo Ditch System (SIHP # -4042) which was fed by water from springs, tunnels, and streams in neighboring Maunawili Valley, Kawainui Swamp in Kailua, and a swampy area near the mouth of Waimānalo Stream, called Waimānalo Lagoon (Neller 1981).

The intense cultivation of sugar led to diverse forms of agriculture which continue to this day in Waimānalo. In 1947, the Waimanalo Sugar Company sold its fee-simple land holdings and the years of its lease of government-owned lands to the Waimanalo Agricultural Development Company who sublet 1- to 20-acre farm lots and up to 150-acre pastoral lots to individual farmers in Waimānalo Valley for intensive diversified agriculture. The Waimānalo Agricultural Experiment Station, an approximately 30-acre agricultural research farm, was established by the University of Hawai‘i in 1950. Research conducted at the experiment station provided local farmers with scientific knowledge about crops and agricultural practices to improve agricultural production in Hawai‘i. In 1953, the Territorial Government established the Waimānalo Farm Lots subdivision which consisted of approximately 9-acre agricultural parcels including seven chicken farms, one dairy, one piggery, and papaya and flower farms.

In 1967, the L.W. Campos Ranch established an approximately 200-acre dairy farm in Waimānalo before being purchased by Foremost Dairies in 1969, which expanded by acquiring an additional approximately 140 acres for pasture. In 1984, an approximately 21-acre parcel was subleased to Universal Synergetics (Unisyn) for the research and development of a commercial anaerobic digestion technology for manure and organic waste conversion into agricultural products or other farm products. In 1997, the dairy was acquired by Meadow Gold Dairies, which ceased operations in 2001 (UH 2001).

Interviewee Iwalani Lowea Kahalewai-Cook recalled gathering and collecting with her grandmother at Cook Ranch on Waikupanaha Street when she was a child. She noted that her grandmother planted native plants including *noni*, foliage, *kukui* nut, and ti leaves which the Hawai‘i Pa‘u Riders use to perpetuate the tradition of *pā‘ū* riding. A *pā‘ū* rider’s costume consists of the *pā‘ū*, which is secured to the rider using six *kukui* nuts. The costume is completed with *lei* adorning both the rider and the horse. Ms. Heavenly Mealani Cook-Kamakeeaina also noted the numerous species of plants at Cook Ranch including ti leaf, bougainvillea, *kauna‘oa*, sea grapes, and dry *kalo*. She also noted that due to the nature of the soil which consists of Coral outcrop (CR) (Foote et al. 1972:29), growing crops at Cook Ranch is difficult.

7.3 Marine Resources

Testimonies associated with LCAs throughout the *ahupua‘a* of Waimānalo noted that Hawaiians settled along the coastal area for marine resources. Several streams flow through Waimānalo including Waimānalo Stream which provided water for irrigated lowland agricultural terraces, Puhā Stream where Hawaiians once practiced the sport of *pu‘e wai*, and Muliwai‘ōlena Stream which was the location of a two-day battle between Ka‘eo, an *ali‘i* from Moloka‘i, and O‘ahu forces during which Mare Amara, Ka‘eo’s foreign gunner, shot the O‘ahu commander (Fornander 1878:2:262).

Interviewee Mrs. Spencer remembers her uncle would dive for squid if her grandmother ever had a craving. If conditions were right he would go out and fish for *‘ō‘io* just off the coast at the end Pu’u One street. Mrs. Spencer explains that now it is rare to find *‘ō‘io* in that same spot.

7.4 Ranching

Cattle and horse ranching in Waimānalo began with the marriage of Thomans Cummins and the High Chiefess Kaumakaokane in 1828. Following his marriage, Cummins received a Royal Patent to an estate of crown lands in Waimānalo in 1842 (Dorrence 1998:19) and leased 970 acres, spanning “from Popo‘oka‘ala point to the hills of Ka‘iwa and Ka‘akaupu of the Ko‘olau district,” from Kamehameha III in 1850 (Williams 1996:155) which he and his son, John A. Cummins turned to a large cattle and horse ranch. They also constructed a landing at Waimānalo Bay (Condé and Best 1973:364) and a railroad line was laid to connect the landing to the Cummins Estate for Kamehameha V (Thomas 1983:77). The Cummins family later bought about 200 acres of *kuleana* lands. By the early 1870s, Chinese rice farmers were using some of these lands under agreement with John A. Cummins (Bartholomew and Associates 1959:14).

The natural environment and the traditional Hawaiian life in Waimānalo were negatively impacted by the introduction of livestock to Hawai‘i. Herds of cattle, sheep, and horses trampled the small scattered homesteads and destroyed the *lo‘i kalo* and the *kī* and *wauke* along their terraced

banks, and larger trees died because their roots could not get enough moisture (*Kuokoa*, 26 October 1906 in Sterling and Summers 1978:244).

Numerous horse riding and equestrian facilities are still located in Waimānalo including Town & Country Stables and the Waimānalo Polo Club. The project area is currently occupied by horse ranches and stables including Cook Ranch and Na Lio O Waimānalo. Cook Ranch is the home of the Hawai‘i Pa‘u Riders Equestrian Unit where they have perpetuated the tradition of *pā‘ū* riding since 1991. In addition to the tradition of *pā‘ū* riding, the Hawai‘i Pa‘u Riders also perpetuate other Hawaiian traditions including *hula*, *mele*, and *oli*. Since 1982, the Hawai‘i Pa‘u Riders Equestrian Unit has participated in numerous parades and events locally and on the mainland. In preparation for these events, the unit holds monthly meetings at the ranch which include horsemanship practice, *hula* and *oli* practice, gathering of foliage and flowers for *lei*, and *lei* making workshops. The Cook Ranch also hosts numerous activities for the community at Cook Ranch including the awards ceremony for the Aloha Festival Parade. Ms. Leiala Ka‘iulani Cook, President of the Hawai‘i Pa‘u Riders Equestrian Unit, noted that her mother was also a professional *hula* dancer and *kumu hula* with a *hālau* in Waimānalo.

7.5 *Wahi Pana* and *Mo‘olelo*

A Hawaiian *wahi pana* “physically and poetically describes an area while revealing its historical or legendary significance” (Landgraf 1994:v). Waimānalo Ahupua‘a contains numerous *wahi pana* and associated *mo‘olelo* that place the specific project area within a broader cultural context.

Waimānalo is a relatively large *ahupua‘a* extending from the peaks of the Ko‘olau Mountains to the coast of Waimānalo between Wailea Point to the north and Makapu‘u Point to the south. In ancient times, the *ahupua‘a* of Waimānalo encompassed a much larger area.

The *mauka* region of the of Waimānalo Ahupua‘a contains several *wahi pana* including the peaks of Lanipō and Pu‘u o Kona; these tower above the northern *mauka* section of Waimānalo Ahupua‘a while the peaks of Makapu‘u and Pu‘u o Moloka‘i characterize the southern *makai* section. A section of cliffs in Waimānalo known as Kaulanaaka‘iole (the resting place of the rat) derived its name from Pikoiaka‘alalā, a famous archer who saw a rat on the cliffs and shot at it (Landgraf 1994:154). A hill in the *mauka* region of the valley, Kalāwehekohe (the day of the opening vagina), was named after the location where a young chiefess lost her virginity to young chief (Charles Alona 1939, Oahu Place Names ms, cited in Sterling and Summers 1978:245). Another hill by the cliffs called Kaupokuhale is reportedly where Hawaiians gathered *‘awa* (Charles Alona 1939, Oahu Place Names ms, cited in Sterling and Summers 1978:245). Haununāhino, a hill toward the coast, was once a famous place of refuge for those losing a battle (McAllister 1933:191). Another hill along the coast, Pu‘ukiloi‘a, was used to observe schools of fish and signal to the canoes where to surround the fish with a net (Charles Alona 1939, Oahu Place Names ms, cited in Sterling and Summers 1978:244).

Several culturally significant *pōhaku* are located in Waimānalo including a natural shrine called Wailea (Water of Lea), a *ko‘a* at Kaluahine (Site 22), Pōhaku Pa‘akikī (unyielding stone; Landgraf 1994:156), another *pōhaku* named Kini near Pāhonu Pond, and a *pōhaku* rooted at the edge of a cliff on a ridge of Makapu‘u overlooking the ocean that Becket and Singer (1999:162) suggest is a Pōhakuokāne (stone of Kāne).

Section 8 Summary and Recommendations

8.1 Results of Background Research

Background research for this study yielded the following results, presented in approximate chronological order:

1. Ko‘olaupoko, the traditional name for the *moku* encompassing Waimānalo, translates literally as “the short windward” in contrast to the northern half of this coastline known as Ko‘olauloa, “the long windward.” This may reflect the relative short distance from the sea to the great *pali* of the Ko‘olau Mountains, which seem to loom directly over much of this district.
2. Waimānalo, Puhā, and Muliwai‘ōlena are streams found in this *ahupua‘a*. A *mauka* spring called Waikupanaha can also be found. Two companion springs, one *mauka*, Kupunakāne, and one *makai* called Kupunawahine, were reported to cry out to each other in soft voices on sunny days (Sterling and Summers 1978:247).
3. Towering above the northern *mauka* section of Waimānalo Ahupua‘a are the peaks of Lanipō and Pu‘u o Kona, while the peaks of Makapu‘u and Pu‘u o Moloka‘i characterize the southern *makai* section.
4. At the time that Kamehameha became the sole ruler of O‘ahu, Moloka‘i, Lāna‘i, Hawai‘i, and Maui, he retained the *ahupua‘a* of Waimānalo as his own personal property when he divided the conquered lands of O‘ahu among his warrior chiefs and counselors (‘Ī‘ī 1959:69-70). His sons Liholiho and Kauikeaouli—Kamehameha II and Kamehameha III, respectively—inherited most of Waimānalo Ahupua‘a (Commissioner of Public Lands 1929:28).
5. As a result of the Kuleana Act of 1850, the *ahupua‘a* of Waimānalo was awarded to Victoria Kamāmalu and subject to the *kuleana* claims of the commoners, and 113 *kuleana* land claims were awarded in Waimānalo (Barrère 1994; Kame‘eleihiwa 1992). No *kuleana* LCAs were located in the vicinity of the current project area.
6. Cattle and horse ranching in Waimānalo began with the marriage of Thomas Cummins and the High Chiefess Kaumakaokane, a relative of Kamehameha I, in 1828. Their marriage provided Cummins with connections to the throne, and he received a Royal Patent to an estate of Crown Lands in Waimānalo in 1842. In 1850, Kamehameha III leased 6,970 acres of land in Waimānalo to Cummins for a period of 50 years (Dorrance 1998), this acreage included the entire Waimānalo Ahupua‘a except for *kuleana* awards.
7. The introduction of livestock to Hawai‘i had an exceedingly negative impact on the natural environment and contributed to the demise of traditional Hawaiian life. The animals trampled the small scattered homesteads and stripped the land of native vegetation (Bryan 1915:226–227). In Waimānalo, ranching destroyed the *lo‘i kalo* and the *kī* (ti; *Cordyline terminalis*) and *wauke* (paper mulberry; *Broussonetia papyrifera*) along their terraced banks, and larger trees died because their roots could not get enough moisture.
8. John A. Cummins saw the potential of sugar production at Waimānalo and in 1880 he organized the Waimanalo Sugar Company and began construction of a sugar mill. As the plantation grew, former ranch lands were converted to cane fields, new irrigation ditches and railroad lines were constructed, and improvements were made to the mill and Waimanalo Landing.
9. By the 1920s, plantation sugarcane fields stretched across the floor of Waimānalo Valley to the base of the Ko‘olau Range (Bartholomew and Associates 1959:14–15). Much of the project area, with the exception of the most *mauka* lands and gulch areas, was cultivated in cane.
10. The intense cultivation of sugar in Waimānalo led to diverse forms of agriculture that continue today. The Waimanalo Sugar Company sold its fee-simple land holdings and the remaining years of its lease of government-owned lands to the Waimanalo Agricultural Development Company in 1947.
11. In 1967, the L.W. Campos Ranch relocated from Kailua to Waimānalo, establishing an approximately 200-acre dairy farm. Campos Ranch was purchased by Foremost Dairies in 1969, which expanded by acquiring an additional approximately 140 acres for pasture. It was during this period that the dairy employee housing was erected.
12. The Waimānalo Military Reservation, including approximately 1,500 acres along the northern coastal portion of Waimānalo, was established in 1917. In 1933, it was renamed Bellows Field and consisted of an infantry and artillery training area, as well as a runway for the Air Corps.
13. The Kalaniana‘ole Highway opened in 1924 and greatly improved transportation to Waimānalo. Additional residential development occurred in the coastal portion of central Waimānalo with the establishment of Waimānalo Homestead by the Hawaiian Homes Commission in 1925. Qualified homesteaders, with 50% or more Hawaiian blood, were awarded residential lots located inland of Kalaniana‘ole Highway in the vicinity of Waimanalo Landing (Bartholomew and Associates 1959:16).
14. The *mauka* region of Waimānalo is characterized by diversified agricultural lots that include plant nurseries, small-scale truck farms, and horse ranches and stables (DHHL 2011:17). The project area is currently occupied by horse ranches including Cook Ranch and Na Lio O Waimānalo.
15. Residential communities are located both *mauka* and *makai* of Kalaniana‘ole Highway including parcels owned by the DHHL such as Waimānalo Villages, Kumuhau, Kaka‘ina, and Pine Tree Triangle (DHHL 2011:9). Small commercial businesses are centered along Kalaniana‘ole Highway, primarily in Waimānalo Town and the *makai* area between Waimānalo Bay State Recreation Area and Waimānalo Beach Park (DHHL 2011:17).

8.2 Results of Community Consultation

CSH attempted to contact NHOs, agencies, and community members. Below is a list of individuals who shared their *mana‘o* and *‘ike* about the project area and the Waimānalo Ahupua‘a:

1. Alu Like, Inc., Waimānalo Kūpuna Program
2. Cook ‘Ohana, Hawai‘i Pā‘ū Riders
3. Carter and Jamie Spencer, *Kama‘āina*

8.3 Impacts

Based on information gathered from the cultural and historic background and community consultation detailed in this CIA report, the proposed project may potentially impact gathering and collecting of Native Hawaiian plants and traditional cultural practices. CSH summarizes the potential impacts:

1. The Cook ‘Ohana is opposed to the Waikupanaha Agricultural Lots project. Cook Ranch is situated on a 3-acre parcel on Waikupanaha Street, located within the project area for the proposed Waikupanaha Agricultural Lots project. Cook Ranch is the home of the Hawai‘i Pa‘u Riders Equestrian Unit. To prepare for the numerous parades they participate in, locally and nationally, the unit holds monthly meetings at the ranch which include horsemanship practice, *hula* and *oli* practice, gathering of foliage and flowers for *lei*, and *lei* making workshops. The Cook Ranch also hosts numerous activities for the community including the awards ceremony for the Aloha Festival Parade which may attract up to 300 people. The Cook ‘Ohana do not want to be removed from the property where they have been perpetuating the Hawaiian traditions of *pā‘ū*, *hula*, *mele*, *oli*, and *lei* making since 1991. Ms. Leiala Cook stated, “we pray that we still be able to perpetuate and keep the culture alive on this ranch.”
2. Ms. Iwalani Lowea Kahalewai-Cook believes the proposed project will have an adverse impact on their traditional gathering practices. She believes Cook Ranch is a culturally significant place because of the *kukui* nuts which they use for draping the *pā‘ū*. She also recalled her grandmother, Lita Cook, planting “all these trees you see here.” Ms. Heavenly Cook also noted the numerous species of plants at Cook Ranch which they gather for making *lei* including ti leaf, bougainvillea, *kauna‘oa*, and sea grapes. Ms. Iwalani Lowea Kahalewai-Cook fears she will no longer have access to the *kukui* nuts and other native Hawaiian plants which her *‘ohana* uses for draping *pā‘ū* and making *leis*.

8.4 Recommendations

Based on information gathered from the cultural and historic background and community consultation detailed in this CIA report, CSH makes the following preliminary recommendations.

1. Project construction workers and all other personnel involved in the construction and related activities of the project should be informed of the possibility of inadvertent cultural finds, including human remains. In the event that any potential historic properties are identified during construction activities, all activities will cease and the SHPD will be notified pursuant to HAR §13-280-3. In the event that *iwi kūpuna* are identified, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40. In addition, in the event of an inadvertent discovery of human remains, the completion of a burial treatment plan, in compliance with HAR §13-300 and HRS §6E-43, is recommended.
2. In the event that *iwi kūpuna* and/or cultural finds are encountered during construction, project proponents should consult with cultural and lineal descendants of the area to

develop a reinterment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance.

Section 9 References Cited

Akana, Collette Leimomi with Kiele Gonzales
2015 *Hānau Ka Ua, Hawaiian Rain Names*. Kamehameha Publishing, Honolulu.

Allen, Jane, Mary F. Riford, Thecla M. Bennett, Gail M. Murakami, and Marion Kelly
1987 *Five Upland Ili: Archaeological and Historical Investigations in the Kaneohe Interchange, Interstate Highway H-3, Island of Oahu, Departmental Report 87-1.* Jane Allen, editor. Anthropology Department, Bernice Pauahi Bishop Museum, Honolulu.

Aloha Festivals
2018 *Aloha Festivals Floral Parade Equestrian Application*. Electronic document, http://www.alohafestivals.com/forms/2018%20AFFP%20App1.pdf
2019a *About*. Electronic document, http://www.alohafestivals.com/about.htm#mission
2019b *Aloha Events*. Electronic document, http://www.alohafestivals.com/aloha-events.htm

Anonymous
1933 *The Hawaiian Annual for 1932*. Printshop Company, Ltd., Honolulu.

Ava Konohiki
2015 Ancestral Visions of ‘Āina website. Available online at http://www.avakonohiki.org/.

Barrère, Dorothy
1994 *The King's Mahele: The Awardess and Their Lands.* Compiled by Dorothy B. Barrère. Ms. on file, State Historic Preservation Division Library, Kapolei, Hawai‘i.

Bartholomew and Associates
1959 *A General Plan for Waimanalo Valley, Island of Oahu, Territory of Hawaii*, Prepared for the Commissioner of Public Lands, Harland Bartholomew and Associates, Honolulu.

Becket, Jan, and Joseph Singer
1999 *Pana O‘ahu: Sacred Stones, Sacred Land*. University of Hawai‘i Press, Honolulu.

Beckwith, Martha
1970 *Hawaiian Mythology*. Originally published 1940. University of Hawaii Press, Honolulu.

Blanche Pope Elementary
2016 Blanche Pope Elementary Newsletter. Electronic document.

Bryan, William Alanson.
1915 *Natural History of Hawaii*. Hawaiian Gazette Company Ltd., Honolulu.

Byerly, David and Patrick M. O’Day
2015 *Archaeological Assessment for Construction of a Residential Swimming Pool at 41-20 Hihimanu Street, Waimanalo Ahupuaa, Koolaupoko District, Oahu Island, Hawaii TMK (1) 4-1-006:057*. Garcia & Associates, Honolulu.

Chinen, Jon J.
1958 *The Great Mahele: Hawaii's Land Division of l848*. University of Hawaii Press, Honolulu.

Cipolla, Craig N.
2013 Native American Historical Archaeology and the Trope of Authenticity. *Historical Archaeology.* Vol. 47, ed. 3:12–22.

Cleghorn, Paul L. and Leona Hamano
2003 *Archaeological Monitoring of the Sandwich Isles Communications Rural Fiber Optics Duct Lines Project Waimanalo, Ko‘olaupoko, Oahu Hawai‘i TMK 4-1-37:1-3 & 58-60*. Pacific Legacy, Inc., Kailua, Hawai‘i.

Commissioner of Public Lands
1929 *Indices of Awards made by the Board of Commissions to Quiet Land Titles in the Hawaiian Islands*. Territorial Office Building, Honolulu.

Condé, Jesse and Gerald M. Best
1973 *Sugar Trains: Narrow Gauge Rails of Hawai‘i*. Glenwood Publishers, Felton, California.

Cordy, R.H. and H.D. Tuggle
1976 Bellows O‘ahu New Work and New Interpretations. *Archaeology and Physical Anthropology in Oceania* 11(3):207–235.

Cowan-Smith, Virginia and Bonnie Domrose Stone
1988 *Aloha Cowboy*. University of Hawaii Press, Honolulu.

Cox, David Walter
1978 *Waimanalo Bay State Recreation Area, Archaeological Monitoring of Fenceline, Water Line, Electrical Line, Sewer Line, Park Development, Phases I and II, Waimanalo, Ko‘olaupoko, O‘ahu Island*. Archaeological Research Center Hawai‘i, Inc., Lāwa‘i, Hawai‘i.

CSH (Cultural Surveys Hawai‘i)
2018 *Native American Graves Protection and Repatriation Act Plan of Action Regarding the Inadvertent Discovery of Human Remains at the Department of Hawaiian Home Lands Loa Family Residence Redevelopment Project, Waimānalo, O‘ahu.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Davis, Bertell D.
1977 *Archaeological Investigations at the Waimanalo Bay State Recreation Area, Ko‘olau-poko, Waimānalo, O‘ahu Island: Phase I, Subsurface Survey.* Archaeological Research Center Hawaii, Inc., Lāwa‘i, Hawai‘i.

Department of Health
2019 Office of Environmental Quality Control website. Available online at http://health.hawaii.gov/oeqc//

Desilets, Michael and Thomas S. Dye
2002 *Archaeological Monitoring and Sampling During Bellows OU7 UST Removal Project Interim Remedial Action, Phase I, Bellows Air Force Station, Waimanalo,*

Koolaupoko, Oahu. International Archaeological Research Institute, Inc., Honolulu.

DHHL (Department of Hawaiian Home Lands)
2008 *Waimānalo Regional Plan*. Honolulu
2011 *Waimānalo Regional Plan*. Honolulu

Dixon, Boyd
1993 *Archaeological Reconnaissance of Five Board of Water Supply Wells on O‘ahu, Hawai‘i.* Anthropology Department, Bernice Pauahi Bishop Museum, Honolulu.

Dorrance, William H.
1998 *Oahu‘s Hidden History. Tours into the Past.* Mutual Publishing, Honolulu.

Douglas, Michele T. and Michael Pietrusewsky
1990 *Human Skeletal Remains Discovered at 41-042 Manana Street, Waimanalo, O‘ahu, Hawai‘i.* University of Hawai‘i at Mānoa, Honolulu.

Drolet, Patricia and Aki Sinoto
2001 *Archaeological Inventory Survey BWS Waimanalo Well III, Waimanalo, Koolaupoko, O‘ahu (TMK: 4-1-08:05, 79, & 80)*, Aki Sinoto Consulting, Honolulu.

Dye, Thomas S.
1998 *Archaeological Services in Support of the Final Environmental Impact Statement for Proposed Expansion of Military Training and the Construction of Improvements to Existing Recreational Resources at Bellows Air Force Station, Waimanalo, Hawaii Task 2: Archaeological Investigation for Specified Areas.* International Archaeological Research Institute, Inc., Honolulu.

Emerson, Nathaniel B.
1915 *Pele and Hiiaka: A Myth from Hawaii.* Honolulu Star-Bulletin Press, Honolulu.

Finsch, Otto
1879 *Letters to Virchow from O‘ahu*. D. Alexander, translator.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawai‘i Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham
1878 *An Account of the Polynesian Race, its Origins and Migrations*. Trübner & Company, London.
1917 *Fornander Collection of Hawaiian Antiquities and Folklore: The Hawaiians' Account of the Formation of Their Islands and Origin of Their Race, with the Traditions of Their Migrations, etc., as Gathered from Original Sources. First Series Memoirs of the Bernice Pauahi Bishop Museum Volume IV Parts I, II and III.* Bishop Museum Press, Honolulu.

Google Earth Imagery
2013 Aerial photographs of Hawai‘i. Google Inc., Mountain View, California. Available online at www.google.com/earth.html.

Griffin, Agnes and Martha Yent
1979 *Archaeological Subsurface Investigation at Waimanalo Bay State Recreation Area, Koolaupoko, Oahu*. Department of Land and Natural History, Division of State Parks, Honolulu.

Hammatt, Hallett H.
2016 *Archaeological Monitoring Report for the Waimānalo District Park Sewer Improvements Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu TMK: [1] 4-1-009:264 and Hīhīmanu Street*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H. and David W. Shideler
2006 *Archaeological Literature Review and Field Check Study of Six DOE Schools, Island of Oahu Hawaii Inter-Island DOE Cesspool Project (Blanche Pope Elementary School; Kaaawa Elementary School; Kahaluu Elementary School; Sunset Beach Elementary School; Waialua High and Intermediate School, and Waimanalo Elementary & Intermediate School).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H., David W. Shideler, and Anthony R. Bush
1999 *Archaeological Inventory Survey of the 21.25 Acre Unisyn Biowaste Technology Property at Waimānalo, Ko‘olaupoko, O‘ahu (TMK 4-1-26:4).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.
2002 *Archaeological Inventory Survey in Support of Modifications of the USDA Hawai‘i Fruit Fly Production Facility at Waimānalo, Ko‘olaupoko, O‘ahu (TMK: 4-1-26: Por. 1).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H., David W. Shideler, and Sallee Freeman
2003 *Archaeological Inventory Survey in Support of Expansion of the USDA Hawai‘i Fruit Fly Production Facility, Addendum to Archaeological Inventory Survey in Support of Modifications of the USDA Hawai‘i Fruit Fly Production Facility at Waimanālo, Ko‘olaupoko, O‘ahu (TMK: 4-1-26: Por. 1).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Handy, E. Craighill and Elizabeth G. Handy
1972 *Native Planters of Hawaii: Their Life, Lore, and Environment*. Bishop Museum Press, Honolulu.

Hawai‘i TMK Service
2014 Tax Map Key [1] 4-1-008. Hawai‘i TMK Service, Honolulu

Hazlett, Alex and Hallett H. Hammatt
2010 *Archaeological Monitoring Report for the Waimānalo Beach Park Wastewater System Reconstruction Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu Island TMK: [1] 4-1-003:016 por and 040 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Historic Hawai‘i Foundation
2014 *Hedemann House/Boyd Estate/Queen's Retreat, Maunawili*. Electronic document. https://historichawaii.org/2014/02/21/hedemann-houseboyd-estatequeens-retreat-maunawili/

Honolulu Advertiser
2003 Services set for Lita Cook, ‘queen of the pa‘u riders’. *Honolulu Advertiser*.

Ho‘oulumāhiehie
2008a *The Epic Tale of Hi‘iakapoliopele: woman of the sunrise, lightning-skirted beauty of Halema‘uma‘u as told by Ho‘oulumāhiehie.* M. Puakea Nogelmeier, translator. Awaiaulu, Honolulu.
2008b *Ka mo‘olelo o Hi‘iakapoliopele: ka wahine i ka hikina a ka lā, ka u‘i palkoki uila o Halema‘uma‘u / ha‘i ‘ia iho e Ho‘ouhimāhiehie; unuhi ‘ia a pa‘i hou ‘ia mai e* M. Puakea Nogelmeier. Awaiaulu, Honolulu.

Huapala
n.d. *Waimānalo.* Electronic document, http://www.huapala.org/Wai/Waimanalo.html
n.d. *Waimānalo ‘Āina Kaulana,* Electronic document, http://www.huapala.org/Wai/Waimanalo_Aina_Kaulana.html

Hunkin, Nifae, Douglas F. Borthwick, and Hallett H. Hammatt
2010 *Archaeological Monitoring Report for the Reconstruction of Wastewater Systems at Waimanalo Elementary and Intermediate School Waimanalo Ahupua‘a, Koolaupoko District, Oahu Island TMK: [1] 4-1-09:12.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

‘Ī‘ī, John Papa
1959 *Fragments of Hawaiian History as Recorded by John Papa ‘I‘i*. Bishop Museum Press, Honolulu.

Jackson, George E.G.
1884 East Coast of Oahu including Waimanalo, Hanauma and Maunalua Bays. Surveyed and drawn by Geo. E.G. Gresley Jackson. Hawaiian Government Survey. Registered Map 1019. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

James, Rob
2004 *The Battle of Nu‘uanu, May 1795*. Kamehameha Schools Press, Honolulu.

Jones, C. Kulani and Hallett H. Hammatt
2005 *Burial Treatment Plan for State Site #: 50-80-02-6519 Ahupuaa Paumalu, District of Koolauloa, Island of Oahu (TMK: portion of [1] 5-9-20).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Ka Leo o Ka Lāhui
1893 Hiiaka-i-ka-poli-o-Pele. 14, 15 March. In *Sites of O‘ahu*, by Sterling and Summers, Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu, pgs. 248–249, 1978.

Kamakau, Samuel Mānaiakalani
1992 *Ruling Chiefs of Hawai‘i.* Revised edition. Kamehameha Schools Press, Honolulu.

Kame‘eleihiwa, Lilikalā
1992 *Native Land and Foreign Desires. Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.

Kawelu, Kathleen L.
2015 *Kuleana and Commitment: Working Toward a Collaborative Hawaiian Archaeology*. Univeristy of Hawai‘i Press, Honolulu.

Kelly, Marion, and Barry Nakamura
1981 *Historical Study of Kawai Nui Marsh Area*, *Island of O‘ahu.* Bernice Pauahi Bishop Museum, Honolulu.

Kirch, Patrick Vinton
1985 *Feathered Gods and Fishhooks.* University of Hawaii Press, Honolulu.

Krauss, Beatrice H.
2003 *A Short History of the Hawaii Agricultural Experiment Station, 1901–1982.* Electronic document, http://www.ctahr.hawaii.edu/CTAHR2001/AboutUs/Krauss_History/khistory.html (accessed 20 October 2010).

LaChance, Frederick, Josephine Yucha, and Hallett H. Hammatt
2016 *Archaeological Monitoring Report for Waimanalo Bay Beach Park Wastewater Reconstruction, Waimanalo Ahupua‘a, Koolaupoko District, Oahu, TMK: [1] 4-1-015:015 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Landgraf, Anne Kapualani
1994 *Nā Wahi Pana O Ko‘olau Poko: Legendary Places of Ko‘olau Poko.* Fred Kalani Meinecke, translator. University of Hawai‘i Press, Honolulu.

Lovelace, George and Jason Ota
1980 *Archaeological Test Coring at Waimanalo Bay State Recreation Area.* Department of Land and Natural Resources, Division of State Parks, Honolulu.

Maly, Kepa and Onaona Maly
2003 *Ka Hana Lawai‘a a me nāKo‘a o na Kai ‘Ewalu: A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands.* Two volumes. Kumu Pono Associates LLC, Hilo, Hawai‘i

McAllister, J. Gilbert
1933 *Archaeology of Oahu*. Bishop Museum Bulletin 104. Bernice Pauahi Bishop Museum, Honolulu.

McElroy, Windy K.
2008 *Archaeological Monitoring Report for the Sandwich Isles Communication‘s Fiber Optic Duct Lines Project, ‘Olu‘olu to Mekia Street, Waimanalo Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu, Hawai‘i.* Garcia & Associates, Honolulu.
2010 *Archaeological Monitoring Report for the Sandwich Isles Communications Fiber Optic Duct Lines Project, Oluolu.* Garcia & Associates, Honolulu.

McGerty, Leann and Robert L. Spear
2010 *A Summary of Previous Archaeological Studies Conducted in Waimanalo Bay Beach Park, Waimanalo Ahupua‘a, Ko‘olaupoko District, Island of O`ahu, Hawai‘i [TMK 4-1-15:15].* Scientific Consultant Services, Inc., Honolulu.

McGregor, Davianna Pomaika‘i
1996 An Introduction to the Hoa‘āina and Their Rights. *Hawaiian Journal of History*, Volume 30. Hawaiian Historical Society, Honolulu.

McGuire, Ka‘ohulani and Hallett H. Hammatt
2000 *Archaeological Monitoring Report for the Installation of Light Poles for a Ballfield at Waimānalo Beach Park, Waimānalo, Ko‘olaupoko District, Island of O‘ahu (TMK: 4-1-003-016).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

McMahon, Nancy A.
1990 *Burial Removal at 41-042 Manana St., Oahu Site No. 50-80-15-4118 TMK: 4-1-05:27 Waimanalo, Koolaupoko, Oahu.* Department of Land and Natural Resources, Honolulu.

Midweek
2015 *We sit down with former Aloha Festivals pa‘u queens*. Electronic document, http://www.midweek.com/oahu-aloha-festival-2015-heritage/.

Moore, James R, Carly Liebhardt, and Joseph Kennedy
2009 *An Archaeological Assessment Report for a Property Located at TMK: (1) 4-1-005:035 in Waimanalo Ahupuaa, Koolaupoko District, Island of Oahu.* Archaeological Consultants of the Pacific, Inc., Hale‘iwa, Hawai‘i.

Nakuina, Moses K.
1902 *Ipumakani a Laamaomao.* Kalamakū Press, Honolulu.
1992 *The Wind Gourd of La‘amaomao*. First edition. Esther T. Mookini and Sarah Nākoa, translators. Kalamakū Press, Honolulu.

Neller, Earl
1981 *Waimānalo Ditch System: Photo Survey*, State Historic Preservation Office, Honolulu.

Office of Hawaiian Affairs
2015 *Papakilo Database.* Office of Hawaiian Affairs cultural and historical database. Electronic document, http://papakilodatabase.com/main/index.php.

Ogg, Randy and Michael F. Dega
2002 *Archaeological Testing and Sampling During Removal of Two Underground Storage Tanks at Sherwood Forest State Park Waimanalo, Ko‘olaupoko District, O‘ahu Island, Hawaii*. Scientific Consultant Services, Honolulu.

Ota, Jason
1980 *Archaeological Monitoring at Waimanalo State Beach Park*. 4 December 1980 memo to James Yamashiro. On file at Department of Land and Natural Resources, State Historic Preservation Division Library, Kapolei, Hawai`i.

Pantaleo, Jeffrey
1994a *Monitoring of the Hawaii Job Corps Center in Waimanalo, O‘ahu*. 10 January 1994. Jeffrey Pantaleo Consultants, Honolulu.
1994b *Hawaii Job Corps Center in Waimanalo, O‘ahu*. 11 April 1994. Jeffrey Pantaleo Consultants, Honolulu.

Pauketat, Timothy R.
2001 *The Archaeology of Traditions.* University Press of Florida, Gainesville, Florida.

Pearson, Richard J.
1971 *Archaeological Reconnaissance Survey: Waimanalo Bay State Recreation Area, Waimanalo, Oahu.* University of Hawai‘i, Honolulu.

Pearson R.J., Patrick J. Kirch, and Michael Pietrusewsky
1971 An Early Prehistoric Site at Bellows Beach, Waimānalo, O‘ahu. *Archaeology and Physical Anthropology in Oceania* 6:204–234.

Perzinski, David, Brian Colin, and Hallett H. Hammatt
2002 *Archaeological Monitoring Report for Waimānalo Kūpuna Housing Project at 41-209 Ilauhole Street, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu Hawai‘i (TMK 4-1-19:32).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Perzinski, David, John Winieski, and Hallett H. Hammatt
2001 *An Archaeological Monitoring Report for Waimānalo Sandwich Isles Communication Project, Waimānalo, Ko‘olaupoko District, O‘ahu, Hawai‘i (TMK: 4-1-19, 20, 21).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pukui, Mary Kawena
1983 *‘Ōlelo No‘eau: Hawaiian Proverbs & Poetical Sayings*. Bishop Museum Press, Honolulu.
1995 *Na Mele Welo: Songs of Our Heritage.* University of Hawai‘i Press, Honolulu.

Pukui, Mary K. and Samuel H. Elbert
1986 *Hawaiian Dictionary.* Second edition. University of Hawaii Press, Honolulu.

Pukui, Mary K., Samuel H. Elbert, and Esther Mookini
1974 *Place Names of Hawaii.* University of Hawaii Press, Honolulu.

Pukui, Mary Kawena and Laura C.S. Green
1995 *Folktales of Hawai‘i.* Bishop Museum Press, Honolulu.

Pukui, Mary Kawena, E.W. Haertig, and Catherine A. Lee
1972 *Nānā i ke Kumu (Look to the Source)* Volume 1 and 2. Hui Hānai, Honolulu.

Runyon, Rosanna, Darienne Day, Amy Hammermeister, and Hallet H. Hammatt
2008 *Archaeological Monitoring Report for the Blanche Pope Elementary School, Hawaii Inter-Island DOE Cesspool Project, Waimanalo Ahupuaa, Koolaupoko District, Oahu Island TMK: [1] 4-1-031:040, 041*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Runyon, Rosanna, Constance R. O'Hare, David W. Shideler, and Hallett H. Hammatt
2013 *Archaeological Inventory Survey for Waimanalo Bay Beach Park Wastewater Reconstruction Waimanalo Ahupuaa, Koolaupoko District, Island of Oahu TMK: (1) 4-1-015:015 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Silva, Carol
1981 Final Report on Historical Documentary Research, Waimānalo. In, *Archaeological Reconnaissance of Proposed Additional Marine Corps Training Areas Bellows Air Force Station O‘ahu, Hawai‘i. Appendix A.* Archaeological Research Associates, Kurtistown, Hawai‘i.

Simonson, Mindy, Amy Hammermeister, Todd Tulchin, and Hallett H. Hammatt
2008 *Final Archaeological Inventory Survey of the Proposed Waimānalo Beach Park Wastewater System Reconstruction Project, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu Island TMK: [1] 4-1-003:016 por and 040 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sinoto, Akihiko
1993 *Hawaii Job Corps Center, Waimanalo, O‘ahu, TMK 4-1-09:1.* Aki Sinoto Consulting, Honolulu.
2001 *Addendum Archaeological Inventory Survey: New Preferred Transmission Route BWS Waimanalo Well III Waimanalo, Koolaupoko, Oahu (TMK 4-1-08:80).* Aki Sinoto Consulting, Honolulu.

Soehren, Lloyd
2010 *Hawaiian Place Names.* Electronic database, ulukau.org/cgi-bin/hpn?l=haw.

State Department of Business, Economic Development and Tourism, Energy Division
1998 Report cited in Hammatt, Hallett H., David W. Shideler, and Anthony R. Bush, *Archaeological Inventory Survey of the 21.25 Acre Unisyn Biowaste Technology Property at Waimānalo, Ko‘olaupoko, O‘ahu (TMK 4-1-26:4)* (Cultural Surveys Hawai‘i Inc., Kailua, Hawai‘i, 1999), pp. 10–11.

State Parks In-House Contract Archaeological Team
1979 *Archaeological Monitoring and Subsurface Investigations at Waimanalo Bay State Beach Park, O‘ahu*, 9 October 1979, 1 November 1979, 27 December 1979 Memo to James Yamashiro. On file at Department of Land and Natural Resources, State Historic Preservation Division Library, Kapolei, Hawai‘i.

Sterling, Elspeth P. and Catherine C. Summers
1978 *Sites of O‘ahu*. Department of Anthropology, Bishop Museum. Bishop Museum Press, Honolulu.

Sue, Roy K.C.
1983 *Waimanalo Watershed Project and Archaeological Survey of the Solid Waste Collection Site Waimanalo, Oahu, TMK 4-1-09:266*. Department of Land and Natural Resources, Honolulu.

Thomas, Mifflin
1983 *Schooner from Windward: Two Centuries of Hawaiian Interisland Shipping*. University of Hawaii Press, Honolulu.

Thrum, Thomas G.
1907 Heiaus and Heiau sites throughout the Hawaiian Islands. *Thrum's Hawaiian Annual* for 1907. Thomas G. Thrum, Honolulu.
1923 *More Hawaiian Folk Tales: A Collection of Native Legends and Traditions.* A.C. McClurg & Co. Chicago.
1933 *Hawaiian Almanac and Annual for 1932.* Thomas G. Thrum, Honolulu.

Tuggle, David H.
1997 *Archaeological Research of Areas Proposed for Development of Military Family Housing and Expansion of Military Training at Bellows Air Force Station, O‘ahu Task 1: Literature Review of the Cultural Resources of the Bellows Area.* International Archaeological Research Institute, Inc., Honolulu.

Tuggle, H. David, Ross Cordy, and M. Child
1978 Volcanic Glass Hydration Rind Age Determinations for Bellows Dune, Hawai‘i. *New Zealand Archaeological Association Newsletter* 21 (2):58–77.

Tulchin, Jon and Matt McDermott
2010 *Archaeological Literature Review and Field Inspection of the Approximately 280-Acre CTAHR Waimānalo Experiment Station, Waimānalo Ahupua‘a, Ko‘olaupoko District, O‘ahu Island TMK: [1]4-1-008:005, 080 por; and 4-1-026:004.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

UH Marine Option Program
1999 *Waimānalo Landing–Underwater Survey Initial Report.* Maritime Archaeology Techniques Course. University of Hawai‘i, Mānoa, Honolulu.

Ulukau
2014 *Māhele Database.* Hawaiian Electronic Library, http://ulukau.org/cgi-bin/vicki?l=en..

University of Hawai‘i
2001 *Minutes of Special Meeting of the University of Hawai‘i Board of Regents.* Electronic document, http://www.hawaii.edu/offices/bor/regular/minute/20011213.regular.html (accessed 18 October 2010).

U.S. Army Mapping Service
1953 U.S. Army Map Service topographic map, Puuloa Quadrangle. USGS Information Services, Denver, Colorado.

U.S. Army War Department
1934 U.S. Army War Department topographic map, Koko Head Quad. USGS Information Services, Denver, Colorado.

U.S. Department of Agriculture
2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/ (accessed March 2005).

U.S. Department of Health and Human Services

2002 *Toxicological Profile for DDT, DDE, and DDD.* U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry. Atlanta, Georgia.

U.S. Geological Survey

1938 O‘ahu Island topographic map. USGS Information Services, Denver, Colorado.

1978 USGS Orthophotoquad, Koko Head Quadrangle. USGS Information Services, Denver, Colorado.

1999 Koko Head USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

Vizenor, Gerald

1999 *Manifest Manners: Narratives on Postindian Survivance*. University of Oklahoma Press, Lincoln, Oklahoma.

Waihona ‘Aina

2000 *The Māhele Database*. Electronic document, http://waihona.com (accessed 10 April 2014).

Williams, Ridnna

1996 John A. Cummins: The Entertainer Prince. *Hawaiian Journal of History*, Vol. 30.

Winburn, Mark and Michael Desilets

2008 *Archaeological Assessment Report for Septic Upgrade and House Addition at Residence of Richard and Tamy DeLeon Waimanalo Ahupua‘a, Ko‘olaupoko District, O‘ahu, Hawai'i TMK (1) 4-1-006:012*. Garcia & Associates, Honolulu.

Yent, Martha and Agnes Griffin

1979 *Memorandum re Bulldozed Areas at Waimanalo Bay State Recreation Area, Koolaupoko, Oahu.* 10 October 1979 Memo to James Yamashiro. Department of Land and Natural Resources, Division of State Parks, Honolulu.

Yucha, Trevor M., David W. Shideler, and Hallett H. Hammatt

2018 *Archaeoloāgical Evaluation and Archaeological Monitoring Plan for the State Department of Defense Emergency Siren Modernization Program, 14 Oahu locations.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

(This page intentionally left blank.)

APPENDIX D

Phase I Environmental Site Assessment Report
By EnviroServices and Training Center, LLC

(This page intentionally left blank.)

PHASE I
ENVIRONMENTAL SITE ASSESSMENT
Waikupanaha Agricultural Lots
Waimanalo, Oahu, Hawaii
TMK (1) 4-1-008: Parcels: 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street

Prepared For:
Hawaii Department of Hawaiian Home Lands
c/o The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Prepared By:

EnviroServices & Training Center, LLC
505 Ward Avenue, Suite 202
Honolulu, Hawaii 96814
tel: (808) 839-7222

ETC Project No. 18-1020

August 2019

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1
2.0 INTRODUCTION 4
2.1 BACKGROUND 4
2.2 PURPOSE 5
2.3 SCOPE OF SERVICES 5
2.4 SIGNIFICANT ASSUMPTIONS 6
2.5 CONDITIONS AND LIMITATIONS 6
2.6 USER RELIANCE 6
3.0 SITE DESCRIPTION 7
3.1 LOCATION AND DESCRIPTION 7
3.2 PHYSICAL SETTING 7
3.2.1 Site Topography 7
3.2.2 Regional Geology 7
3.2.3 Site Geology 7
3.2.4 Regional Hydrogeology 8
3.2.5 Site Hydrogeology 8
3.2.6 Nearest Surface Water Bodies 9
3.3 CURRENT USE OF THE SUBJECT PROPERTY 9
3.4 CURRENT USES OF THE ADJOINING PROPERTIES 9
4.0 USER-PROVIDED INFORMATION 10
4.1 REQUIRED INFORMATION 10
4.1.1 Environmental Liens 10
4.1.2 Activity and Use Limitations 10
4.1.3 Specialized Knowledge 10
4.1.4 Valuation Reduction for Environmental Issues 10
4.1.5 Commonly Known or Reasonably Ascertainable Information 10
4.1.6 Degree of Obviousness of Potential Contamination 10
4.2 OTHER INFORMATION PERTAINING TO THE SUBJECT PROPERTY 11
4.2.1 Reason for Performing Phase I ESA 11
4.2.2 Title Records 11
4.2.3 Owner, Property Manager, and Former Occupant Information 11
5.0 RECORDS REVIEW 12
5.1 STANDARD ENVIRONMENTAL RECORD SOURCES 12
5.2 FEDERAL NPL AND DELISTED NPL 13
5.2.1 Federal CERCLIS and CERCLIS NFRAP 13
5.2.2 Federal RCRA CORRACTS 13
5.2.3 Federal RCRA (non-CORRACTS) TSD Facilities 13
5.2.4 Federal RCRA Generator 13
5.2.5 Federal Institutional Control/Engineering Control Registries 14
5.2.6 Federal ERNS 14
5.2.7 State Equivalent NPL and CERCLIS 14
5.2.8 State Landfill and/or Solid Waste Disposal 14
5.2.9 State Leaking Underground Storage Tanks 15
5.2.10 State Registered Underground Storage Tanks 15
5.2.11 State Institutional Control Registry 15
5.2.12 State Voluntary Cleanup/Response Sites 15
5.2.13 State Brownfields 15

5.2.14 Unmappable/Orphan Sites *15*
5.3 ADDITIONAL ENVIRONMENTAL RECORD SOURCES 16
5.4 TIER 1 VAPOR ENCROACHMENT SCREEN 16
5.5 HISTORICAL USE INFORMATION ON THE SUBJECT AND ADJOINING PROPERTIES 17
5.5.1 Aerial Photograph Review *18*
5.5.2 Fire Insurance Maps *18*
5.5.3 Historical Topographic Map Review *19*
5.5.4 Property Tax Files and Land Title Records *19*
5.5.5 Building Permit Records *20*
6.0 SITE RECONNAISSANCE 21
6.1 METHODOLOGY AND LIMITING CONDITIONS 21
6.2 GENERAL SITE SETTING 21
6.3 OBSERVATIONS 21
6.4 USTS / ASTS 23
6.5 HYDRAULIC AND DIELECTRIC FLUID CONTAINING EQUIPMENT 23
7.0 INTERVIEWS 24
8.0 FINDINGS AND OPINIONS 29
8.1 SITE DESCRIPTION 29
8.2 USER PROVIDED INFORMATION 29
8.3 RECORDS REVIEW 29
8.3.1 Standard Environmental Record Sources *29*
Federal NPL and Delisted NPL *29*
Federal CERCLIS and CERCLIS NFRAP *29*
Federal RCRA CORRACTS *30*
Federal RCRA (non-CORRACTS) TSD Facilities *30*
Federal RCRA Generator *30*
Federal Institutional Control/Engineering Control Registries *30*
Federal ERNS *30*
State Equivalent NPL and CERCLIS *30*
State Landfill and/or Solid Waste Disposal *30*
State Leaking Underground Storage Tanks *31*
State Registered Underground Storage Tanks *31*
State Institutional Control Registry *31*
State Voluntary Cleanup/Response Sites *31*
State Brownfields *31*
Unmappable/Orphan Sites *32*
8.3.2 Additional Environmental Record Sources *32*
8.3.3 Tier 1 Vapor Encroachment Screen (VES) *32*
8.3.4 Historical Use Information on the Subject and Adjoining Properties *32*
8.4 SITE RECONNAISSANCE 33
8.5 INTERVIEWS 33
9.0 DATA GAPS 35
10.0 CONCLUSIONS 36
11.0 ENVIRONMENTAL PROFESSIONAL CERTIFICATION 37
12.0 DEVIATIONS AND ADDITIONAL SERVICES 38
13.0 REFERENCES 39

APPENDICES

Appendix I. Figures
Appendix II. Photographic Documentation
Appendix III. Research Documentation
Appendix IV. Regulatory Records Documentation (EDR Radius Map Report)
Appendix V. Qualifications of the Environmental Professional

1.0 EXECUTIVE SUMMARY

This report presents the results of a Phase I Environmental Site Assessment (ESA) performed by EnviroServices & Training Center, LLC (ETC) in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E1527-13. This Phase I ESA was completed for the State of Hawaii - Department of Hawaiian Home Lands (DHHL) through The Limtiaco Consulting Group (collectively, Client) for an approximate 32-acre property located along Waikupanaha Street in Waimanalo, Hawaii, herein referred to as the Subject Property. The Subject Property is identified as Tax Map Key (TMK) identification number (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street.

Visual observation for the use and/or storage of hazardous materials and hazardous waste was performed on October 4, 2018 and May 22, 2019. Visual inspection of the Subject Property indicated that the groundcover generally consists of bare soil, gravel, and vegetation with limited areas of asphalt pavement (i.e. Waikupanaha Street) and concrete pavement (e.g. platforms, walkways, etc.) within select tenant spaces. Specifically, the Subject Property is developed with horse corrals, stables, equestrian practice arenas, bird coops, storage sheds/trailers/containers, a large metal-frame gazebo, restrooms, etc. The remaining areas of the Subject Property primarily consist of pasture, outdoor equipment storage, and unoccupied vegetated land. The following tenants were observed to occupy the Subject Property at the time of ETC's site reconnaissance activities: 1) Sports Turf Hawaii, Inc., 2) Na Lio'o Waimanalo, 3) Cook's Ranch, and 4) Alan Silva. ETC understands that the Subject Property was formerly occupied by a fifth tenant, 5) Char Ranch, who operated a therapeutic riding center known as Manawale'a Riding Center. Char Ranch's lease agreement was reportedly terminated by DHHL in or around 2013 due to violations associated with suspected illegal activities.

During ETC's visual observations of the Subject Property, one 55-gallon metal drum was discovered within the Cook's Ranch tenant space. Although the drum appeared to be intact and in good condition, the drum was unlabeled and contained an unknown liquid substance. Furthermore, a black and dried material was observed on the lid and along the side of the drum. Cook's Ranch personnel indicated having no knowledge of the origins or contents of the drum. ETC also observed two 55-gallon metal drums within the former Char Ranch tenant space. The drums were observed to be in poor condition (i.e. rusted with visible holes), were also unlabeled, and contained an unknown liquid substance. Furthermore, a dark oily residue was observed on the lid of one of the two drums. Although no obvious visual or olfactory indications of a release onto the ground surfaces were observed (i.e. surface staining or petroleum odor); ETC was unable to determine whether a past release of hazardous substance or petroleum product from the three discovered drums had occurred. Based on these findings coupled with the condition of the drums, ETC cannot dismiss the possible presence of contaminant impacts associated with the unlabeled and/or corroded drums. As such, this finding is considered a REC. No significant findings to indicate any suspect recognized environmental conditions (RECs), historical RECs, controlled RECs, or *de minimis* conditions were identified during ETC's site reconnaissance of the remaining areas of the Subject Property (i.e. Sports Turf Hawaii, Inc., Na Lio'o Waimanalo, Alan Silva tenant spaces).

Interview findings revealed the past and prior use of the Subject Property included suspect illegal auto mechanic activities. Specifically, areas on the north and east portions of the

Subject Property were reportedly formerly occupied by illegal "chop-shops" associated with Char Ranch and Cook's Ranch tenant areas. Activities associated with the suspect activities included disassembling vehicles, oil changes, tune-ups, etc. Although the suspect illegal auto mechanic activities are no longer conducted on the Subject Property, ETC's visual observation of these areas indicated the presence of solid waste (e.g. rusted automotive parts, scrap metal, storage trailers, etc.) commonly associated with automotive activities (i.e. "chop shop"). Aside from the observed solid waste, no evidence of a release was observed within these areas. Interview findings also revealed that an unoccupied area on the northeast portion of the Subject Property was formerly illegally sublease to a trucking business (i.e. Hiroshima Trucking) for the purposes of heavy equipment maintenance, parking, and storage. It was also reported that oil-staining, typically associated with vehicle maintenance and leaking equipment, was previously observed on the ground surface within this area. Aside from a remnant concrete platform associated with the former trucking business, no evidence of a release was observed within this area.

Interview findings also revealed that illegal dumping had occurred on the Subject Property for many years. Specifically, Char Ranch reportedly authorized trucking companies to illegally dump various construction and/or demolition debris (e.g. aggregate, roofing materials, concrete with rebar, etc.) in stockpiles throughout the Subject Property. It was also reported that a large pit was excavated on the northwest corner of the Subject Property for the purposes of dumping solid waste associated with the Char Ranch "chop-shop." It is suspected that petroleum products and/or hazardous materials may have also been disposed of into the pit (e.g. drums of used oil, etc.). Although the reported pit was not observed during ETC's site reconnaissance, possible evidence of the former pit was identified in ETC's review of a 2008 aerial photograph, which depicts a sizeable area on the northwest corner of the Subject Property partially backfilled with dirt. According to information provided by Subject Property tenants, solid waste associated with past illegal dumping is currently buried beneath the ground surface throughout the Subject Property.

Although ETC did not observe evidence any past releases associated with the former automotive activities, trucking businesses and/or suspect solid waste dumping; ETC cannot dismiss the possibility that residual contamination associated with these activities may exist on the Subject Property. This finding is considered a REC. No additional evidence of suspect hazardous materials or heavy surface staining was observed on the Subject Property. Additionally, no evidence of underground storage tanks (USTs) or aboveground storage tanks (ASTs) were observed on the Subject Property.

The Subject Property was identified by the contracted database as a Release Notifications site (HI SPILLS) for "illegal dumping in Waimanalo." As such, ETC requested and reviewed facility files from the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Office. Document review indicated that an incident of dumping was reported to the DOH HEER Office in May 2014 (Case No. 20140502-1250) with regard to three unknown containers located on the north portion of the Subject Property. Document review indicated that the containers were planned to be removed and disposed of by Pacific Environmental Corporation. Although no additional documentation verifying the disposal of the containers was found through ETC's research, evidence of the containers was not observed during ETC's site reconnaissance. As such, it is likely that the containers have been removed from the site.

In addition to Subject Property findings, the contracted database search identified one (1) Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) No Further Remedial Action Planned (NFRAP) site, three (3) State Hazardous Waste Sites (SHWS), and four (4) Leaking Underground Storage Tank (LUST) sites within the specified radii of the Subject Property. Based on these findings, ETC requested and reviewed select facility files from the DOH HEER Office and the DOH Solid and Hazardous Waste Branch (SHWB). File review findings indicated that none of these facilities were considered a REC for the Subject Property.

In summary, ETC performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 on the Subject Property. This assessment revealed no evidence of RECs in connection with the Subject Property except:

- Contaminant impacts associated with a potential release from the three unlabeled 55-gallon drums containing unknown substances, located within the Cook's Ranch and former Char Ranch tenant spaces.
- The potential presence of residual contamination associated with past and prior usage of the Subject Property (e.g. auto mechanic, trucking activities, suspect solid waste dumping, etc.).

2.0 INTRODUCTION

EnviroServices & Training Center, LLC (ETC) was contracted by the State of Hawaii - Department of Hawaiian Home Lands (DHHL) through The Limtiaco Consulting Group (collectively, Client) to complete a Phase I Environmental Site Assessment (ESA) for a property located in Waimanalo, Oahu, Hawaii, herein referred to as the Subject Property. The Subject Property is identified as Tax Map Key (TMK) identification number (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street.

This Phase I ESA was performed in accordance with the ASTM International Standard E1527-13 entitled *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (referred to herein as the ASTM Practice). The ASTM Practice is intended for use by parties who wish to assess the environmental condition of commercial real estate with respect to contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. The ASTM Practice was designed to satisfy 'all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice' as defined in 42 United States Code (U.S.C.) §9601(35)(B).

2.1 Background

Under CERCLA, persons may be held liable to clean up hazardous substances at properties that they either currently own or operate, or owned or operated at the time of disposal. Strict liability in the context of CERCLA means that a potentially responsible party may be liable for environmental contamination based solely on property ownership and without regard to fault or negligence.

In 1986, the Superfund Amendments and Reauthorization Act (SARA) amended CERCLA by creating an "innocent landowner" defense to CERCLA liability for those persons who could successfully demonstrate, among other requirements, that they "did not know and had no reason to know" prior to purchasing the property that any hazardous substance that is the subject of a release or threatened release was disposed of on, in, or at the property. Such persons, to demonstrate that they had "no reason to know" must have undertaken, prior to, or on the date of acquisition of the property, "all appropriate inquiries" into the previous ownership and uses of the property consistent with good commercial or customary standards and practices.

The Small Business Liability Relief and Brownfields Revitalization Act (referred to as "the Brownfields Amendments") was enacted in January 2002 to amend CERCLA. These amendments included providing funds to assess and clean up brownfield sites, clarifying CERCLA liability provisions for certain landowners, and providing funding to enhance state and tribal cleanup programs.

Subtitle B of Title II of the Brownfields Amendments revised CERCLA and clarified the requirements necessary to establish the innocent landowner defense. The Brownfields Amendments also added protections from CERCLA liability for "bona fide prospective purchasers" and "contiguous property owners" who meet certain statutory requirements. Each of the CERCLA liability provisions for innocent landowners, bona fide prospective purchasers, and contiguous property owners (referred to collectively as "landowner liability protections," or LLPs) requires that, among other requirements, persons claiming the liability protections conduct

all appropriate inquiries into prior ownership and use of a property prior to or on the date a person acquires a property.

A key provision of the Brownfields Amendments finalized regulations and set federal standards for the conduct of all appropriate inquiries; these federal standards were promulgated in the *Standards and Practices for All Appropriate Inquiries, Final Rule, 40 CFR Part 312*, referred to as the AAI Final Rule.

Section 312.11 of the AAI Final Rule indicates that the ASTM International Standard E1527-05/13, entitled *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, may be used to comply with the requirements set forth in Sections 312.23 through 312.31 of the AAI Final Rule. Therefore, this Phase I ESA was performed in conformance with the ASTM International Standard E1527-13.

2.2 Purpose

The purpose and goal of this Phase I ESA is to conduct an inquiry to identify recognized environmental conditions in connection with the Subject Property, to the extent feasible pursuant to the process described in the ASTM Practice. The term recognized environmental condition (REC) is defined as:

> "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions."

As defined in the ASTM Practice, for the purposes of this Phase I ESA, the term "migrate" or "migration" refers to the movement of hazardous substances or petroleum products in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface (ASTM, 2013).

ETC understands this Phase I ESA will be used by ETC's Client to assess environmental conditions and potential environmental liabilities, if any, associated with the Subject Property.

2.3 Scope of Services

The scope of work included the following tasks:

- Develop a site description for the Subject Property including background, physical characteristics, and historical site conditions.
- Evaluate user provided information, including but not limited to environmental liens, activity and use limitations, specialized knowledge, valuation reduction of environmental issues, and other information pertaining to the property.
- Evaluate information in programs such as NPL, CERCLIS, FINDS, ERNS, RCRA notifiers, and other governmental information systems within specific radii of the property to identify sites that would have the potential to impact the property.

- Conduct a visual site reconnaissance from publicly accessible areas detailing the current property and adjacent property conditions.
- Conduct a visual evaluation of the adjacent properties to identify high-risk neighbors and the potential for a chemical to migrate onto the property.
- Conduct interviews with owner(s), site manager(s), occupant(s), local government official(s), and/or other individuals with past and prior use history of the property, if available.
- Conduct a Tier 1 Vapor Encroachment Screening for the subject property in conformance with the ASTM Practice E2600-15.
- Complete a written report detailing the Phase I ESA findings and conclusions.
- Document supportive information including maps, site photographs, regulatory records, and interview.

2.4 Significant Assumptions

This Phase I ESA is limited by the availability of information at the time of the assessment. Interviews were conducted, and interviewee's responses were assumed as answered in good faith, to the extent of his/her actual knowledge. Since no hydrogeological data was available for the Subject Property, groundwater was assumed to flow in the direction of the surface topography of the Subject Property and surrounding areas.

2.5 Conditions and Limitations

ETC completed this Phase I ESA for the Subject Property in accordance with the scope and limitations of ASTM Practice E1527-13. ETC's findings and conclusions contained herein are professional opinions based solely upon visual observations, interviews, and interpretation of the historical information and documents available to ETC at the time this Phase I ESA was conducted. Opinions stated in this report do not apply to changes that may occur after the services were performed.

ETC performed the specified services for this project with the degree of care, skill, and diligence ordinarily exercised by professional consultants performing the same or similar services. No other warranty, guarantee, or representation, expressed or implied, is included or intended; unless otherwise specifically agreed to in writing by both ETC and ETC's Client.

2.6 User Reliance

This report is intended for the sole use of ETC's Client (the "User" of this report), exclusively for the project site indicated. ETC's Client may use and release this report, including making and retaining copies, provided such use is limited to the particular site and project for which this report is provided. However, the services performed may not be appropriate to satisfy the needs of other users. Release of this report to third parties is at the sole risk of the said user(s), and ETC is not liable for any claims or damages resulting from or connected with such release or any third party's use or reuse of this report.

3.0 SITE DESCRIPTION

3.1 Location and Description

The Subject Property consists of approximately 32-acres of partially improved land located in Waimanalo, Hawaii, on the east portion of the island of Oahu. The Subject Property is identified as TMK identification number (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street. A map of the Subject Property is included in Appendix I, Figure 1.

3.2 Physical Setting

Groundcover on the Subject Property generally consists of bare soil, gravel, and vegetation with limited areas of concrete pavement (e.g. platforms, walkways, etc.) within select tenant spaces and the asphalt paved portion of Waikupanaha Street. The Subject Property and surrounding areas appear to exhibit varying topography with an overall downward sloping gradient to the north. A site plan is included as Appendix I, Figure 2. Photographic documentation of ETC's site reconnaissance is included in Appendix II.

3.2.1 Site Topography

Topographic map coverage of the Subject Property and surrounding areas is provided by the United States Geological Survey, Island of Oahu, Hawaii, 7.5-minute Series, Koko Head Quadrangle, 1999. The elevation of the Subject Property ranges from approximately 15- to 60-feet above mean sea level (msl).

3.2.2 Regional Geology

Oahu is formed by the erosional remnants of two shield volcanoes: the Waianae range to the west, and the Koolau range to the east. The Waianae volcano is estimated to have formed 2.4- to 3.6 -million years ago. It consists of a tholeiitic lava shield with a thick cap of transitional to alkalic rock. Rejuvenation-stage volcanic of undifferentiated age occurs in Kolekole Pass and on the south flank of the Waianae shield. Dike orientations define northwest and southwest rift zones (Macdonald, et al., 1983).

The Koolau volcano is estimated to have formed 1.8- to 2.6 -million years ago (Macdonald, et al., 1983). It consists of a tholeiitic lava shield and lacks an alkalic cap. It has well defined major dike complex trending northwest-southwest.

A third, minor rift zone referred to as the Kaau rift trends southward from Kaau crater, near the upland crest of the Koolau Ridge. After a long dormant period and periods of deep erosion, the Koolau volcano developed abundant and scattered rejuvenation-stage vents, typically aligned on northeast-striking fissures (Macdonald, et al., 1983).

3.2.3 Site Geology

The north and east portions of the Subject Property are mapped as Coral Outcrop (CR). CR consists of coral or cemented calcareous sand on the island of Oahu. CR occurs when small areas of coral outcrop are exposed on the ocean shore, on the coastal planes, and at the foot of uplands. Evaluations typically range from sea level to approximately 100-feet. The annual rainfall for CR amounts to 18- to 40-inches. Vegetation is sparse in these areas and primarily

consists of kiawe, koa haole, and fingergrass. CR is primarily used for military installations, quarries, and urban development (USDA 1972).

The south and west portions of the Subject Property are mapped as Mamala Cobbly Silty Clay Loam, 0- to 12-percent slopes (MnC). MnC consists of shallow, well-drained soils along the coastal plains on the island of Oahu and Kauai. This soil formed in alluvium deposited over coral limestone and consolidated calcareous sand. In a representative profile, the surface layer is approximately 8-inches thick and consists of reddish-brown silty clay loam. The subsoil is approximately 11-inches thick and consists of dark reddish-brown silty clay. The soil is underlain by coral limestone and consolidated calcareous sand at depths of 8- to 20- inches. MnC is neutral to mildly alkaline, with a moderate permeability, and a slight to moderate erosion hazard. Additionally, runoff is very slow to medium. The annual rainfall for MnC amounts to 18- to 25-inches, most of which occurs between November and April. The natural vegetation for MnC consists of kiawe, koa haole, bristly foxtail, and swollen fingergrass. This soil is primarily used for sugarcane, truck crops, orchards, and pasture (USDA 1972).

3.2.4 Regional Hydrogeology

The primary drinking water in the Hawaiian Islands is drawn from basal groundwater. Basal groundwater is formed by rainwater percolating down through the residual soils and permeable volcanic rock. The portion of the island situated below sea level is saturated with ocean salt water, except within rift zones of the volcanoes where fresh water forms a basal lens called the "Ghyben-Herzberg" lens. A zone of transition between the fresh groundwater and the ocean salt water occurs due to the constant movement of the interface as a result of tidal fluctuations, seasonal fluctuations in recharge and discharge and aquifer development (Macdonald et al., 1983).

Groundwater aquifers in Hawaii occur under two principal conditions at high altitudes above sea level: perched and dike-impounded. Downward percolation of rainwater may be impeded by low permeability materials such as dense volcanic sediments, alluvial clay, and volcanic ash, which can cause the formation of a perched aquifer. A dike-impounded aquifer results from steeply dipping volcanic dikes serving as a barrier, sequestering water into compartments and reservoirs of impermeable lavas. Recharge of freshwater aquifers occurs in areas of high rainfall, which are the interior mountainous areas. The groundwater flows from the recharge areas to the areas of discharge along the shoreline. Frictional resistance to groundwater flow causes it to pile up within the island until it attains sufficient hydraulic head to overcome friction. Thus, basal groundwater tends to slope toward the shoreline (Nichols et al., 1996).

3.2.5 Site Hydrogeology

The Subject Property is underlain by the Waimanalo Aquifer System, which is part of the Windward Aquifer Sector on the island of Oahu. The aquifer is classified by Mink and Lau, 1990, with the system identification number 30604212 (11111). This system includes an unconfined, high level aquifer in dike compartments. The groundwater in this aquifer is described as a currently-used, fresh (<250-mg/l Cl-) drinking water source. The groundwater is further described as irreplaceable with a high vulnerability to contamination (Mink and Lau 1990).

3.2.6 Nearest Surface Water Bodies

The nearest surface water bodies include an apparent retention basin located approximately 0.10-miles southeast of the Subject Property and an apparent drainage canal located approximately 0.18-miles west of the Subject Property. Additionally, Waimanalo Bay is located approximately 0.56-miles northeast of the Subject Property. Waimanalo Bay is contiguous with the Pacific Ocean.

3.3 Current Use of the Subject Property

With the exception of Waikupanaha Street, the Subject Property is currently owned by DHHL and is occupied by the following four (4) recreational and commercial-type tenants:

- Sports Turf Hawaii, Inc. (~20-acres) – Landscaping
- Na Lio'o Waimanalo (~3-acres) – Equestrian / Horse Boarding Facility
- Cook's Ranch (~3-acres) – Equestrian / Horse Boarding Facility
- Alan Silva (~0.7-acres) – Private Ranch

ETC understands that the Subject Property was formerly occupied by a fifth tenant known as Char Ranch. Char Ranch operated the Manawale'a Riding Center, which served as an equestrian facility for disabled youth. Char Ranch's lease permit was reportedly terminated by DHHL in or around 2013 due to violations associated with suspect illegal activities.

ETC understands that DHHL plans to convert the Subject Property into an agricultural homestead subdivision. As such, current Subject Property tenants are expected to vacate the property in the foreseeable future.

3.4 Current Uses of the Adjoining Properties

ETC visually inspected the neighboring properties and their operations from the Subject Property and publicly accessible areas. The Subject Property is bordered to the west by agricultural farms and an aggregate hauling company (i.e. Hiroshima Trucking); to the north by a plant nursery (i.e. A&K Nursery), beyond which is Hihimanu Street; to the east by a former rock quarry; and to the south by undeveloped vegetated land. Note that a number of homeless encampments were also observed along Waikupanaha Street. Other land uses in the vicinity of the Subject Property include agricultural fields and residential homes.

4.0 USER-PROVIDED INFORMATION

This section is intended to provide information obtained from the User of this Phase I ESA that will help identify RECs associated with the Subject Property. The information provided does not require the user to have the technical expertise of an environmental professional, and are generally not provided by the environmental professional performing the Phase I ESA.

4.1 Required Information

To qualify for one of the LLPs offered by the Brownfields Amendments, the user must provide the following information (if available) to the environmental professional. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete. Mr. Kalei Young, Land Agent, State of Hawaii - Department of Hawaiian Home Lands (User) provided ETC with the information in the following subsections.

4.1.1 Environmental Liens

The User did not have any information pertaining to any environmental liens or governmental notifications relating to past or recurrent violations of environmental laws with respect to the Subject Property.

4.1.2 Activity and Use Limitations

The User did not have any information pertaining to activity and land use limitations filed or recorded in a registry under federal, tribal, state, or local law.

4.1.3 Specialized Knowledge

The User did not have any specialized knowledge of experience related to the Subject Property or nearby properties.

4.1.4 Valuation Reduction for Environmental Issues

The User indicated that the purpose of the Phase I ESA is related to planned land-use changes of the Subject Property; therefore, valuation reduction for environmental issues pertaining to the Subject Property is not applicable.

4.1.5 Commonly Known or Reasonably Ascertainable Information

The User was not aware of any commonly known or reasonably ascertainable information about the Subject Property that would help the environmental professional identify conditions indicative of releases or threatened releases.

4.1.6 Degree of Obviousness of Potential Contamination

The User did not have any additional knowledge related to obvious indicators that point to the presence or likely presence of contamination at the Subject Property based on their knowledge and/or experience related to the Subject Property.

4.2 Other Information Pertaining to the Subject Property

4.2.1 Reason for Performing Phase I ESA

This Phase I ESA was conducted as part of a feasibility study prior to planned land-use changes of the Subject Property.

4.2.2 Title Records

The User did not provide title records/documents. However, ETC conducted a limited land title search. The title records review is documented in Section 5.4.4.

4.2.3 Owner, Property Manager, and Former Occupant Information

Subject Property Owner and Manager: Mr. Kalei Young
Department of Hawaii Home Lands
Tel: (808) 620-9463

5.0 RECORDS REVIEW

5.1 Standard Environmental Record Sources

To obtain information concerning RECs at or near the Subject Property, ETC contracted Environmental Data Resources, Inc. (EDR) to conduct an environmental database search. EDR is a company that specializes in the review of public regulatory environmental databases. The regulatory agency report provided (Appendix IV) is based on an evaluation of the data collected and compiled by a contracted data research company.

The radius search report focused on the Subject Property and adjacent properties that may impact the Subject Property. Adjacent properties listed in governmental environmental records are identified within a specific search radius (Table 1). The search radius varies depending on the particular record being researched. The search is designed to meet the requirements of the current industry approach as described in ASTM Practice E1527-13. The information provided is assumed to be correct and complete, unless noted otherwise.

Table 1: ASTM Practice Environmental Record Sources and Recommended Search Distances

Environmental Database Sources	ASTM Practice Search Distances (miles)
Federal NPL Site List	1.0
Federal Delisted NPL Sites	0.5
Federal CERCLIS List	0.5
Federal CERCLIS NFRAP Site List	0.5
Federal RCRA CORRACTS Facilities List	1.0
Federal RCRA non-CORRACTS TSD Facilities List	0.5
Federal RCRA Generators List	Subject Property and adjoining properties
Federal Institutional Control/Engineering Control Registries	Subject Property only
Federal ERNS List	Subject Property only
State-Equivalent NPL	1.0
State-Equivalent CERCLIS	0.5
State Landfill and/or Solid Waste Disposal Site Lists	0.5
State Leaking UST List	0.5
State Registered UST List	Subject Property and adjoining properties
State Institutional Control Registry	Subject Property only
State Voluntary Cleanup/Response (VCP/VRP) Sites	0.5
State Brownfields Sites	0.5

5.2 Federal NPL and Delisted NPL

The National Priorities List (NPL) is the Environmental Protection Agency's (EPA) database of uncontrolled or abandoned hazardous waste properties, which are considered to pose an immediate threat to human health and the environment. These properties are identified for priority remedial response actions under the Superfund Program. The Subject Property was not identified as a NPL site or a delisted NPL site. Additionally, no Federal NPL or delisted NPL sites were identified within a 1-mile radius of the Subject Property.

5.2.1 Federal CERCLIS and CERCLIS NFRAP

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database contains information on various aspects of potentially uncontrolled or abandoned hazardous waste properties from initial screening and assessment phases listed in the NPL. The Subject Property was not identified as an active CERCLIS site or a CERCLIS No Further Remedial Action Planned (NFRAP) site. However, the database search identified one (1) Federal CERCLIS NFRAP site within a 0.5-mile radius of the Subject Property.

5.2.2 Federal RCRA CORRACTS

The RCRA Corrective Action Sites (CORRACTS) database contains Resource Conservation Recovery Information System (RCRIS) sites with reported corrective action. The Subject Property was not identified as a CORRACTS facility. Additionally, the database search did not identify any CORRACTS sites within a 1-mile radius of the Subject Property.

5.2.3 Federal RCRA (non-CORRACTS) TSD Facilities

The EPA's RCRA program identifies and tracks hazardous waste from the point of generation to the point of final disposal. The RCRA Treatment, Storage, or Disposal (TSD) facility database compiles data from reporting facilities that treat, store, or dispose of hazardous waste. The Subject Property was not identified as a RCRA TSD facility. Additionally, the database search did not identify any RCRA TSD facilities within a 0.5-mile radius of the Subject Property.

5.2.4 Federal RCRA Generator

The RCRA Generator database is a compilation by EPA's RCRIS of regulated facilities that generate hazardous waste. The Subject Property was not identified as a RCRA generator. Additionally, no RCRA facilities were identified on potentially adjoining properties with respect to the Subject Property.

5.2.5 Federal Institutional Control/Engineering Control Registries

Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or affect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on a site. The EPA Institutional Control and Engineering Control registry maintains a list of sites with institutional or engineering controls in place. The Subject Property was not identified as having institutional or engineering controls in place.

5.2.6 Federal ERNS

The Emergency Response Notification System (ERNS) tracks the initial notification of reported oil and hazardous material spills. The database contains information regarding the discharger, release date, material, amount released, incident location, and release action taken. The Subject Property was not identified as an ERNS facility.

5.2.7 State Equivalent NPL and CERCLIS

The CERCLIS list is a compilation of known or suspected uncontrolled or abandoned hazardous waste sites. These sites either have been investigated or are currently under investigation by the EPA for the release, or threatened release, of hazardous substances. Once a site is placed in CERCLIS, it may be subject to several levels of review and evaluation, and ultimately placed on the National Priorities List.

The State of Hawaii does not have a formal "State Superfund" program; therefore, the State Hazardous Waste Sites (SHWS) are the State of Hawaii's equivalent to the EPA's CERCLIS database. Since this information is acquired from the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Office, these sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup that use State funds (State Equivalent Superfund) are identified along with sites where the potentially responsible parties pay for cleanup. The Subject Property was not identified as a SHWS. However, the database search identified three (3) SHWS facilities within a 1-mile radius of the Subject Property.

5.2.8 State Landfill and/or Solid Waste Disposal

The State of Hawaii has records that include an inventory of solid waste disposal facilities and/or landfills. These may include active or inactive facilities, or open dumps that failed to meet RCRA Subtitle D, Section 4004 criteria for solid waste landfills or disposal sites. The Subject Property was not identified as a Solid Waste Facility/Landfill (SWF/LF) facility, nor did the database search identify any SWF/LF facilities within a 0.5-mile radius of the Subject Property.

5.2.9 State Leaking Underground Storage Tanks

The DOH UST Program maintains a list of all reported leaks and releases from USTs. The Subject Property was not identified as a leaking underground storage tank (LUST) facility. However, the database search identified four (4) LUST facilities within a 0.5-mile radius of the Subject Property.

5.2.10 State Registered Underground Storage Tanks

The DOH UST Program's registration system tracks known and registered UST systems. The Subject Property was not identified as a UST facility. Additionally, the database search did not identify any UST facilities located on an adjacent property or in close proximity to the Subject Property.

5.2.11 State Institutional Control Registry

Institutional Controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on a site. The State Institutional Control list includes Voluntary Response Program (VRP) and Brownfield Sites with institutional controls in place. The Subject Property was not identified as having institutional controls in place.

5.2.12 State Voluntary Cleanup/Response Sites

The Hawaii VRP was created on July 7, 1997 by amendments made to Hawaii's Environmental Response Law (ERL). The purpose of the VRP is to streamline the cleanup process in a way that encourages prospective developers, lenders, and purchasers to voluntarily clean up properties. The VRP facilitates the cleanup process and, in certain situations, provides relief from the strict liability provisions of the Federal CERCLA and Hawaii ERL. The Subject Property was not identified as a VRP site. Additionally, the database search did not identify any VRP sites within a 0.5-mile radius of the Subject Property.

5.2.13 State Brownfields

A Brownfields Site is land which the expansion, redevelopment, or reuse of may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. The Subject Property was not identified as a Brownfields Site. Additionally, the database search did not identify any Brownfields Sites located within a 0.5-mile radius of the Subject Property.

5.2.14 Unmappable/Orphan Sites

One (1) unmappable site was identified in the Orphan Summary of the EDR report. Unmappable sites are not plotted due to poor or inadequate address information. Due to the inaccurate or incomplete information provided by a respective agency, these sites cannot be plotted with confidence. Review of the site addresses and names, coupled with ETC's site reconnaissance findings, indicated that neither the Subject Property nor adjacent properties were identified in the Orphan Summary of the database report.

5.3 Additional Environmental Record Sources

The EDR database included a number of other regulatory databases that are not specified by the ASTM Practice. The Subject Property was identified as a Release Notifications site (HI SPILLS) with regard to illegal dumping. No additional sites surrounding the Subject Property were identified in the Additional Environmental Record Sources of the database search.

5.4 Tier 1 Vapor Encroachment Screen

ETC conducted a Tier 1 Vapor Encroachment Screen (VES) for the Subject Property. The Tier 1 VES was conducted in conformance with the scope and limitations of ASTM Practice E2600-15.

The purpose and goal of a Tier 1 VES is to conduct an inquiry to identify whether a vapor encroachment condition (VEC) exists on the Subject Property. The term vapor encroachment condition is defined as the "presence or likely presence of chemical(s) of concern (COC) vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater or both, either on or near the target property as identified by a Tier 1 or Tier 2 screen."

To obtain information concerning VECs at or near the Subject Property, ETC contracted EDR to conduct the VES. A VES is a radius search report that focuses on the Subject Property and adjacent properties that may impact the Subject Property. The search radius varies depending on the particular record researched. The search is designed to meet the recommended search radius described in ASTM Practice E2600-15.

Table 2: ASTM Practice E2600-15 Environmental Record Sources and Recommended Search Distances

Environmental Database Sources	ASTM Practice Search Distances (miles) COC and Petroleum Hydrocarbon Chemicals of Concern
Federal NPL Site List	1/3
Federal CERCLIS List	1/3
Federal RCRA CORRACTS Facilities List	1/3
Federal RCRA non-CORRACTS TSD Facilities List	1/3
Federal RCRA Generators List	Subject Property only
Federal Institutional Control/Engineering Control Registries	Subject Property only
Federal ERNS List	Subject Property only
State-Equivalent NPL	1/3
State-Equivalent CERCLIS	1/3
State Landfill and/or Solid Waste Disposal Site Lists	1/3
State Leaking UST List	1/3
State Registered UST List	Subject Property only
State Institutional Control/Engineering Control Registries	Subject Property only
State Voluntary Cleanup/Response (VCP/VRP) Sites	1/3
State Brownfields Sites	1/3

The Subject Property was identified as a SPILLS site by the contracted database. Additionally, the contacted database search identified one (1) CERCLIS NFRAP site, one (1) SHWS facility and three LUST (3) sites within the specified radii of the Subject Property. VES results are discussed in Section 8.3.2.

5.5 Historical Use Information on the Subject and Adjoining Properties

Historical uses of the Subject Property and adjoining properties were investigated through the review of documentation available from public land records and State of Hawaii archived information. In addition, available aerial photographs, plat maps, Sanborn maps, and building permits were reviewed.

5.5.1 Aerial Photograph Review

Aerial photographs from the EDR Aerial Photo Decade Package were reviewed. A total of seven aerial photographs included the Subject Property. These photographs were dated 1968, 1975, 1978, 1985, 1992, 2001, and 2008.

In the 1968 aerial photograph, the Subject Property appears to be primarily undeveloped and unoccupied, with the exception of two rectangular structures located on the north portion of the site. Surrounding areas also appear generally undeveloped and/or utilized for agricultural purposes. Areas to the north and east of the Subject Property appear developed with residential homes and roadways. Waikupanaha Street is also visible in the 1968 aerial photograph.

In the 1975, 1978, and 1992 aerial photographs, the Subject Property and surrounding areas are difficult to discern due to poor image-resolution. Although not clearly visible, the north portion of the Subject Property appears partially developed with several rectangular structures and an apparent road which adjoins Waikupanaha Street. The southeast portion of the Subject Property appears to be included as part of a large excavated pit, which extends eastward, beyond the boundaries of the site (i.e. the former rock quarry). Surrounding areas appear similar to the 1968 photograph, with no significant changes.

In the 2001 and 2008 aerial photographs, the Subject Property appears fully developed and/or utilized similar to its current configuration as a multi-tenant complex. The former rock quarry appears to diminish in size from the 1992 to 2001 aerial photograph and appears fully overgrown in vegetation in the 2008 aerial photograph. In the 2008 aerial photograph, a sizeable area on the northeast corner of the Subject Property appears to be backfilled with dirt. Surrounding areas appear primarily undeveloped and/or utilized for agricultural purposes.

ETC also reviewed several aerial photographs (over 150 images) depicting portions the Subject Property and surrounding areas. The aerial photographs were provided to ETC by TLCG and generated by ControlPoint Surveying Inc. and Dudek in October 2018 as part of an aerial drone survey.

Based on ETC's review, the Subject Property generally appears coveredin dense vegetation, with the exception of select areas that are developed with structures and features associated with equestrian facilities (e.g. stables, riding arenas, etc.). Additionally, a limited number of stored items (e.g. trailers, heavy equipment, etc.) are located on the south portion of the Subject Property. Surrounding areas to the north and west appear to be occupied by commercial and/or agricultural businesses, while the east and south surrounding areas appear undeveloped and fully overgrown in vegetation

5.5.2 Fire Insurance Maps

ETC contracted EDR to conduct a search for Sanborn fire insurance maps of the Subject Property. The search results indicated that the Subject Property is an unmapped property; therefore, Sanborn maps were not available.

5.5.3 Historical Topographic Map Review

ETC contracted EDR to conduct a search of historic USGS topographic maps for the Subject Property. A total of nine (9) topographic maps were provided that included the Subject Property. These maps were dated 1928/1930, 1952, 1954, 1959, 1969, 1970, 1983, 1999, and 2013.

The Subject Property and surrounding areas appear undeveloped and unoccupied in the 1928/1930 topographic map. Areas further north and northwest appear to be developed with features associated with the Waimanalo Sugar Company (e.g. sugar mill, railroad tracks, camp housing, etc.).

In the 1952 and 1954 topographic maps, the north portion of the Subject Property appears developed with two rectangular structures. Additionally, two intersecting roads appear to traverse the south portion of the Subject Property. The remaining portions of the Subject Property appear to be covered in vegetation. With the exception of a water tank on the east adjacent property, surrounding areas appear similar to the 1928/1930 map, with no significant changes. The previously depicted features associated with the Waimanalo Sugar Company are no longer present in the 1952 map and these areas appear to be redeveloped with public access roads and residential homes. Additionally, an area west of the Subject Property appears to be utilized as an "experimental station" by the University of Hawaii.

In the 1959, 1969, and 1970 topographic map, the Subject Property appears similar to the 1954 map, with no significant changes. However, in the 1983 and 1999 topographic maps, the south portion of the Subject Property appears occupied by an area labeled as a "Gravel Pit". The pit appears to extend onto the east adjacent property. With the exception of a single structure on the north portion of the site, the Subject Property appears undeveloped. Aside from road and highway outlines, no details or developments are depicted in the 2013 topographic map.

5.5.4 Property Tax Files and Land Title Records

ETC conducted a limited chain of title search for the Subject Property at the Honolulu County Property Tax office. ETC is not a professional title search company and does not warrant the completeness or accuracy of the information provided, but considers the data useful in screening the Subject Property for environmentally suspect owners or lessees.

Property records were dated from 1938 to 2013. Review of the property records indicate that the Subject Property parcels are currently owned by DHHL (previously Hawaiian Homes Commission) who has owned the Subject Property parcels since at least 1938. Chain of title records also indicate that there are no current lessees listed for the Subject Property. However, previous lessees of the Subject Property include, but are not limited to, Kanani W. Auwae, Frank Rutgers Jr., Ben Char Jr., Allan K. Silva, June K. and Roy Pires, John and Lita Cook, Hawaii Pa'u Riders, and Grace Pacific Corporation. Chain of title records indicate that the majority of previous lessee agreements were terminated on or around 2013. Additionally, property records indicate that Parcels 093, 094, 095, and 096 originated from the larger Parcel 002. Note that the Waikupanaha Street portion of the Subject Property does not have a TMK number; and it therefore, owned by the State of Hawaii.

5.5.5 Building Permit Records

A review of available building permits issued by the City and County of Honolulu indicates that two building permits were issued for the Subject Property. Specifically, a building permit was issued to the Subject Property in February 2000 with regard to electrical work (Permit No. 505321). A second building permit was issued to the Subject Property in September 2007 with regard to the construction of restrooms at the Manawale'a Riding Center (Permit No. 617292). No other building permits pertaining to the Subject Property were found through ETC's research.

6.0 SITE RECONNAISSANCE

To complete a visual survey and identify the use and/or storage of hazardous materials on the Subject Property, ETC performed an initial site reconnaissance on October 5, 2018. A second site reconnaissance was conducted on May 22, 2019.

6.1 Methodology and Limiting Conditions

ETC personnel performed the site reconnaissance by systematically inspecting all areas of the Subject Property. Due to safety concerns associated with the physical conditions of the site (i.e. steep terrain, dense vegetation, etc.), areas within the north portion of the Subject Property could not be inspected. Although not fully inspected, ETC was able to visually inspect areas within the north portion of the site from Waikupanaha Street and accessible dirt paths. Additionally, several tenant structures were closed and locked at the time of ETC's site reconnaissance. Therefore, visual inspection of the interior areas within select structures (i.e. trailers, sheds, storage containers, etc.) could not be completed. Although not inspected, ETC believes that based on the nature of the tenant businesses coupled with tenant-provided information, the contents of these structures are not anticipated to cause a significant environmental impairment to the Subject Property. Furthermore, no visual indications of a release were observed around the perimeter or within the vicinity of the structures. No other areas of the Subject Property were restricted from ETC's visual observation. Maps of the Subject Property are included in Appendix I. Photographic documentation of ETC's site reconnaissance is included in Appendix II.

6.2 General Site Setting

The Subject Property consists of approximately 32-acres of partially improved land located in Waimanalo, Oahu. The Subject Property is bound to the west by agricultural farms and an aggregate hauling company (i.e. Hiroshima Trucking); and partially bound to the east by a vertical drop-off, which borders the former rock quarry. The west border of the Subject Property includes Waikupanaha Street, which is an asphalt paved public road. The northwest portion of the Subject Property is developed with several structures and features associated with current tenant operations. Specifically, the Subject Property is developed with horse corrals and stables, equestrian practice arenas, bird coops, storage sheds/trailers/containers, a large metal-frame gazebo, restrooms, etc. The east portion of the Subject Property is developed with a cell phone tower. The remaining areas of the Subject Property consist of pasture, outdoor equipment storage, and undeveloped vegetated land. The following tenants were observed to occupy the Subject Property at the time of ETC's site reconnaissance activities: 1) Sports Turf Hawaii, Inc., 2) Na Lio'o Waimanalo, 3) Cook's Ranch, and 4) Alan Silva.

6.3 Observations

Visual inspection of the Subject Property indicated that the groundcover generally consists of bare soil, gravel, and vegetation with limited areas of asphalt pavement (i.e. Waikupanaha Street) and concrete pavement (e.g. platforms, walkways, etc.) within select tenant spaces.

ETC observed approximately ten stockpiles of construction/landscaping materials (i.e. sand, rock, crushed asphalt), storage containers/trailers, heavy equipment (e.g. backhoes,

tractors, etc.), four empty plastic tote tanks, piles of used tires, plastic tarps, and other miscellaneous items stored within the Sports Turf Hawaii, Inc tenant space. No evidence of current or past release from the stored items was observed. ETC observed a gated riding arena, horse stables, and storage sheds/trailer located on the southwest portion of the Subject Property. According to Subject Property tenants, the area is currently occupied by a family member associated with Sports Turf Hawaii, Inc. No evidence of petroleum or hazardous materials was observed within this area.

ETC observed a fishing boat and a dilapidated, abandoned structure located on the southeast portion of the Subject Property. Based on information provided by Subject Property tenants, the structure is a remnant feature from a previous tenant who operated a horse ranch on the south portion of the Subject Property. No significant environmental concerns associated with the boat or abandoned structure were observed. ETC also observed two open areas on the southeast portion of the Subject Property, which appeared to have been recently backfilled with dirt. Based on information provided by Subject Property tenants, the backfilled areas were likely sinkholes or voids associated with the former rock quarry. No evidence of surface spills, staining, distressed vegetation, or debris was observed within the backfill material.

ETC observed an on-site septic system located within the Cook's Ranch tenant space. According to on-site personnel, all bathroom drains discharge to the onsite septic system. The septic tank is regularly pumped by a local Waimanalo pumping company and no environmental concerns associated with the septic tank have been reported. ETC also observed a limited amount of over-the-counter products and supplies (e.g. paint cans, fuel canister, leaf blower, etc.) stored within the Cook's Ranch tenant space. According to on-site personnel, these items are associated with light-maintenance and general facility upkeep. All stored items appeared to be in good to fair condition with no evidence of a release. ETC also observed an unlabeled 55-gallon metal drum located beneath a trailer, on the north portion of the Cook's Ranch tenant space. Although the drum appeared to be intact and in good condition, the drum was unlabeled and contained an unknown liquid substance. Additionally, a black and dried material was observed on the lid and along the side of the drum. Cook's Ranch personnel indicated having no knowledge of the origins or contents of the drum. Although no petroleum odors or obvious indications of staining was observed on the ground surface surrounding the drum, ETC was unable to determine whether a past release of petroleum product or hazardous materials from the drum had occurred.

ETC observed a limited quantity of general solid waste (e.g. rusted and abandoned automotive parts, used tires, and metal scraps) located within an unoccupied and overgrown area on the east portion of the Subject Property. Based on tenant-provided information, this area was formerly occupied by Cook's Ranch who had operated an illegal auto mechanic business (i.e. "chop-shop") out of the Subject Property. Activities associated with the illegal business reportedly included disassembling vehicles, oil changes, tune-ups, etc. No evidence of a release was observed within this area.

ETC observed three abandoned trailers located on the northernmost portion of the Subject Property. According to Subject Property tenants, this area was formerly occupied by Char Ranch who also operated an illegal auto mechanic business (i.e. "chop-shop") out of the Subject Property. Although Char Ranch has since vacated the property, remnant items associated with the former "chop-shop" are still present. Specifically, ETC observed a limited amount of general solid waste (i.e. miscellaneous auto parts, papers, empty plastic bottles and buckets) located within and around the general vicinity of the trailers. ETC also observed two 55-gallon metal

drums stored on the ground surface within this area. The drums were observed to be in poor condition (i.e. rusted with visible holes), were unlabeled, and contained an unknown liquid substance. Additionally, dark oily-residue was observed on the lid of one of the two drums. While no obvious visual or olfactory indications of a release onto the ground surface were observed (i.e. surface staining or petroleum odor); ETC was unable to determine whether a past release of hazardous product had occurred.

ETC observed a concrete platform located on the northeast portion of the Subject Property. According to information provided by Subject Property tenants, this area was formerly occupied by Char Ranch who had illegally sublet the site to a commercial trucking business, known as Hiroshima Trucking. Activities associated with the trucking business reportedly included maintenance of haul trucks and heavy equipment (e.g. oil changes, etc.). At the time of ETC's site reconnaissance, the area was fully overgrown in vegetation and no vehicles, heavy equipment, and/or evidence of hazardous materials were observed in the vicinity of the platform.

No additional evidence of the generation, storage, or disposal of hazardous substances or petroleum products was observed on the Subject Property.

6.4 USTs / ASTs

A visual inspection for the presence of USTs or aboveground storage tanks (ASTs) was also conducted. No visual evidence (e.g., vent or fill pipes, dispensers, etc.) of the presence of USTs or ASTs was observed.

6.5 Hydraulic and Dielectric Fluid Containing Equipment

A visual inspection was conducted to locate any hydraulic and electrical equipment, or electrical components that use fluids that may contain PCBs. ETC observed a total of eight Hawaiian Electric Company (HECO)-owned pole-mounted transformers (Transformer Nos. 48428, 80182, 82645, 82646, 82878, 91805, 91808, and 91895) located on the west portion of the Subject Property, along Waikupanaha Street. The transformers appeared to be in good condition with no evidence of a release. No additional potential PCB-containing equipment was observed on the Subject Property.

7.0 INTERVIEWS

The objective of conducting interviews is to obtain information from past and present owners, operators, and occupants of the Subject Property to identify potential RECs in connection with the Subject Property. ETC conducted an interview with the Subject Property owner and occupants.

Mr. Kalei Young, Department of Hawaii Home Lands (DHHL), Subject Property Owner

Mr. Young provided ETC with the following information regarding the Subject Property.

- Mr. Young's knowledge of the Subject Property dates back approximately 7 years. Mr. Young is the Land Manager for the Subject Property.
- Mr. Young's primary contact with Subject Property tenants is limited to taking complaints about the homeless issue on the property and/or non-payment of rent.
- An agricultural water line is located on the Subject Property; however, the source of water is unknown.
- Farm equipment repair is conducted on the Subject Property.
- There are no ASTs and/or USTs on the Subject Property.
- There has been no known burying or burning of any waste or rubbish on the Subject Property.
- The Subject Property and adjoining properties have never been used for industrial purposes. The Subject Property and adjoining properties are not used as a gasoline station, printing facility, photo developing facility, landfill, waste TSDF, or recycling.
- There are no known former pits, ponds, or lagoons located on the Subject Property in connection with waste treatment or disposal.
- There are no known environmental liens or governmental notifications relating to past or recurrent violations of environmental laws with respect to the Subject Property.

Mr. Logan Hamocon, Sports Turf Hawaii, Inc., Subject Property Occupant

Mr. Hamocon provided ETC with the following information regarding the Subject Property.

- Mr. Hamocon's knowledge of the Subject Property dates back approximately 10 years. Mr. Hamocon is the owner of Sports Turf Hawaii, Inc.
- Prior to Mr. Hamocon's tenancy, the south portion of the Subject Property was formerly utilized as a rock quarry. It is reported that a groundwater well associated with the quarry exists; however, the location of the well is unknown.
- Remnant items (i.e. abandoned cars, scrap metal, concrete, and general solid waste) that had been left behind by a previous tenant have been removed from Mr. Hamocon's tenant space. However, there are two remaining storage containers which are suspected to contain various paint products.

- The Subject Property is included as part of the Windward Oahu Soil and Water Conservation District.
- There are no floor drains, sumps, or sewage infrastructure located within Mr. Hamocon's tenant space. Potable water is provided by the State of Hawaii Department of Agriculture.
- There are no transformers located within Mr. Hamocon's tenant space.
- There are limited amounts of used oil (approximately 20-gallons per year), green waste, recycled metal, and general solid waste stored and/or generated within Mr. Hamocon's tenant space. All generated waste is discarded at PVT Landfill.
- There has been no known burying or burning of any waste or rubbish on the Subject Property.
- There are no ASTs and/or USTs within Mr. Hamocon's tenant space.
- There are no issues with runoff onto or off of Mr. Hamocon's tenant space.
- There are no additional known environmental concerns associated with Mr. Hamocon's tenant space and/or surrounding properties.

Ms. June Pires, Na Lio'o Waimanalo, Subject Property Occupant

Ms. Pires provided ETC with the following information regarding the Subject Property.

- Ms. Pires's knowledge of the Subject Property dates back approximately 18 years. Ms. Pires is the owner of Na Lio'o Waimanalo whose operations include equestrian boarding.
- The north portion of the Subject Property was previously occupied by Mr. Ben Char (of Char Ranch) who operated a therapeutic riding center known as Manawale'a Riding Center. In addition to equestrian activities, Mr. Char was involved in an illegal "Chop Shop" business and trucking business which occupied areas on the northernmost portion the Subject Property. Activities associated with these businesses included disassembling vehicles, oil changes, etc. Char Ranch's tenancy was eventually terminated by DHHL in or around 2013. Mr. Char has cleared and removed a majority of items associated with the illegal businesses; however, some miscellaneous items still remain on-site.
- For many years, Mr. Char allowed trucking companies to dump various construction and demolition materials throughout the Subject Property. Ms. Pires indicated that the dumped materials were eventually buried beneath the ground surface in an effort to level the site. Ms. Pires has uncovered crushed coral, rock, concrete, and rebar buried beneath her tenant space.
- An unoccupied area behind Ms. Pires tenant space was formerly utilized as an illegal "chop shop" associated with Cook's Ranch. Remnant items from the illegal auto mechanic business still remain on-site (i.e. abandoned vehicles, automotive parts, etc.).
- The southernmost portion of the Subject Property was historically included as part of the adjacent former rock quarry. Eventually, the rock quarry was backfilled and the south portion of the Subject Property was re-occupied by a former tenant (Gilbert Ani) who utilized the space as a horse ranch. An abandoned building, currently located on the south portion of the Subject Property, is associated with the former ranch.

- There are no floor drains located within the Na Lio'o Waimanalo tenant space. Potable water is provided by the City and County of Honolulu.
- There is no sanitary sewage infrastructure within Ms. Pire's tenant space; however, there is an on-site portable which is cleaned on a weekly basis. No leaks or issues related to the portable toilet have been reported.
- Electricity to the ranch is supplied by four portable generators which are locked up at the end of each day. There have been no reported issues related to the generators.
- Aside from limited amounts of over-the-counter liquid detergents (i.e. Clorox, horse soap), weed control products (i.e. Round-up), and motor oils used for an on-site golf cart and weed-wacker, there are no hazardous materials or substances stored or handled on the Subject Property.
- Incidents of fugitive dumping have been reported on the southernmost portion of the Subject Property. All dumped waste (i.e. used tires, white goods, etc.) have been removed and properly disposed of at the Waimanalo Dump.
- The southernmost portion of the Subject Property occasionally floods during heavy rain events. Stormwater collected on the southern portion of the Subject Property discharges into the adjacent gulch or onto Ms. Pires property. Ms. Pires indicated that no issues with runoff have been reported (i.e. visible oil sheens, etc.).
- There are no additional known environmental concerns associated with Ms. Pires tenant space and/or surrounding properties.

Ms. Leilala Cook, Cook's Ranch, Subject Property Occupant

Ms. Cook provided ETC with the following information regarding the Subject Property.

- Ms. Cook's knowledge of the Subject Property dates back approximately 28-years, to when her parents first occupied the Subject Property in 1990. At that time, Cook's Ranch was the sole tenant on the Subject Property.
- Prior to Cook's Ranch tenancy, the Subject Property was occupied by Rodger James (of Rodger James Ranch), who had passed away, leaving the Subject Property abandoned and overgrown. Ms. Cook's parents hired multiple bulldozers to clear and reclaim the area. Several abandoned structures, vehicles, and telephone poles were removed in the process.
- Ms. Cook and her father currently own Cook's Ranch and are the founding members of the Hawaii Pa'u Riders. Primary operations of the ranch include horseback riding training, Hawaiian education workshops, and hula lesson.
- There is one male/female restroom located within the Cook's Ranch tenant space. Restroom drains (i.e. toilets, sinks, etc.) discharge to an onsite septic system. The septic tank is pumped bi- monthly by a local Waimanalo pumping company. There have been no reported issues related to the septic system. Note that there are no floor drains located within Cook's Ranch.
- Electricity to the ranch is supplied by a portable generator which is taken off-site at the end of each day.

- Potable water is provided by the City and County of Honolulu. There are potable water faucets located within the Cook's Ranch restrooms, at every horse stall, and within a horse wash-rack area.
- Aside from limited amounts of over-the-counter shampoos and soaps used for horse baths, there are no hazardous materials or substances stored or handled on the Subject Property.
- All storage containers/trailers/sheds located within Cook's Ranch are stocked with horse feed and horse tack (i.e. grass hay, blankets, saddle pads, etc.).
- Maintenance activities within Cook's Ranch are infrequent and all supplies associated with facility up-keep are stored off-site.
- There are no current or past issues related with runoff from adjacent properties onto the Subject Property.
- There have been no incidences of fugitive dumping within the Cook's Ranch tenant space.
- There are no additional known environmental concerns associated with Mr. Cook's tenant space and/or surrounding properties.

Mr. Allan Silva, Private Ranch, Subject Property Occupant

Mr. Silva provided ETC with the following information regarding the Subject Property.

- Mr. Silva's knowledge of the Subject Property dates back approximately 23 years.
- In 1995, Mr. Silva and former business partner, Ben Char (of Char Ranch) signed a joint lease agreement for the Subject Property. However, due to illegal activities associated with Char Ranch, Mr. Silva was eventually granted a separate lease agreement by DHHL.
- Char Ranch formerly operated the Manawale'a Riding Center, which provided horseback riding lessons for disabled youth.
- Mr. Char also operated an illegal auto mechanic business out of the Subject Property. Auto mechanic activities included oil changes, engine/transmission repair, tune-ups, etc. According to Mr. Silva, a large pit was excavated on the north portion of the Subject Property for the purposes of dumping solid waste associated with the auto mechanic business. Mr. Silva suspects that barrels of used oil, wood, and other miscellaneous solid waste were dumped into the pit. The pit was reportedly backfilled and is currently overgrown in vegetation.
- Mr. Char illegally sublet an area on the north portion of the Subject Property to a trucking business known as Hiroshima Trucking. Hiroshima Trucking utilized the Subject Property as a parking lot and storage area for hauling tucks and heavy equipment (e.g. bulldozers, backhoes, steamrollers, etc.). Equipment maintenance activities were also reportedly conducted in this area (e.g. oil changes, etc.). Furthermore, Mr. Silva recalls observing oil stains on the ground surface within this area. In an effort to minimize environmental impacts associated with leaking equipment, Hiroshima Trucking reportedly excavated a shallow pit within this area. Coral was filled in the pit as a means to absorb oil from parked vehicles/heavy equipment.

- During Ben Char's tenancy, various trucking companies were invited to illegally dump soil, aggregate, and construction debris (aggregate, concrete with rebar, etc.) in stockpiles throughout the north portion of the Subject Property. According to Mr. Silva, the Subject Property was eventually leveled and the debris piles were either buried underground or discarded onto the adjacent properties.
- A concrete platform and storage trailers associated with Char Ranch's illegal operations still exist on the Subject Property. The associated trailers have recently been ransacked by vagrants.
- Mr. Silva's tenant space was formerly used to board his personal horses. The tenant space is now used by Mr. Silva to raise and breed racing pigeons.
- Aside from 1-gallon petroleum containers used to fuel a weed-trimmer and lawn mower, there are no hazardous materials or substances stored or handled within Mr. Silva's tenant space. All liquid products are stored in an on-site, locked shed.
- There are no floor drains located within Mr. Silva's tenant space. Potable water is provided by the City and County of Honolulu.
- The source of electricity to Mr. Silva's tenant space was previously provided by a HECO transformer. There is currently no source of electricity to the site.
- There is no sewer infrastructure within Mr. Silva's tenant space. The former Char Ranch facility reportedly has restrooms and an associated septic system. No issues related to the Char Ranch septic system have been reported.
- There are no additional known environmental concerns associated with Mr. Silva's tenant space and/or surrounding properties.

Ms. Kim Fujinaga, Ms. Barbara Matayoshi, and Ms. Nanea Chambers, Na Lio'o Waimanalo , Subject Property Occupants

Ms. Fujinaga, Ms. Matayoshi, and Ms. Chambers provided ETC with the following information regarding the Subject Property.

- Ms. Fujinaga, Ms. Matayoshi, and Ms. Chambers have boarded their horses at Na Lio'o Waimanalo for approximately 18- to 25-years.
- Ms. Fujinaga, Ms. Matayoshi, and Ms. Chambers recall several years of solid waste dumping on the Subject Property. Specifically, multiple haul trucks were observed transporting miscellaneous construction and demolition debris (i.e. concrete, aggregate, roofing materials, etc.) and dumping the items throughout Subject Property. The dumped materials are currently buried beneath the site.

8.0 FINDINGS AND OPINIONS

8.1 Site Description

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

8.2 User Provided Information

No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

8.3 Records Review

8.3.1 Standard Environmental Record Sources

Federal NPL and Delisted NPL

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

Federal CERCLIS and CERCLIS NFRAP

Database review indicated that *Golden Melon Farms* was listed as a CERCLIS NFRAP site; and *Waimanalo Area-wide Groundwater Investigation* was listed as a SHWS. These two sites were found to be associated/linked. File review indicated that groundwater contamination was reportedly discovered in a single groundwater monitoring well (Waimanalo Well No. 1), located at 41-550 Waimanalo Street. Facility file records indicate that in 1994, the Honolulu Board of Water Supply (HBWS) discovered elevated concentrations of alachlor in Waimanalo Well No. 1, exceeding the DOH action levels of 2 µg/L. Records indicate that the likely source of alachlor was related to herbicide application at the nearby Golden Melon Farms. Note that Golden Melon Farms is located approximately 0.5-miles southeast of Waimanalo Well No. 1.

In an effort to delineate the extent of herbicide contamination, additional groundwater and subsurface soil sampling was conducted at eight locations within the general Waimanalo area. Investigative findings indicated that contaminant concentrations were not detected in any of the additional samples and that elevated concentrations of alachlor had been limited to groundwater found within Waimanalo Well No. 1. Furthermore, several subsequent rounds of groundwater sampling from Well No. 1 indicated that alachlor had dropped to concentrations below the applicable action levels.

Review of a DOH HEER letter, dated April 15, 2013, indicated that Waimanalo Well No. 1 has since been transferred to the Hawaii Department of Agriculture (HDOA) as a backup source for the Waimanalo Irrigation System to provide non-potable irrigation water to area farmers. Furthermore, during a recent overhaul of the well's pumps and other equipment, water samples collected from the well indicated that alachlor concentrations did not exceed DOH action levels. Golden Melon Farms (now known as Waimanalo Country Farms) no longer uses alachlor-based herbicides and the facility is currently listed as a 'no further action' site. Based on these findings coupled with the fact that Waimanalo Well No. 1 is located at least 0.8-miles west of the Subject Property, ETC believes that contaminant migration is not a significant concern.

No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

Federal RCRA CORRACTS

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

Federal RCRA (non-CORRACTS) TSD Facilities

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

Federal RCRA Generator

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

Federal Institutional Control/Engineering Control Registries

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

Federal ERNS

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Equivalent NPL and CERCLIS

ETC's database review indicated that *Waimanalo Area-wide Groundwater Investigation* and *Golden Melon Farms* are both listed as SHWS. These sites have been discussed in the Federal CERCLIS and CERLIS NFRAP section and therefore will not be repeated here.

Hawaiian Home Lands Waimanalo was also listed as a SHWS by the contracted database. Based on ETC's file and database review, petroleum contaminated soil was discovered in a residential development, located approximately 0.4-miles east of the Subject Property. Following trenching and removal of stained soils, confirmation soil sampling indicated that petroleum and petroleum-related constituents were reported below applicable DOH action levels. As such, the site received a 'no further action' determination from the DOH HEER Office in June 1997. Based on this information, ETC believes this site does not pose a significant concern for the Subject Property.

No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Landfill and/or Solid Waste Disposal

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Leaking Underground Storage Tanks

ETC's database review indicated that Meadow Gold Dairies (9-202526) is listed as a LUST site and located approximately 0.3-miles southwest of the Subject Property. As such, ETC requested and reviewed the facility file from the DOH SHWB. Information contained within the facility file indicated that a release was reported in April 1993 following the removal of two 2,000-gallon capacity USTs (containing diesel and gasoline) from the site (Release ID No. 930085). Following removal of the USTs, visual and olfactory observations indicated the presence of a petroleum release within the UST excavation. Analytical data for soil samples collected from within the UST excavation indicated the presence TPH as gasoline (G) and diesel (D), benzene, toluene, and ethylbenzene at concentrations exceeding the DOH cleanup criteria in effect at that time. As such, release response efforts were initiated, which included over-excavation of the UST pit and several rounds of subsurface soil, soil gas, and groundwater investigations. The excavation was eventually backfilled with clean soil and an estimated 1,300-cubic yards of suspect petroleum-impacted soil was stockpiled onsite and allowed to naturally attenuate for a period of approximately nine months. ETC's review of the most recent "Additional Release Response Activities Report", dated February 2004, indicated that none of the previously detected petroleum-related constituents were detected at concentrations above DOH Tier 1 Action Levels for soil and groundwater samples. Based on these findings, the facility received a 'no further action' determination from the DOH in June 2004. Based on these findings, ETC believes contaminant migration from the Meadow Gold Dairies site does not pose a significant concern for the Subject Property.

ETC's database review indicated that the three (3) remaining LUST facilities are classified as "no further action" sites, disconfirmed releases, are situated topographically downgradient or crossgradient from the Subject Property, and/or are too distant to pose a reasonable risk of impacting the Subject Property.

No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Registered Underground Storage Tanks

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Institutional Control Registry

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Voluntary Cleanup/Response Sites

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

State Brownfields

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Unmappable/Orphan Sites

Waimanalo Sugar Company was identified by the contracted database as an unmappable/orphan site. As such, ETC requested and reviewed facility files from the DOH HEER Office. Based on document review, an environmental investigation was initiated by the DOH HEER Office in 2012 with regard to two parcels associated with the former *Waimanalo Sugar Company* mill/sugarcane fields (i.e. TMK (1) 4-1-008: Parcels 018 and 081). On August 20, 2012, the DOH HEER Office collected five, multi-increment surface soil samples in order to evaluate the potential presence of residual pesticides and/or herbicides associated with the former mill. Resultant data indicated that constituent concentrations were detected below the DOH Environmental Action Levels (EALs) for unrestricted land-use. As such, in November 2012, the site received a 'no further action' determination from the DOH HEER Office. Based on these findings coupled with the fact that the former plantation mill was located approximately 1.4-miles southeast of the Subject Property, ETC believes that contaminant impacts related to the former *Waimanalo Sugar Company* do not pose a significant concern for the Subject Property.

No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

8.3.2 Additional Environmental Record Sources

ETC's database review indicated that the Subject Property was also listed as a SPILLS site for "illegal dumping in Waimanalo." As such, ETC requested and reviewed facility files from the DOH HEER Office. Document review indicated that an incident of fugitive dumping was reported to the DOH HEER Office in May 2014 (Case No. 20140502-1250). Specifically, three containers filled with an unknown substance were discovered on the northern-most portion of the Subject Property. Document review indicated that the containers were planned to be removed by Pacific Environmental Corporation. No further information pertaining to the SPILLS site was found during ETC's research. Given the fact that the three containers were not observed during ETC's site reconnaissance, it is likely that the dumped containers have been removed from the site. No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

8.3.3 Tier 1 Vapor Encroachment Screen (VES)

The Subject Property was identified by the database as a registered UST site. Additionally, the contacted database search identified one (1) CERCLIS NFRAP site, one (1) SHWS and three (3) LUST site within the specified radii of the Subject Property.

All previously obtained data reviewed and discussed as part of this Phase I ESA (Section 1.0 to 8.0) were evaluated as part of a Tier 1 VES. ETC's review indicated that Phase I ESA findings (e.g., Sanborn maps, aerial photographs, etc.) do not indicate any potential VECs in connection with the Subject Property. The Tier 1 VES was performed in conformance with the scope and limitations of ASTM Practice E2600-15 on the Subject Property.

8.3.4 Historical Use Information on the Subject and Adjoining Properties

No significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

8.4 Site Reconnaissance

During ETC's visual observations of the Subject Property, one 55-gallon metal drum was observed located within the Cook's Ranch tenant space. Although the drum appeared to be intact and in good condition, the drum was unlabeled and contained an unknown liquid substance. Additionally, a black and dried material was observed on the lid and along the side of the drum. Cook's Ranch personnel indicated having no knowledge of the origins or contents of the drum. ETC also observed two 55-gallon metal drums on the northwest corner of the Subject Property. Based on their location within the former Char Ranch "chop-shop" area, the drums are likely remnant items associated with illegal auto mechanic operations. The drums were observed to be in poor condition (i.e. rusted with visible holes), were unlabeled, and contained an unknown liquid substance. Furthermore, a dark oily residue was observed on the lid of one of the two drums.

Although no obvious visual or olfactory indications of a release were observed with regard to the three discovered drums (i.e. surface staining or petroleum odor); ETC was unable to determine whether a past release of hazardous substance or petroleum product from the drums had occurred. Based on these findings coupled with the condition of the drums, ETC cannot dismiss the possible presence of contaminant impacts associated with the unlabeled and/or corroded drums. As such, this finding is considered a REC.

No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

8.5 Interviews

Interview findings confirmed by numerous Subject Property tenants revealed the past and prior use of the Subject Property for illegal auto mechanic activities. Specifically, areas on the north and east portions of the Subject Property were formerly occupied by illegal "chop-shops" associated with Char Ranch and Cook's Ranch. Activities associated with the illegal businesses reportedly included disassembling vehicles, oil changes, tune-ups, etc. Although illegal auto mechanic activities are no longer conducted on the Subject Property, general solid waste associated with the former "chop-shops" still remain on-site (e.g. rusted automotive parts, scrap metal, storage trailers, etc.). Interview findings also revealed that an unoccupied area on the northeast portion of the Subject Property was illegally sublet to a trucking business (i.e. Hiroshima Trucking) for the purposes of heavy equipment maintenance, parking, and storage. It was reported that oil-staining, typically associated with vehicle maintenance and leaking equipment, was observed on the ground surface within this area. Although no petroleum and/or hazardous substance release associated with the former "chop-shops" and trucking business was observed during ETC's site reconnaissance; ETC cannot dismiss the possible presence of residual contamination associated with past handling and storage of petroleum products and/or hazardous materials within these areas.

Interview findings also revealed that solid waste dumping had occurred on the Subject Property for many years. Specifically, Char Ranch reportedly authorized trucking companies to illegally dump various construction and/or demolition debris (e.g. aggregate, roofing materials, concrete with rebar, etc.) in stockpiles throughout the Subject Property. It was also reported that a large pit was excavated on the northwest corner of the Subject Property for the purposes of dumping solid waste associated with the Char Ranch "chop-shop." It is suspected that hazardous

materials and petroleum products may have also been disposed of into the pit (e.g. drums of used oil, etc.). Possible evidence of the former solid waste pit was identified in ETC's review of a 2008 aerial photograph, which depicts a sizeable area on the northwest corner of the Subject Property partially backfilled with dirt. According to information provided by Subject Property tenants, solid waste associated with past dumping are currently buried beneath the ground surface.

Although ETC did not observe evidence of a petroleum and/or hazardous substance release associated with the former auto mechanic/trucking businesses and/or solid waste dumping; ETC cannot dismiss the possible presence of residual contamination from these activities. As such, this finding is considered a REC for the Subject Property. No other significant findings to indicate suspect RECs, historical RECs, controlled RECs, or *de minimis* conditions were identified.

9.0 DATA GAPS

Data gaps are defined as the lack of, or inability to obtain, information required by the ASTM Practice despite good faith efforts by the environmental professional to gather such information. ETC identified the following data gaps:

- Although all *reasonably ascertainable* maps, site photographs, and standard historical sources (e.g., aerial photos, Sanborn maps, chain of title records, etc.) were reviewed, such documents and information were not available at five-year intervals. This data gap represents a "data failure." However, based on ETC's collective review of the documents and information available, this "data failure" does not represent a significant data gap (as described in Sections 8.3.2.3 and 12.7 of the ASTM Practice).
- ETC was unable to inspect limited areas within the northernmost portion of the Subject Property due to safety hazards associated with steep terrain and dense vegetation. Although not fully inspected, ETC was able to visually inspect most areas within the north portion of the site from Waikupanaha Street and accessible dirt paths. Additionally, several tenant structures were closed and locked at the time of ETC's site reconnaissance. Therefore, visual inspection of the interior areas within select structures (i.e. trailers, sheds, storage containers, etc.) could not be inspected. Although not inspected, ETC believes that based on the nature of the tenant businesses coupled with tenant-provided information, the contents of these structures are not anticipated to cause a significant environmental impairment to the Subject Property. Furthermore, no visual indications of a release were observed around the perimeter or within the vicinity of the structures. As such, this data gap is not considered significant.

10.0 CONCLUSIONS

ETC has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 of the Subject Property located in Waimanalo, Oahu, Hawaii, identified as TMK identification number (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street. Any exceptions to, or deletions from, the ASTM Practice E1527-13 are described in Section 12.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject Property except:

- Contaminant impacts associated with a potential release from the three unlabeled 55-gallon drums containing unknown substances, located within the Cook's Ranch and former Char Ranch tenant spaces.
- The potential presence of residual contamination associated with past and prior usage of the Subject Property (e.g. auto mechanic, trucking activities, suspect solid waste dumping, etc.).

11.0 ENVIRONMENTAL PROFESSIONAL CERTIFICATION

We declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared by:

Sharla Nakashima
Environmental Professional
EnviroServices & Training Center, LLC

August 2019

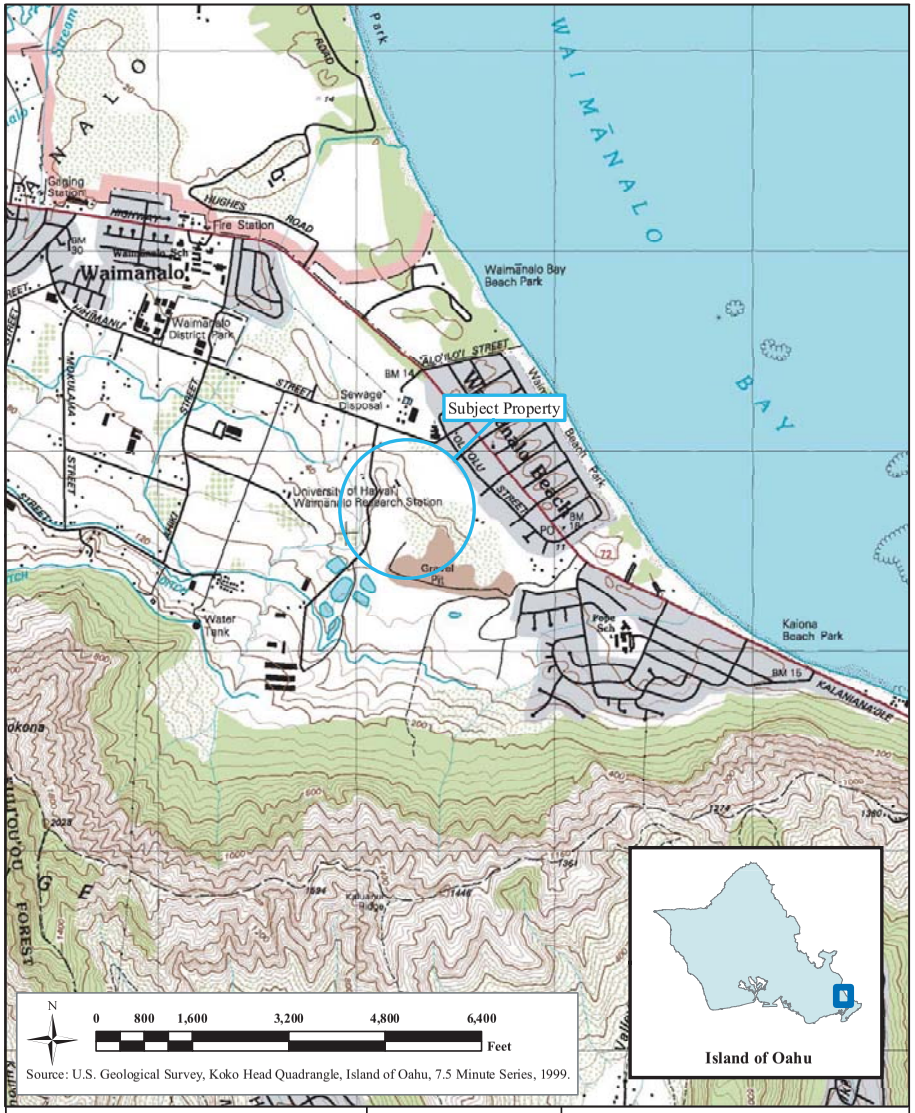
12.0 DEVIATIONS AND ADDITIONAL SERVICES

No client-imposed constraints were identified. As such, there were no deletions from the ASTM Practice E1527-13 upon completion of this Phase I ESA. No additional services were requested or completed.

13.0 REFERENCES

- ASTM International. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E1527-13.
- City and County of Honolulu, Department of Planning and Permitting, Building Permit Records.
- Environmental Data Resources, Inc. September 19, 2018. *The EDR Aerial Photo Decade Package*. Report Inquiry No. 5428383.8.
- Environmental Data Resources, Inc. September 19, 2018. *The EDR Historical Topo Map Report*. Order No. 5428383.4.
- Environmental Data Resources, Inc. September 19, 2018. *The EDR Radius Map™ with GeoCheck®*. Report Inquiry No. 5428383.2s.
- Environmental Data Resources, Inc. September 19, 2018. *Sanborn® Map Report*. Order No. 5428383.3.
- Environmental Data Resources, Inc. November 7, 2018. *The EDR Vapor Encroachment Screen*. Order No. 5428383.2s.
- Environmental Data Resources, Inc. May 16, 2019. *The EDR Radius Map™ with GeoCheck®*. Report Inquiry No. 5654255.2s.
- Macdonald, G.A., A.T. Abbot, and F.L. Peterson. 1983. *Volcanoes in the Sea*. University of Hawaii Press.
- Mink, John F. and Stephen L. Lau. March 1990. Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii.
- State of Hawaii Department of Health, Hazard Evaluation and Emergency Response Office records.
- State of Hawaii Department of Health, Solid and Hazardous Waste Branch records.
- State of Hawaii Taxation Map Bureau, Tax Map Key (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, and 096.
- U.S. Department of Agriculture Soil Conservation Service. 1972. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.
- U.S. Department of Interior Geological Survey. 1999. Koko Head Quadrangle, Island of Oahu, Hawaii, 7.5 Minute Series (Topographic Maps).

APPENDIX I
FIGURES

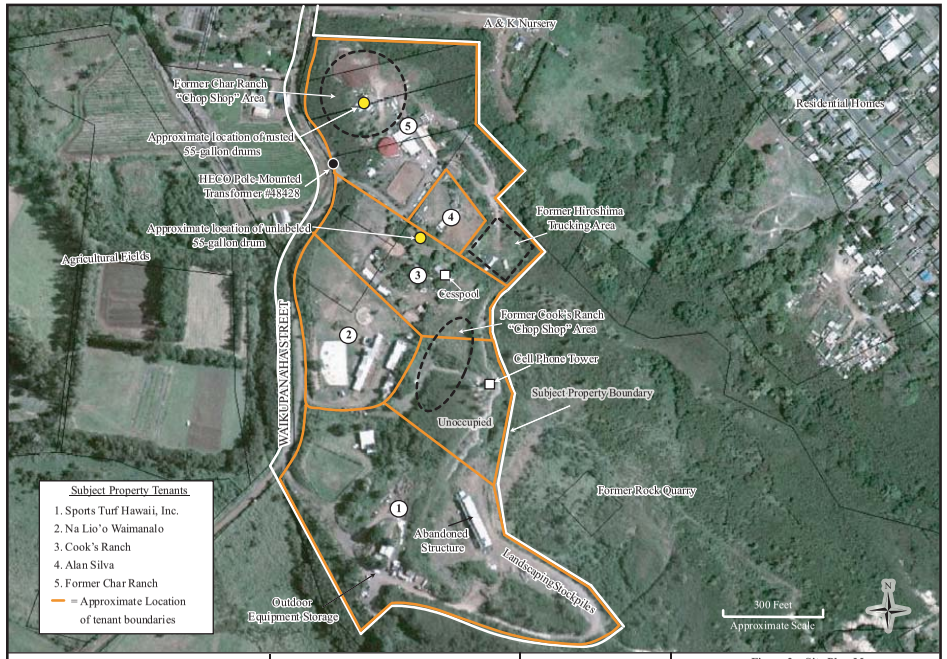


Source: U.S. Geological Survey, Koko Head Quadrangle, Island of Oahu, 7.5 Minute Series, 1999.

enviro SERVICES & TRAINING CENTER, LLC	Project No. 18-1020 August 2019	**Figure 1 - Site Location Map** Phase I Environmental Site Assessment Waikupanaha Agricultural Lots Waimanalo, Oahu, Hawaii TMK (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street

Source: The Limtiaco Consulting Group, 2019

enviro SERVICES & TRAINING CENTER, LLC	Project No. 18-1020 1 inch = 150 feet August 2019	**Figure 2 - Aerial Site Map** Phase I Environmental Site Assessment Waikupanaha Agricultural Lots Waimanalo, Oahu, Hawaii TMK (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096, and a portion of Waikupanaha Street



enviro SERVICES & TRAINING CENTER, LLC

Project No. 18-1020

August 2019

Figure 3 - Site Plan Map
Phase I Environmental Site Assessment
Waikupanaha Agricultural Lots
Waimanalo, Oahu, Hawaii
TMK (1) 4-1-008: Parcels 002 (portion), 093, 094, 095, 096 and a portion of Waikupanaha Street

APPENDIX II
PHOTOGRAPHIC DOCUMENTATION

Photograph 1: Aerial view of Sports Turf Hawaii, Inc. tenant space, located on the south portion of the Subject Property. Source: Control Point Surveying; taken October 2018.

Photograph 2: View of stockpiles of sand, dirt, crushed asphalt, and rock, located within the Sports Turf Hawaii, Inc. tenant space.

Photograph 3: View of stored items (i.e. tires, heavy equipment, etc.), located within the Sports Turf Hawaii, Inc, tenant space.

Photograph 4: Aerial view of riding arena located within the Sports Turf Hawaii, Inc. tenant space. Source: Control Point Surveying; taken October 2018.

Photograph 5: View of horse stables located within the Sports Turf Hawaii, Inc. tenant space.

Photograph 6: View of fishing boat located within the Sports Turf Hawaii, Inc. tenant space.

Photograph 7: View of abandoned metal-frame structure located within the Sports Turf Hawaii, Inc. tenant space.

Photograph 8: View of backfilled area located on the south portion of the Subject Property.

Photograph 9: View of cell phone tower located on the east portion of the Subject Property.

Photograph 10: Aerial view of Na Lio'o Waimanalo tenant space, located on the west portion of the Subject Property. Source: Control Point Surveying; taken October 2018.

Photograph 11: View of riding arena located within the Na Lio'o Waimanalo tenant space.

Photograph 12: View of stables located within the Na Lio'o Waimanalo tenant space.

Photograph 13: Aerial view of Cook's Ranch tenant space, located on the west portion of the Subject Property. Source: Control Point Surveying; taken October 2018.

Photograph 14: View of horse stables located within the Cook's Ranch tenant space.

Photograph 15: View of storage area located within the Cook's Ranch tenant space.

Photograph 16: View of restroom located within the Cook's Ranch tenant space.

Photograph 17: View of on-site septic system located within the Cook's Ranch tenant space.

Photograph 18: View of miscellaneous supplies/equipment and caretakers home located within Cook's Ranch tenant space.

Photograph 19: View of paint cans and miscellaneous stored supplies located within the Cook's Ranch tenant space.

Photograph 20: View of unlabeled 55-gallon drum located within the Cook's Ranch tenant space.

Photograph 21: View of remnant solid waste associated with illegal "chop shop" located behind Cook's Ranch tenant space.

Photograph 22: Aerial view of Alan Silva's tenant space, located on the north portion of the Subject Property. Source: Control Point Surveying; taken October 2018.

Photograph 23: View of horse stables located within Alan Silva's tenant space.

Photograph 24: View of bird coops located within Alan Silva's tenant space.

Photograph 22: Aerial view of former Char Ranch tenant space, located on the north portion of the Subject Property. Source: Control Point Surveying; taken October 2018.

Photograph 23: View of driveway and front entrance to former Char Ranch tenant space.

Photograph 24: View of gazebo located within the former Char Ranch tenant space.

Photograph 25: View of storage shed located within the former Char Ranch tenant space.

Photograph 26: View of restroom facility located within the former Char Ranch tenant space.

Photograph 27: View of empty horse stables located within the former Char Ranch tenant space.

Photograph 28: Aerial view of trailers associated with the former Char Ranch illegal "chop shop", located on the north portion of the Subject Property. Source: Control Point Surveying; taken October 2018.
.

Photograph 29: Interior view of storage trailer located within the former Char Ranch tenant space (1 of 2).

Photograph 30: Interior view of storage trailer located within the former Char Ranch tenant space (2 of 2).

Photograph 31: View of general solid waste located within the former Char Ranch tenant space.

Photograph 32: View of corroded and unlabeled 55-gallon drum located within the former Char Ranch tenant space (1 of 2).

Photograph 33: View of corroded and unlabeled 55-gallon drum located within the former Char Ranch tenant space (2 of 2).

Photograph 34: View of concrete pad associated with illegal trucking operations (i.e. former location of Hiroshima Trucking), located within the former Char Ranch tenant space .

Photograph 35: View of off-site homeless camps, located along Waikupanaha Street.

Photograph 36: View of HECO-owned pole-mounted transformer (Transformer No. 48428) located along Waikupanaha Street.

Photograph 37: View of HECO-owned pole-mounted transformer (Transformer No. 80182) located along Waikupanaha Street.

Photograph 38: View of HECO-owned pole-mounted transformers (Transformer Nos. 91805, 91808, 91895) located along Waikupanaha Street.

Photograph 39: View of HECO-owned pole-mounted transformers (Transformer Nos. 82645, 82646, 82878) located along Waikupanaha Street.

APPENDIX III
RESEARCH DOCUMENTATION

Waikupanaha Ag Lots
Not Reported
Waimanalo, HI 96795

Inquiry Number: 5428383.4
September 19, 2018

EDR Historical Topo Map Report
with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

09/19/18

Site Name:	Client Name:
Waikupanaha Ag Lots	Enviro Srvcs. and Trng. Center
Not Reported	505 Ward Avenue
Waimanalo, HI 96795	Honolulu, HI 96814
EDR Inquiry # 5428383.4	Contact: Eva Kakone

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Enviro Srvcs. and Trng. Center were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.#	TLCG Waimanalo - Waikupana
Project:	18-1020

Coordinates:

Latitude:	21.33133 21° 19' 53" North
Longitude:	-157.704506 -157° 42' 16" West
UTM Zone:	Zone 4 North
UTM X Meters:	634348.26
UTM Y Meters:	2359370.12
Elevation:	16.00' above sea level

Maps Provided:

2013	1928, 1930
1999	
1983	
1970	
1969	
1959	
1954	
1952	

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2018 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2013 Source Sheets

Koko Head

7.5-minute, 24000

1999 Source Sheets

Koko Head

7.5-minute, 24000
Aerial Photo Revised 1999

1983 Source Sheets

Koko Head

7.5-minute, 24000
Aerial Photo Revised 1978

1970 Source Sheets

OAHU

15-minute, 62500

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1969 Source Sheets

Koko Head

7.5-minute, 24000
Aerial Photo Revised 1968

1959 Source Sheets

Koko Head

7.5-minute, 24000
Aerial Photo Revised 1959

1954 Source Sheets

HONOLULUVICINITYNORTH

7.5-minute, 24000

HONOLULUVICINITYSOUTH

7.5-minute, 24000

1952 Source Sheets

Koko Head

7.5-minute, 24000
Aerial Photo Revised 1952

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1928, 1930 Source Sheets

MOKAPU

7.5-minute, 20000

KOKOHEAD

7.5-minute, 20000

Historical Topo Map

2013

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

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Koko Head, 2013, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

Historical Topo Map

1999

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

0 Miles 0.25 0.5 1 1.5

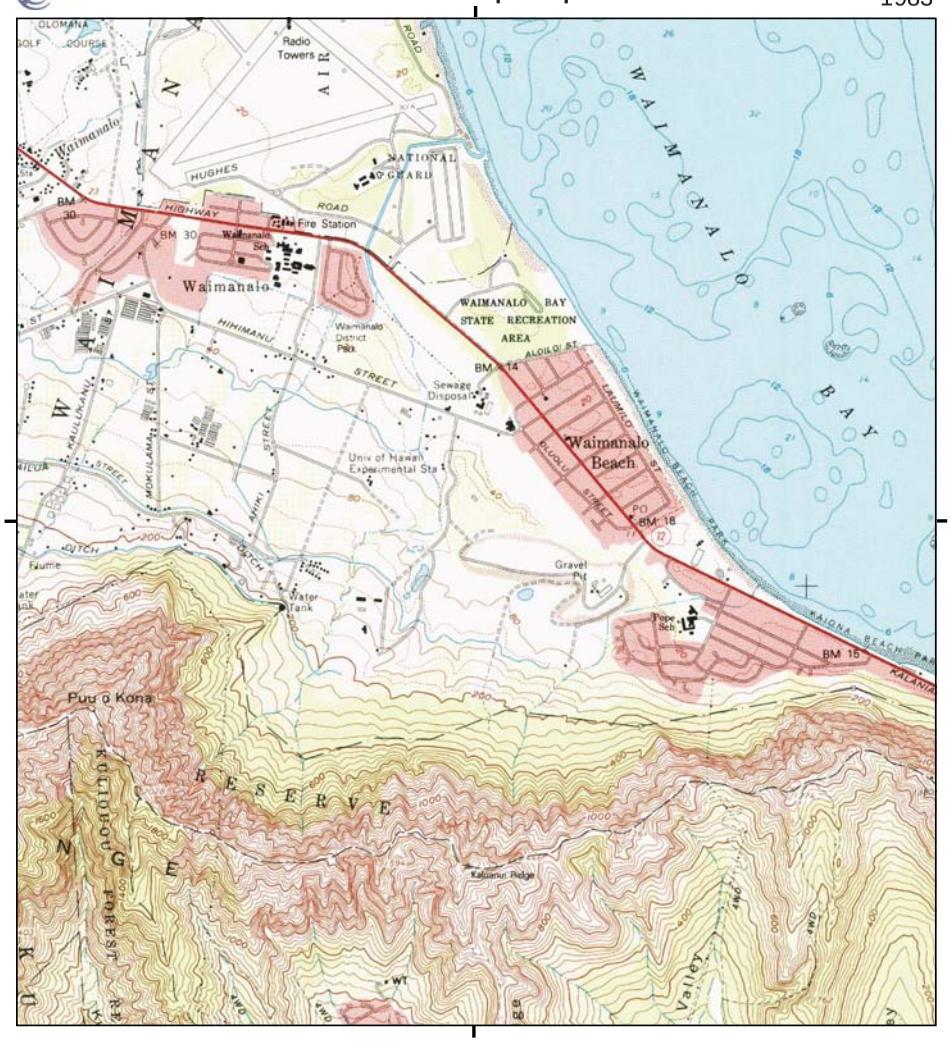
NW N NE
W E
SW S SE

TP, Koko Head, 1999, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

Historical Topo Map

1983



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

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

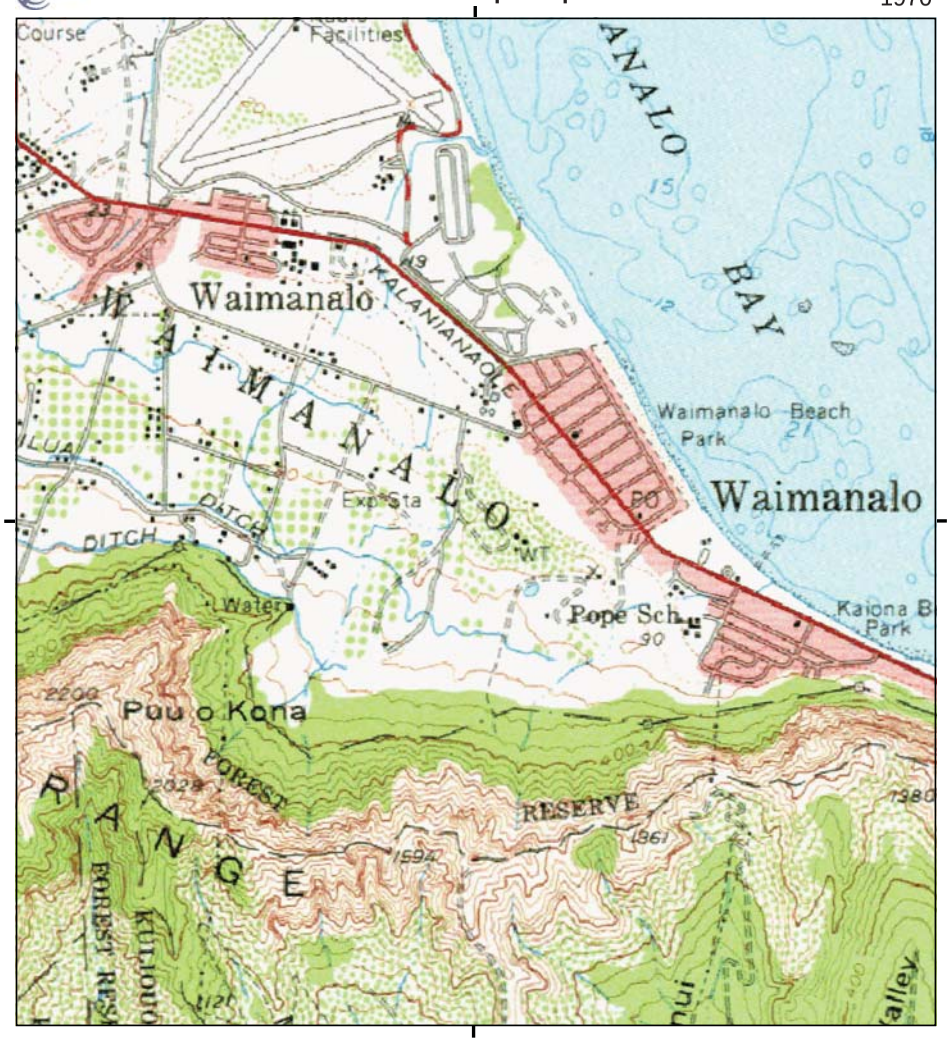
TP, Koko Head, 1983, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Historical Topo Map

1970



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

0 Miles 0.25 0.5 1 1.5

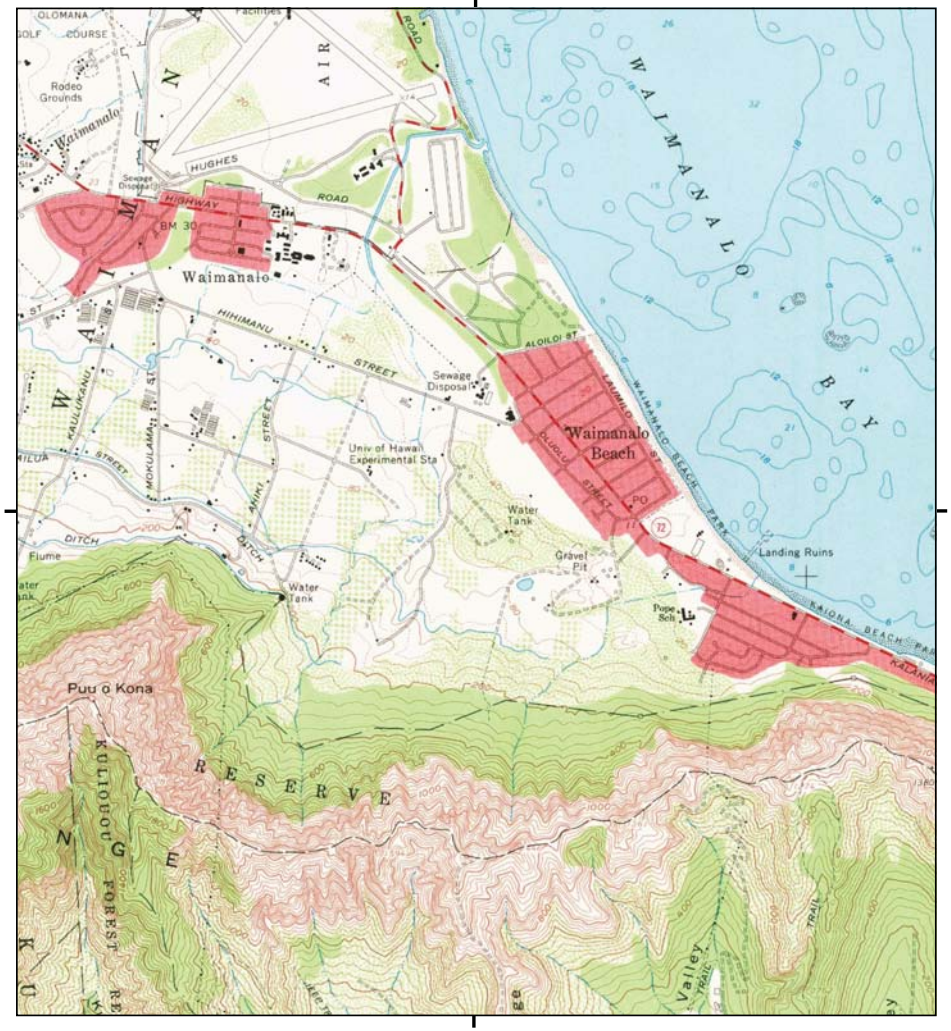
NW N NE
W E
SW S SE

TP, OAHU, 1970, 15-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Historical Topo Map 1969



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

0 Miles 0.25 0.5 1 1.5

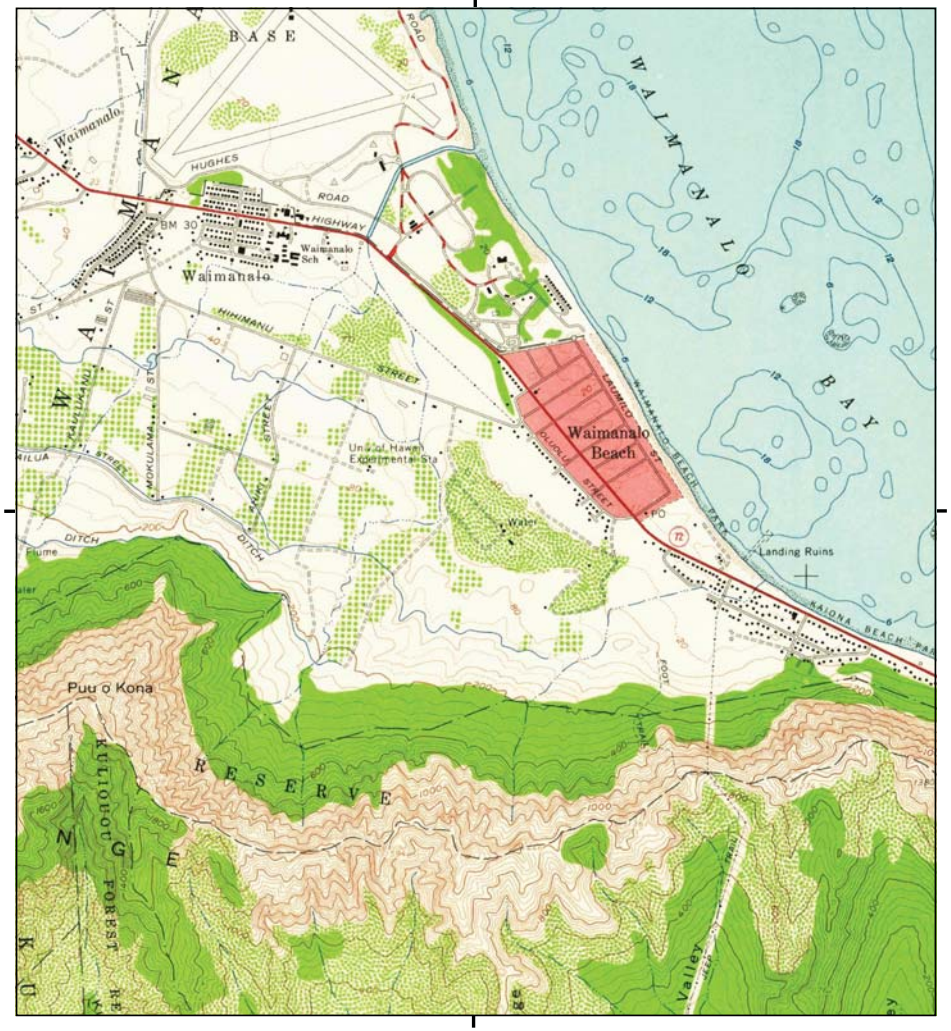
NW N NE
W E
SW S SE

TP, Koko Head, 1969, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Historical Topo Map 1959



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

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

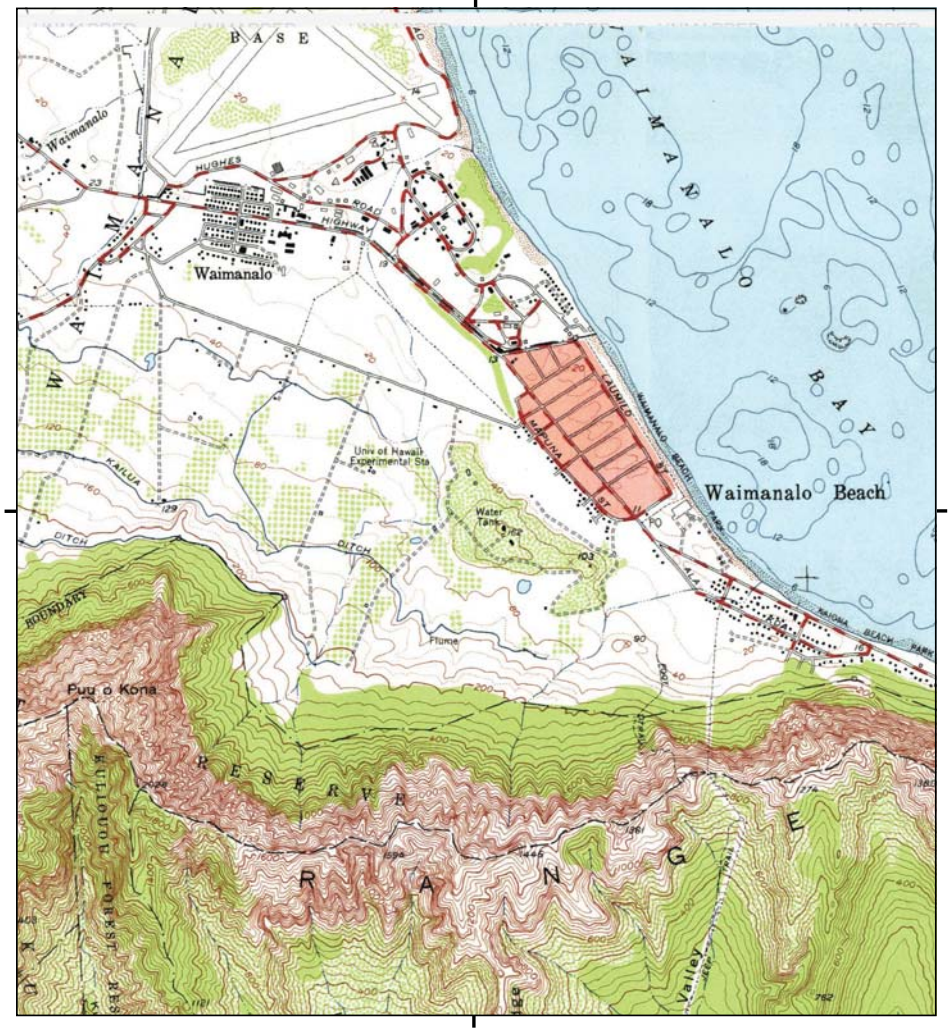
TP, Koko Head, 1959, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Historical Topo Map

1954



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

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

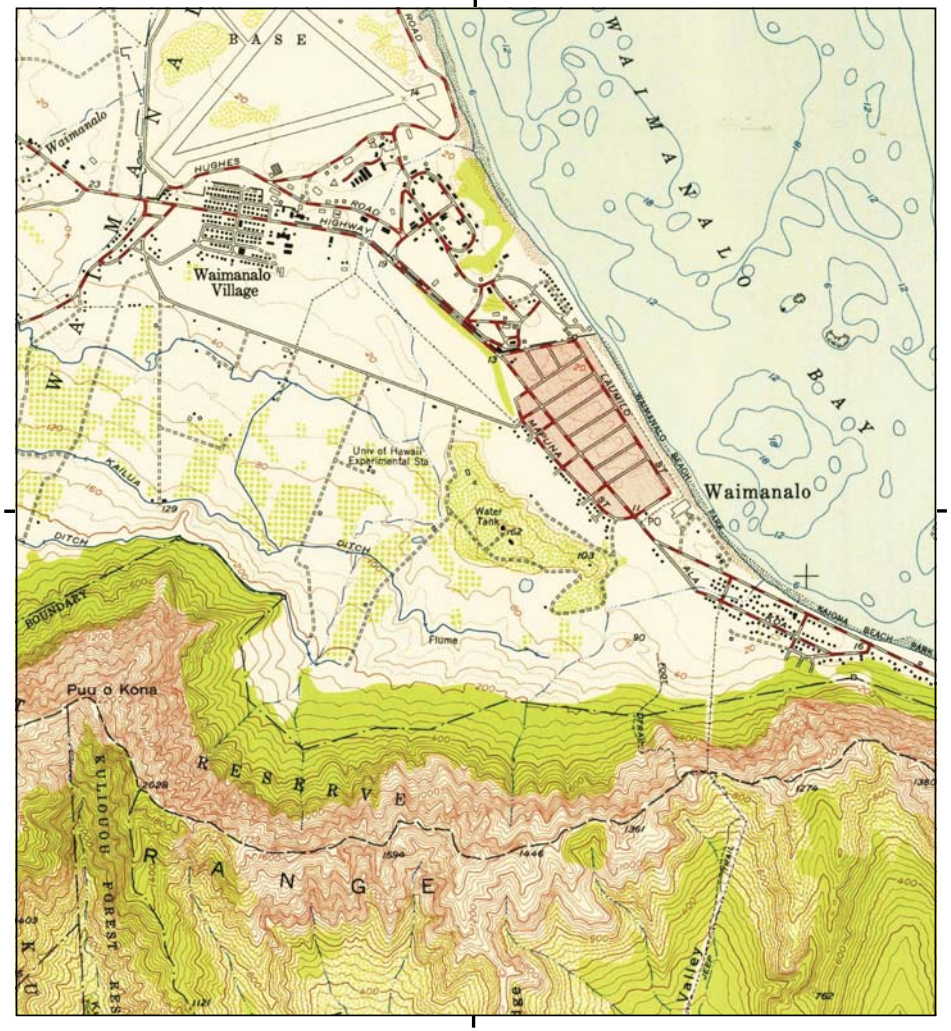
TP, HONOLULUVICINITYSOUTH, 1954, 7.5-minute
NW, HONOLULUVICINITYNORTH, 1954, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Historical Topo Map

1952



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

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

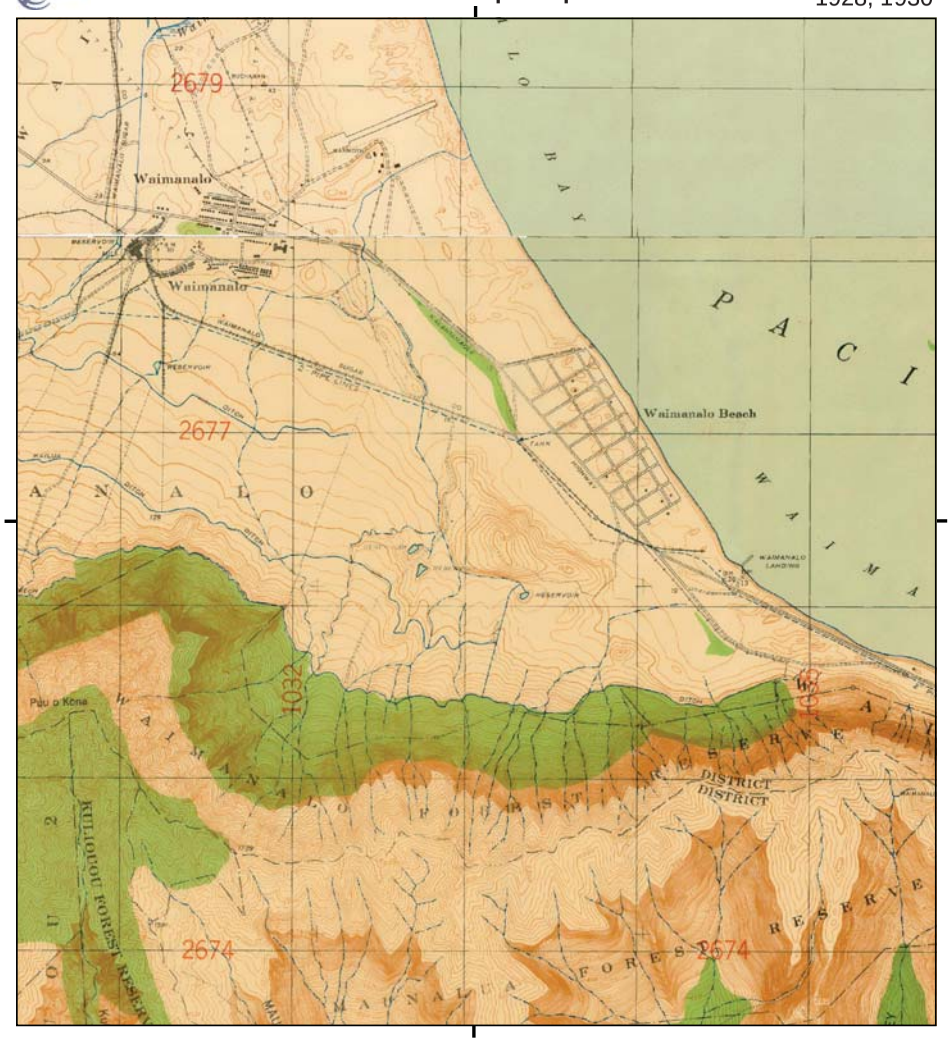
TP, Koko Head, 1952, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Historical Topo Map

1928, 1930



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

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, KOKOHEAD, 1930, 7.5-minute
N, MOKAPU, 1928, 7.5-minute

SITE NAME: Waikupanaha Ag Lots
ADDRESS: Not Reported
Waimanalo, HI 96795
CLIENT: Enviro Srvcs. and Trng. Center

N

Waikupanaha Ag Lots
Not Reported
Waimanalo, HI 96795

Inquiry Number: 5428383.8
September 19, 2018

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

09/19/18

Site Name:	Client Name:
Waikupanaha Ag Lots	Enviro Srvcs. and Trng. Center
Not Reported	505 Ward Avenue
Waimanalo, HI 96795	Honolulu, HI 96814
EDR Inquiry # 5428383.8	Contact: Eva Kakone

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2008	1"=500'	Flight Date: April 23, 2008	USGS
2001	1"=500'	Acquisition Date: March 20, 2001	USGS/DOQQ
1992	1"=500'	Flight Date: October 02, 1992	USGS
1985	1"=750'	Flight Date: April 29, 1985	USGS
1978	1"=500'	Flight Date: January 06, 1978	USGS
1975	1"=500'	Flight Date: July 15, 1975	USGS
1968	1"=500'	Flight Date: February 08, 1968	USGS

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2018 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

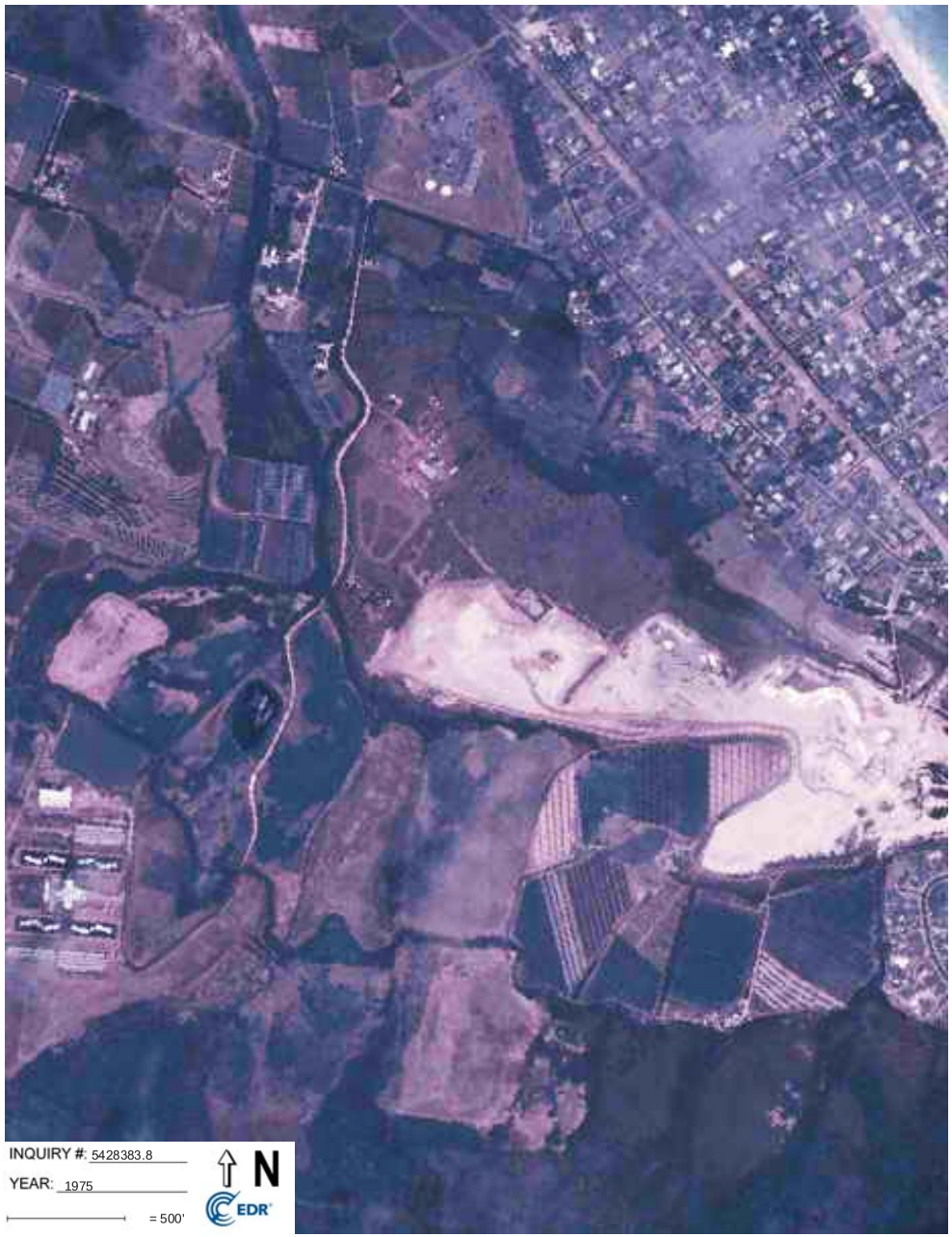
EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

INQUIRY #: 5428383.8
YEAR: 2001
= 500'
N
EDR

INQUIRY #: 5428383.8
YEAR: 1992
= 500'
N
EDR

INQUIRY #: 5428383.8
YEAR: 1985
= 750'
N
EDR

INQUIRY #: 5428383.8
YEAR: 1978
= 500'
N
EDR


INQUIRY #: 5428383.8
YEAR: 1975
= 500'
N
EDR

INQUIRY #: 5428383.8
YEAR: 1968
= 500'
N
EDR

Waikupanaha Ag Lots
Not Reported
Waimanalo, HI 96795

Inquiry Number: 5428383.3
September 19, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

09/19/18

Site Name:	Client Name:
Waikupanaha Ag Lots	Enviro Srvcs. and Trng. Center
Not Reported	505 Ward Avenue
Waimanalo, HI 96795	Honolulu, HI 96814
EDR Inquiry # 5428383.3	Contact: Eva Kakone

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Enviro Srvcs. and Trng. Center were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # E720-4ECF-B25A
PO # TLCG Waimanalo - Waikupanaha
Project 18-1020

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results
Certification #: E720-4ECF-B25A

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

Enviro Srvcs. and Trng. Center (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2018 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

Waikupanaha Ag Lots
Not Reported
Waimanalo, HI 96795

Inquiry Number: 5428383.5
September 19, 2018

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

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

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2017 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc. or its affiliates is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer. Reproduction of City Directories without permission of the publisher or licensed vendor may be a violation of copyright.

Data by infoUSA
Copyright©2008
All Rights Reserved

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2014	☐	☑	EDR Digital Archive
2010	☐	☑	EDR Digital Archive
2005	☐	☑	EDR Digital Archive
2000	☐	☑	EDR Digital Archive
1995	☐	☑	EDR Digital Archive
1992	☐	☑	EDR Digital Archive
1987	☐	☑	EDR Digital Archive
1982	☐	☑	EDR Digital Archive
1977	☐	☑	EDR Digital Archive

FINDINGS

TARGET PROPERTY STREET

Not Reported
Waimanalo, HI 96795

No Addresses Found

FINDINGS

CROSS STREETS

Year	*CD Image*	*Source*
WAIKUPANAHA ST		
2014	pg. A2	EDR Digital Archive
2010	pg. A4	EDR Digital Archive
2005	pg. A6	EDR Digital Archive
2000	pg. A8	EDR Digital Archive
1995	pg. A10	EDR Digital Archive
1992	pg. A12	EDR Digital Archive
1987	pg. A14	EDR Digital Archive
1982	pg. A15	EDR Digital Archive
1977	pg. A16	EDR Digital Archive

City Directory Images

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2014

41	DUNLAP, BURKE P
	FIRTH, ANTHONY M
41114	MARTINEZ, ELIZABETH
41130	A & K NURSERY INC
41139	TACTO, RODRIGO T
41170	CHAR, BENJAMIN K
	MANAWALEA
41430	HILLTOP RANCH
	TYSON, BOB C
41500	HOME & BUSINESS REMODLG CONSLT
	SANANIKONE, PUONG
	TLS CORP
41510	MALONEY, BLAIR
41520	MALONEY, CHIAKI
41530	CAVASSO CAMPBELL
	CAVASSO, NANETTE L
41555	PROGRESSIVE LANDSCAPING INC
41614	MORIN, RON P
	SHARONS PLANTS LLC
41639	GILBERT, SAM S
41647	HIGASHIYA, STEVEN M
41650	FOOD & AGRICULTURE CAL DEPT
41659	MURAKAMI, GARY M
41672	41-672 WAIKUPANAHA LLC
	DOLLOPAC, DIANNE
41717	YOKOOJI, LANCE K
41740	YAMADA, AYAKO
41758	FUKUI RODNEY
41763	KEPA, MARK
41772	YASUTAKE, JILLIAN B
41803	OCCUPANT UNKNOWN,
41821	WEB ONE INC
	YEE, WARREN Q
41845	MEDEIROS, LOUELLA
	NOA, THOMAS
41847	MAKAIKE, LAUNA
	ONTAI, CARLEEN V
	PARKER, DONNA A
	YAW, ARLENE
41849	RISNER, WELIWELI C
41851	ADAIR, KRISTINA
41856	HOFF, JEFFREY L
	REEVES-ESTRADA, MATHEW
	TACUB, CHELSEA
41859	HOAPILI, JOHN G
41865	OLIVER, MARK D
41866	DILLINER, JAMETTE K
41870	FELICIANO, FLORENTINO C
41905	MAT HAWAII INC
	POCOCK, REAL

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2014 (Cont'd)

41905	REZENTES, SHARON
41910	GABRIEL, RUSSELL L
41924	KENDRICK, WILLIAM D
41949	SHIMOKAWA FARMS
	SHIMOKAWA, ROBBY M
41951	QUALITY TURFGRASS
41978	AULD, WILLIAM L
	BALL, ANTHONY M
	KEALOHA, ROBERT A
	KEAULANA, MOSES K
	LAPERA, TOM
	MAIAVA, MADELINE L
	MEDEIROS, RYAN V
	MENDONZA, JAKE
	PENEKU, DENNIS
	SHELBY, BARRY E
	WAIWAIOLE, CYNTHIA
	WRIGHT, ROXANNE T
	YEARIAN, DAVID F
41979	LUM, ARNOLD K
	LUM, JASMINE
	OCCUPANT UNKNOWN,
	TUISAMATA, IOANE T
41982	NIMZ, STEPHEN M
41984	CARLOS, PETER K
41986	OCCUPANT UNKNOWN,
411010	TURBEVILLE, SHERYL
411016	KALAMA, KRIMSEN
411020	HART, BRUCE K
411040	BARTHOLOME, K
411140	GLASSMAN, NANCY
	OLOMANA GARDENS
411143	ISLAND GROWER SUPPLIES LLC
411150	OCCUPANT UNKNOWN,
411200	WADE, STEWART L
411300	MANUA HEALTH SYSTEM INC
	NA KUPUNA O HAWAII NEI INC
	NATIVE HAWAIIAN HOLDING CO INC
	PHILLIPS, TIANA K
	PUUHONUA O WAIMANALO VLG INC
411350	MAIKAI, REGINA

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2010

41139	TACTO, RODRIGO T
41170	CHAR, BENJAMIN K
	MANAWALEA
41249	OCCUPANT UNKNOWN,
41500	SANANIKONE, PUONG
	TLS CORP
41510	MALONEY, BLAIR
41512	MALONEY, SEAN P
41530	CAVASSO CAMPBELL
	OCCUPANT UNKNOWN,
41555	DUNLAP, BURKE P
	PROGRESSIVE LANDSCAPING INC
41608	PETERSEN, SHARON L
41614	MORIN, RON P
	SHARONS PLANTS LLC
41628	FIRTH, ANTHONY M
41639	GILBERT, SAM
41647	HIGASHIYA, STEVEN M
41650	FOOD & AGRICULTURE CAL DEPT
41717	YOKOOVI, ROBYNN M
41740	YAMADA, AYAKO
41758	MENDOZA, HELEN K
41763	NEEDS, ERICH L
41803	KAITA, DAVID K
41821	OCCUPANT UNKNOWN,
	WEB ONE INC
41847	CONK, ELIZABETH
	ONTAI, CARLEEN V
	YAW, ARLENE
41851	KULANI, LOUELLA
	TALAEAI, JOYCE L
41856	HOFF, JEFFREY L
	REEVES-ESTRADA, MATHEW
41859	HOAPILI, JOHN G
41866	CABANA, ELVIRA P
	DILLINER, JAMETTE
	ELLERSAICK, LEESA R
	FUERTES, JAISY N
41870	FELICIANO, FLORENTINO C
41876	YAMAGUCHI, RENE H
41905	MAT HAWAII INC
	POCOCK, REAL
	REZENTES, SHARON
41924	DEYCAZA, MICHAEL
	TAMASHIRO, GENE
	YAMAMOTO, LINDA T
41937	OCCUPANT UNKNOWN,
41949	SHIMOKAWA FARMS
	SHIMOKAWA, ROBBY M
41951	QUALITY TURFGRASS

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2010 (Cont'd)

41951	STATON, THOMAS C
41960	ALL TREE SERVICES INC
41978	AULD, WILLIAM L
	BALL, ANTHONY M
	KEAULANA, MOSES K
	MAIAVA, MADELINE L
	MEDEIROS, RYAN V
	MEINEL, KEONE P
	MIZUTA, ROBIN T
	PENEKU, DENNIS
	SHELBY, BARRY E
	TORRES, SHANELLE
	WAIWAIOLE, CYNTHIA
	WRIGHT, ROXANNE T
	YEARIAN, DAVID F
41979	SUPERIOR ISLAND MAINT INC
41982	NIMZ, STEPHEN M
41984	CARLOS, DANIEL K
41986	OCCUPANT UNKNOWN,
411010	TURBEVILLE, SHERYL
411016	KALAMA, DAVID L
411020	OCCUPANT UNKNOWN,
411040	BARTHOLOME, K
411080	OCCUPANT UNKNOWN,
411100	LAGARETA, BRUCE C
411140	OCCUPANT UNKNOWN,
411141	OCCUPANT UNKNOWN,
411143	DRUCKMAN, RICHARD F
	STOCKTON, GORDON K
411160	WALDEN, V
411200	WADE, STEWART L
411300	CPR LLC
	PHILLIPS, JUNE M
411350	MAIKAI, REGINA

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2005

41114	OLOMANA GARDENS
41130	A & K NURSERY INC
41139	TACTO, J
41170	CHAR, BENJAMIN K
	MANAWALEA
41330	DOMINGO, A D
	SOUTHERN FOODS GROUP LP II
41430	TYSON, BOB
41500	SANANIKONE, PUONG
	TLS CORP
41510	MALONEY, COLIN M
41512	FARAWELL, RICHARD H
41530	CAVASSO CAMPBELL
	OCCUPANT UNKNOWN,
41555	KAPOLEI NURSERY & GARDENING
	PROGRESSIVE LANDSCAPING INC
41608	PETERSEN, SHARON L
41614	PETERSEN, CINDY M
	SHARONS PLANTS LLC
41647	HIGASHIYA, STEVEN
41650	FOOD & AGRICULTURE CAL DEPT
41659	MURAKAMI, GARY
41717	YOKOOJI, LANCE K
41740	YAMADA, AYAKO
41758	MENDOZA, HELEN K
41763	OCCUPANT UNKNOWN,
41821	BATTIEST, ALLEN A
41845	MICHELSEN, ANN L
41847	ILAE, ROXY B
	ONTAI, CARLEEN
	PARKER, DONNA A
	TOM, WENDELL T
41849	MEDEIROS, GEORGIANA
41851	TALAEAI, JOYCE L
41859	AHUNA-HOAPILI, GLORY A
41866	TAM, WILLIAM R
41870	VIERNES, LETICIA R
41876	LUNA, THOMAS
41905	MAT HAWAII INC
	TEIXEIRA, TONI
41924	MIYAMOTO, CLYDE
41949	SHIMOKAWA FARMS
	SHIMOKAWA, ROBERT N
41951	QUALITY TURFGRASS
41978	AULD, WILLIAM
	HIMAN, GILBERT
	INOUYE, CURT
	KEALOHA, LLOYD P
	KEAULANA, MOSES K
	KILBEY, ALAN B

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2005 (Cont'd)

41978	LAPERA, TOM
	MAFI, PATRICK
	MEDEIROS, LYLE
	MEINEL, KEONE P
	MIZUTA, ROBIN
	PENEKU, DENNIS
	SANCHEZ, ADRIAN
	WEAVER, LEIANNE R
	WRIGHT, ROXANNE
41979	LUM, GORDON A
41982	OCCUPANT UNKNOWN,
41986	OCCUPANT UNKNOWN,
411016	KALAMA, DAVID L
411020	HART, HIRIATA F
411040	TAVARES, ADAM
411060	ICC ENTERPRISE
411080	OCCUPANT UNKNOWN,
411135	JOAO, KARIN N
411140	MARTINEZ, GLENN A
	MIXED PLATE HOME REPAIR
	OLOMAMAGAIDE
411141	OCCUPANT UNKNOWN,
411143	LAGARETA, KOALANI
	REMOS, ALBERT R
	STOCKTON, GORDON K
411150	BLUE SKY HEALING ART
411160	WALDEN, V G
411200	WARE, STEWART L
411350	MAIKAI, REGINA

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2000

41130	A & K NURSERY INC
41139	TACTO, J
41170	CHAR, B
41300	FABINAL, BONNIE M
41330	CADAMIA, B
	DOMINGO, A D
	PENNA, RUSSELL
	SOUTHERN FOODS GROUP LP
41430	TYSON, BOB
41438	HARRISON, DEBRA
41512	MALONEY, PATRICK
41555	DUNLAP, BURKE
	KAPOLEI NURSERY & GARDENING
	PROGRESSIVE LANDSCAPING INC
41608	PETERSEN, S L
41614	SHARONS PLANTS LTD
41628	FIRTH, VIVIAN I
41639	TEXEIRA, JOHN A
41650	CALIFORNIA DEPT FD AGRICULTURE
41659	MURAKAMI, HENRY Y
41740	YAMADA, AYAKO
41758	FUKUI RODNEY
	MENDOZA, H K
41849	MEDEIROS, G
41851	CLARK, K D
	TALAEAI, JOYCE
41859	AHUNA-HOAPILI, GLORY A
41866	REYLUBONG, NIEVES
	TAM, WILLIAM
41876	VASCONCELLOS, DAN
41905	TEIXEIRA, M A
41924	MIYAMOTO, HENRY H
41949	SHIMOKAWA FARMS
	SHIMOKAWA, ROBBY
41951	QUALITY TURFGRASS
	STATON, THOMAS A
41978	AULD, WILLIAM
	HIMAN, GILBERT
	INOUYE, CURT
	KALAWAIA, CHAD
	KEALOHA, LLOYD P
	KEAULANA, MOSES K
	KILBEY, ALAN B
	LAPERA, TOM
	MEDEIROS, ANTONE A
	MEINEL, KEONE
	PAWLOSKI, JEFF
	PENEKU, DENNIS
41979	LUM, ARNOLD K
	PRECISION CARPENTRY

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 2000 (Cont'd)

41982	NIMZ, STEPHEN M
41986	FRANKS, MIQUEL
411015	KALAMA, DAVID L
411016	CAROLLO, PHILLIP M
411040	LARSEN, DAVID
	TAVARES, ADAM
	TEIXEIRA, JOHN S
411060	MARTINEZ, E
411080	REMOS, ALBERT R
411100	HILSON, MIKE
	JOAO, ARTHUR
	MURRAY, K D
	OCCUPANT UNKNOWN,
	PAULS PLANTS
	STOCKTON, P
411140	MARTIN ELIZABETH PA ATTORNEY
411200	WADE, STEWART L
411300	ALOHALANI, CRYSTAL
	BILLUPS, HOLLY
	CHANG, GERSHOM
	KANAHELE, DENNIS
	MAUKELE, JOE
	PHILLIPS, TIANA

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1995

41130	A & K NURSERY INC
	TACTO, A F
	YAMADA, KAZ
41139	TACTO, J
41249	UNISYN BIOWASTE TECHNOLOGY
41300	FABINAL, BONNIE M
41330	CAETANO, DENISE
	CARLTON, ROBERT
	CASTILLO, CHERYL
	DUQUE, DARIO
	JARDINE, RENFRED B
	KANE, S
	MEADOW GOLD DAIRIES INC
	RIVERA, ORLINO
	RODBY, KENNETH
41430	GORDON, S W
	LARSENPRICE, H
41500	CADAMIA, B
41510	WADE, STEWART L
41512	MALONEY, PATRICK
41608	PETERSEN, S L
41614	MORIN, RON P
	SHARONS PLANTS LTD
41639	TEXEIRA, JOHN A
41650	DIERKS, KEVIN
	LEWIS, D
	MASHITA INC
41659	MURAKAMI, HENRY Y
41740	YAMADA, KAZUTO
41758	BALINTONA, B
	FUKUI RODNEY
	MENDOZA, H K
41821	HIGA, RAYMOND T
41845	KAHIKINA, C
41847	LAY, G
	MCCARTHY, J
41851	HOLMES, ALAN
	TALAEAI, JOYCE
41856	ADAMES, E
	RIFE, JOHN M
41905	HANGAI, HARRY H
	TEIXEIRA, M A
41924	MIYAMOTO, HENRY H
41937	QUALITY TURFGRASS
41949	SHIMOKAWA, ISAMI
41960	FULLER, BILL
	PUA MELIA PLANTATION INC
41978	AULD, WILLIAM
	DIAS, CLYDE A
	FALEAFINE, ALO

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1995 (Cont'd)

41978	HIMAN, GILBERT
	JOHNSON, ARTHUR C
	KEALOHA, LLOYD P
	KEALOHA, R A
	KEAULANA, MOSES K
	LAPERA, TOM SR
	MAFI MASONRY
	MEDEIROS, ANTONE A
	MIZUTA, M
	PAWLOSKI, JEFF
	PENEKU, DENNIS
	RAWLINS, MANUEL
	WAIWAIOLE, BRENTON
41979	HUGHES, SAM
	LUM, ARNOLD K
	PHILLIPS, PHIL
	PRECISION CARPENTRY
41982	NIMZ, STEPHEN M
41984	CONOVER, DANNA
41986	TEIXEIRA, MANUEL S JR
411015	KALAMA, DAVID L
411016	CAROLLO, PHILLIP M
411040	LARSEN, DAVID
	TAVARES, ADAM JR
	TEIXEIRA, JOHN S
411100	HILSON, MIKE
	JOAO, ARTHUR
	KANE, BOB
	MURRAY, K D
	PERRY, P
	REMOS, A
	STOCKTON, P

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1992

41	CAROLLO, PHILLIP M
	FOSTER, PAUL M
	JOAO, ARTHUR
	KALAMA, DAVID L
	KIRBY, JOSEPH F
	LARSEN, DAVID
	MURRAY, K D
	TAVARES, ADAM JR
	TEIXEIRA, JOHN S
41130	A & K NURSERY INC
	TACTO, A F
	YAMADA, KAZ
41139	HASEBE, LARRY Y
41249	WASHINGTON ENERGY COMPANY
41300	FABINAL, BONNIE M
41330	CAETANO, DENISE
	KANE, S
	LEE, CLAYTON C
	RIVERA, ORLINO
	RODBY, KENNETH
41430	BUTLER, DAVID E
	LARSEN, H
41500	CADAMIA, B
	ZIMMER, FREDK
41510	WADE, STEWART L
41512	MALONEY, PATRICK
41608	PETERSEN, S L
41614	MORIN, RON P
	SHARONS PLANTS LTD
41639	TEXEIRA, JOHN A
41650	GILBREATH, JOHN
	SIMON, C
	WEST COAST INTERNATIONAL INC
41659	MURAKAMI, HENRY Y
41740	YAMADA, KAZUTO
41758	BALINTONA, B
	CONTEMPORARY LANDSCAPERS
	MENDOZA, H K
41821	HIGA, RAYMOND T
41847	GORDON, S W
41849	KAM, BRANDT
	MEDEIROS, JOEL
41851	LOPEZ, THEO J
	TALAEAI, JOYCE
41856	RIFE, JOHN M
41876	VASCONCELLOS, DAN
41905	FEED & FARM INC
	HANGAI, HARRY H
	TEIXEIRA, M A
41924	MIYAMOTO, HENRY H

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1992 (Cont'd)

41937	QUALITY TURFGRASS
41949	SHIMOKAWA, ISAMI
41960	FULLER, BILL
	PUA MELIA PLANTATION INC
41978	AULD, WILLIAM
	DECASTRO, JOHN D
	DIAS, CLYDE A
	HIMAN, GILBERT
	JOHNSON, ARTHUR C
	KEALOHA, LLOYD P
	KEALOHA, R A
	KEAULANA, MOSES K
	LAPERA, THOMAS
	MEDEIROS, ANTONE A
	PAWLOSKI, JEFF
	PENEKU, DENNIS
	RACOMA, ALEX
	RAWLINS, MANUEL
	TEIXEIRA, RICHARD R
	UTU, S
	WEAVER, ROSLYN
41979	HUGHES, SAM
	LUM, ARNOLD K
	PHILLIPS, PHIL
41982	NIMZ, STEPHEN M
41984	CARLOS, DWAYNE
41986	TEIXEIRA, MANUEL S JR

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1987

41330	WAIMANALO DAIRY INC
41512	PLANT WAREHOUSE INC THE
41614	SHARONS LTD
41650	AGRICLTRAL RES TCHNOLOGY GROUP
41740	A & K NURSERY INC
41949	SHIMOKAWA FARM
411100	DIAMOND HEAD BUILDERS INC

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1982

41512	PLANT WAREHOUSE INC THE
41614	SHARONS LTD
41740	A & K NURSERY INC
41949	SHIMOKAWA FARM
411100	DIAMOND HEAD BUILDERS INC

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WAIKUPANAHA ST 1977

41650	RAINBOW PROPERTIES INC
41772	GARDEN LANDSCAPING INC
41949	SHIMOKAWA FARM
45510	FLORSHEIM FARMS HAWAII INC
411100	DIAMOND HEAD BUILDERS INC

Waikupanaha Ag Lots
Not Reported
Waimanalo, HI 96795

Inquiry Number: 5428383.2s
November 7, 2018

EDR Vapor Encroachment Screen

Prepared using EDR's Vapor Encroachment Worksheet

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Primary Map	2
Secondary Map	3
Map Findings	4
Record Sources and Currency	GR-1

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

Disclaimer - Copyright and Trademark Notice

The EDR Vapor Encroachment Worksheet enables EDR's customers to make certain online modifications that effects maps, text and calculations contained in this Report. As a result, maps, text and calculations contained in this Report may have been so modified. EDR has not taken any action to verify any such modifications, and this report and the findings set forth herein must be read in light of this fact. Environmental Data Resources shall not be responsible for any customer's decision to include or not include in any final report any records determined to be within the relevant minimum search distances.

This report contains information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANYSUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.
Purchaser accepts this report "AS IS". Any analyses, estimates, ratings, or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can produce information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2018 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by EDR. The report was designed to assist parties seeking to meet the search requirements of the ASTM Standard Practice for Assessment of Vapor Encroachment into Structures on Property Involved in Real Estate Transactions (E 2600).

STANDARD ENVIRONMENTAL RECORDS	Default Area of Concern (Miles)*	property	1/10	> 1/10
Federal NPL site list	1.0	0	0	0
Federal Delisted NPL site list	1.0	0	0	0
Federal CERCLIS list	0.5	0	0	0
Federal CERCLIS NFRAP site list	0.5	0	0	1
Federal RCRA CORRACTS facilities list	1.0	0	0	0
Federal RCRA non-CORRACTS TSD facilities list	0.5	0	0	0
Federal RCRA generators list	0.25	0	0	0
Federal institutional controls / engineering controls registries	0.5	0	0	0
Federal ERNS list	0.001	0	0	-
State- and tribal - equivalent NPL	not searched	-	-	-
State- and tribal - equivalent CERCLIS	1.0	0	0	1
State and tribal landfill and/or solid waste disposal site lists	0.5	0	0	0
State and tribal leaking storage tank lists	0.5	0	0	3
State and tribal registered storage tank lists	0.25	0	0	2
State and tribal institutional control / engineering control registries	0.5	0	0	0
State and tribal voluntary cleanup sites	0.5	0	0	0
State and tribal Brownfields sites	0.5	0	0	0

ADDITIONAL ENVIRONMENTAL RECORDS				
Local Brownfield lists	0.5	0	0	0
Local Lists of Landfill / Solid Waste Disposal Sites	0.5	0	0	0
Local Lists of Hazardous waste / Contaminated Sites	0.001	0	0	-
Local Lists of Registered Storage Tanks	not searched	-	-	-
Local Land Records	0.001	0	0	-
Records of Emergency Release Reports	0.001	0	1	-
Other Ascertainable Records	1.0	0	0	1

EDR HIGH RISK HISTORICAL RECORDS				
EDR Exclusive Records	1.0	0	0	0
Exclusive Recovered Govt. Archives	0.001	0	0	-

EXECUTIVE SUMMARY

EDR RECOVERED GOVERNMENT ARCHIVES

EDR Exclusive Records	1.0	0	0	0
Exclusive Recovered Govt. Archives	0.001	0	0	-

*The Default Area of Concern may be adjusted by the environmental professional using experience and professional judgement. Each category may include several databases, and each database may have a different distance. A list of individual databases is provided at the back of this report.

EXECUTIVE SUMMARY

TARGET PROPERTY INFORMATION

ADDRESS

WAIKUPANAHA AG LOTS
NOT REPORTED
WAIMANALO, HI 96795

COORDINATES

Latitude (North):	21.33133 - 21˚ 19' 52.785645"
Longitude (West):	157.704506 - 157˚ 42' 16.24878"
Elevation:	16 ft. above sea level

EXECUTIVE SUMMARY

SEARCH RESULTS

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

STANDARD ENVIRONMENTAL RECORDS

Name	Address	Dist/Dir	Map ID	Page
ALII IV SERVICE STATION UST: UST LUST: LUST	41-1025 KALANIANAOLE HWY	1/10 - 1/3 N	◆ 2	8
WAIMANALO WASTEWATER TREATMENT PLANT Financial Assurance: Financial Assurance LUST: LUST	41-1060 KALANIANAOLE HWY	1/10 - 1/3 N	◆ 3	10
GOLDEN MELON FARMS SEMS-ARCHIVE: SEMS-ARCHIVE	KULAIWI ROAD	1/10 - 1/3 E	◆ A4	10
GOLDEN MELON FARMS SHWS: SHWS	41-254 KULAIWI ST	1/10 - 1/3 ENE	◆ A5	12
MEADOW GOLD DAIRIES - WAIMANALO FARM UST: UST LUST: LUST	41-330 WAIKUPANAHA ST	1/10 - 1/3 WSW	▲ 6	12

ADDITIONAL ENVIRONMENTAL RECORDS

Name	Address	Dist/Dir	Map ID	Page
ILLEGAL DUMPING IN WAIMANALO SPILLS: SPILLS	41-170 WAIKUPANAHA STREET	<1/10 NNW	▲ 1	8
WAIMANALO WASTEWATER TREATMENT PLANT Financial Assurance: Financial Assurance LUST: LUST	41-1060 KALANIANAOLE HWY	1/10 - 1/3 N	◆ 3	10

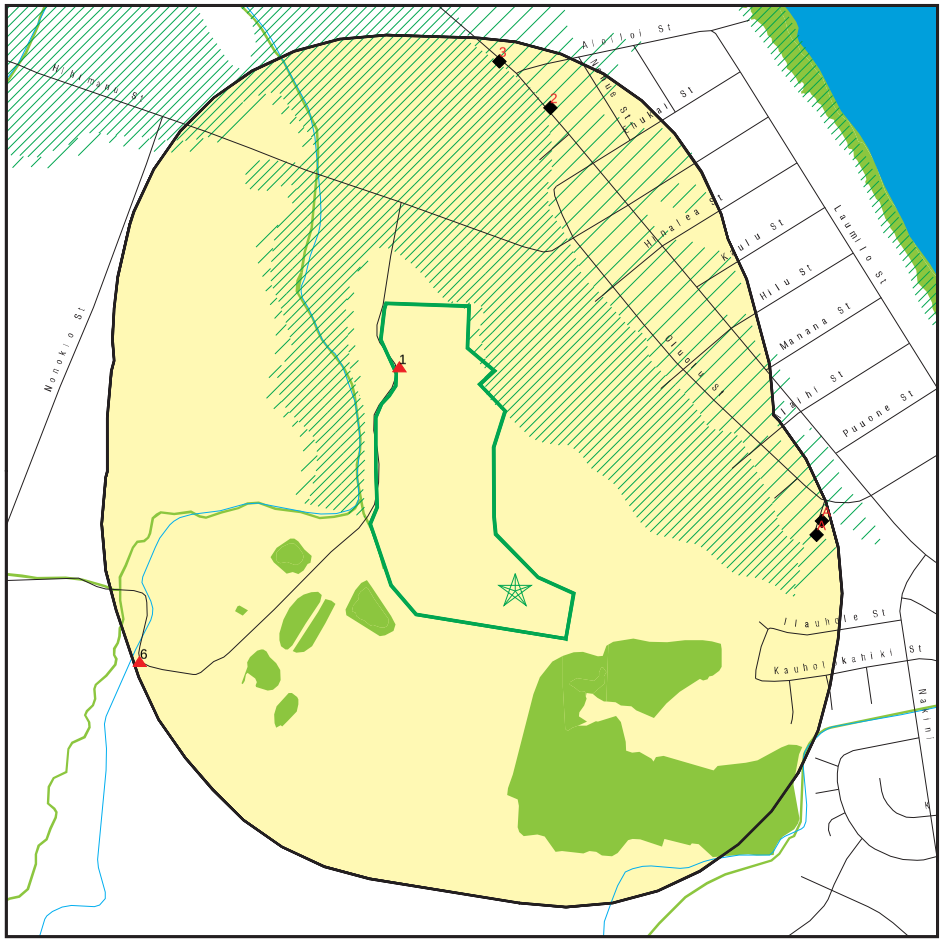
EDR HIGH RISK HISTORICAL RECORDS

Name	Address	Dist/Dir	Map ID	Page
Not Reported				

EDR RECOVERED GOVERNMENT ARCHIVES

Name	Address	Dist/Dir	Map ID	Page
Not Reported				

PRIMARY MAP - 5428383.2S



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

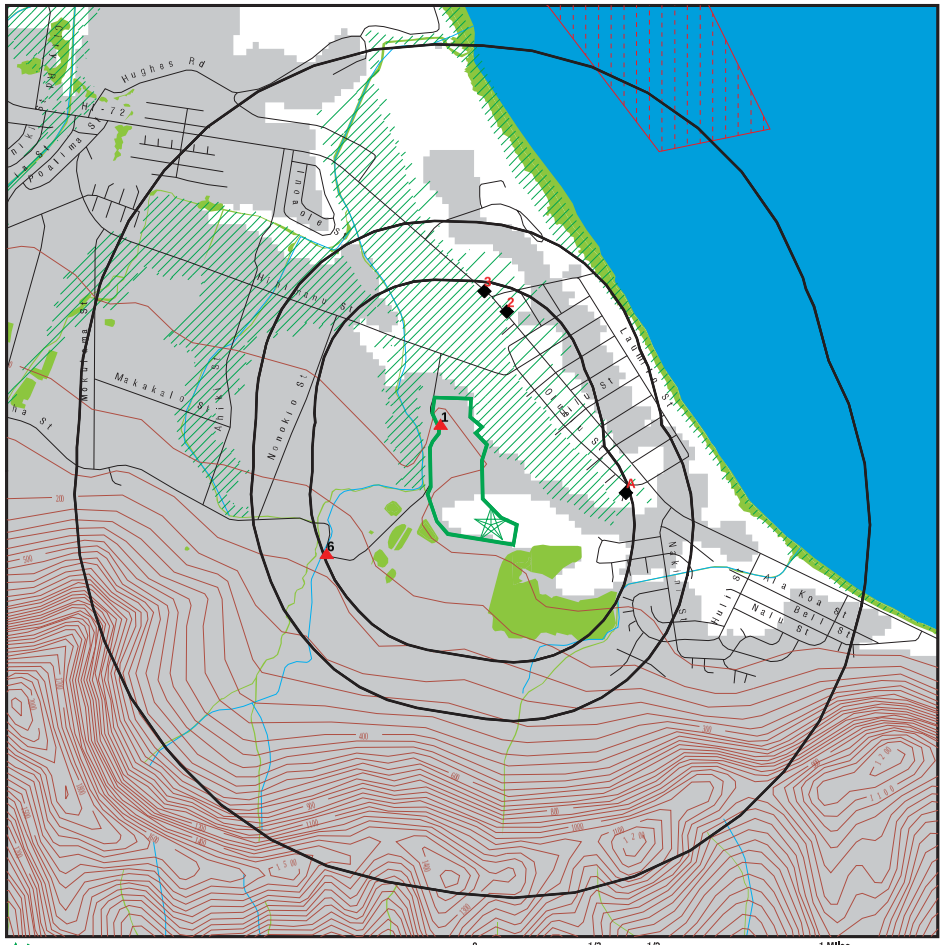
0 300 1/3 1/2 Miles

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

SITE NAME: Walkupanaha Ag Lots ADDRESS: Not Reported Waimanalo HI 96795 LAT/LONG: 21.33133 / 157.704506	CLIENT: Envlro Srvcs. and Trng. Center CONTACT: Eva Kakone INQUIRY #: 5428383.2s DATE: September 19, 2018 12:43 pm

Copyright © 2018 EDR, Inc. © 2015 TomTom Rel. 2015.

SECONDARY MAP - 5428383.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area

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

SITE NAME: Walkupanaha Ag Lots ADDRESS: Not Reported Waimanalo HI 96795 LAT/LONG: 21.33133 / 157.704506	CLIENT: Envlro Srvcs. and Trng. Center CONTACT: Eva Kakone INQUIRY #: 5428383.2s DATE: September 19, 2018 12:42 pm

Copyright © 2018 EDR, Inc. © 2015 TomTom Rel. 2015.

MAP FINDINGS

LEGEND

FACILITY NAME FACILITY ADDRESS, CITY, ST, ZIP			EDR SITE ID NUMBER
◆ MAP ID#	Direction Distance Range Relative Elevation	(Distance feet / miles) Feet Above Sea Level	ASTM 2600 Record Sources found in this report. Each database searched has been assigned to one or more categories. For detailed information about categorization, see the section of the report Records Searched and Currency.

Worksheet:

Comments:
Comments may be added on the online Vapor Encroachment Worksheet.

DATABASE ACRONYM: Applicable categories (A hoverbox with database description).

ILLEGAL DUMPING IN WAIMANALO 41-170 WAIKUPANAHA STREET, WAIMANALO, HI, 96795			S117391813
▲ 1	NNW <1/10	(0 ft. / 0 mi.)	Records of Emergency Release Reports
	44 ft. Higher Elevation	60 ft. Above Sea Level	

Worksheet:

Impact on Target Property: VEC does not exist

HI SPILLS: Records of Emergency Release Reports

Island:	Oahu
Supplemental Loc. Text:	Not Reported
Case Number:	20140502-1250
HID Number:	Not Reported
Facility Registry Id:	Not Reported
Lead and Program:	HEER EP&R
ER:	None
Units:	Illegal Dumping in Waimanalo
Substances:	Unknown
Less Or Greater Than:	Not Reported
Numerical Quantity:	0
Units:	Not Reported
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2014-05-02 00:00:00
Result:	Refer to C&C Refuse
File Under:	Not Reported
Latitude:	Not Reported
Longitude:	Not Reported

ALII IV SERVICE STATION 41-1025 KALANIANAOLE HWY, WAIMANALO, HI, 96795	U001236177

◆ 2	N 1/10 - 1/3	(1404 ft. / 0.266 mi.)	State and tribal leaking storage tank lists State and tribal registered storage tank lists
	6 ft. Lower Elevation	10 ft. Above Sea Level	

Worksheet:

Impact on Target Property: VEC does not exist

LUST: State and tribal leaking storage tank lists

Facility ID:	9-200742
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	09/01/1998
Release ID:	940146
Project Officer:	Jose Ruiz

UST: State and tribal registered storage tank lists

Facility ID:	9-200742
Owner:	PARADISE PETROLEUM DBA ALII PETROLEUM
Owner Address:	6600 KALANIANAOLE HWY
Owner City,St,Zip:	Waimanalo, 96795 96795
Latitude:	21.340145
Longitude:	-157.703813
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching
Tank ID:	R-1
Date Installed:	04/22/1973
Tank Status:	**Permanently Out of Use**
Date Closed:	05/08/1994
Tank Capacity:	6000
Substance:	Gasoline
Tank ID:	R-2
Date Installed:	04/22/1973
Tank Status:	**Permanently Out of Use**
Date Closed:	05/08/1994
Tank Capacity:	2000
Substance:	Gasoline
Tank ID:	R-3
Date Installed:	04/22/1973
Tank Status:	**Permanently Out of Use**
Date Closed:	05/08/1994
Tank Capacity:	2000
Substance:	Gasoline
Tank ID:	R-4
Date Installed:	04/22/1973
Tank Status:	**Permanently Out of Use**
Date Closed:	05/08/1994
Tank Capacity:	1000
Substance:	Gasoline

ALII IV SERVICE STATION, 41-1025 KALANIANAOLE HWY, WAIMANALO, HI 96795 (Continued)

WAIMANALO WASTEWATER TREATMENT PLANT 41-1060 KALANIANAOLE HWY, WAIMANALO, HI, 96795			U003154904
◆ 3	N 1/10 - 1/3	(1615 ft. / 0.306 mi.)	State and tribal leaking storage tank lists Other Ascertainable Records
	6 ft. Lower Elevation	10 ft. Above Sea Level	

Worksheet:

Impact on Target Property: VEC does not exist

LUST: State and tribal leaking storage tank lists

Facility ID:	9-200796
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	05/06/1997
Release ID:	970054
Project Officer:	Richard Takaba
Facility ID:	9-200796
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	11/18/2009
Release ID:	080026
Project Officer:	Richard Takaba

HI Financial Assurance: Other Ascertainable Records

Alt Facility ID:	9-200796
Tank Id:	R-1
Tank Status:	Permanently Out of Use
FRTYPE:	Self Insured
Expiration Date:	06/30/2007
Alt Facility ID:	9-200796
Tank Id:	r-M-2
Tank Status:	Permanently out of Use
FRTYPE:	Self Insured
Expiration Date:	06/30/2007

GOLDEN MELON FARMS KULAIWI ROAD, WAIMANALO, HI, 96795			1000984391
◆ A4	E 1/10 - 1/3	(1637 ft. / 0.31 mi.)	Federal CERCLIS NFRAP site list
	2 ft. Lower Elevation	14 ft. Above Sea Level	

Worksheet:

Impact on Target Property: VEC does not exist

SEMS Archive: Federal CERCLIS NFRAP site list

Site ID:	905235
EPA ID:	HI0001051366
Cong District:	2

GOLDEN MELON FARMS, KULAIWI ROAD, WAIMANALO, HI 96795 (Continued)

FIPS Code:	15003
FF:	N
NPL:	Not on the NPL
Non NPL Status:	NFRAP-Site does not qualify for the NPL based on existing information

SEMS Archive Detail:

Region:	9
Site ID:	905235
EPA ID:	HI0001051366
Site Name:	GOLDEN MELON FARMS
NPL:	N
FF:	N
OU:	0
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1
Start Date:	Not Reported
Finish Date:	2013-11-08 00:00:00
Qual:	Not Reported
Current Action Lead:	EPA Perf In-Hse

Region:	9
Site ID:	905235
EPA ID:	HI0001051366
Site Name:	GOLDEN MELON FARMS
NPL:	N
FF:	N
OU:	0
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	Not Reported
Finish Date:	2007-11-14 00:00:00
Qual:	N
Current Action Lead:	EPA Perf

Region:	9
Site ID:	905235
EPA ID:	HI0001051366
Site Name:	GOLDEN MELON FARMS
NPL:	N
FF:	N
OU:	0
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1995-03-02 00:00:00
Finish Date:	1995-03-02 00:00:00
Qual:	Not Reported
Current Action Lead:	St Perf

GOLDEN MELON FARMS 41-254 KULAIWI ST, WAIMANALO, HI, 96795			S107022544
◆ A5	ENE 1/10 - 1/3	(1694 ft. / 0.321 mi.)	State- and tribal - equivalent CERCLIS
	5 ft. Lower Elevation	11 ft. Above Sea Level	

Worksheet:

Impact on Target Property: VEC does not exist

SHWS: State- and tribal - equivalent CERCLIS

Organization:	Not Reported
Supplemental Location:	End of Kulaiwi Rd
Island:	Oahu
Environmental Interest:	Golden Melon Farms
HID Number:	HI0001051366
Facility Registry Identifier:	110009278067
Lead Agency:	HEER
Program:	State
Project Manager:	Laura Young
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Golden Melon Farms
HID Number:	HI0001051366
Facility Registry Identifier:	110009278067
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Alachchor detected at concentrations of 1.7-2.9 ug/L in Waimanalo Well I (located 0.5 mile from Golden Melon Farms)
Nature of Residual Contamination:	Not Reported
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	No Engineering Control Required
Description of Restrictions:	Not Reported
Institutional Control:	Not Reported
Within Designated Areawide Contamination:	Waimanalo GW Contamination Plume
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	01/20/2009
Document Number:	2009-029-LY
Document Subject:	No Further Action (NFA) Determination at Golden Melon Farms located at 41-254 Kulaiwi St, Waimanalo HI 96795
Project Manager:	Laura Young
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

MEADOW GOLD DAIRIES - WAIMANALO FARM 41-330 WAIKUPANAHA ST, WAIMANALO, HI, 96795	U001237422

MAP FINDINGS

▲ 6	WSW 1/10 - 1/3	(1727 ft. / 0.327 mi.)	State and tribal leaking storage tank lists State and tribal registered storage tank lists
	123 ft. Higher Elevation	139 ft. Above Sea Level	

Worksheet:

Impact on Target Property: VEC does not exist

LUST: State and tribal leaking storage tank lists

Facility ID:	9-202526
Facility Status:	Site Cleanup Completed (NFA)
Facility Status Date:	06/24/2004
Release ID:	930085
Project Officer:	Shunsheng Fu

UST: State and tribal registered storage tank lists

Facility ID:	9-202526
Owner:	MEADOW GOLD DAIRIES
Owner Address:	Not Reported
Owner City,St,Zip:	Waimanalo, 96795 96795
Latitude:	21.330690
Longitude:	-157.711908
Horizontal Reference Datum Name:	NAD83
Horizontal Collection Method Name:	Address Matching
Tank ID:	R-1
Date Installed:	Not Reported
Tank Status:	**Permanently Out of Use**
Date Closed:	04/01/1993
Tank Capacity:	2000
Substance:	Gasoline
Tank ID:	R-2
Date Installed:	Not Reported
Tank Status:	**Permanently Out of Use**
Date Closed:	04/01/1993
Tank Capacity:	2000
Substance:	Diesel

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
ENVIRONMENTAL RECORDS						
Federal NPL site list						
US	NPL	National Priority List	EPA	07/17/2018	08/09/2018	09/07/2018
US	Proposed NPL	Proposed National Priority List Sites	EPA	07/17/2018	08/09/2018	09/07/2018
US	NPL LIENS	Federal Superfund Liens	EPA	10/15/1991	02/02/1994	03/30/1994
Federal CERCLIS list						
US	SEMS	Superfund Enterprise Management System	EPA	07/17/2018	08/09/2018	09/07/2018
Federal RCRA CORRACTS facilities list						
US	CORRACTS	Corrective Action Report	EPA	03/01/2018	03/28/2018	06/22/2018
Federal RCRA TSD facilities list						
US	RCRA-TSDF	RCRA - Treatment, Storage and Disposal	Environmental Protection Agency	03/01/2018	03/28/2018	06/22/2018
Federal RCRA generators list						
US	RCRA-LQG	RCRA - Large Quantity Generators	Environmental Protection Agency	03/01/2018	03/28/2018	06/22/2018
US	RCRA-SQG	RCRA - Small Quantity Generators	Environmental Protection Agency	03/01/2018	03/28/2018	06/22/2018
US	RCRA-CESQG	RCRA - Conditionally Exempt Small Quantity Generators	Environmental Protection Agency	03/01/2018	03/28/2018	06/22/2018
Federal institutional controls / engineering controls registries						
US	LUCIS	Land Use Control Information System	Department of the Navy	05/14/2018	05/18/2018	07/20/2018
US	US ENG CONTROLS	Engineering Controls Sites List	Environmental Protection Agency	07/31/2018	08/28/2018	09/14/2018
US	US INST CONTROL	Sites with Institutional Controls	Environmental Protection Agency	07/31/2018	08/28/2018	09/14/2018
Federal ERNS list						
US	ERNS	Emergency Response Notification System	National Response Center, United States Coast	06/18/2018	06/27/2018	09/14/2018
State and tribal - equivalent CERCLIS						
HI	SHWS	Sites List	Department of Health	01/23/2018	02/21/2018	02/26/2018
State and tribal landfill / solid waste disposal						
HI	SWF/LF	Permitted Landfills in the State of Hawaii	Department of Health	09/17/2012	04/03/2013	05/10/2013
State and tribal leaking storage tank lists						
HI	LUST	Leaking Underground Storage Tank Database	Department of Health	03/16/2018	03/21/2018	04/10/2018
US	INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land	Environmental Protection Agency	04/10/2018	05/18/2018	07/20/2018
US	INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land	EPA, Region 5	04/12/2018	05/18/2018	07/20/2018
US	INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land	EPA Region 10	04/12/2018	05/18/2018	07/20/2018
US	INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land	EPA Region 8	04/25/2018	05/18/2018	07/20/2018
US	INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land	EPA Region 7	04/24/2018	05/18/2018	07/20/2018
US	INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land	EPA Region 6	04/01/2018	05/18/2018	07/20/2018
US	INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land	EPA Region 4	05/08/2018	05/18/2018	07/20/2018
US	INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land	EPA Region 1	04/13/2018	05/18/2018	07/20/2018

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
State and tribal registered storage tank lists						
HI	UST	Underground Storage Tank Database	Department of Health	03/16/2018	03/21/2018	04/10/2018
US	INDIAN UST R7	Underground Storage Tanks on Indian Land	EPA Region 7	04/24/2018	05/18/2018	07/20/2018
US	INDIAN UST R9	Underground Storage Tanks on Indian Land	EPA Region 9	04/10/2018	05/18/2018	07/20/2018
US	INDIAN UST R10	Underground Storage Tanks on Indian Land	EPA Region 10	04/12/2018	05/18/2018	07/20/2018
US	INDIAN UST R6	Underground Storage Tanks on Indian Land	EPA Region 6	04/01/2018	05/18/2018	07/20/2018
US	INDIAN UST R4	Underground Storage Tanks on Indian Land	EPA Region 4	05/08/2018	05/18/2018	07/20/2018
US	INDIAN UST R5	Underground Storage Tanks on Indian Land	EPA Region 5	04/12/2018	05/18/2018	07/20/2018
US	INDIAN UST R8	Underground Storage Tanks on Indian Land	EPA Region 8	04/25/2018	05/18/2018	07/20/2018
US	INDIAN UST R1	Underground Storage Tanks on Indian Land	EPA, Region 1	04/13/2018	05/18/2018	07/20/2018
US	FEMA UST	Underground Storage Tank Listing	FEMA	05/15/2017	05/30/2017	10/13/2017
State and tribal institutional control / engineering control registries						
HI	ENG CONTROLS	Engineering Control Sites	Department of Health	01/23/2018	02/21/2018	02/26/2018
HI	INST CONTROL	Sites with Institutional Controls	Department of Health	01/23/2018	02/21/2018	02/26/2018
State and tribal voluntary cleanup sites						
HI	VCP	Voluntary Response Program Sites	Department of Health	01/23/2018	02/21/2018	02/26/2018
US	INDIAN VCP R1	Voluntary Cleanup Priority Listing	EPA, Region 1	07/27/2015	09/29/2015	02/18/2016
US	INDIAN VCP R7	Voluntary Cleanup Priority Lisitng	EPA, Region 7	03/20/2008	04/22/2008	05/19/2008
State and tribal Brownfields sites						
HI	BROWNFIELDS	Brownfields Sites	Department of Health	01/23/2018	02/21/2018	02/26/2018
Other Records						
US	CONSENT	Superfund (CERCLA) Consent Decrees	Department of Justice, Consent Decree Library	03/31/2018	04/16/2018	06/29/2018
US	ROD	Records Of Decision	EPA	05/13/2018	05/30/2018	06/29/2018
US	LIENS 2	CERCLA Lien Information	Environmental Protection Agency	05/13/2018	05/30/2018	06/29/2018
US	DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations	EPA, Region 9	01/12/2009	05/07/2009	09/21/2009
US	US HIST CDL	National Clandestine Laboratory Register	Drug Enforcement Administration	05/18/2018	06/20/2018	09/14/2018
US	2020 COR ACTION	2020 Corrective Action Program List	Environmental Protection Agency	09/30/2017	05/08/2018	07/20/2018
US	LEAD SMELTER 1	Lead Smelter Sites	Environmental Protection Agency	05/13/2018	05/30/2018	06/29/2018
US	LEAD SMELTER 2	Lead Smelter Sites	American Journal of Public Health	04/05/2001	10/27/2010	12/02/2010
US	PCB TRANSFORMER	PCB Transformer Registration Database	Environmental Protection Agency	05/24/2017	11/30/2017	12/15/2017
US	FUSRAP	Formerly Utilized Sites Remedial Action Program	Department of Energy	08/08/2017	09/11/2018	09/14/2018
US	SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing	Environmental Protection Agency	01/01/2017	02/03/2017	04/07/2017
US	COAL ASH EPA	Coal Combustion Residues Surface Impoundments List	Environmental Protection Agency	07/01/2014	09/10/2014	10/20/2014
US	COAL ASH DOE	Steam-Electric Plant Operation Data	Department of Energy	12/31/2005	08/07/2009	10/22/2009
US	US AIRS (AFS)	Aerometric Information Retrieval System Facility Subsystem (	EPA	10/12/2016	10/26/2016	02/03/2017
US	US AIRS MINOR	Air Facility System Data	EPA	10/12/2016	10/26/2016	02/03/2017
US	US FIN ASSUR	Financial Assurance Information	Environmental Protection Agency	03/01/2018	03/27/2018	06/22/2018
US	EPA WATCH LIST	EPA WATCH LIST	Environmental Protection Agency	08/30/2013	03/21/2014	06/17/2014
US	Delisted NPL	National Priority List Deletions	EPA	07/17/2018	08/09/2018	09/07/2018
US	SEMS-ARCHIVE	Superfund Enterprise Management System Archive	EPA	07/17/2018	08/09/2018	09/07/2018
US	RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated	Environmental Protection Agency	03/01/2018	03/28/2018	06/22/2018
US	HMIRS	Hazardous Materials Information Reporting System	U.S. Department of Transportation	03/26/2018	03/27/2018	06/08/2018

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	DOT OPS	Incident and Accident Data	Department of Transporation, Office of Pipeli	07/31/2012	08/07/2012	09/18/2012
US	US CDL	Clandestine Drug Labs	Drug Enforcement Administration	05/18/2018	06/20/2018	09/14/2018
US	US BROWNFIELDS	A Listing of Brownfields Sites	Environmental Protection Agency	06/18/2018	06/20/2018	09/14/2018
US	DOD	Department of Defense Sites	USGS	12/31/2005	11/10/2006	01/11/2007
US	FEDLAND	Federal and Indian Lands	U.S. Geological Survey	12/31/2005	02/06/2006	01/11/2007
US	FUDS	Formerly Used Defense Sites	U.S. Army Corps of Engineers	01/31/2015	07/08/2015	10/13/2015
US	UMTRA	Uranium Mill Tailings Sites	Department of Energy	06/23/2017	10/11/2017	11/03/2017
US	ODI	Open Dump Inventory	Environmental Protection Agency	06/30/1985	08/09/2004	09/17/2004
US	US MINES	Mines Master Index File	Department of Labor, Mine Safety and Health A	05/03/2018	05/31/2018	06/29/2018
US	US MINES 2	Ferrous and Nonferrous Metal Mines Database Listing	USGS	12/05/2005	02/29/2008	04/18/2008
US	US MINES 3	Active Mines & Mineral Plants Database Listing	USGS	04/14/2011	06/08/2011	09/13/2011
US	PRP	Potentially Responsible Parties	EPA	10/25/2013	10/17/2014	10/20/2014
US	TRIS	Toxic Chemical Release Inventory System	EPA	12/31/2016	01/10/2018	01/12/2018
US	TSCA	Toxic Substances Control Act	EPA	12/31/2016	06/21/2017	01/05/2018
US	FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA/Office of Prevention, Pesticides and Toxi	04/09/2009	04/16/2009	05/11/2009
US	FTTS INSP	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA	04/09/2009	04/16/2009	05/11/2009
US	HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HIST FTTS INSP	FIFRA/TSCA Tracking System Inspection & Enforcement Case Lis	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	SSTS	Section 7 Tracking Systems	EPA	12/31/2009	12/10/2010	02/25/2011
US	ICIS	Integrated Compliance Information System	Environmental Protection Agency	11/18/2016	11/23/2016	02/10/2017
US	PADS	PCB Activity Database System	EPA	06/01/2017	06/09/2017	10/13/2017
US	MLTS	Material Licensing Tracking System	Nuclear Regulatory Commission	08/30/2016	09/08/2016	10/21/2016
US	RADINFO	Radiation Information Database	Environmental Protection Agency	04/03/2018	04/05/2018	06/29/2018
US	FINDS	Facility Index System/Facility Registry System	EPA	02/21/2018	02/23/2018	03/23/2018
US	RAATS	RCRA Administrative Action Tracking System	EPA	04/17/1995	07/03/1995	08/07/1995
US	RMP	Risk Management Plans	Environmental Protection Agency	05/01/2018	05/17/2018	09/07/2018
US	BRS	Biennial Reporting System	EPA/NTIS	12/31/2015	02/22/2017	09/28/2017
US	PWS	Public Water System Data	EPA	12/17/2013	01/09/2014	10/15/2014
US	INDIAN RESERV	Indian Reservations	USGS	12/31/2014	07/14/2015	01/10/2017
US	INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	Environmental Protection Agency	12/31/1998	12/03/2007	01/24/2008
HI	AIRS	List of Permitted Facilities	Department of Health	08/02/2018	08/06/2018	09/11/2018
HI	CDL	Clandestine Drug Lab Listing	Department of Health	08/04/2010	09/10/2010	10/22/2010
HI	DRYCLEANERS	Permitted Drycleaner Facility Listing	Department of Health	08/02/2018	08/06/2018	09/11/2018
HI	Financial Assurance	Financial Assurance Information Listing	Department of Health	06/07/2018	06/12/2018	07/30/2018
HI	LEAD	Lead Inspection Listing	Department of Health	06/07/2018	06/12/2018	07/11/2018
HI	SPILLS	Release Notifications	Department of Health	08/14/2018	08/21/2018	09/11/2018
HI	SPILLS 90	SPILLS90 data from FirstSearch	FirstSearch	03/10/2012	01/03/2013	02/11/2013
HI	UIC	Underground Injection Wells Listing	Department of Health	02/07/2013	02/12/2013	04/09/2013
US	UXO	Unexploded Ordnance Sites	Department of Defense	09/30/2017	06/19/2018	09/14/2018
US	FUELS PROGRAM	EPA Fuels Program Registered Listing	EPA	05/21/2018	05/23/2018	09/07/2018
US	ABANDONED MINES	Abandoned Mines	Department of Interior	09/10/2018	09/11/2018	09/14/2018
US	ECHO	Enforcement & Compliance History Information	Environmental Protection Agency	09/02/2018	09/05/2018	09/14/2018
US	DOCKET HWC	Hazardous Waste Compliance Docket Listing	Environmental Protection Agency	01/04/2018	01/19/2018	04/13/2018
US	IHS OPEN DUMPS	Open Dumps on Indian Land	Department of Health & Human Serivces, Indian	04/01/2014	08/06/2014	01/29/2015

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
HISTORICAL USE RECORDS						
US	EDR MGP	EDR Proprietary Manufactured Gas Plants	EDR, Inc.			
US	EDR Hist Auto	EDR Exclusive Historical Auto Stations	EDR, Inc.			
US	EDR Hist Cleaner	EDR Exclusive Historical Cleaners	EDR, Inc.			
HI	RGA HWS	Recovered Government Archive State Hazardous Waste Facilitie	Department of Health		07/01/2013	01/08/2014
HI	RGA LF	Recovered Government Archive Solid Waste Facilities List	Department of Health		07/01/2013	01/17/2014
HI	RGA LUST	Recovered Government Archive Leaking Underground Storage Tan	Department of Health		07/01/2013	01/03/2014

STREET AND ADDRESS INFORMATION

© 2015 TomTom North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

APPENDIX IV
REGULATORY RECORDS DOCUMENTATION *(EDR Radius Map Report)*

Waikupanaha Ag Lots
Waikupanaha Street
Waimanalo, HI 96795

Inquiry Number: 5654255.2s
May 16, 2019

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

FORM-LBE-DCA

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	**ES1**
Overview Map	**2**
Detail Map	**3**
Map Findings Summary	**4**
Map Findings	**8**
Orphan Summary	**22**
Government Records Searched/Data Currency Tracking	**GR-1**

GEOCHECK ADDENDUM

Physical Setting Source Addendum	**A-1**
Physical Setting Source Summary	**A-2**
Physical Setting SSURGO Soil Map	**A-5**
Physical Setting Source Map	**A-12**
Physical Setting Source Map Findings	**A-14**
Physical Setting Source Records Searched	**PSGR-1**

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

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2019 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

WAIKUPANAHA STREET
WAIMANALO, HI 96795

COORDINATES

Latitude (North):	21.3329890 - 21 19' 58.76''
Longitude (West):	157.7061580 - 157 42' 22.16''
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	634177.5
UTM Y (Meters):	2359413.5
Elevation:	41 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5941079 KOKO HEAD, HI
Version Date:	2013

MAPPED SITES SUMMARY

Target Property Address:
WAIKUPANAHA STREET
WAIMANALO, HI 96795

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
Reg	BELLOWS AIR FORCE ST		DOD	Same	4225, 0.800, NE
1	ILLEGAL DUMPING IN W	41-170 WAIKUPANAHA S	SPILLS	Higher	1 ft.
A2	WAIMANALO CENTRAL OF	41-1032 KALANIANAOLE	UST, Financial Assurance	Lower	902, 0.171, NNE
A3	ALII IV SERVICE STAT	41-1025 KALANIANAOLE	LUST, UST	Lower	921, 0.174, NNE
A4	WAIMANALO WASTEWATER	41-1060 KALANIANAOLE	LUST, Financial Assurance	Lower	991, 0.188, North
5	MEADOW GOLD DAIRIES	41-330 WAIKUPANAHA S	LUST, UST	Higher	1630, 0.309, WSW
B6	GOLDEN MELON FARMS	KULAIWI ROAD	SEMS-ARCHIVE	Lower	1722, 0.326, East
B7	GOLDEN MELON FARMS	41-254 KULAIWI ST	SHWS	Lower	1769, 0.335, East
8	HAWAIIAN HOME LANDS	KAUHOLOKAHIKI ST	SHWS, SPILLS	Lower	2111, 0.400, ESE
9	WAIMANALO 76/7-ELEVE	41-849 KALANIANAOLE	LUST, UST, Financial Assurance	Lower	2259, 0.428, East
10	ST-1O SHERWOOD FORES		FUDS	Lower	2940, 0.557, North
11	WAIMANALO AREAWIDE G	41-550 WAIKUPANAHA S	SHWS	Higher	4399, 0.833, West

TARGET PROPERTY SEARCH RESULTS

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

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
NPL LIENS..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY..... Federal Facility Site Information listing
SEMS..... Superfund Enterprise Management System

Federal RCRA CORRACTS facilities list

CORRACTS..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG..... RCRA - Large Quantity Generators
RCRA-SQG..... RCRA - Small Quantity Generators
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS..... Land Use Control Information System
US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROL..... Sites with Institutional Controls

Federal ERNS list

ERNS..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Permitted Landfills in the State of Hawaii

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

ENG CONTROLS..... Engineering Control Sites
INST CONTROL..... Sites with Institutional Controls

State and tribal voluntary cleanup sites

VCP..... Voluntary Response Program Sites
INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Brownfields Sites

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
ODI..... Open Dump Inventory
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register
CDL..... Clandestine Drug Lab Listing
US CDL..... National Clandestine Laboratory Register

Local Land Records

LIENS 2..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS..... Hazardous Materials Information Reporting System

SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ..... RCRA - Non Generators / No Longer Regulated
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties
PADS ..... PCB Activity Database System
ICIS ..... Integrated Compliance Information System
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ..... Material Licensing Tracking System
COAL ASH DOE ..... Steam-Electric Plant Operation Data
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ..... PCB Transformer Registration Database
RADINFO ..... Radiation Information Database
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ..... Incident and Accident Data
CONSENT ..... Superfund (CERCLA) Consent Decrees
INDIAN RESERV ..... Indian Reservations
FUSRAP ..... Formerly Utilized Sites Remedial Action Program
UMTRA ..... Uranium Mill Tailings Sites
LEAD SMELTERS ..... Lead Smelter Sites
US AIRS ..... Aerometric Information Retrieval System Facility Subsystem
US MINES ..... Mines Master Index File
ABANDONED MINES ..... Abandoned Mines
FINDS ..... Facility Index System/Facility Registry System
DOCKET HWC ..... Hazardous Waste Compliance Docket Listing
ECHO ..... Enforcement & Compliance History Information
UXO ..... Unexploded Ordnance Sites
FUELS PROGRAM ..... EPA Fuels Program Registered Listing
AIRS ..... List of Permitted Facilities
DRYCLEANERS ..... Permitted Drycleaner Facility Listing
Financial Assurance ..... Financial Assurance Information Listing
LEAD ..... LEAD
UIC ..... Underground Injection Wells Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ..... EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ..... EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ..... EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS ..... Recovered Government Archive State Hazardous Waste Facilities List

RGA LF ..... Recovered Government Archive Solid Waste Facilities List
RGA LUST ..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

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

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

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 03/11/2019 has revealed that there is 1 SEMS-ARCHIVE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
GOLDEN MELON FARMS	KULAIWI ROAD	E 1/4 - 1/2 (0.326 mi.)	B6	12

State- and tribal - equivalent CERCLIS

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

A review of the SHWS list, as provided by EDR, and dated 09/27/2018 has revealed that there are 3 SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WAIMANALO AREAWIDE G	41-550 WAIKUPANAHA S	W 1/2 - 1 (0.833 mi.)	11	21

Lower Elevation	Address	Direction / Distance	Map ID	Page
GOLDEN MELON FARMS	41-254 KULAIWI ST	E 1/4 - 1/2 (0.335 mi.)	B7	13

Lower Elevation	Address	Direction / Distance	Map ID	Page
HAWAIIAN HOME LANDS	***KAUHOLOKAHIKI ST***	***ESE 1/4 - 1/2 (0.400 mi.)***	***8***	***14***

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Health's Active Leaking Underground Storage Tank Log Listing.

A review of the LUST list, as provided by EDR, and dated 03/01/2019 has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MEADOW GOLD DAIRIES Release ID: 930085 Facility Id: 9-202526 Facility Status: Site Cleanup Completed (NFA)	***41-330 WAIKUPANAHA S***	***WSW 1/4 - 1/2 (0.309 mi.)***	***5***	***12***

Lower Elevation	Address	Direction / Distance	Map ID	Page
ALII IV SERVICE STAT Release ID: 940146 Facility Id: 9-200742 Facility Status: Site Cleanup Completed (NFA)	***41-1025 KALANIANAOLE***	***NNE 1/8 - 1/4 (0.174 mi.)***	***A3***	***10***
WAIMANALO WASTEWATER Release ID: 080026 Release ID: 970054 Facility Id: 9-200796 Facility Status: Site Cleanup Completed (NFA)	***41-1060 KALANIANAOLE***	***N 1/8 - 1/4 (0.188 mi.)***	***A4***	***11***
WAIMANALO 76/7-ELEVE Release ID: 140003 Release ID: 970008 Facility Id: 9-201177 Facility Status: Site Cleanup Completed with EHE/EHMP Facility Status: Site Cleanup Completed (NFA)	***41-849 KALANIANAOLE***	***E 1/4 - 1/2 (0.428 mi.)***	***9***	***16***

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Health's Listing of Underground Storage Tanks.

A review of the UST list, as provided by EDR, and dated 03/01/2019 has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
WAIMANALO CENTRAL OF Tank Status: Currently in Use	***41-1032 KALANIANAOLE***	***NNE 1/8 - 1/4 (0.171 mi.)***	***A2***	***9***

Tank Status: Permanently Out of Use Facility Id: 9-200536 Date Closed: 01/10/1994				
ALII IV SERVICE STAT Tank Status: Permanently Out of Use Facility Id: 9-200742 Date Closed: 05/08/1994	***41-1025 KALANIANAOLE***	***NNE 1/8 - 1/4 (0.174 mi.)***	***A3***	***10***

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

SPILLS: Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

A review of the SPILLS list, as provided by EDR, and dated 03/18/2019 has revealed that there is 1 SPILLS site within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ILLEGAL DUMPING IN W	41-170 WAIKUPANAHA S	0 - 1/8 (0.000 mi.)	1	8

Other Ascertainable Records

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 01/31/2015 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
ST-1O SHERWOOD FORES Federal Facility ID:: HI9799FA101 INST ID:: 54134		N 1/2 - 1 (0.557 mi.)	10	20

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

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

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BELLOWS AIR FORCE ST		NE 1/2 - 1 (0.800 mi.)	0	8

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
WAIMANALO SUGAR COMPANY DHHL PARCE	SHWS

OVERVIEW MAP - 5654255.2S

Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
National Priority List Sites
Dept. Defense Sites

0 1/4 1/2 1 Miles

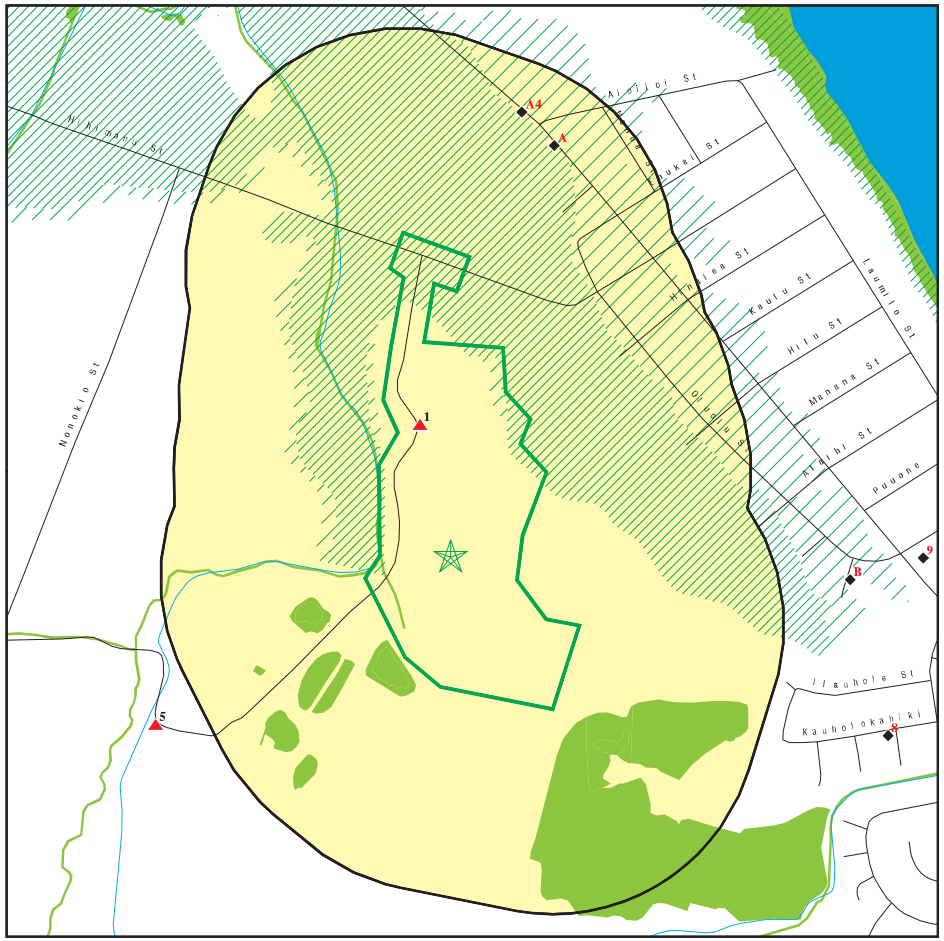
Indian Reservations BIA
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

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

SITE NAME: Walkupanaha Ag Lots ADDRESS: Walkupanaha Street Waimanalo HI 96795 LAT/LONG: 21.332989 / 157.706158	CLIENT: Envlro Srvcs. and Trng. Center CONTACT: Sharla Nakashima INQUIRY #: 5654255.2s DATE: May 16, 2019 11:35 am

Copyright © 2019 EDR, Inc. © 2015 TomTom Rel. 2015.

DETAIL MAP - 5654255.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

0 1/8 1/4 1/2 Miles

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

SITE NAME: Walkupanaha Ag Lots ADDRESS: Walkupanaha Street Waimanalo HI 96795 LAT/LONG: 21.332989 / 157.706158	CLIENT: Enviro Srvcs. and Trng. Center CONTACT: Sharla Nakashima INQUIRY #: 5654255.2s DATE: May 16, 2019 11:36 am

Copyright © 2019 EDR, Inc. © 2015 TomTom Rel. 2015.

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	1	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	0	2	1	NR	3
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	2	2	NR	NR	4
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UST	0.250		0	2	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
SPILLS	0.001		1	NR	NR	NR	NR	1
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	1	NR	1
DOD	1.000		0	0	0	1	NR	1
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
LEAD	0.001		0	NR	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	0.001		0	NR	NR	NR	NR	0
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	1	4	5	3	0	13

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
DOD Region NE 1/2-1 4225 ft.	**BELLOWS AIR FORCE STATION** **BELLOWS AIR FORCE STATION (County), HI**	**DOD**	**CUSA147746 N/A**

DOD:

Feature 1:	Air Force DOD
Feature 2:	Not reported
Feature 3:	Not reported
URL:	Not reported
Name 1:	Bellows Air Force Station
Name 2:	Not reported
Name 3:	Not reported
State:	HI
DOD Site:	Yes
Tile name:	HIHONOLULU

---

1 **< 1/8** **1 ft.**	**ILLEGAL DUMPING IN WAIMANALO** **41-170 WAIKUPANAHA STREET** **WAIMANALO, HI 96795**	**SPILLS**	**S117391813 N/A**

Relative: Higher

Actual: 60 ft.

SPILLS:

2nd Address:	Not reported
Island:	Oahu
Supplemental Loc. Text:	Not reported
Case Number:	20140502-1250
Facility Registry ID:	Not reported
HID Number:	Not reported
Lead and Program:	HEER EP&R
ER:	None
Less Or Greater Than:	Not reported
Units:	Illegal Dumping in Waimanalo
Activity Type:	Response
Activity Lead:	Adam Teekell
Assignment End Date:	2014-05-02 00:00:00
Result:	Refer to C&C Refuse
File Under:	Not reported
Substances:	Unknown
Quanity:	0
Units:	Not reported
Reported Date:	Not reported
Release Date:	Not reported
Release Duration:	Not reported
Media:	Not reported
Waterbody:	Not reported
Summary:	Not reported
Is Noteworthy for Reports:	Not reported
Is the Release a Fugitive Dumping:	Not reported
Tax Map Key:	Not reported
Assigned SOSC:	Not reported
Notified Agencies:	Not reported
Response Measures Taken:	Not reported
Incident Report Number:	Not reported
Coordination Needed:	Not reported
Tier II Facility:	Not reported
RMP:	Not reported
Follow-up Received On:	Not reported
Cost Recovery:	Not reported

ILLEGAL DUMPING IN WAIMANALO (Continued) **S117391813**

Invoice To: Not reported
Closed Date: Not reported
Comments: Not reported
Latitude: Not reported
Longitude: Not reported

A2 NNE 1/8-1/4 0.171 mi. 902 ft. **WAIMANALO CENTRAL OFFICE** **UST** **U001236168**
41-1032 KALANIANAOLE HWY **Financial Assurance** **N/A**
WAIMANALO, HI 96795

Site 1 of 3 in cluster A

Relative: Lower
Actual: 10 ft.

UST:
Facility ID: 9-200536
Owner: Hawaiian Telcom
Owner Address: 1177 Bishop Street, Suite 20
Owner City,St,Zip: Waimanalo, 96795 96795
Latitude: 21.340078
Longitude: -157.704532
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: Map

Tank ID: M-1
Date Installed: 05/01/1994
Tank Status: Currently in Use
Date Closed: Not reported
Tank Capacity: 550
Substance: Diesel

Tank ID: R-1
Date Installed: 05/07/1980
Tank Status: Permanently Out of Use
Date Closed: 01/10/1994
Tank Capacity: 500
Substance: Diesel

HI Financial Assurance:
Alt Facility ID: 9-200536
Tank Id: M-1
Tank Status: Currently in Use
FRTYPE: Other
Expiration Date: Not reported

Alt Facility ID: 9-200536
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: Not reported

Alt Facility ID: 9-200536
Tank Id: M-1
Tank Status: Currently in Use
FRTYPE: Insurance
Expiration Date: 02/01/2011

Alt Facility ID: 9-200536

WAIMANALO CENTRAL OFFICE (Continued) **U001236168**

Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 02/01/2011

Alt Facility ID: 9-200536
Tank Id: M-1
Tank Status: Currently in Use
FRTYPE: Insurance
Expiration Date: 05/02/2017

Alt Facility ID: 9-200536
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 05/02/2017

A3 NNE 1/8-1/4 0.174 mi. 921 ft. **ALII IV SERVICE STATION** **LUST** **U001236177**
41-1025 KALANIANAOLE HWY **UST** **N/A**
WAIMANALO, HI 96795

Site 2 of 3 in cluster A

Relative: Lower
Actual: 10 ft.

LUST:
Facility ID: 9-200742
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 09/01/1998
Release ID: 940146
Project Officer: Jose Ruiz

UST:
Facility ID: 9-200742
Owner: PARADISE PETROLEUM DBA ALII PETROLEUM
Owner Address: 6600 KALANIANAOLE HWY
Owner City,St,Zip: Waimanalo, 96795 96795
Latitude: 21.340145
Longitude: -157.703813
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: Address Matching

Tank ID: R-1
Date Installed: 04/22/1973
Tank Status: Permanently Out of Use
Date Closed: 05/08/1994
Tank Capacity: 6000
Substance: Gasoline

Tank ID: R-2
Date Installed: 04/22/1973
Tank Status: Permanently Out of Use
Date Closed: 05/08/1994
Tank Capacity: 2000
Substance: Gasoline

Tank ID: R-3

ALII IV SERVICE STATION (Continued) **U001236177**

Date Installed: 04/22/1973
Tank Status: Permanently Out of Use
Date Closed: 05/08/1994
Tank Capacity: 2000
Substance: Gasoline

Tank ID: R-4
Date Installed: 04/22/1973
Tank Status: Permanently Out of Use
Date Closed: 05/08/1994
Tank Capacity: 1000
Substance: Gasoline

A4 North 1/8-1/4 0.188 mi. 991 ft. **WAIMANALO WASTEWATER TREATMENT PLANT** **LUST** **U003154904**
41-1060 KALANIANAOLE HWY **Financial Assurance** **N/A**
WAIMANALO, HI 96795

Site 3 of 3 in cluster A

Relative: Lower
Actual: 10 ft.

LUST:
Facility ID: 9-200796
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 11/18/2009
Release ID: 080026
Project Officer: Richard Takaba

Facility ID: 9-200796
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 05/06/1997
Release ID: 970054
Project Officer: Richard Takaba

HI Financial Assurance:
Alt Facility ID: 9-200796
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Self Insured
Expiration Date: 06/30/2007

Alt Facility ID: 9-200796
Tank Id: r-M-2
Tank Status: Permanently out of Use
FRTYPE: Self Insured
Expiration Date: 06/30/2007

5 WSW 1/4-1/2 0.309 mi. 1630 ft. **MEADOW GOLD DAIRIES - WAIMANALO FARM** **LUST** **U001237422**
41-330 WAIKUPANAHA ST **UST** **N/A**
WAIMANALO, HI 96795

Relative: Higher
Actual: 139 ft.

LUST:
Facility ID: 9-202526
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 06/24/2004
Release ID: 930085
Project Officer: Shunsheng Fu

UST:
Facility ID: 9-202526
Owner: MEADOW GOLD DAIRIES
Owner Address: Not reported
Owner City,St,Zip: Waimanalo, 96795 96795
Latitude: 21.330690
Longitude: -157.711908
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: Address Matching

Tank ID: R-1
Date Installed: Not reported
Tank Status: Permanently Out of Use
Date Closed: 04/01/1993
Tank Capacity: 2000
Substance: Gasoline

Tank ID: R-2
Date Installed: Not reported
Tank Status: Permanently Out of Use
Date Closed: 04/01/1993
Tank Capacity: 2000
Substance: Diesel

B6 East 1/4-1/2 0.326 mi. 1722 ft. **GOLDEN MELON FARMS** **SEMS-ARCHIVE** **1000984391**
KULAIWI ROAD **HI0001051366**
WAIMANALO, HI 96795

Site 1 of 2 in cluster B

Relative: Lower
Actual: 14 ft.

SEMS Archive:
Site ID: 0905235
EPA ID: HI0001051366
Cong District: 02
FIPS Code: 15003
FF: N
NPL: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

SEMS Archive Detail:
Region: 09
Site ID: 0905235
EPA ID: HI0001051366
Site Name: GOLDEN MELON FARMS
NPL: N
FF: N

GOLDEN MELON FARMS (Continued) **1000984391**

OU:	00
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1
Start Date:	Not reported
Finish Date:	2013-11-08 05:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf In-Hse
Region:	09
Site ID:	0905235
EPA ID:	HI0001051366
Site Name:	GOLDEN MELON FARMS
NPL:	N
FF:	N
OU:	00
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	Not reported
Finish Date:	2007-11-14 05:00:00
Qual:	N
Current Action Lead:	EPA Perf
Region:	09
Site ID:	0905235
EPA ID:	HI0001051366
Site Name:	GOLDEN MELON FARMS
NPL:	N
FF:	N
OU:	00
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1995-03-02 05:00:00
Finish Date:	1995-03-02 05:00:00
Qual:	Not reported
Current Action Lead:	St Perf

B7 **East** **1/4-1/2** **0.335 mi.** **1769 ft.**

GOLDEN MELON FARMS **SHWS** **S107022544**
41-254 KULAIWI ST **N/A**
WAIMANALO, HI 96795

Site 2 of 2 in cluster B

Relative: Lower
Actual: 11 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	End of Kulaiwi Rd
Island:	Oahu
Environmental Interest:	Golden Melon Farms
HID Number:	HI0001051366
Facility Registry Identifier:	110009278067
Lead Agency:	HEER
Program:	State
Project Manager:	Laura Young
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard

GOLDEN MELON FARMS (Continued) **S107022544**

Island:	Oahu
SDAR Environmental Interest Name:	Golden Melon Farms
HID Number:	HI0001051366
Facility Registry Identifier:	110009278067
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Alachchor detected at concentrations of 1.7-2.9 ug/L in Waimanalo Well I (located 0.5 mile from Golden Melon Farms)
Nature of Residual Contamination:	Not reported
Use Restrictions:	No Hazard Present for Unrestricted Residential Use
Engineering Control:	No Engineering Control Required
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Waimanalo GW Contamination Plume
Site Closure Type:	No Further Action Letter - Unrestricted Residential Use
Document Date:	01/20/2009
Document Number:	2009-029-LY
Document Subject:	No Further Action (NFA) Determination at Golden Melon Farms located at 41-254 Kulaiwi St, Waimanalo HI 96795
Project Manager:	Laura Young
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

---

8 **ESE** **1/4-1/2** **0.400 mi.** **2111 ft.**

HAWAIIAN HOME LANDS WAIMANALO **SHWS** **1006821101**
KAUHOLOKAHIKI ST **SPILLS** **N/A**
WAIMANALO, HI 96795

Relative: Lower
Actual: 20 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	End of Kauholokahiki St
Island:	Oahu
Environmental Interest:	Hawaiian Home Lands Waimanalo
HID Number:	Not reported
Facility Registry Identifier:	110013791450
Lead Agency:	HEER
Program:	State
Project Manager:	Bryce Hataoka
Hazard Priority:	NFA
Potential Hazards And Controls:	No Hazard
Island:	Oahu
SDAR Environmental Interest Name:	Hawaiian Home Lands Waimanalo
HID Number:	Not reported
Facility Registry Identifier:	110013791450
Lead Agency:	HEER
Potential Hazard And Controls:	No Hazard
Priority:	NFA
Assessment:	Response Necessary
Response:	Response Complete
Nature of Contamination:	Found: Petroleum.
Nature of Residual Contamination:	No residues remaining above HDOH EALs.
Use Restrictions:	No Hazard Present For Unrestricted Residential Use
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported

HAWAIIAN HOME LANDS WAIMANALO (Continued) **1006821101**

Within Designated Areawide Contamination: Not reported
Site Closure Type: No Further Action Letter - Unrestricted Residential Use
Document Date: 06/05/1997
Document Number: 1997-204-BH
Document Subject: Waimanalo Residence Lots - No Further Action Letter
Project Manager: Bryce Hataoka
Contact Information: (808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

SPILLS:
2nd Address: Not reported
Island: Oahu
Supplemental Loc. Text: End of Kauholokahiki St
Case Number: 19970519-1611
Facility Registry ID: 110013791450
HID Number: Not reported
Lead and Program: HEER EP&R
ER: No
Less Or Greater Than: Not reported
Units: Hawaiian Homelands Waimanalo
Activity Type: Response
Activity Lead: Liz Galvez
Assignment End Date: Not reported
Result: Refer to ISST
File Under: State of Hawaii, Department of Hawaiian Home Lands
Substances: Oil
Quanity: Not reported
Units: Not reported
Reported Date: Not reported
Release Date: Not reported
Release Duration: Not reported
Media: Not reported
Waterbody: Not reported
Summary: Not reported
Is Noteworthy for Reports: Not reported
Is the Release a Fugitive Dumping: Not reported
Tax Map Key: Not reported
Assigned SOSC: Not reported
Notified Agencies: Not reported
Response Measures Taken: Not reported
Incident Report Number: Not reported
Coordination Needed: Not reported
Tier II Facility: Not reported
RMP: Not reported
Follow-up Received On: Not reported
Cost Recovery: Not reported
Invoice To: Not reported
Closed Date: Not reported
Comments: Not reported
Latitude: 21.338984
Longitude: -157.71910700000001

2nd Address: Not reported
Island: Oahu
Supplemental Loc. Text: End of Kauholokahiki St
Case Number: 19970519-1611
Facility Registry ID: 110013791450
HID Number: Not reported

HAWAIIAN HOME LANDS WAIMANALO (Continued) **1006821101**

Lead and Program: HEER EP&R
ER: No
Less Or Greater Than: Not reported
Units: Hawaiian Homelands Waimanalo
Activity Type: Response
Activity Lead: Liz Galvez
Assignment End Date: Not reported
Result: Refer to ISST
File Under: State of Hawaii, Department of Hawaiian Home Lands
Substances: Oil
Quanity: Not reported
Units: Not reported
Reported Date: Not reported
Release Date: Not reported
Release Duration: Not reported
Media: Not reported
Waterbody: Not reported
Summary: Not reported
Is Noteworthy for Reports: Not reported
Is the Release a Fugitive Dumping: Not reported
Tax Map Key: Not reported
Assigned SOSC: Not reported
Notified Agencies: Not reported
Response Measures Taken: Not reported
Incident Report Number: Not reported
Coordination Needed: Not reported
Tier II Facility: Not reported
RMP: Not reported
Follow-up Received On: Not reported
Cost Recovery: Not reported
Invoice To: Not reported
Closed Date: Not reported
Comments: Not reported
Latitude: 21.329788000000001
Longitude: -157.69787400000001

---

9 East 1/4-1/2 0.428 mi. 2259 ft. | **WAIMANALO 76/7-ELEVEN (#171)** | **LUST** | **U001236283**
41-849 KALANIANAOLE HWY | **UST** | **N/A**
WAIMANALO, HI 96795 | **Financial Assurance**

Relative: Lower
Actual: 18 ft.

LUST:
Facility ID: 9-201177
Facility Status: Site Cleanup Completed with EHE/EHMP
Facility Status Date: 05/07/2018
Release ID: 140003
Project Officer: Richard Takaba

Facility ID: 9-201177
Facility Status: Site Cleanup Completed (NFA)
Facility Status Date: 08/17/1999
Release ID: 970008
Project Officer: Richard Takaba

UST:
Facility ID: 9-201177

WAIMANALO 76/7-ELEVEN (#171) (Continued) **U001236283**

Owner: Mid Pac Petroleum LLC
Owner Address: 1132 Bishop Street, Suite 2500
Owner City,St,Zip: Waimanalo, 96795 96795
Latitude: 21.332930
Longitude: -157.697000
Horizontal Reference Datum Name: NAD83
Horizontal Collection Method Name: GPS

Tank ID: 1
Date Installed: 10/01/1996
Tank Status: Currently In Use
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 1
Date Installed: 10/01/1996
Tank Status: Currently In Use
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 2
Date Installed: 10/01/1996
Tank Status: Currently In Use
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: 2
Date Installed: 10/01/1996
Tank Status: Currently In Use
Date Closed: Not reported
Tank Capacity: 10000
Substance: Gasohol

Tank ID: R-1
Date Installed: 04/05/1979
Tank Status: Permanently Out of Use
Date Closed: 10/25/1996
Tank Capacity: 10000
Substance: Gasoline

Tank ID: R-1
Date Installed: 04/05/1979
Tank Status: Permanently Out of Use
Date Closed: 10/25/1996
Tank Capacity: 10000
Substance: Gasoline

Tank ID: R-2

WAIMANALO 76/7-ELEVEN (#171) (Continued) **U001236283**

Date Installed: 04/05/1979
Tank Status: Permanently Out of Use
Date Closed: 10/25/1996
Tank Capacity: 10000
Substance: Gasoline

Tank ID: R-2
Date Installed: 04/05/1979
Tank Status: Permanently Out of Use
Date Closed: 10/25/1996
Tank Capacity: 10000
Substance: Gasoline

Tank ID: R-3
Date Installed: 04/05/1979
Tank Status: Permanently Out of Use
Date Closed: 10/15/1996
Tank Capacity: 10000
Substance: Gasoline

Tank ID: R-3
Date Installed: 04/05/1979
Tank Status: Permanently Out of Use
Date Closed: 10/15/1996
Tank Capacity: 10000
Substance: Gasoline

HI Financial Assurance:
Alt Facility ID: 9-201177
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: 01/01/2004

Alt Facility ID: 9-201177
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: 01/01/2004

Alt Facility ID: 9-201177
Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: 01/01/2004

Alt Facility ID: 9-201177
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Other
Expiration Date: 01/01/2004

Alt Facility ID: 9-201177
Tank Id: 2

WAIMANALO 76/7-ELEVEN (#171) (Continued) **U001236283**

Tank Status: Currently In Use
FRTYPE: Other
Expiration Date: 01/01/2004

Alt Facility ID: 9-201177
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 03/31/2012

Alt Facility ID: 9-201177
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 03/31/2012

Alt Facility ID: 9-201177
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 03/31/2012

Alt Facility ID: 9-201177
Tank Id: 2
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 03/31/2012

Alt Facility ID: 9-201177
Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 03/31/2012

Alt Facility ID: 9-201177
Tank Id: R-1
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/30/2016

Alt Facility ID: 9-201177
Tank Id: 2
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/30/2016

Alt Facility ID: 9-201177
Tank Id: R-3
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/30/2016

Alt Facility ID: 9-201177
Tank Id: 1
Tank Status: Currently In Use
FRTYPE: Insurance
Expiration Date: 09/30/2016

WAIMANALO 76/7-ELEVEN (#171) (Continued) **U001236283**

Alt Facility ID: 9-201177
Tank Id: R-2
Tank Status: Permanently Out of Use
FRTYPE: Insurance
Expiration Date: 09/30/2016

---

10 North 1/2-1 0.557 mi. 2940 ft. **ST-1O SHERWOOD FOREST USTS** **FUDS** **1012129418 N/A**

WAIMANALO, HI

Relative: Lower

Actual: 4 ft.

FUDS:
EPA Region: 09
Congressional District: 02
FUDS Number: H09HI0477
State: HI
Facility Name: ST-1O SHERWOOD FOREST USTS
Fiscal Year: 2013
City: WAIMANALO
Federal Facility ID: HI9799FA101
Telephone: 808-835-4004
INST ID: 54134
County: HONOLULU
RAB: Not reported
CORPS_DIST: Honolulu District (POH)
NPL Status: Not Listed
CTC: 414.69999999999999
Current Owner: State Government
Future Prog: Not reported
Description: The site is part of the Waimanalo Bay Recreation Area and it identified by TMK: 4-01-015:015 and consists of 47.76 acres. Geophysical surveys and site surveys were conducted on June 13, July 15, an d August 2, 1996 and two USTs are suspected. Based upon documentation, these are the two USTs listed in the excess portion.
Current Program: Not reported
History: The site was part of the Bellows Air Force and was returned to the State of Hawaii on 25 July 1966 by deed through the authority of an Executive Order No. 11230 dated June 28, 1965. The site is a f ormer gas station and was reported to have two USTs. Geophysical surveys indicate that the 2 USTs are still there.
Latitude Degree: 21
Latitude Minute: 21
Latitude Second: 48
Latitude Direction: N
Longitude Degree: -157
Longitude Minute: 43
Longitude Second: 31
Longitude Direction: E

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
11 West 1/2-1 0.833 mi. 4399 ft.	**WAIMANALO AREAWIDE GROUNDWATER CONTAMINATION 41-550 WAIKUPANAHA ST WAIMANALO, HI 96795**	**SHWS**	**S107022545 N/A**

Relative:
Higher

Actual:
137 ft.

SHWS:

Organization:	Not reported
Supplemental Location:	Waikupanaha St Between Ahiki St and Mokulama St
Island:	Oahu
Environmental Interest:	Waimanalo Areawide Groundwater Contamination
HID Number:	HI0000989707
Facility Registry Identifier:	110014032901
Lead Agency:	HEER
Program:	State
Project Manager:	Eric Sadoyama
Hazard Priority:	Low
Potential Hazards And Controls:	Hazard Present
Island:	Oahu
SDAR Environmental Interest Name:	Waimanalo Areawide Groundwater Contamination
HID Number:	HI0000989707
Facility Registry Identifier:	110014032901
Lead Agency:	HEER
Potential Hazard And Controls:	Hazard Present
Priority:	Low
Assessment:	Assessment Ongoing
Response:	Not reported
Nature of Contamination:	Found: Alachlor was found in the "Waimanalo I" well (BWS Well 3-2043-002) at TMK 141027003.
Nature of Residual Contamination:	Not reported
Use Restrictions:	Controls Required to Manage Contamination
Engineering Control:	Not reported
Description of Restrictions:	Not reported
Institutional Control:	Not reported
Within Designated Areawide Contamination:	Waimanalo GW Contamination Plume
Site Closure Type:	Not reported
Document Date:	Not reported
Document Number:	Not reported
Document Subject:	Not reported
Project Manager:	Eric Sadoyama
Contact Information:	(808) 586-4249 2385 Waimano Home Rd, Pearl City, HI 96782

Count: 1 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
WAIMANALO	S113230525	WAIMANALO SUGAR COMPANY DHHL PARCE	CORNER OF HIHIMANU AND KAKAINA	96795	SHWS

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites
A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens
Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing
A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/05/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System
SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 34

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 34

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System
LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/22/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 41

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/10/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/31/2019
Date Data Arrived at EDR: 02/04/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/31/2019
Date Data Arrived at EDR: 02/04/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/26/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 36
Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/26/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: Sites List
Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 09/27/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 12/04/2018
Number of Days to Update: 15
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Permitted Landfills in the State of Hawaii
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/17/2012
Date Data Arrived at EDR: 04/03/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 37
Source: Department of Health
Telephone: 808-586-4245
Last EDR Contact: 03/29/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/01/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 02/26/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Semi-Annually

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/12/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 03/08/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 54
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 03/12/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 50
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/25/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Varies

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 03/01/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 02/26/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/12/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/03/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 11/07/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 03/08/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 54
Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 03/12/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 50
Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Control Sites
A listing of sites with engineering controls in place.

Date of Government Version: 09/27/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 12/04/2018
Number of Days to Update: 15
Source: Department of Health
Telephone: 404-586-4249
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

INST CONTROL: Sites with Institutional Controls
Voluntary Remediation Program and Brownfields sites with institutional controls in place.

Date of Government Version: 09/27/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 12/04/2018
Number of Days to Update: 15
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

VCP: Voluntary Response Program Sites
Sites participating in the Voluntary Response Program. The purpose of the VRP is to streamline the cleanup process in a way that will encourage prospective developers, lenders, and purchasers to voluntarily cleanup properties.

Date of Government Version: 09/27/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 12/04/2018
Number of Days to Update: 15
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/25/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Sites
With certain legal exclusions and additions, the term 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Date of Government Version: 09/27/2018
Date Data Arrived at EDR: 11/19/2018
Date Made Active in Reports: 12/04/2018
Number of Days to Update: 15
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/17/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 24
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/19/2019
Next Scheduled EDR Contact: 07/01/2019
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/23/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/24/2019
Date Data Arrived at EDR: 02/26/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 50
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Lab Listing
A listing of clandestine drug lab site locations.

Date of Government Version: 08/04/2010
Date Data Arrived at EDR: 09/10/2010
Date Made Active in Reports: 10/22/2010
Number of Days to Update: 42
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/24/2019
Date Data Arrived at EDR: 02/26/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 50
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 7
Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/26/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 49
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/26/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

SPILLS: Release Notifications
Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 03/18/2019
Date Data Arrived at EDR: 03/19/2019
Date Made Active in Reports: 05/06/2019
Number of Days to Update: 48
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 03/10/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/11/2013
Number of Days to Update: 39
Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21
Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 04/03/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62
Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/12/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339
Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/12/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/13/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/26/2019
Date Made Active in Reports: 05/07/2019
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/26/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/06/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/10/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/22/2019
Next Scheduled EDR Contact: 07/01/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/20/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/24/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 18

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2019
Date Data Arrived at EDR: 02/14/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/10/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/10/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 04/08/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/07/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/05/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/02/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/02/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 01/29/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 51

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/30/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 02/11/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 38
Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/05/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Varies

BRS: Biennial Reporting System
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218
Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546
Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/11/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program
DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3
Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 05/02/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23
Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26
Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36
Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100
Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100
Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/27/2018
Date Data Arrived at EDR: 02/27/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 33
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49
Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/01/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97
Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/01/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines
An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/27/2019
Date Data Arrived at EDR: 03/28/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 34
Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/21/2019
Next Scheduled EDR Contact: 06/24/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/15/2019
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 03/15/2019
Number of Days to Update: 10
Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 03/05/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 03/03/2019
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 27
Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/09/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71
Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 03/01/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74
Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/15/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 02/21/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 39
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Quarterly

AIRS: List of Permitted Facilities
A listing of permitted facilities in the state.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 29
Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 03/29/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

DRYCLEANERS: Permitted Drycleaner Facility Listing
A listing of permitted drycleaner facilities in the state.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 29
Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 03/29/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

Financial Assurance: Financial Assurance Information Listing
A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 13
Source: Department of Health
Telephone: 808-586-4226
Last EDR Contact: 04/08/2019
Next Scheduled EDR Contact: 06/24/2019
Data Release Frequency: Varies

LEAD: Lead Inspection Listing
Lead inspections

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/13/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 49
Source: Department of Health
Telephone: 808-586-5800
Last EDR Contact: 03/11/2019
Next Scheduled EDR Contact: 06/24/2019
Data Release Frequency: Varies

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 02/07/2013
Date Data Arrived at EDR: 02/12/2013
Date Made Active in Reports: 04/09/2013
Number of Days to Update: 56
Source: Department of Health
Telephone: 808-586-4258
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List
The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 191

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List
The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 200

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Health in Hawaii.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Health
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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

State Wetlands Data: Wetlands Inventory
Source: Office of Planning
Telephone: 808-587-2895

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

© 2015 TomTom North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

WAIKUPANAHA AG LOTS
WAIKUPANAHA STREET
WAIMANALO, HI 96795

TARGET PROPERTY COORDINATES

Latitude (North):	21.332989 - 21 19' 58.76"
Longitude (West):	157.706158 - 157 42' 22.17"
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	634177.5
UTM Y (Meters):	2359413.5
Elevation:	41 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5941079 KOKO HEAD, HI
Version Date:	2013

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

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

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

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

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

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

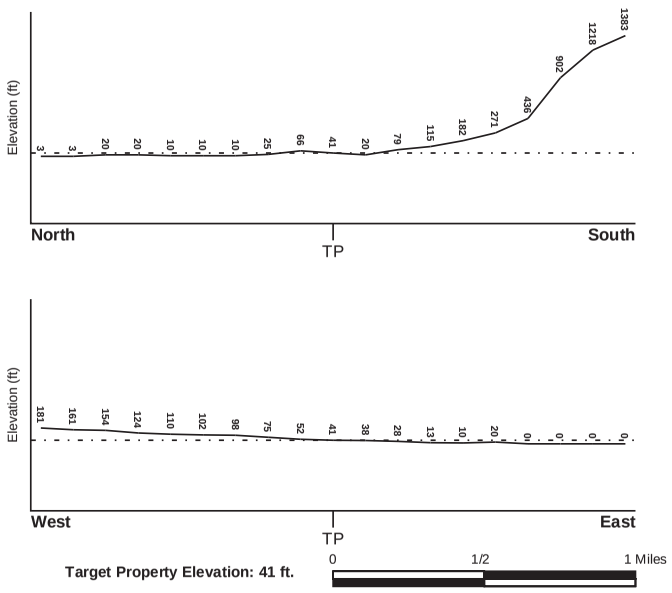
TOPOGRAPHIC INFORMATION

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

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 41 ft.

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

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

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

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

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
15003C0385G	FEMA FIRM Flood data
Additional Panels in search area:	**FEMA Source Type**
15003C0380H	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
KOKO HEAD	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

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

AQUIFLOW®

Search Radius: 1.000 Mile.

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

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

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

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

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

ROCK STRATIGRAPHIC UNIT

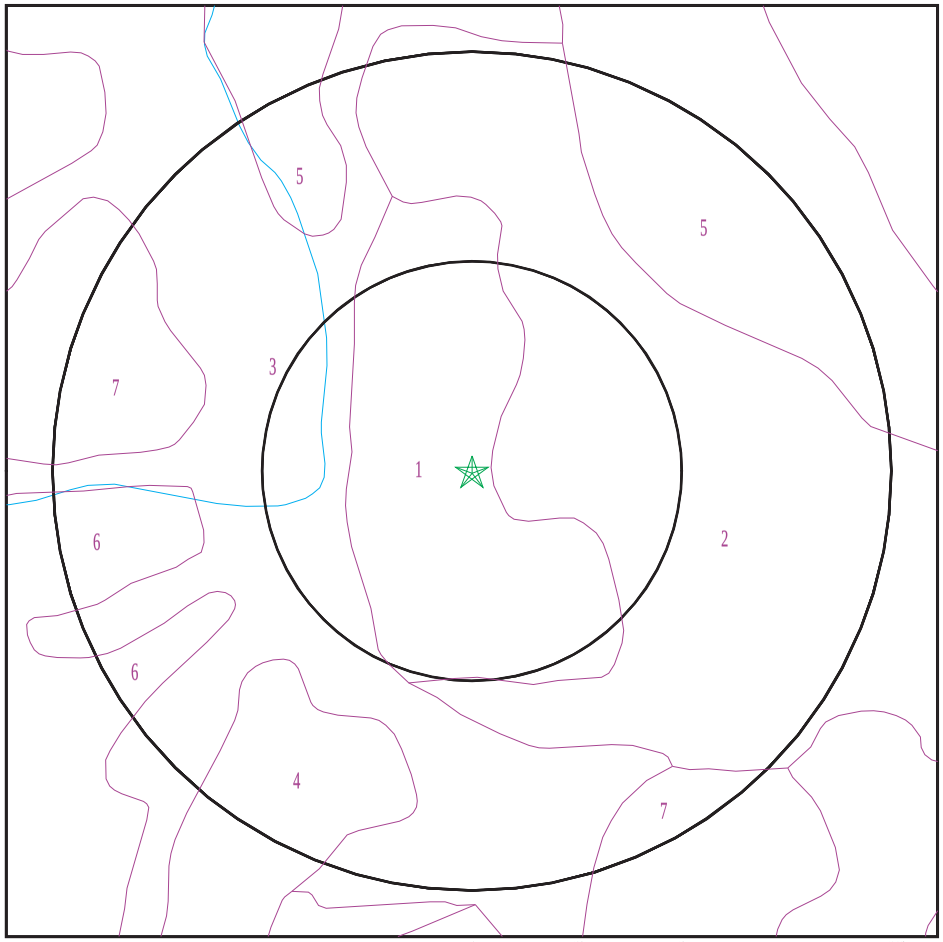
Era: -
System: -
Series: -
Code: N/A *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: -

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

SSURGO SOIL MAP - 5654255.2s



★ Target Property
SSURGO Soil
Water

0 0.35 0.7 1.4 Miles

SITE NAME: Walkupanaha Ag Lots ADDRESS: Walkupanaha Street Waimanalo HI 96795 LAT/LONG: 21.332989 / 157.706158	CLIENT: Envlro Srvcs. and Trng. Center CONTACT: Sharla Nakashima INQUIRY #: 5654255.2s DATE: May 16, 2019 11:36 am

Copyright © 2019 EDR, Inc. © 2015 TomTom Rel. 2015.

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

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

Soil Map ID: 1

Soil Component Name: Mamala

Soil Surface Texture: stony silty clay loam

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

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 48 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	stony silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:
2	7 inches	18 inches	stony silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:
3	18 inches	29 inches	bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:

Soil Map ID: 2

Soil Component Name: Coral outcrop

Soil Surface Texture: bedrock

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

Soil Drainage Class: Excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	59 inches	bedrock	Not reported	Not reported	Max: 42 Min: 1.41	Max: Min:

Soil Map ID: 3

Soil Component Name: Haleiwa

Soil Surface Texture: silty clay

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

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	16 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6
2	16 inches	64 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6

Soil Map ID: 4

Soil Component Name: Pohakupu

Soil Surface Texture: silty clay loam

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

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4.23 Min: 0.42	Max: 6.5 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	75 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4.23 Min: 0.42	Max: 6.5 Min: 6.1

Soil Map ID: 5

Soil Component Name: Haleiwa

Soil Surface Texture: silty clay

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

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	16 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6
2	16 inches	64 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 14 Min: 4.23	Max: 7.3 Min: 6.6

Soil Map ID: 6

Soil Component Name: Pohakupu

Soil Surface Texture: silty clay loam

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

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4.23 Min: 0.42	Max: 6.5 Min: 6.1
2	12 inches	75 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4.23 Min: 0.42	Max: 6.5 Min: 6.1

Soil Map ID: 7

Soil Component Name: Waialua

Soil Surface Texture: clay

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

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4.23 Min: 1.41	Max: 7.3 Min: 6.1
2	11 inches	59 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4.23 Min: 1.41	Max: 7.3 Min: 6.1

LOCAL / REGIONAL WATER AGENCY RECORDS

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

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000269898	1/8 - 1/4 Mile SE
A2	USGS40000269949	1/4 - 1/2 Mile NNE
A5	USGS40000269953	1/4 - 1/2 Mile North
A6	USGS40000269952	1/4 - 1/2 Mile NNE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A9	USGS40000269956	1/4 - 1/2 Mile North
A11	USGS40000269958	1/4 - 1/2 Mile North
C15	USGS40000269970	1/4 - 1/2 Mile North
B17	USGS40000269975	1/4 - 1/2 Mile ESE
B19	USGS40000269887	1/2 - 1 Mile ESE
C20	USGS40000269976	1/2 - 1 Mile NNE
D22	USGS40000269981	1/2 - 1 Mile NNE
E25	USGS40000269983	1/2 - 1 Mile NNE
F26	USGS40000269995	1/2 - 1 Mile North
E29	USGS40000269994	1/2 - 1 Mile NNE
G31	USGS40000270001	1/2 - 1 Mile NNE
H33	USGS40000269985	1/2 - 1 Mile NE
I35	USGS40000270012	1/2 - 1 Mile NNE
J38	USGS40000269915	1/2 - 1 Mile West

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

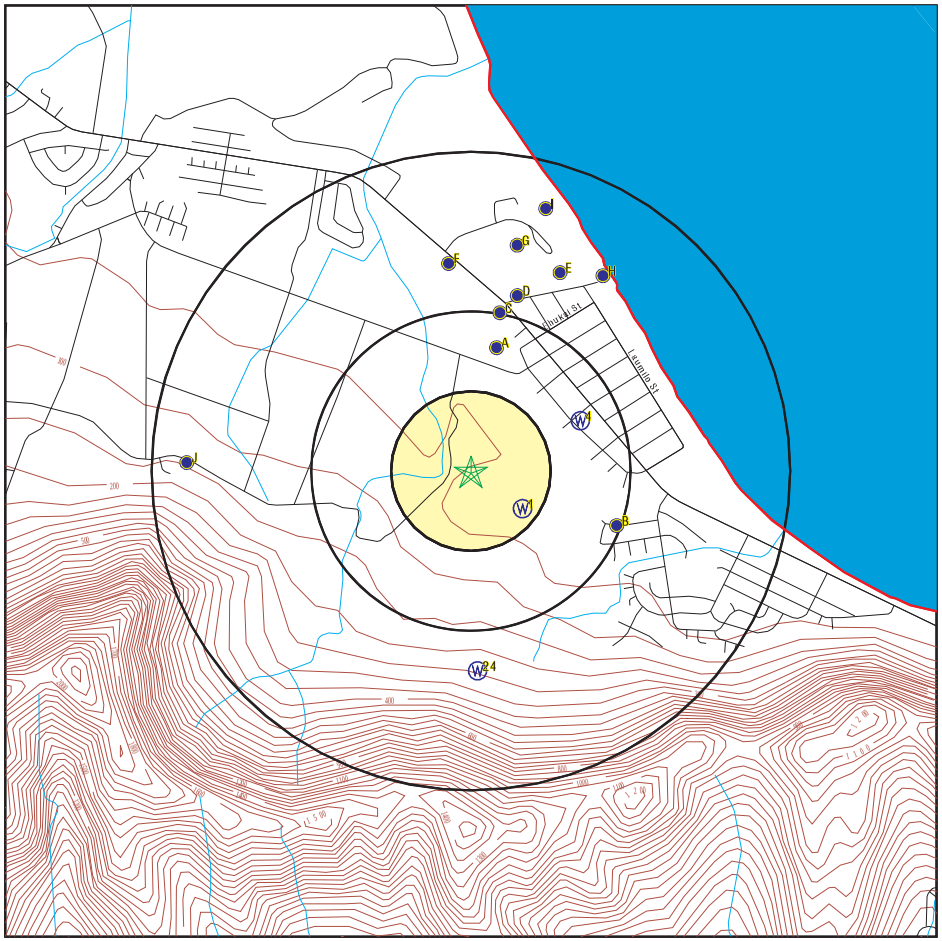
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

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

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A3	HI1100000001083	1/4 - 1/2 Mile NNE
4	HI1100000001086	1/4 - 1/2 Mile ENE
A7	HI1100000001082	1/4 - 1/2 Mile North
A8	HI1100000001080	1/4 - 1/2 Mile NNE
A10	HI1100000001084	1/4 - 1/2 Mile North
A12	HI1100000001073	1/4 - 1/2 Mile North
B13	HI1100000001072	1/4 - 1/2 Mile ESE
B14	HI1100000001081	1/4 - 1/2 Mile ESE
C16	HI1100000001079	1/4 - 1/2 Mile North
B18	HI1100000001085	1/2 - 1 Mile ESE
D21	HI1100000001074	1/2 - 1 Mile NNE
D23	HI1100000001071	1/2 - 1 Mile NNE
24	HI1100000000925	1/2 - 1 Mile South
E27	HI1100000001078	1/2 - 1 Mile NNE
F28	HI1100000001076	1/2 - 1 Mile North
E30	HI1100000001070	1/2 - 1 Mile NNE
G32	HI1100000001069	1/2 - 1 Mile NNE
H34	HI1100000001075	1/2 - 1 Mile NE
I36	HI1100000001077	1/2 - 1 Mile NNE
J37	HI1100000001088	1/2 - 1 Mile West

PHYSICAL SETTING SOURCE MAP - 5654255.2s



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons
Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location

SITE NAME: Walkupanaha Ag Lots ADDRESS: Walkupanaha Street Waimanalo HI 96795 LAT/LONG: 21.332989 / 157.706158	CLIENT: Envlro Srvcs. and Trng. Center CONTACT: Sharla Nakashima INQUIRY #: 5654255.2s DATE: May 16, 2019 11:36 am

Copyright © 2019 EDR, Inc. © 2015 TomTom Rel. 2015.

Map ID Direction Distance Elevation	Database	EDR ID Number
1 **SE** **1/8 - 1/4 Mile** **Lower**	**FED USGS**	**USGS40000269898**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-04 W420-1 WAM	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19530101
Well Depth:	100	Well Depth Units:	ft
Well Hole Depth:	100	Well Hole Depth Units:	ft

A2 **NNE** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000269949**	

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042.01B -15/408-9	Type:	Well: Interconnected wells
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19680302
Well Depth:	204	Well Depth Units:	ft
Well Hole Depth:	211	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1968-05-07
Feet below surface:	9.30	Feet to sea level:	Not Reported
Note:	Not Reported		

A3 **NNE** **1/4 - 1/2 Mile** **Lower**	**HI WELLS**	**HI1100000001083**	

Well ID:	3-2042-015	Well Name:	Waimanalo B
Well Owner:	Honolulu Sewers	Land Owner:	State of Hawaii
Pump Rate (g/m):	Not Reported	Year Drillled:	1968
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Percussion	Casing Diameter (in):	16
Ground Elevation (ft):	11	Well Depth (ft):	211
Solid Casing Depth:	80	Perforated Casing Depth:	Not Reported
Major Well Use:	Other	Inital Water Level (ft):	1
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	3000	Test Drawdown Rate (ft):	3
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-200	Solid Casing Bottom Elevation:	-69
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported

Latest WCR1 Report:	1/1/1968	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

4 **ENE** **1/4 - 1/2 Mile** **Lower**	**HI WELLS**	**HI1100000001086**	

Well ID:	3-2042-018	Well Name:	Saffery
Well Owner:	F. Beck		
Land Owner:	Department of Hawaiian Home Lands, Oahu (Main) DHHL		
Pump Rate (g/m):	50	Year Drillled:	1976
Original Well Name:	Not Reported	Driller:	F. Beck
Well Construction Type:	Not Reported	Casing Diameter (in):	2
Ground Elevation (ft):	15	Well Depth (ft):	20
Solid Casing Depth:	17	Perforated Casing Depth:	20
Major Well Use:	Irrigation (non-domestic, non-agriculture)		
Inital Water Level (ft):	Not Reported	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	0
Date Tested:	Not Reported	Test Pump Rate (g/m):	Not Reported
Test Drawdown Rate (ft):	Not Reported	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-5
Solid Casing Bottom Elevation:	-2	Year Installed:	1991
Pump Capacity (MM gal/day):	0.072	Pump Intake Depth:	Not Reported
Latest Head:	Not Reported	Latest WCR1 Report:	1/1/1976
Latest WCR2 Report:	Not Reported	Transmissivity:	Not Reported
Min to pump 5 volumes:	Not Reported		

A5 **North** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000269953**	

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042.01A -14/408-9	Type:	Well: Interconnected wells
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19680131
Well Depth:	200	Well Depth Units:	ft
Well Hole Depth:	220	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1968-04-04
Feet below surface:	8.80	Feet to sea level:	Not Reported
Note:	Not Reported		

A6 **NNE** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000269952**	

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-12 T142-1 WAM	Type:	Well

Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19670101
Well Depth:	219	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

A7
North
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001082**

Well ID:	3-2042-014	Well Name:	Waimanalo A
Well Owner:	Honolulu Sewers	Land Owner:	State of Hawaii
Pump Rate (g/m):	Not Reported	Year Drillled:	1968
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Percussion	Casing Diameter (in):	14
Ground Elevation (ft):	11	Well Depth (ft):	220
Solid Casing Depth:	97	Perforated Casing Depth:	Not Reported
Major Well Use:	Other	Inital Water Level (ft):	1
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	3000	Test Drawdown Rate (ft):	3.1
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-209	Solid Casing Bottom Elevation:	-86
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1968	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

A8
NNE
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001080**

Well ID:	3-2042-012	Well Name:	Waimanalo Stp 8
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1967
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	10	Well Depth (ft):	219
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-209	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1967	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID
Direction
Distance
Elevation Database EDR ID Number

A9
North
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269956**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042.01C -16/408-9	Type:	Well: Interconnected wells
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19680501
Well Depth:	202	Well Depth Units:	ft
Well Hole Depth:	210	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1968-05-21
Feet below surface:	9.30	Feet to sea level:	Not Reported
Note:	Not Reported		

A10
North
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001084**

Well ID:	3-2042-016	Well Name:	Waimanalo C
Well Owner:	Honolulu Sewers	Land Owner:	State of Hawaii
Pump Rate (g/m):	Not Reported	Year Drillled:	1968
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Percussion	Casing Diameter (in):	16
Ground Elevation (ft):	12	Well Depth (ft):	210
Solid Casing Depth:	120	Perforated Casing Depth:	Not Reported
Major Well Use:	Other	Inital Water Level (ft):	2
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	3000	Test Drawdown Rate (ft):	9.5
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-198	Solid Casing Bottom Elevation:	-108
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1968	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

A11
North
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269958**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-05 T136 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660101

Well Depth:	450	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

A12
North
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001073**

Well ID:	3-2042-005	Well Name:	Waimanalo STP 1
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	2
Ground Elevation (ft):	12	Well Depth (ft):	450
Solid Casing Depth:	358	Perforated Casing Depth:	450
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-438	Solid Casing Bottom Elevation:	-346
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

B13
ESE
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001072**

Well ID:	3-2042-004	Well Name:	Waimanalo
Well Owner:	Harry Makalena		
Land Owner:	Department of Hawaiian Home Lands, Oahu (Main) DHHL		
Pump Rate (g/m):	Not Reported	Year Drillled:	1953
Original Well Name:	Not Reported	Driller:	G. Ernsbarger
Well Construction Type:	Not Reported	Casing Diameter (in):	2
Ground Elevation (ft):	70	Well Depth (ft):	100
Solid Casing Depth:	100	Perforated Casing Depth:	Not Reported
Major Well Use:	Abandoned-Lost	Inital Water Level (ft):	25
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	185	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-30	Solid Casing Bottom Elevation:	-30
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1953	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID
Direction
Distance
Elevation — Database — EDR ID Number

B14
ESE
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001081**

Well ID:	3-2042-013	Well Name:	Waimanalo
Well Owner:	Pacific Concrete & Rock Co.		
Land Owner:	Department of Hawaiian Home Lands, Oahu (Main) DHHL		
Pump Rate (g/m):	0	Year Drillled:	1968
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Percussion	Casing Diameter (in):	16
Ground Elevation (ft):	28	Well Depth (ft):	160
Solid Casing Depth:	30	Perforated Casing Depth:	50
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	39	Date Tested:	11/30/1968
Test Pump Rate (g/m):	2000	Test Drawdown Rate (ft):	2.7
Test Chloride Content (MG/L):	9500	Test Water Temp:	23.8
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-132	Solid Casing Bottom Elevation:	-2
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	11/25/1968	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

C15
North
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269970**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-11 T142 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660101
Well Depth:	190	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

C16
North
1/4 - 1/2 Mile
Lower

HI WELLS **HI1100000001079**

Well ID:	3-2042-011	Well Name:	Waimanalo STP 7
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	10	Well Depth (ft):	180
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported

Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-170	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

B17
ESE
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000269975**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-13 W420-1A WA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Hawaii volcanic-rock aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19681231	Well Depth:	160
Well Depth Units:	ft	Well Hole Depth:	160
Well Hole Depth Units:	ft		

B18
ESE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001085**

Well ID:	3-2042-017	Well Name:	Waimanalo
Well Owner:	Pacific Concrete & Rock Co.		
Land Owner:	Department of Hawaiian Home Lands, Oahu (Main) DHHL		
Pump Rate (g/m):	Not Reported	Year Drillled:	1969
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Percussion	Casing Diameter (in):	20
Ground Elevation (ft):	30	Well Depth (ft):	90
Solid Casing Depth:	52	Perforated Casing Depth:	Not Reported
Major Well Use:	Mining, Dust Control	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	2400	Test Drawdown Rate (ft):	0.6
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-60	Solid Casing Bottom Elevation:	-22
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	7/8/1969	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID
Direction
Distance
Elevation — Database — EDR ID Number

B19
ESE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269887**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-17 W420-1B WA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19690701
Well Depth:	90	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

C20
NNE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269976**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-06 T137 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660901
Well Depth:	340	Well Depth Units:	ft
Well Hole Depth:	340	Well Hole Depth Units:	ft

D21
NNE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001074**

Well ID:	3-2042-006	Well Name:	Waimanalo STP 2
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	12	Well Depth (ft):	328
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-316	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
D22 **NNE** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000269981**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-03 W408-8 WAM	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19430101
Well Depth:	88	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

D23
NNE
1/2 - 1 Mile
Lower
HI WELLS **HI1100000001071**

Well ID:	3-2042-003	Well Name:	Waimanalo
Well Owner:	United States Air Force	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	Not Reported	Year Drillled:	1943
Original Well Name:	Not Reported	Driller:	W. Mullin
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	15	Well Depth (ft):	88
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	88
Major Well Use:	Unused	Inital Water Level (ft):	1
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	310	Date Tested:	Not Reported
Test Pump Rate (g/m):	150	Test Drawdown Rate (ft):	0.7
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-73	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1943	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

24
South
1/2 - 1 Mile
Higher
HI WELLS **HI1100000000925**

Well ID:	3-1942-001	Well Name:	Waimanalo III
Well Owner:	Honolulu Board of Water Supply, BWS		
Land Owner:	State of Hawaii, DLNR Land Division Oahu, DLNR-LD		
Pump Rate (g/m):	250	Year Drillled:	1996
Original Well Name:	Not Reported	Driller:	Roscoe Moss Hawaii Inc
Well Construction Type:	Percussion	Casing Diameter (in):	12
Ground Elevation (ft):	275	Well Depth (ft):	575
Solid Casing Depth:	476	Perforated Casing Depth:	Not Reported
Major Well Use:	County	Inital Water Level (ft):	23.16
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	84	Date Tested:	1/31/1996

Test Pump Rate (g/m):	711	Test Drawdown Rate (ft):	50.8
Test Chloride Content (MG/L):	81	Test Water Temp:	24.9
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-300	Solid Casing Bottom Elevation:	-201
Year Installed:	2007	Pump Capacity (MM gal/day):	0.36
Pump Intake Depth:	376	Latest Head:	Not Reported
Latest WCR1 Report:	2/16/1996	Latest WCR2 Report:	11/29/2007
Transmissivity:	5927	Min to pump 5 volumes:	Not Reported

E25
NNE
1/2 - 1 Mile
Lower
FED USGS **USGS40000269983**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-10 T141 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660101
Well Depth:	36	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

F26
North
1/2 - 1 Mile
Lower
FED USGS **USGS40000269995**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-08 T139 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660101
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

E27
NNE
1/2 - 1 Mile
Lower
HI WELLS **HI1100000001078**

Well ID:	3-2042-010	Well Name:	Waimanalo STP 6
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	14	Well Depth (ft):	36
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported

Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-22	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

F28
North
1/2 - 1 Mile
Lower

HI WELLS **HI100000001076**

Well ID:	3-2042-008	Well Name:	Waimanalo STP 4
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	10	Well Depth (ft):	0
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	Not Reported	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

E29
NNE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269994**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-02 W408-7 WAM	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19430101
Well Depth:	88	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

E30
NNE
1/2 - 1 Mile
Lower

HI WELLS **HI100000001070**

Well ID:	3-2042-002	Well Name:	Waimanalo
Well Owner:	United States Air Force	Land Owner:	City & County of Honolulu, C&CH

Pump Rate (g/m):	Not Reported	Year Drillled:	1943
Original Well Name:	Not Reported	Driller:	W. Mullin
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	12	Well Depth (ft):	58
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	58
Major Well Use:	Unused	Inital Water Level (ft):	0.5
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	3725	Date Tested:	Not Reported
Test Pump Rate (g/m):	200	Test Drawdown Rate (ft):	1.4
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	25.6
Temp Unit:	C	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-46	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1943	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

---

G31
NNE
1/2 - 1 Mile
Lower

FED USGS **USGS40000270001**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-01 W408-6 WAM	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19430101
Well Depth:	106	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

G32
NNE
1/2 - 1 Mile
Lower

HI WELLS **HI100000001069**

Well ID:	3-2042-001	Well Name:	Waimanalo
Well Owner:	United States Air Force	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	Not Reported	Year Drillled:	1943
Original Well Name:	Not Reported	Driller:	W. Mullin
Well Construction Type:	Percussion	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	20	Well Depth (ft):	100
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Unused	Inital Water Level (ft):	9.5
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	116	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-80	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1943	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

H33
NE
1/2 - 1 Mile
Lower

FED USGS **USGS40000269985**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-07 T138 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660101
Well Depth:	320	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

H34
NE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001075**

Well ID:	3-2042-007	Well Name:	Waimanalo STP 3
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	10	Well Depth (ft):	320
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	-310	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

I35
NNE
1/2 - 1 Mile
Lower

FED USGS **USGS40000270012**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2042-09 T140 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660101
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

I36
NNE
1/2 - 1 Mile
Lower

HI WELLS **HI1100000001077**

Well ID:	3-2042-009	Well Name:	Waimanalo STP 5
Well Owner:	Honolulu Sewers	Land Owner:	City & County of Honolulu, C&CH
Pump Rate (g/m):	0	Year Drillled:	1966
Original Well Name:	Not Reported	Driller:	Continental Drilling Hawaii, Inc
Well Construction Type:	Not Reported	Casing Diameter (in):	Not Reported
Ground Elevation (ft):	10	Well Depth (ft):	0
Solid Casing Depth:	Not Reported	Perforated Casing Depth:	Not Reported
Major Well Use:	Observation	Inital Water Level (ft):	Not Reported
Water Level After Drilling:	Not Reported	Water Level After Install:	Not Reported
Chloride Content (mg/L):	0	Date Tested:	Not Reported
Test Pump Rate (g/m):	Not Reported	Test Drawdown Rate (ft):	Not Reported
Test Chloride Content (MG/L):	Not Reported	Test Water Temp:	Not Reported
Temp Unit:	Not Reported	Max Chloride Level:	Not Reported
Minimum Chloride Level:	Not Reported	Draft Year:	Not Reported
Hole Bottom Elevation:	Not Reported	Solid Casing Bottom Elevation:	Not Reported
Year Installed:	Not Reported	Pump Capacity (MM gal/day):	Not Reported
Pump Intake Depth:	Not Reported	Latest Head:	Not Reported
Latest WCR1 Report:	1/1/1966	Latest WCR2 Report:	Not Reported
Transmissivity:	Not Reported	Min to pump 5 volumes:	Not Reported

J37
West
1/2 - 1 Mile
Higher

HI WELLS **HI1100000001088**

Well ID:	3-2043-002	Well Name:	Waimanalo I
Well Owner:	Hawaii Department of Agriculture Oahu, HDOA		
Land Owner:	Hawaii Department of Agriculture Oahu, HDOA		
Pump Rate (g/m):	200	Year Drillled:	1952
Original Well Name:	Not Reported	Driller:	Samson/Smock
Well Construction Type:	Not Reported	Casing Diameter (in):	12
Ground Elevation (ft):	142	Well Depth (ft):	280
Solid Casing Depth:	136	Perforated Casing Depth:	Not Reported
Major Well Use:	Agriculture-Crops and Processing		
Inital Water Level (ft):	29	Water Level After Drilling:	Not Reported
Water Level After Install:	Not Reported	Chloride Content (mg/L):	30
Date Tested:	Not Reported	Test Pump Rate (g/m):	210
Test Drawdown Rate (ft):	108.6	Test Chloride Content (MG/L):	Not Reported
Test Water Temp:	Not Reported	Temp Unit:	Not Reported
Max Chloride Level:	Not Reported	Minimum Chloride Level:	Not Reported
Draft Year:	Not Reported	Hole Bottom Elevation:	-138
Solid Casing Bottom Elevation:	Not Reported	Year Installed:	1977
Pump Capacity (MM gal/day):	0.288	Pump Intake Depth:	251
Latest Head:	Not Reported	Latest WCR1 Report:	Not Reported
Latest WCR2 Report:	11/12/2009	Transmissivity:	190
Min to pump 5 volumes:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation	Database	EDR ID Number
J38 **West** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40000269915**

Organization ID:	USGS-HI	Organization Name:	USGS Hawaii Water Science Center
Monitor Location:	3-2043-02 W420 WAIMA	Type:	Well
Description:	Not Reported	HUC:	20060000
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19521110
Well Depth:	280	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	1	Level reading date:	1952-11-28
Feet below surface:	110.70	Feet to sea level:	Not Reported
Note:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for HONOLULU County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 96795

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	-0.300 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

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

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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

State Wetlands Data: Wetlands Inventory
Source: Office of Planning
Telephone: 808-587-2895

HYDROGEOLOGIC INFORMATION

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

GEOLOGIC INFORMATION

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

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

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Well Index Database
Source: Commission on Water Resource Management
Telephone: 808-587-0214
CWRM maintains a Well Index Database to track specific information pertaining to the construction and installation of production wells in Hawaii.

OTHER STATE DATABASE INFORMATION

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

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

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

© 2015 TomTom North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

APPENDIX V
QUALIFICATIONS OF THE ENVIRONMENTAL PROFESSIONAL

PROFESSIONAL QUALIFICATIONS

Name: **Sharla M. Nakashima**

Title: Environmental Scientist

Education: BS, Chemistry, University of Hawaii at Manoa, 2000

Training: OSHA 40 Hour HAZWOPER
DOT Hazardous Materials Handling

Experience: EnviroServices & Training Center, LLC, Environmental Chemist, 2000 to Present.
University of Hawaii, Chemistry Department, Graduate Research Assistant, 2000.

Ms. Nakashima's primary responsibilities are conducting Phase I and II environmental site assessments. She is also the lead person to conduct data QA/QC/validation/reduction. Ms. Nakashima possesses experience in operating global positioning system (GPS) instrumentation and conducting hazardous materials inventories/classifications/ segregations/compatibility determinations.

PAST PROJECT EXPERIENCE

Sharla M. Nakashima

Phase I Environmental Site Assessments on the Islands of Oahu, Maui, Kauai, Hawaii, Lanai; Environmental Professional. Ms. Nakashima has conducted numerous Phase I environmental site assessments throughout the State of Hawaii in accordance with generally accepted Phase I industry protocol as described in the ASTM E-1527 standard and to satisfy "all appropriate inquiry" as defined in 42 United States Code (U.S.C.) §9601(35)(B). Work sites included commercial, industrial, agricultural, condemned, and residential land ranging in size from small properties (less than 2.0 acres) to larger properties (greater than 300.0 acres).

Phase II Environmental Site Assessments/Site Screening Assessments on the Islands of Oahu, Maui, Kauai, Hawaii, Lanai; Project Manager. Ms. Nakashima has performed numerous Phase II environmental site assessments and site screening assessments throughout the State of Hawaii. Projects included surface soil investigation utilizing both multi-incremental and discrete sampling protocols and subsurface soil/groundwater investigations using hand tools, direct-push rig, and hollow-stem augering techniques. Contaminants investigated included petroleum/petroleum-related compounds, heavy metals, pesticides/herbicides, PCBs, and dioxins/furans.

Phase II Environmental Site Assessments/Site Screening Activities; GPS Team Leader. Ms. Nakashima utilized Trimble Navigation Global Positioning System (GPS) instrumentation and Geographical Information Systems (GIS) applications for numerous projects to identify/locate pre-determined sample locations, document sample locations or site features, and/or identify property limits. GIS data obtained were incorporated in both the planning and reporting phases of applicable projects.

Underground Storage Tank (UST) Closure and Release Response; Environmental Scientist. Ms. Nakashima has closed numerous UST systems throughout the State of Hawaii. Closure and release response activities were performed in accordance with Hawaii Administrative Rules 11-281. Duties included coordination and management of various subcontractors, documentation of closure (both removal and close in place), release assessment sample collection, site remediation, waste profiling/packaging/disposal, communication with State regulators, and report preparation.

Voluntary Response Program (VRP) Site Assessment and Remediation; Environmental Scientist/Project Manager. Ms. Nakashima has served as both environmental scientist and project manager on several VRP projects on the Island of Oahu. Ms. Nakashima worked on all phases of the VRP, including project scoping, planning document preparation, field sampling, data assessment, contaminated media removal/remediation, confirmation sampling, and report preparation. Contaminants addressed included petroleum/petroleum-related compounds, heavy metals, pesticides/herbicides, PCBs, and dioxins/furans.

Industrial Wastewater Discharge Permitting (IWDP), Environmental Scientist. Ms. Nakashima acquired an IWDP which authorized the facility to discharge industrial wastewater into the City and County of Honolulu's publicly owned treatment works (POTW) under Chapter 14 of the Revised Ordinances of Honolulu.

Underground Injection Control (UIC) Permitting, Environmental Scientist. Ms. Nakashima acquired a UIC permit for two dry wells located at a car rental facility in Kona, Hawaii. Work included investigation and application procedures required by the Hawaii Department of Health-Safe Drinking Water Branch.

Hazardous Materials Inventory, Environmental Chemist. Ms. Nakashima conducted a hazardous materials survey at over sixty (60) public intermediate and high schools on the islands of Oahu, Kauai, Maui, Molokai, Lanai and Hawaii. Work included identification and categorizing of over 30,000 hazardous materials, conducting photographic documentation, and determining NFPA labeling requirements for classroom storage areas potentially containing hazardous materials.

Household Hazardous Waste (HHW) Collection, Environmental Scientist. Ms. Nakashima assisted with the collection of HHW in Honolulu, Lahaina, Wailuku, Hilo, and Kona. Tasks included identification, packaging, labeling, transportation and disposition of HHW in accordance with OSHA, EPA, and DOT protocol.

Hazardous Waste Characterization and/or Disposal, Environmental Scientist. Ms. Nakashima assisted in the disposal of various chemicals and hazardous wastes at an abandoned laboratory in Waimanalo, Oahu. Additional sites included several public intermediate and high schools. Tasks included identification, packaging, labeling, transportation and disposition of hazardous waste in accordance with OSHA, EPA, DOT, and local regulations.

Asbestos Air-Monitoring, City and County – Department of Agriculture, Environmental Scientist. Ms. Nakashima assisted and/or conducted air monitoring using low volume sampling pumps during asbestos abatement activities.

Laboratory Studies, Research Assistant. Ms. Nakashima conducted studies of protein conformational dynamics through photothermal methods and purified horse heart myoglobin within thin layered polymer slides and organic solvents. Lab experience also included utilization of Gas Chromatogrpahy (GC) -Mass Spectrometry (MS), High Performance Liquid Chromatography (HPLC), Nuclear Magnetic Resonance (NMR), Infrared (IR) spectrometry, and Ultraviolet/Visible (UV-VIS) Spectrometer.

APPENDIX E

Biological Survey Report by AECOS, Inc.

(This page intentionally left blank.)

AECOS No. 1555B

Biological survey for Subsistence Agricultural Homesteads on lots TMK: 4-1-008: 002 (por.), 093, 094, 095, and 096 Waimānalo, Koʻolau Poko District, Oʻahu

Prepared by:

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

May 8, 2019

Biological survey for Subsistence Agricultural Homesteads on lots TMK: 4-1-008: 002 (por.), 093, 094, 095, and 096 Waimānalo, Koʻolau Poko District, Oʻahu

May 8, 2019 - REVISED[1] | ***Draft*** | *AECOS* No. 1555B

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

Introduction

The Department of Hawaiian Homelands (DHHL) is proposing to convert approximately 30 ac (12 ha) of Hawaiian Homelands properties (TMK: 4-1-008:002 (por.), 093, 094, 095, and 096) into Subsistence Agricultural Homestead (SAHs). The subject parcels are located near the intersection of Waikupanaha Street and Hihimanu Street in Waimānalo on windward Oʻahu ("Project" area; see Figure 1). This report presents results of a natural resources survey conducted in the Project area[2], the primary purpose of which was to determine whether any environmental resource of special interest or concern are present on the site, especially any plant or animal species currently proposed or listed as threatened or endangered under either federal or state endangered species statutes.

Site Description

A substantial portion of the Project area is an ancient lithified dune, with soil types "coral outcrop" (CR) and stony silty clay loam (MnC; characterized by alluvial material overlying limestone material) covering much of the site (Foote, et al., 1972). This ancient lithified sand dune has been extensively mined at a quarry occupying the southeast part of the site. A cliff of this rock material

[1] AECOS No. 1555A, February 14, 2019 report is here revised to incorporate results of additional field surveys along Waikupanaha Street proposed for improvements related to the subject Project.
[2] This report was prepared for TLCG for use in planning and design services.

showing typical thin bedding of dune sand (see cover photo) separates the now-abandoned quarry from the higher ground of the majority of the site. This cliff extends, partly as a natural feature marking the edge of the dune, all along the east side, wrapping around the north end and extending along the makai side of Waikupanaha Street. Additionally surveyed was all of that section of Waikupanaha Street from the intersection with Hihimanu Street to the gate at the back entrance to the University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR), Waimānalo Research Station (Figure 2).

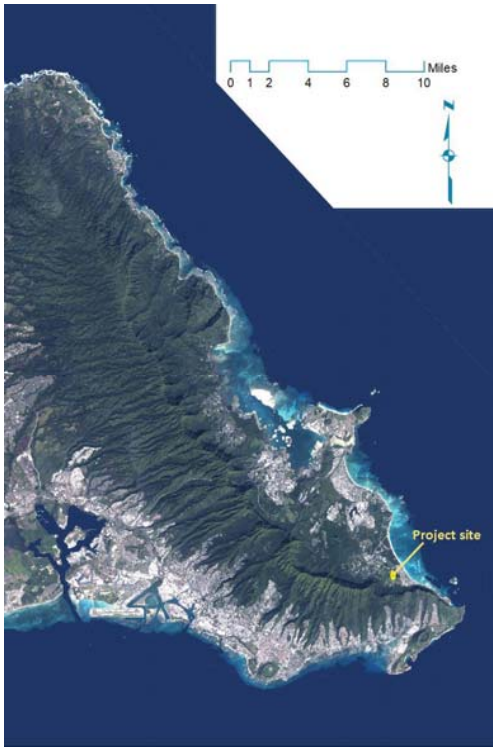


Figure 1. Eastern O'ahu showing Project location.

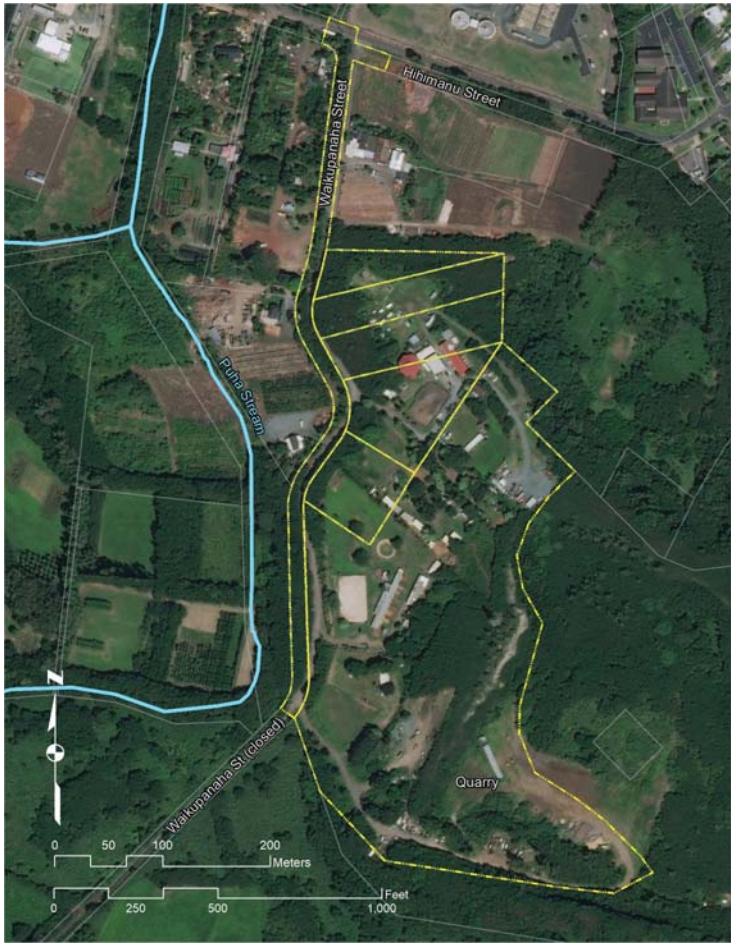


Figure 2. Project and Waikupanaha Street surveyed in Waimānalo outlined in yellow.

The higher ground of the Project area is currently used as horse boarding and training facilities, with other unoccupied portions covered in dense Guinea grass (*Megathyrsus maximus*) or *koa haole* (*Leucaena leucocephala*) scrub growth.

Methods

Botanical Survey

AECOS biologists conducted a botanical survey of the Project area on October 4, 2018 using a wandering pedestrian transect that entailed covering the entire Project site. Handheld GNSS units (Trimble GeoXH and GeoXT 6000 Series) were used to record a progress track and mark positions of features and plant species of special interest or concern. Plant species were identified as they were encountered and notations made in a field notebook, which was used to develop qualitative abundance values for each species as the survey progressed. Any plant not immediately recognized during the survey was photographed and/or a representative feature (e.g., a flower, fruit, or leaf) collected for later identification at the laboratory. The survey period encompassed the early rainy season and most plants were readily identifiable by fruits and flowers. Waikupanaha Street in the Project area was surveyed on May 2, 2019, also a generally wet period.

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 and crop plants. More recent name changes for naturalized plant species follow Imada (2012).

Avian Survey

AECOS biologist conducted an avian survey of the Project area on October 4, 2018 and a segment of Waikupanaha Street on May 2, 2019. Avian surveys were conducted during the morning hours when birds are most active. Point-count stations (see Figure 3) are selected in representative environments within the Project area to maximize the likelihood of observing a full range of birds. Weather conditions were ideal for avian observations during both surveys, with no rain and light wind. At each point-count station, all birds observed and/or heard during a 6-minute period were identified to species and counted. Any additional avian species observed in the Project area beyond these point-count periods were noted as incidental observations.

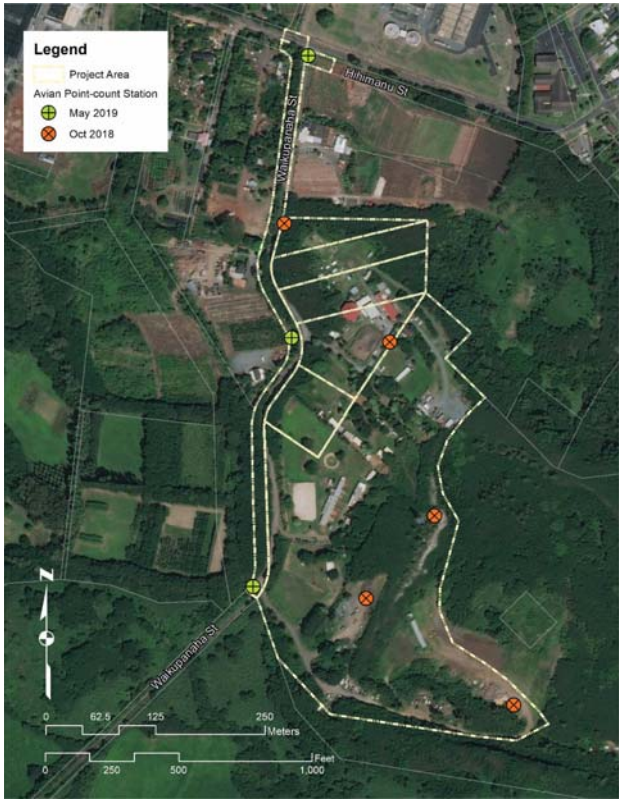


Figure 3. Avian point-count station locations in the Project area and along Waikupanaha Street.

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

Mammalian Survey

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

Results

Vegetation

Vegetation across the survey area is highly variable from place to place, largely because so much of the site is currently utilized by equestrian facilities or has been previously utilized for other purposes, such as a limestone quarry. Presently unused, open areas are dominated by Guinea grass (*Megathyrsus maximus*) forming dense grassland stands that exclude most other plants. Other areas are covered by *koa haole* (*Leucaena leucocephala*) shrubland (Figure 4). Vegetation along Waikupanaha Street from Hihimanu Street to the end of public access is a mixture of Guinea grass, *koa haole*, ruderal verge vegetation, and ornamental trees planted fronting various agricultural parcels (Figure 5).

Open areas of mostly ruderal weeds, *koa haole* scrub, and dense Guinea grass characterize different parts of the quarry bottom. *Koa haole* scrub along Waikupanaha Street, representing the base of an indurated dune once partly mined in the quarry, includes numerous mock orange (*Murraya paniculata*) shrubs, an ornamental clearly naturalizing in this area. Areas within and adjacent to the equestrian facilities harbor both ornamentals and a variety of weeds where maintenance has been infrequent. As a consequence, these disturbed areas (and disturbed open areas in the quarry) account for a moderately large species list for the survey, with however no evidence of remnant native plant assemblages.

Flora

A listing of the plant species recorded during the October 2018 survey is provided as Table 1. In all, the listing has 127 species of vascular plants: one gymnosperm, and 126 species of angiosperms (flowering plants). No ferns were recorded. Of the total, only four species (3%) are regarded as native to the Hawaiian Islands and all are indigenous (native, but also distributed elsewhere in the Pacific). Found in low numbers are the ubiquitous, ruderal *'uhaloa* (*Waltheria indica*), *'ilima* (*Sida fallax*), and *milo* (*Thespesia populnea*).

Drone image provided by TLCG.

Figure 4. Typical vegetation "types" found in Project area: equestrian facilities (disturbed vegetation) and pockets of previously disturbed but currently unused land (background) and areas of *koa haole* scrub and fields of Guinea grass (foreground).

Indigenous beach vitex (*Vitex rotundifolia*), a popular ornamental, was seen planted as a landscape plant. Four (3%) early Polynesian plants were recorded for the site: *kukui* (*Aleurites moluccensis*), *ki* (*Cordyline fruticosa*), *noni* (*Morinda cirtifolia*), and *niu* (*Cocos nucifera*). All of these "natives" are common and widespread in the Islands.

The added survey for proposed roadway improvements of Waikupanaha Street revealed 65 plant species growing along the verge and land adjacent. Of these identified plant species, 20 (31%) were not previously recorded as growing on the Project site. Thirteen (20%) are ornamentals (not including several naturalized species likely planted as landscape plants. None of the recorded species is of any particular concern; indeed, a single indigenous *pōpolo* (*Solanum americanum*) plant was the only native species observed on May 2.

Table 1. Plant species identified during the October 2018 and May 2019 surveys of (TMK: 4-1-008: 002 (por.), 093, 094, 095, and 096) in Waimānalo, O'ahu.

Family / Species	Common name	Status	Abundance SITE	Abundance STREET	Notes
GYMNOSPERMS					
AURACARIACEAE					
Auracaria columnaris (G. Forst.) J.D. Hook.	Cook pine	Nat	R		
FLOWERING PLANTS					
DICOTYLEDONES					
ACANTHACEAE					
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	Oa	✓	
Barleria repens C. Nees	pink ruellia	Nat	R		
Justicia betonica L.	white shrimp plant	Nat	Oc		
Pseuderanthemum carruthersii var. *caruthersii* (W. Bull.) Fosb.	pseuderanthemum	Orn	R		
AIZOACEAE					
Trianthema portulacastrum L.	---	Nat	Ua	✓	
AMARANTHACEAE					
Alternanthera pungens Kunth	khaki weed	Nat	U	✓	
Amaranthus dubius Mart. ex Thell.	spleen ameranth	Nat	R	✓	
Amaranthus spinosus L.	spiny amaranth	Nat	Oc	✓	
ANACARDIACEAE					
Mangifera indica L.	mango	Nat	R		
Schinus terebinthifolius Raddi	Christmas berry	Nat	Ou	✓	
ANNONACEAE					
Annona sp.	---	Orn	--	✓	<1>
APOCYNACEAE					
Plumeria rubra L.	plumeria	Orn	U	✓	
ARALIACEAE					
Schefflera actinophylla (Endl.) Harms	octopus or umbrella tree	Nat	R		
ASTERACEAE (COMPOSITAE)					
Bidens alba (L.) DC.	beggartick	Nat	Oa	✓	
Bidens pilosa L.	*kī nehe*	Nat	R		
Calyptocarpus vialis Less.	---	Nat	Oa	✓	
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat	U		
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	--	✓	
Flaveria trinervia (Spreng.) C. Mohr	---	Nat	R		
Pluchea carolinensis (Jacq.) G. Don	sourbush	Nat	R	✓	
Sphagneticola trilobata (L.) Pruski	wedelia	Nat	Uc	✓	
Synedrella nodiflora (L.) Gaertn.	nodeweed	Nat	--	✓	

Table 1 (continued).

Family / Species	Common name	Status	Abundance SITE	Abundance STREET	Notes
ASTERACEAE (continued)					
Tridax procumbens L.	coat buttons	Nat	Uc		
Verbesina encelioides (Cav.) Benth. & Hook.	golden crown-beard	Nat	Oa		
BASELLACEAE					
Basella alba L.	Malabar-spinach	Orn	--	✓	
BIGNONIACEAE					
Tabebuia heterophylla (A.P. de Candolle) Brit.	pink tecoma	Orn	R		
Spathodea campanulata P. Beauv.	African tulip tree	Nat	R		
BORAGINACEAE					
Carmona retusa (Vahl) Massamune		Nat	--	✓	
Heliotropium procumbens Mill.	---	Nat	Oc		
BRASSICACEAE					
Lepidium virginicum Mill.	---	Nat	--	✓	
BUDDLEIACEAE					
Buddleiua asiatica Lour.	dog tail	Nat	R	✓	
CACTACEAE					
Opuntia sp.	*panini*	Nat	R	✓	<1>
CAPPARACEAE					
Cleome gynandra L.	wild spider flower	Nat	R	✓	
CARICACEAE					
Carica papaya L.	papaya	Nat	U	✓	
CASUARINACEAE					
Casuarina equisetifolia L.	ironwood	Nat	U		
CHENOPODIACEAE					
Chenopodium carinatum R. Br.	---	Nat	R		
CLUSIACEAE					
Clusia rosea Jacq.	autograph tree	Nat	R		
CONVOLVULACEAE					
Ipomoea batatas (L.) Lam.	sweet potato		--	✓	
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	O	✓✓	
Ipomoea triloba L.	little bell	Nat	R		
CUCURBITACEAE					
Coccinia grandis (L.) Voigt	scarlet-fruited gourd	Nat	R		
Momordica charantia L.	bitter melon	Nat	U	✓	
EUPHORBIACEAE					
Aclypha wilkesiana Müll. Arg.	beefsteak plant	Orn	R		
Aleurites moluccana (L.) Willd.	*kukui*	**Pol**	O		
Alysicarpus vaginalis (L.) DC.	Alyce clover	Nat	R		

Table 1 (continued).

Family / Species	Common name	Status	Abundance SITE	Abundance STREET	Notes
EUPHORBIACEAE (continued)					
Codiaeum variegatum (L.) Blume	croton	Orn	R		
Euphorbia hirta L.	garden spurge	Nat	O	✓	
Euphorbia hypericifolia L.	graceful spurge	Nat	R	✓	
Euphorbia hyssopifolia L.	---	Nat	U		
Euphorbia prostrata Small	prostrate spurge	Nat	Uo	✓	
Macaranga tanarius (L.) Müll. Arg.	---	Nat	R		
Phyllanthus tenellus Roxb.	---	Nat	R	✓	
Ricinus communis L.	castor bean	Nat	Oc	✓	
indet.	---	Orn	R		
FABACEAE					
Albizia saman F. Muell.	monkeypod	Nat	R		
Caesalpinia pulcherrima (L.) Swartz	*ʻohia aliʻi*	Orn	R	✓	
Chamaecrista nictitans (L.) Moench	partridge pea	Nat	R		
Crotalaria incana L.	fuzzy rattlepod	Nat	R		
Desmanthus pernambucanus (L.) Thell.	virgate mimosa	Nat	Uc		
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	Nat	Ua		
Enterolobium cyclocarpum (N, Jacq.) Griseb.	juv. earpod tree	Nat	R		<1>
Indigofera hendecaphylla Jacq.	creeping indigo	Nat	R		
Indigofera sufffruticosa Mill.	indigo, *ʻinikō*	Nat	U		
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	AA	✓✓	
Macroptilium atropurpureum (DC.) Urb.	---	Nat	O		
Mimosa pudica L.	sensitive plant	Nat	Uc		
Neonotonia wightii (Wight & Arnott) Lackey	glycine vine	Nat	AA	✓✓	
Pithecellobium dulce (Roxb.) Benth.	*ʻopiuma*	Nat	R		
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat	R		
Senna cf. *alata* (L.) Roxb.	candle bush	Nat	R		<1>
Senna surrattensis (N.L. Burm.) H. Irwin & Barneby	scrambled egg plant	Nat	R	✓	
Sesbania grandiflora (L.) Poiret	*ʻohai keʻokeʻo*	Orn	--	✓	
Vigna sp.	*nanea*-like vine	Nat	R		
indet. Fabaceae	---	Orn	R		
LAMIACEAE					
Hyptis pectinata (L.) Poit.	comb hyptis	Nat	U	✓	
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat	U	✓	
Ocimum gratissimum L.	wild basil	Nat	R		

Table 1 (continued).

Family / Species	Common name	Status	Abundance SITE	Abundance STREET	Notes
MALVACEAE					
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat	R	✓	
Gossypium hirsutum L.	upland cotton	Nat	--	✓	
Hibiscus rosa-sinensis L.	Chinese hibiscus	Orn	U		
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat	Oc	✓	
Sida ciliaris L.	---	Nat	Oc		
Sida fallax Walp.	*ʻilima*	**Ind**	U		
Sida spinosa L.	prickly sida	Nat	U	✓	
Thespesia populnea (L.) Sol. ex Corrêa	*milo*	**Ind**	R		
Waltheria indica L.	*ʻuhaloa*	**Ind**	O		
MORACEAE					
Ficus macrophylla Pers.	Moreton Bay fig	Orn	R		
Ficus microcarpa L. fil.	Chinese banyan	Nat	O	✓	
Morus alba L.	white mulberry	Nat	--	✓✓	
MORINGACEAE					
Moringa oleifera Lam.	horseradish tree	Nat	--	✓	
MUSACEAE					
Musa hybrid	banana, *maiʻa*	**Pol**	--	✓	
MYRTACEAE					
Syzygium cumini (L.) Skeels	Java plum	Nat	--	✓✓	
NYCTAGINACEAE					
Boerhavia coccinea Mill.	false *ʻalena*	Nat	Uu		
Bougainvillea glabra Choisy	bougainvillea	Orn	U	✓	
PASSIFLORACEAE					
Passiflora suberosa L.	*huehue haole*	Nat	R		
PHYTOLACCACEAE					
Rivina humilis L.	coral berry	Nat	Ou	✓	
RUBIACEAE					
Morinda citrifolia Hillbr.	*noni*	**Pol**	O		
Spermacoce assurgens Ruiz & Pav.	buttonweed	Nat	U		
RUTACEAE					
Citrus sp.	---	Orn	--	✓	<1>
Murraya paniculata (L.) W. Jack	mock orange	Nat	Oa	✓	
SOLANACEAE					
Nicotiana glauca R. C. Graham					
Solanum americanum Mill.	*pōpolo*	**Ind**	--	✓	
Solanum lycopersicum L.	tomato	Orn	--	✓	
Solanum torvum Mill.	pea aubergine	Nat	--	✓	

Table 1 (continued).

Family / Species	Common name	Status	Abundance SITE	Abundance STREET	Notes
ULMACEAE					
Trema orientalis (L.) Blume	gunpowder tree	Nat	R		
VERBENACEAE					
Citharexylum spinosum L.	fiddlewood	Nat	Uu		<1>
Lantana montevidensis (Spreng.) Briq.	trailing lantana	Nat	U		
Stachytarpheta australis Moldenke	---	Nat	U		
Stachytarpheta cayennensis (Rich.) Vahl	---	Nat	U		
Verbena littoralis Kunth	*ōwī*	Nat	R		
Vitex rotundifolia L. fil.	beach vitex	**Ind**	R		
ZYGOPHYLLACEAEAE					
Tribulus terrestris L.	puncture vine	Nat	Rc		
MONOCOTYLEDONES					
AGAVACEAE					
Agave sp.	---	Orn	R		<1>
Cordyline fruticosa (L.) A. Chev.	*ki*, ti	**Pol**	O		
Dracaena fragrans (L.) Ker Gawl.	corn plant, fragrant dracaena	Orn	R		
Dracaena marginata Lam.	money tree	Orn	R	✓	
Dracaena sanderiana M.T. Masters	sanderiana	Orn	R		
Sansevieria trifasciata Prain	bowstring hemp	Orn	Uo		
ARECACEAE					
Cocos nucifera L.	*niu*, coconut	**Pol**	U	✓	
Livistona chinensis (Jacq) R. Br. ex Mart.	Chinese fan palm	Nat	R	✓	
Roystonea regia (Kunth) O.F. Cook	Cuban royal palm	Orn	--	✓	
Veitchia merrillii (Beccari) H.E. Moore	Manila palm	Orn	U	✓	
BROMELIACEAE					
Aechmea sp.	---	Orn	R	✓	
COMMELINACEAE					
Commelina benghalensis L.	hairy *honohono*	Nat	R		
Tradescantia spathacea Sw.	Moses-in-the boat	Orn	R		
CYPERACEAE					
Cyperus gracilis R. Br.	McCoy grass	Nat	Uc		
Cyperus rotundus L.	nut grass	Nat	Ua		
HELICONIACEAE					
Heliconia bihai (L.) R. Br.	---	Orn	R		
LILIACEAE					
Allium fistulosum L.	green onion	Orn	--	✓	
Crinum asiaticum L.	spider lily	Orn	R		

Table 1 (continued).

Family / Species	Common name	Status	Abundance SITE	Abundance STREET	Notes
POACEAE					
Cenchrus ciliaris L.	buffelgrass	Nat	U		
Cenchrus echinatus L.	common sandbur	Nat	R		
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	O	✓	
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	O	✓✓	
Dactyloctenium aegypticum (L.) Willd.	beach wiregrass	Nat	Uc		
Dichanthium aristatum (Poir.) Hubb.	Wilder grass	Nat	U		
Digiteria insularis (L.) Mez ex Ekman	sourgrass	Nat	Ca	✓	
Digiteria radicosa (J. Presl.) Miq.	---	Nat	R		
Eleusine indica (L.) Gaertn.	wiregrass	Nat	U	✓	
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	U		
Megathyrsus maximus (Jacq.) B.K. Simon & W.L, Jacobs	Guinea grass	Nat	AA	✓✓	
Melinus repens (Willd.) Zizka	Natal redtop	Nat	Uo		
Paspalum dilatatum Poir.	Dallis grass	Nat	U		
Paspalum fimbriatum Kunth	Panama grass	Nat	--	✓	
Pennisetum purpureum Schumach.	elephant grass	Nat	U		
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat	Uo		
Sorghum halepense (L.) Pers.	Johnson grass	Nat	Ru		

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 = ornamental; crop or landscape plant not established outside of cultivation.
- **Pol** = Early Polynesian introduction; canoe plant.

Abundance = occurrence ratings for plants on property in July 2013.

- 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 (o – 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 (i.e., clustered or limited to specific areas).

✓ - Species recorded along Waikupanaha Street in May 2019; ✓✓ - Especially abundant (locally dominant) along Waikupanaha Street in May 2019 survey.

Notes:

<1> Plant lacking flowers or fruit at time of survey; identification uncertain.

Figure 5. Waikupanaha Street near the Project site showing typical vegetation lining the roadway.

Birds

The avian survey of the Project area on October 4, 2018 recorded a total of 152 individual birds of 22 species representing 16 families (Table 2) from five point-count stations. A supplemental avian survey of Waikupanaha Street on May 2, 2019 recorded a total of 169 individual birds of 20 species representing 13 families from three point-count stations. Species relative abundance during each survey are provided in Table 2. Few native indigenous bird species were detected in October 2018 survey, and no native species were detected during the May 2019 survey.

Mammals

Land uses of the Project area support several mammalian species, most of which are domesticated. Horse (*Equus caballus*), goat (*Capra hircus*), pig (*Sus scrofa*), domestic cat (*Felis catus*), and domestic dog (*Canis lupus familiaris*)

Table 2. Avian species detected during the October 4, 2018 survey of TMK: 4-1-008:002 (por.), 093, 094, 095, and 096, and May 2, 2019 survey of Waikupanaha Street, Waimānalo, O'ahu.

ORDER FAMILY *Species*	Common Name	Status	***RA*** Street	***RA*** Site
GALLIFORMES				
PHASIANIDAE				
Francolinus pondicerianus	Grey Francolin	NN	0.3	0.4
Gallus gallus	Domestic Chicken	ND	4.0	2.0
Pavo cristatus	Indian Peafowl	NN	0.3	0.2
COLUMBIFORMES				
COLUMBIDAE				
Columba livia	Rock Pigeon	NN	-	2.0
Streptopelia chinensis	Spotted Dove	NN	2.7	1.8
Geopelia striata	Zebra Dove	NN	3.0	2.6
CHARADRIIFORMES				
CHARADRIIDAE				
*Pluvialis fulva**	Pacific Golden-Plover; *kōlea*	**IM**	-	0.4
SULIFORMES				
FREGATIDAE				
Fregata minor	Great Frigatebird; *'iwa*	**I**	-	0.6
PSITTACIFORMES				
PSITTACULIDAE				
Psittacula krameri	Rose-ringed Parakeet†	NN	0.3	-
PELECANIFORMES				
ARDEIDAE				
*Bubulcus ibis**	Cattle Egret	NN	3.0	0.4
PASSERIFORMES				
ALAUDIDAE				
*Alauda arvensis**	Eurasian Skylark	NN	-	0.2
PYCNONOTIDAE				
Pycnonotus cafer	Red-vented Bulbul	NN	3.0	3.2
Pycnonotus jocosus	Red-whiskered Bulbul	NN	1.7	1.6
ZOSTEROPIDAE				
Zosterops japonicus	Japanese White-eye	NN	3.0	4.4
TIMALIIDAE				
Garrulax canorus	Chinese Hwamei	NN	0.3	-
Leiothrix lutea	Red-billed Leiothrix	NN	-	1.2

Table 2 (continued).

ORDER FAMILY *Species*	Common Name	Status	***RA*** Street	***RA*** Site
MUSCICAPIDAE				
Copsychus malabaricus	White-rumped Shama	NN	1.3	1.2
STURNIDAE				
Acridotheres tristis	Common Myna	NN	8.7	3.6
CARDINALIDAE				
*Cardinalis cardinalis**	Northern Cardinal	NN	2.7	0.4
THRAUPIDAE				
Paroaria coronata	Red-crested Cardinal	NN	3.3	0.6
FRINGILLIDAE				
*Haemorhous mexicanus**	House Finch	NN	2.3	0.4
PASSERIDAE				
*Passer domesticus**	House Sparrow	NN	-	1.0
ESTRILDIDAE				
Estrilda astrild	Common Waxbill	NN	5.0	1.8
Lonchura oryzivora	Java Sparrow	NN	1.3	0.6
Lonchura punctulata	Scaly-breasted Munia	NN	2.7	-
Lonchura atricapilla	Chestnut Munia	NN	7.3	-

* Species protected by Migratory Bird Treaty Act (MBTA).
† Species observed between count stations, incidental observation.

Legend to Table 2.

Status – **I** = Indigenous
IM = Indigenous Migrant.
NN = Naturalized, non-native species (introduced).
ND = Naturalized, domestic
RA = Relative Abundance; the species count divided by number of stations.

Two of the species observed in October 2018 are species native to the Hawaiian Islands: Pacific Golden-Plover or *kōlea* (*Pluvialis fulva*), an indigenous migratory shorebird; and Great Frigatebird or *ʻiwa* (*Frigata minor*), an indigenous seabird. Two *kōlea* were observed on an unimproved road running through the quarry area, and three *ʻiwa* were circling high above the Project vicinity. Occurrence of *ʻiwa* over the Hawaiian Islands is not uncommon. All other birds observed are naturalized, non-native species. No breeding colonies or nesting sites for seabird species were observed in the Project area.

were noted at several residences within the Project area and along Waikupanaha Street. Small Asian mongoose (*Herpestes javanicus auropunctatus*) was encountered occasionally throughout the site. One or more of the four naturalized rodents (Family Muridae) found in the Hawaiian Islands are likely to utilize the Project area to some extent.

Discussion

Botanical Resources

A floristic composition of 3% natives (6% if early Polynesian introductions are included) is less than is typical for lowland Oʻahu, but not unusual given the project location and long-term uses. Thus, there is no expectation for the site to support remnants of a native forest flora and minimal opportunity for native plants to become established; the *ʻuhaloa*, *milo*, and *ʻilima* are exceptions due to their ability to grow in disturbed environments. A previous biological survey (David and Guinther, 2012) conducted on 283 ac (114 ha) of land close by to the south (along the closed portion of Waikupanaha Street and abutting the present south boundary of the Project area) yielded 117 species of vascular plants in an area of mixed pasture fields, experimental agricultural plantings, and some forested lands, each with distinct floristic characteristics.

- The Division of Aquatic Resources (HDLNR-DAR, 2018) recommends establishing ground cover using native plants as buffers downslope of agricultural plots. Four species suitable for the climate and soil conditions over much of the site are suggested: *pōhinahina* (*Vitex rotundifolia*), *ʻakiʻaki* (*Sporobolus virginicus*), *paʻu o Hiʻiaka* (*Jaquemontia sandwicense*), and *pōhuehue* (*Ipomoea pes-capre*). While we certainly can agree with the suggestion, our recommendation is that efforts must focus on erosion control and capturing of nutrients and other substances in run-off. Many non-natives, especially spreading grasses (such as Bermuda) that can be maintained as vegetated berms and swales exist that could be, in many situations, more effective and efficient to maintain than the native ground covers suggested. Other types of barriers (wattles, silt screens, geotextile socks, petroleum absorption pads, etc.) could also be deployed in certain situations. These other measures must be utilized in the event of any failures to establish the described native plantings.

Avian Resources

The avian assemblage surveyed in the Project area is consistent with the environment. Non-native birds comprise 97% of the birds counted in the Project site and 100% of birds along Waikupanaha Street. Most abundant were Japanese White-eye (*Zosterops japonicus*) at the Project site and Common Myna (*Acridotheres tristis*) along Waikupanaha Street. While not observed during our surveys, threatened or endangered avian species may transit-through, overfly, or otherwise utilize the Project site.

The Hawaiian endemic subspecies of the Short-eared Owl (*Asio flammeus sandwichensis*), or *pueo,* may occur in the vicinity of the Project area. Short-eared Owl are listed by the state as endangered on Oʻahu Island only (HAR 13-124). Short-eared Owls are a ground nesting species which favor grassy, relatively undisturbed areas with infrequent human activity, such as pastureland. Nests are vulnerable to mammalian predation and human terrestrial disturbance (HDLNR-DOFAW, 2005).

- If the Project conversion to Subsistence Agricultural Homestead (SAH) results in grubbing or grading of areas that are currently undeveloped and receive infrequent human-use, a survey for Short-eared Owl ground-nesting activity should be undertaken in these locations immediately prior to the start of ground disturbance.

- If a nest is discovered, Hawaiʻi Department of Land and Natural Resources (DLNR) must be notified before proceeding with any activity that could disturb Short-eared Owl nesting.

Given the Project proximity to the ocean and notable seabird habitat on cliffs and offshore islets in the Waimānalo region, night-flying seabirds may overfly the Project site. Federal and state protected seabird species include threatened Newell's Shearwater or *ʻaʻo* (*Puffinus newelli*), endangered Hawaiian Petrel or *ʻuaʻu* (*Pterodroma sandwichensis*), and endangered Band-rumped Storm-Petrel or *ʻakēʻakē (Oceanodroma castro*; USFWS, 1983; Cooper and Day, 1998; Ainley et al., 2001; Day et al., 2003). USFWS advises that Hawaiian seabirds may traverse projects during the breeding, nesting and fledging seasons (March 1 to December 15). Night lights can disorient seabirds, resulting in their potential downing and harm from collision with objects and/or predation by dogs and cats if downed (Telfer, 1979; Reed et al., 1985; Telfer et al., 1987; Podolsky et. al, 1998; Mostello and Conant, 2018).

- If the Project conversion to SAH will result in additional night-time lighting sources, including lights from night-time construction, residential lighting, or street lights, then risk of incidentally downing nocturnally-flying seabirds will increase. To avoid and minimize potential project impacts to seabirds, USFWS recommend the following applicable measures: fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary; install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area; and avoid night-time construction during the seabird fledging period from September 15 through December 15 (USFWS, nd (c)). All external lighting structures should be fully "dark sky compliant" (HDLNR-DOFAW, 2016).

White Tern (*Gygis alba*), or *manu o Kū*, is another indigenous seabird listed as threatened under the State of Hawaiʻi endangered species statute, HRS 195D (HDLNR, 2015). White Tern occurs on Oʻahu (USFWS, 2005), with the majority of the population found in the Honolulu area. White Tern was not observed (or expected to occur) in the Project area, and Project conversion to SAH is not anticipated to have a deleterious impact to the species.

Mammalian Resources

Mammals observed during the survey are not native to Hawaiʻi and offer little value from an ecological perspective. With the exception of the endangered Hawaiian hoary bat, all terrestrial mammals currently found on the Island of Oʻahu are alien species, and most are ubiquitous.

The Hawaiian hoary bat is the only Endangered Species Act (ESA)-listed terrestrial mammal in the Hawaiian Islands. Due to the potentially widespread distribution and cryptic habit of Hawaiian hoary bat, a survey for this species was not conducted in the Project area. Instead, potential roost trees were noted when present. Trees suitable for Hawaiian hoary Bat roosting (woody trees over 4.5 m or 15 ft) are common in the Project area. Stands of ironwood (*Casuarina equisetifolia*) and gunpowder tree (*Trema orientalis*) grow along the limestone cliff and quarry. A large Java plum grows along Waikupanaha Street. Many other large trees occur around the occupied properties.

- If the Project conversion to SAH will result in the clearing of trees that may serve as potential bat roosts, it is recommended that no woody vegetation taller than 4.6 m (15 ft) be removed during the bat pupping season, between June 1 and September 15 (USFWS, nd (b,c)). During this period, bat pups or female bats carrying pups may be less able to rapidly vacate a roost tree that is felled.

- Use of barbed wire to top fence lines may entangle flying bats and must be avoided (Zimpfer & Bonaccorso, 2010).

Because Hawaiian hoary bat is a habitat generalists that may occupy a wide geographic home range (Bonaccorso, 2010), site conversion to SAH is not anticipated to have a deleterious impact on this species, so long as appropriate aforementioned BMPs are followed.

Jurisdictional Waters

The Project area does not contain waters that would be considered to be jurisdictional under the Clean Water Act (CWA). Remnants of ditches, presumably formerly used for irrigation, are present in the northern part of the survey area and on the northwest side of Waikupanaha Street. PVC pipes in the roadside ditch indicate irrigation water may still be transported in that ditch, but only in the pipes. The National Wetlands Inventory (NWI) Wetlands Mapper (USFW, nd (a)) and USGS topographic map (USGS, 1999) do not show aquatic features, such as streams and wetlands, in the survey area. The nearest potentially jurisdictional water, Puha Stream, is found to the west of the Project, across Waikupanaha Street and outside the Project boundary.

The delivery of water to and from the properties will be an important consideration in the conversion to Subsistence Agricultural Homesteads (SAHs). Waterways, particularly those directly connected to other waters such as Puha Stream, can transport substances generated during grading and grubbing or as run-off from agricultural plots. Effective BMPs that minimize erosion and prevent sediment run-off into ditches and streams should be employed to reduce land-based pollutants entering waterways (see above under Botanical Resources)

Critical Habitat

Federally delineated Critical Habitat is not present in Waimānalo (USFWS, nd (a)). Thus, the Project will not impinge on federally designated Critical Habitat. No equivalent designation exists under state law. No species of plants or animals currently proposed for listing or listed under either the federal or State of Hawaiʻi endangered species statutes (HDLNR 1998, 2015; USFWS, nd (b)) were recorded by this survey. Species not observed may, however, occur in the general vicinity and are discussed here.

References

Ainley, D. G, R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, in: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna. Studies in Avian Biology No. 22*. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. Pp. 108-123.

Bonaccorso, F.J. 2010. Ōpe`ape`a: Solving the puzzles of Hawaii's only bat. *Bats: Bat Conservation International*, 28: 10-12.

Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., D. F. Stotz, B. M. Winger, and K. Winker. 2018. Check-list of North American Birds (online). American Ornithological Society. http://checklist.aou.org/taxa; last accessed on February 14, 2019.

Cooper, B. A. and R. H. Day. 1998. Summer behavior and mortality of Dark-rumped Petrels and Newell's Shearwaters at power lines on Kauai. *Colonial Waterbirds*, 21(1): 11-19.

_____ and R. H. Day. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newells' Shearwaters at Power Lines on Kauai. *Colonial Waterbirds*, 21(1): 11-19.

David, R. E. and E. B. Guinther. 2012. Biological surveys conducted for the University of Hawaiʻi, College of Tropical Agriculture and Human Resources, Waimānalo Research Station Master Plan MGD Site, Koʻolau Poko District, Island of Oʻahu. Prep. for Kimura International, Inc. 23 pp.

Day, R. H., B. A. Cooper, and T. C. Telfer. 2003. Decline of Townsend's (Newell's Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. *The Auk,* 120: 669-679.

Foote, D. E., E. L. Hill, S. Nakamura, and F. Stephens. 1972. Soil survey of the Islands of Kauai, Oahu, Molokai, and Lanai, State of Hawaii. USDA, Soil Conservation Service in cooperation with Univ. Hawaii Agr. Exp. Station. U.S. Government Printing Office, Washigton, D.C.

Hawaiʻi Department of Land and Natural Resources (HDLNR). 1998. Chapter 107. Threatened and Endangered Plants. Department of Land and

Natural Resources. State of Hawai'i. Administrative Rule under Title 13. Subtitle 5, Part 1, dated March 23, 1998.

Hawai'i Department of Land and Natural Resources. 2015. Chapter 124. Indigenous Wildlife, Endangered, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife. Department of Land and Natural Resources. State of Hawaii. Administrative Rule under Title 13. Subtitle 5, Part 2, dated February 17, 2015. Exhibits dated November 1, 2014.

_____, Division of Aquatic Resources (HDLNR-DAR). 2018. Memorandum dated 12/12/2018 from Justin Goggins to Brian J. Neilson, Acting DAR Administrator. 3 pp.

_____, Division of Forestry and Wildlife (HDLNR-DOFAW). 2016. Wildlife Lighting. PDF available at URL: http://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf; last accessed on January 17, 2018.

_____, _____. 2005. Hawaii's Comprehensive Wildlife Conservation Strategy: Pueo or Hawaiian Short-eared Owl. PDF available at URL: http://dlnr.hawaii.gov/wildlife/files/2013/09/Fact-Sheet-pueo.pdf; last accessed October 1, 2018.

Imada, C. T. 2012. Hawaiian Native and Naturalized Vascular Plants Checklist (December 2012 update). *Bishop Museum Tech. Rept*. 60. 380 pp.

Mostello, A., and S. Conant. 2018. Diets of native and introduced apex predators in Hawai'i. *Pacific Conservation Biology*, 24 (1): 25-34.

Podolsky, R., D. G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kaua'i. *Colonial Waterbirds*, 21: 20-34.

Reed, J. R., J. L tel, and J. P. Hailman 1985. Light Attraction in Endangered Procellariform Birds: Reduction by Shielding Upward Radiation. *The Auk*, 102: 377-383.

Staples, G. W. and D. R. Herbst. 2005. *A Tropical Garden Flora. Plants Cultivated in the Hawaiian Islands and other Tropical Places.* Bishop Museum, Honolulu. 908 pp.

Telfer, T. C. 1979. Successful Newell's Shearwater Salvage on Kauai. *'Elepaio*, 39:71

Telfer, T. C., J. L. Sincock, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: conservation efforts and effects of moon phase. *Wildlife Soc. Bull*., 15: 406-413.

U.S. Fish & Wildlife Service (USFWS). 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.

_____. 2005. Regional Seabird Conservation Plan, Pacific Region. U.S. Fish and Wildlife Service, Migratory Birds and Habitats Program, Pacific Region, Portland, Oregon. Available online at URL: https://www.fws.gov/pacific/migratorybirds/PDF/Seabird%20Conservation%20Plan%20Complete.pdf; last accessed on July 1, 2018.

_____. no date (a). National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Available online at URL: http://www.fws.gov/wetlands/ Data/Mapper.html; last accessed on July 1, 2018.

_____. no date (b). USFWS Endangered Species. Available online at URL: https://www.fws.gov/endangered/; Last visited on June 3, 2018 and Environmental Conservation Online System (ECOS), online at URL: https://ecos.fws.gov/ecp/species-reports; last visited on June 21, 2018.

_____. no date (c). USFWS Pacific Islands Fish and Wildlife Office. Avoidance and Minimization Measures. Available online at URL: https:// https://www.fws.gov/Pacificislands/promo.cfm?id=177175840/; Last visited on January 12, 2019.

U.S. Geological Survey (USGS). 1999. NIMA 5420 I SW-Series W833, Topographic Map, Koko Head Quadrangle.

VanderWerf, E. A., R. E. David, P. Donaldson, R. May, H. D. Pratt, P. Pyle, and L. Tanino. 2018. First report of the Hawaii Bird Records Committee: records reviewed 2014 - 2016. *Western Birds*, 49(1): 2-23.

Wagner, W. L., D. R. Herbst and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i: Volume I and II*. Bishop Museum Special Publication 83. University of Hawai'i Press. 1853 pp.

_____ and _____. 1999. *Supplement to the Manual of the flowering plants of Hawai'i*, pp. 1855-1918. *In:* Wagner, W. L., D. R. Herbst, and S. H. Sohmer,

Manual of the flowering plants of Hawai'i. Revised edition. 2 vols. University of Hawaii Press and B.P. Bishop Museum.

Wilson, D. E. and D. M. Reeder (eds.). 2005. *Wilson & Reeder's Mammal Species of the World (Third Edition).* Available online at URL: http://www.departments.bucknell.edu/biology/resources/msw3/browse.asp; last visited on February 14, 2019.

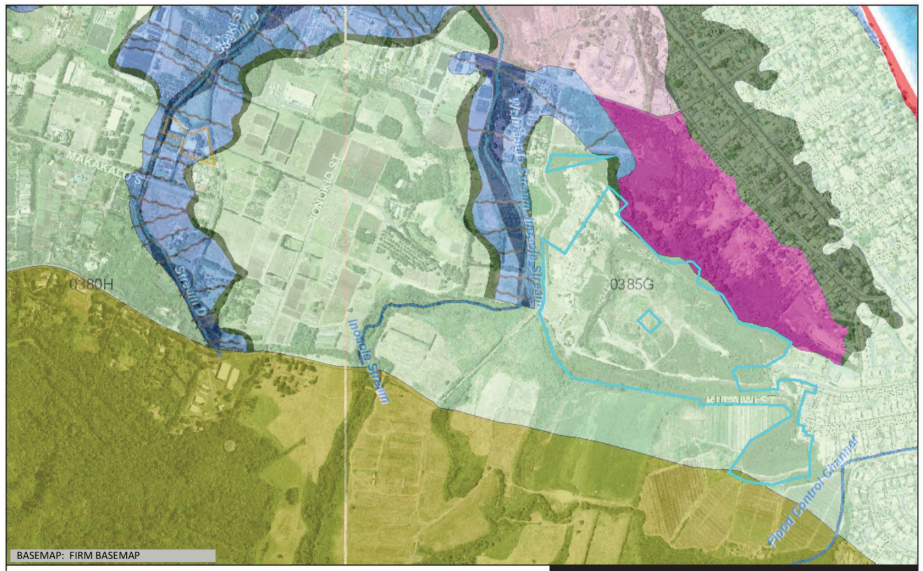
Zimpfer, J., and F. Bonaccorso. 2010. Barbed wire fences and Hawaiian hoary bats: what we know. Hawaii Conservation Conference. Honolulu, HI.

(This page intentionally left blank.)

APPENDIX F

Flood Hazard Assessment Report of Flood Hazard Information and Sea Level Rise Viewer Information

(This page intentionally left blank.)



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-1-008:002
WATERSHED:	KAHAWAI
PARCEL ADDRESS:	41-223 LUPE ST WAIMANALO, HI 96795

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0385G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011

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

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

0 600 1,200 ft

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

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

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

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

Zone A: No BFE determined.

Zone AE: BFE determined.

Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.

Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.

Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.

Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.

Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

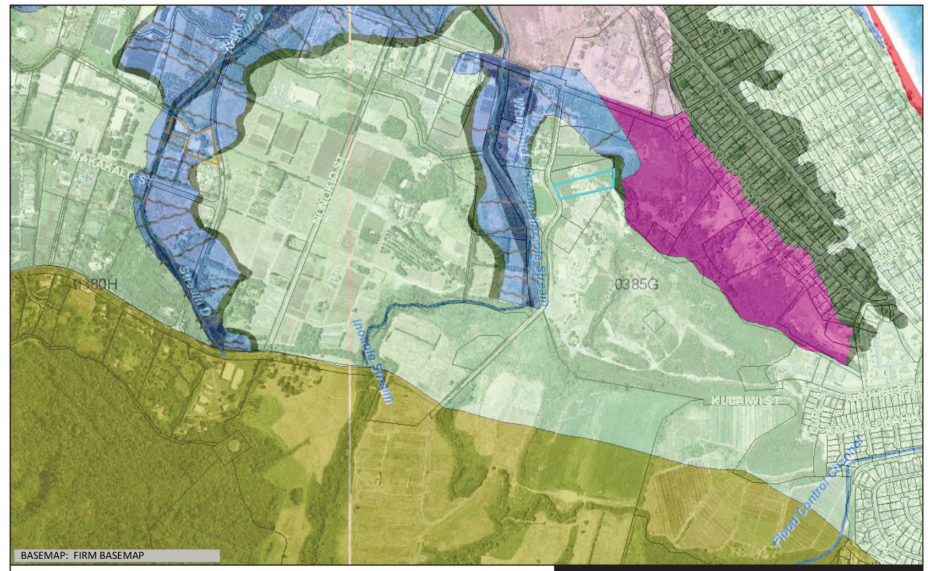
NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

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

Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

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



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-1-008:093
WATERSHED:	KAHAWAI
PARCEL ADDRESS:	41-146 WAIKUPANAHA ST WAIMANALO, HI 96795

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0385G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011

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

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

0 600 1,200 ft

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

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

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

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

Zone A: No BFE determined.

Zone AE: BFE determined.

Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.

Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.

Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.

Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.

Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

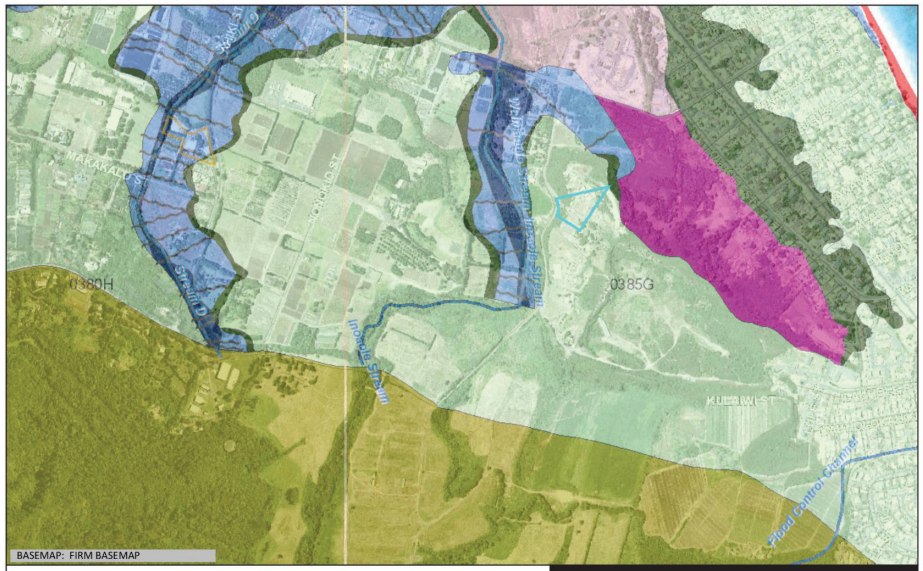
NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

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

Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

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



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-1-008:094
WATERSHED:	KAHAWAI
PARCEL ADDRESS:	UNKNOWN ADDRESS WAIMANALO, HI 96795

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0385G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011

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

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

0 600 1,200 ft

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

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

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

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

Zone A: No BFE determined.

Zone AE: BFE determined.

Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.

Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.

Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.

Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.

Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

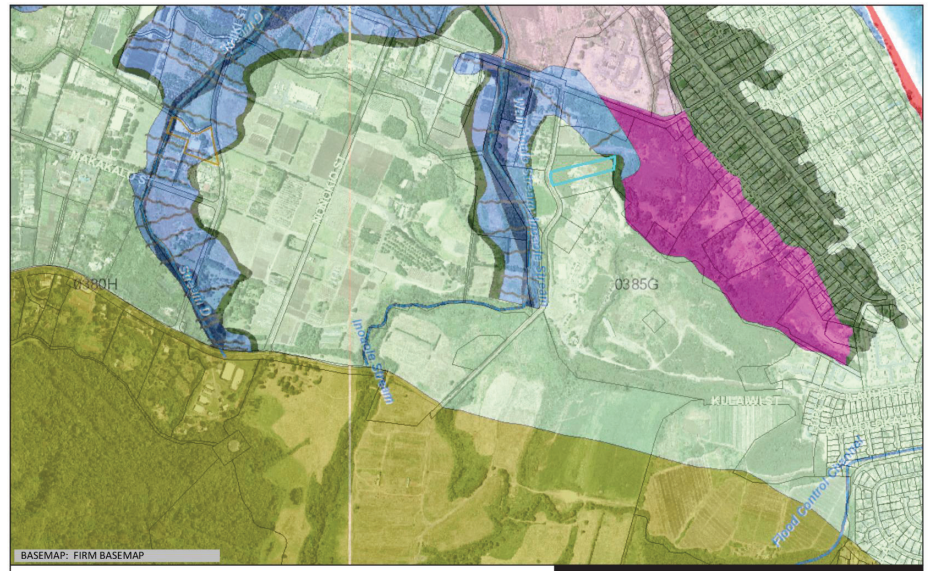
NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

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

Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

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



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-1-008:095
WATERSHED:	KAHAWAI
PARCEL ADDRESS:	41-170 A WAIKUPANAHA ST WAIMANALO, HI 96795

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0385G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011

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

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

0 600 1,200 ft

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

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

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

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

Zone A: No BFE determined.

Zone AE: BFE determined.

Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.

Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.

Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.

Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.

Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

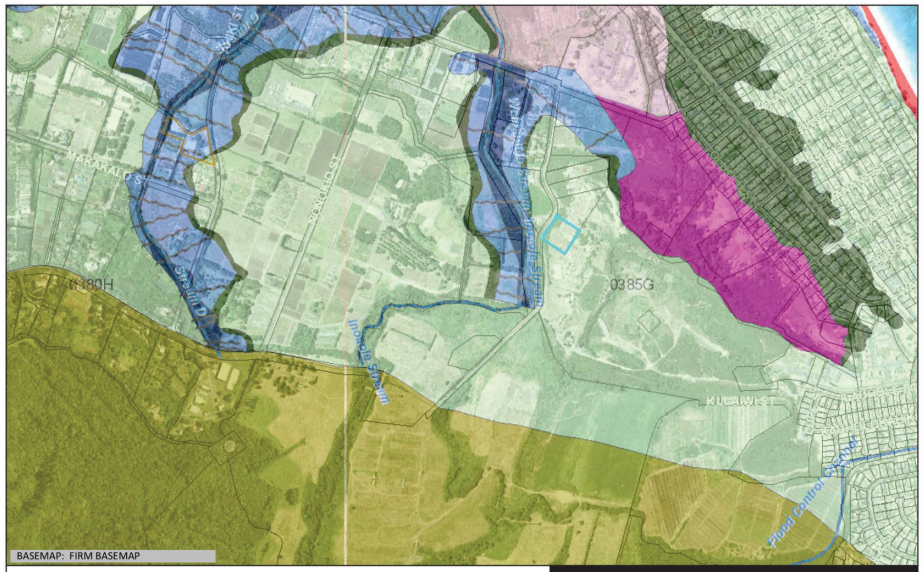
NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

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

Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

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



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-1-008:096
WATERSHED:	KAHAWAI
PARCEL ADDRESS:	UNKNOWN ADDRESS WAIMANALO, HI 96795

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0385G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011

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

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

0 600 1,200 ft

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

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

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

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

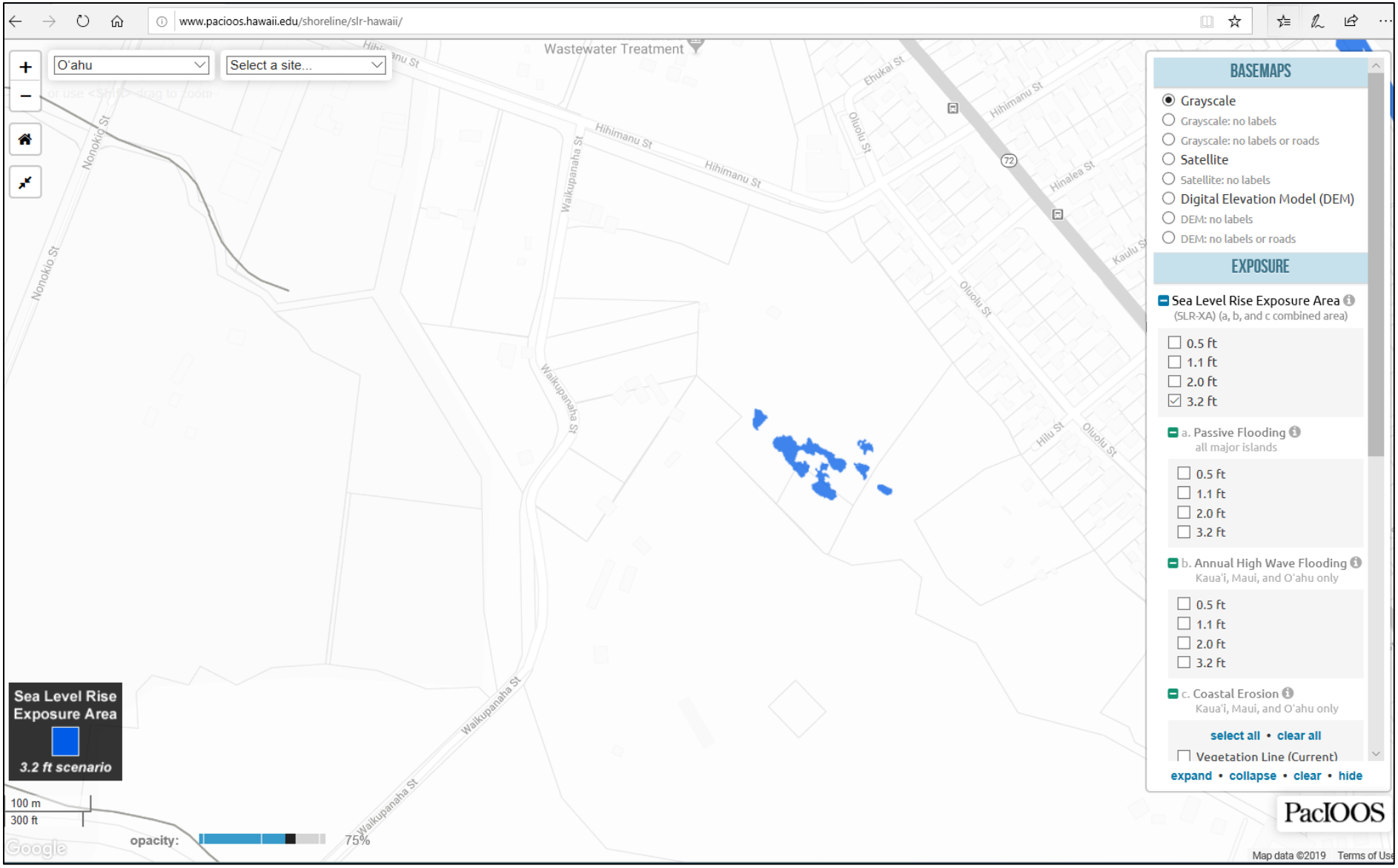
	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action);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

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

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

OTHER FLOOD AREAS

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


www.pacioos.hawaii.edu/shoreline/slr-hawaii/
O'ahu
Select a site...
Wastewater Treatment
Hihimanu St
Nonokio St
Waikupanaha St
Ehukai St
Oluolu St
Hinalea St
Kaulu St
Hiliu St
BASEMAPS
Grayscale
Grayscale: no labels
Grayscale: no labels or roads
Satellite
Satellite: no labels
Digital Elevation Model (DEM)
DEM: no labels
DEM: no labels or roads
EXPOSURE
Sea Level Rise Exposure Area
(SLR-XA) (a, b, and c combined area)
0.5 ft
1.1 ft
2.0 ft
3.2 ft
a. Passive Flooding
all major islands
0.5 ft
1.1 ft
2.0 ft
3.2 ft
b. Annual High Wave Flooding
Kaua'i, Maui, and O'ahu only
0.5 ft
1.1 ft
2.0 ft
3.2 ft
c. Coastal Erosion
Kaua'i, Maui, and O'ahu only
select all • clear all
Vegetation Line (Current)
expand • collapse • clear • hide
Sea Level Rise Exposure Area
3.2 ft scenario
100 m
300 ft
opacity:
75%
PacIOOS
Map data ©2019
Terms of Use

APPENDIX G

Traffic Impact Assessment Report by SSFM International

(This page intentionally left blank.)

FINAL

DHHL Waikupanaha development

Tax Map Key 4-1-008:002(Por.), 093-096

Traffic Impact Analysis Report

Waimanalo, Island of Oahu

September 16, 2019

Prepared for

Limtiaco Consulting Group and Department of Hawaiian Homelands (DHHL)

Prepared by

SSFM International

Table of Contents

I. PROJECT DESCRIPTION 1
II. EXISTING CONDITIONS 4
A. Geometric Configuration 4
1. Roadway Configuration 4
B. Volumes 7
1. Vehicular Volume 7
2. Bus Transit Volumes 11
3. Pedestrian and Bicycle Volumes 11
C. Level of Service 11
1. Methodology 11
2. Intersection Level of Service Results 13
III. FUTURE CONDITIONS 14
A. Surrounding Area Conditions 14
B. Volumes 14
1. Future Without Project Volumes 14
2. Project Related Volumes 14
3. Future With Project Volumes 15
C. Future Level of Service 19
1. Intersection LOS Results for Future without project conditions 19
2. Intersection LOS Results for Future With project conditions 19
3. Mitigation 20
IV. COMPLETE STREETS MEASURES 21
V. SUMMARY 23
VI. REFERENCES 24

List of Figures

Figure 1: Project Location Map 2
Figure 2: Proposed Site Plan 3
Figure 3: Existing Lane Configurations 6
Figure 4: Kalanianaole Hwy (Inoaole St and Tinker Rd), 24-Hour Volume Distribution (2016) 8
Figure 5: Kalanianaole Hwy (Waimanalo Bay State Recreation Area and Aloiloi St), 24-Hour Volume Distribution (2016) 9
Figure 6: Existing 2019 Peak Hour Volumes 10
Figure 7: Future 2022 Without Project Peak Hour Volumes 16
Figure 8: Project-Related Peak Hour Trips 17
Figure 9: Future 2022 With Project Peak Hour Volumes 18

List of Tables

Table 1: Roadway Traffic Volumes 7
Table 2: LOS Criteria for Unsignalized Intersections 12
Table 3: LOS Criteria for Signalized Intersections 12
Table 4: Existing 2019 Intersection Level of Service 13
Table 5: Estimated Trips Generated by Project 15
Table 6: Future 2022 Without Project Intersection Level of Service 19
Table 7: Future 2022 With Project Intersection Level of Service 20

List of Appendices

Appendix A – 24-Hour and Peak Period Traffic Counts
Appendix B – Bus Route Schedule and Map
Appendix C – Analysis Reports Existing (2019) Conditions
Appendix D – Analysis Reports Future (2022) Without Project Conditions
Appendix E – Analysis Reports Future (2022) With Project Conditions

I. PROJECT DESCRIPTION

The Department of Hawaiian Homelands (DHHL) is proposing to develop a 30-acre site in Waimanalo, on the Island of Oahu, Hawaii. The property is located on Waikupanaha Street, 600 feet south of its intersection with Hihimanu Street. The project site is proposed to be developed into at least 31 subsistence parcels for DHHL beneficiaries. The project will be broken up into multiple phases, and the project's complete build out and occupancy is expected by the end of 2022.

The property is zoned as "General Agriculture District (AG-2)". The project location, along with the study intersections associated with the TIAR, are shown in Figure 1. DHHL's proposed site plan is shown in Figure 2. Subsistence farming/cultivating of the land will be done on each of the proposed parcels; beneficiaries may build a dwelling on the parcel but it is not required.

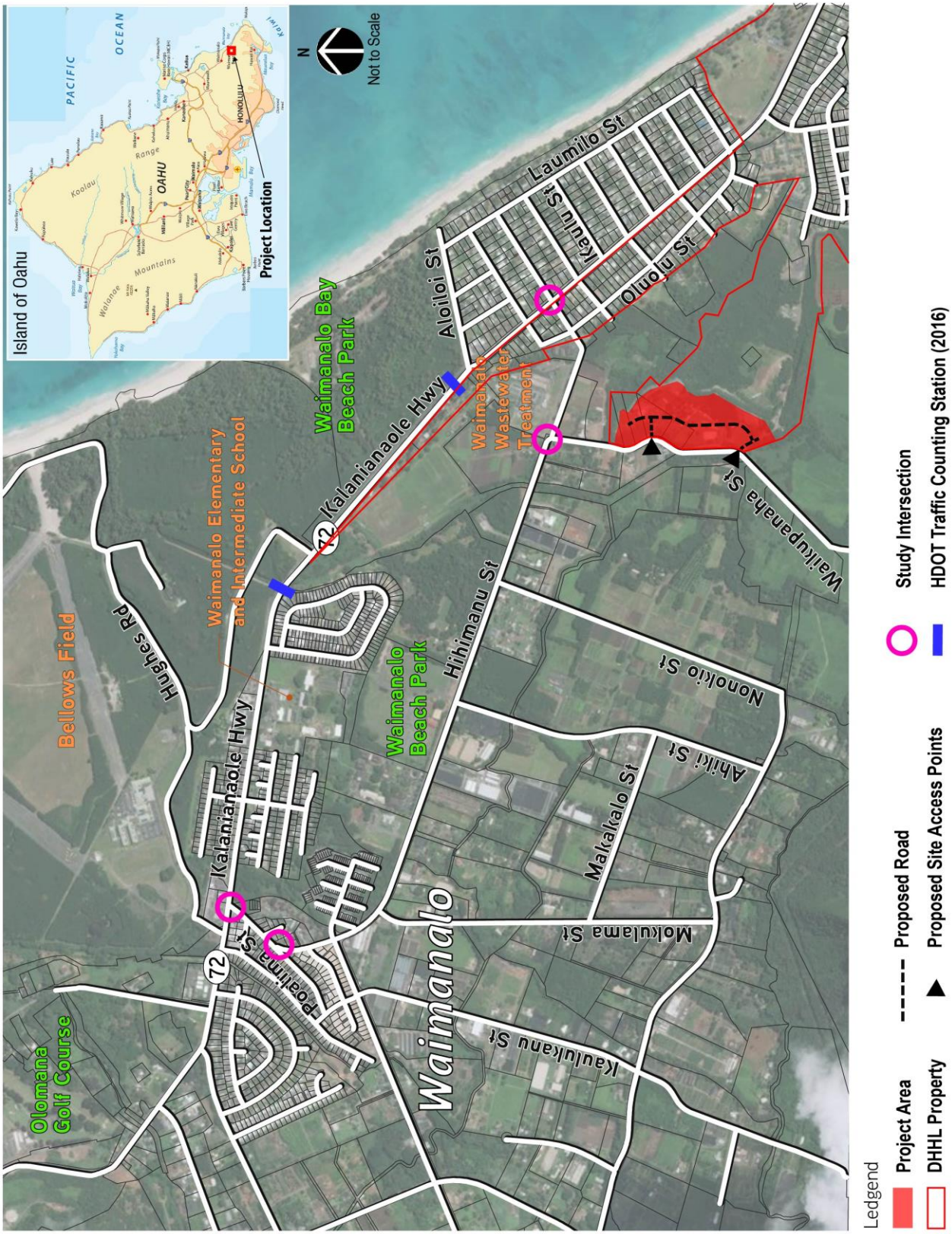


Figure 1: Project Location Map

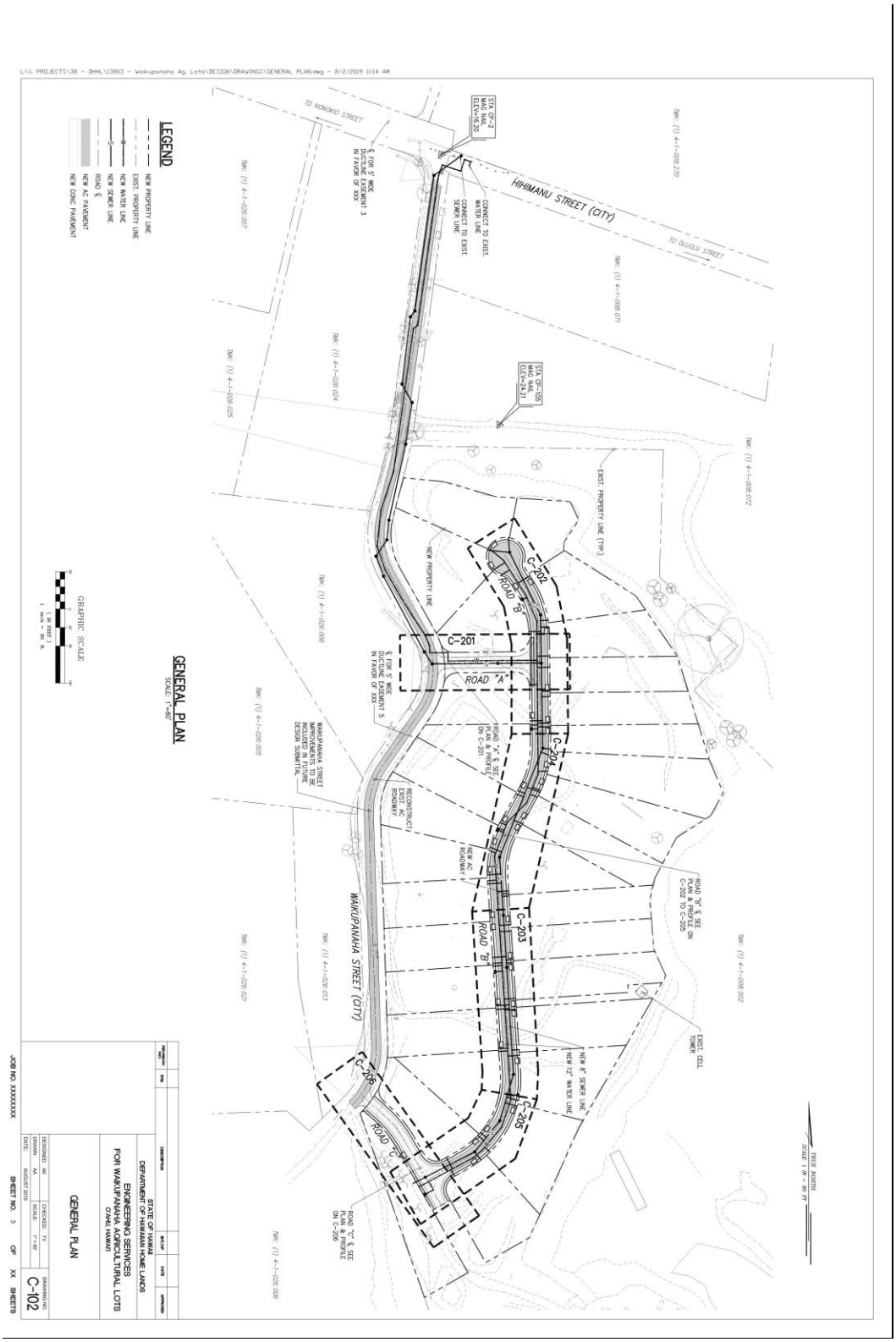


Figure 2: Proposed Site Plan

II. EXISTING CONDITIONS

A. Geometric Configuration

1. Roadway Configuration

a) Kalanianaole Highway

Kalanianaole Highway is a two-lane, State-owned roadway, designated as Route 72, classified as an urbanized principal arterial. The posted limit varies between 25 mph to 35 mph, with the lower speed limits through the residential neighborhoods and commercial areas. Kalanianaole Highway begins at the southeast end of the intersection of Route 62 with Kailua Road, extends around the east end of Oahu, and merges into Interstate H-1, spanning 18.43 miles. Kalanianaole Highway is the only route in and out of Waimanalo and Hawaii Kai communities. In the project area, on-street parking is prohibited along both sides of the street and designated shoulders vary from zero to five feet wide in the project area.

b) Hihimanu Street

Hihimanu Street is a two-lane county owned roadway. Hihimanu Street originates from Poalima Street and ends at intersection with Laumilo Street. The posted limit varies from 15 mph to 25 mph, with the lower speed limits through the residential neighborhoods. Raised sidewalk exists on the North side of the pavement on Hihimanu Street between Kakaina Street and Waimanalo District Park.

c) Waikupanaha Street

Waikupanaha Street is two lane, two-way county-owned roadway. Sidewalks are not present on either side of the road. Waikupanaha Street ends without connecting to other streets. It ends at a gate about 2000 feet south of Hihimanu Street. This 2000 foot section of Waikupanaha Street will provide access to the two planned driveways of the proposed development.

The study intersections include the following:

1. Kalanianaole Highway and Poalima Street
    a. A four-leg signalized intersection with Kalanianaole Highway oriented in an east-west direction.
    b. Dedicated left turn lanes are present for eastbound and westbound approaches. Crosswalks exist on all approaches.
    c. The north leg is the driveway of Waimanalo Town shopping center.
2. Poalima Street and Hihimanu Street
    a. A three legged Y-intersection with stop control only on one leg of Poalima Street.
    b. The right turns from Poalima Street onto Hihimanu Street and left turns from Hihimanu Street onto Poalima Street are offset from the intersection due to the tight angle, and are excluded from the analysis.
3. Hihimanu Street and Waikupanaha Street
    a. A three legged T-intersection with stop control on Waikupanaha Street.
4. Kalanianaole Highway and Hihimanu Street
    a. A four legged intersection with stop control on both approaches of Hihimanu Street

b. No dedicated turn lanes, but one crosswalk on the south leg of Kalanianaole Highway.

Existing (2019) lane configurations and traffic controls at the study intersections are shown in Figure 3.

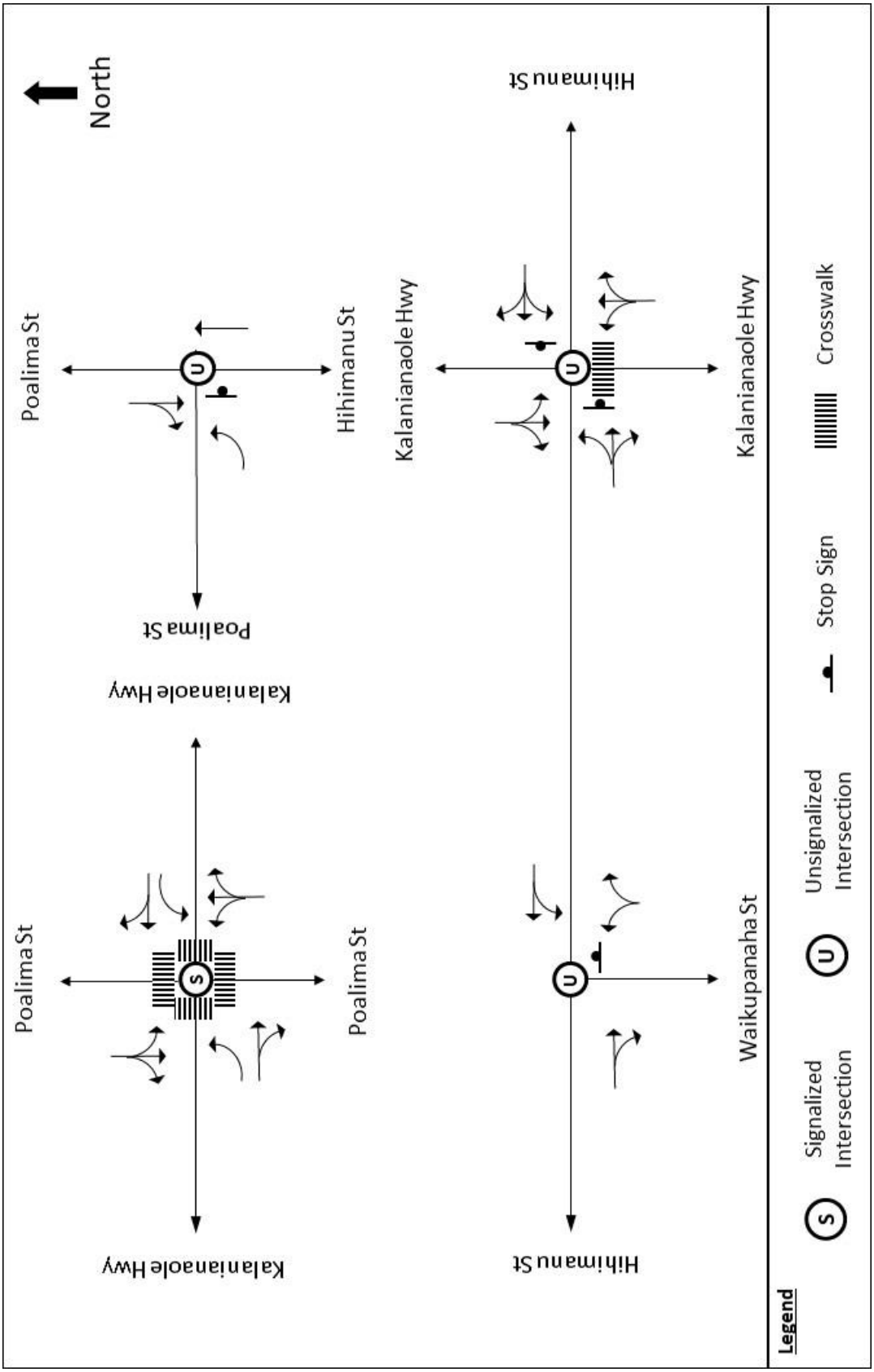


Figure 3: Existing Lane Configurations

B. Volumes

1. Vehicular Volume

a) Roadway Traffic Volumes

Average daily traffic (ADT) volumes along Kalanianaole Highway in the study area are shown in Table 1. The ADT is based on Hawaii DOT traffic counts included in *Historical Traffic Station Maps, 2016*.

Table 1: Roadway Traffic Volumes

Roadway	Location	2016 ADT
Kalanianaole Highway	Between Inoaole Street and Tinker Road	14,700
	Between Waimanalo Bay Recreation Area and Aloiloi Street	13,700

Source: *Historical Traffic Station Maps* (HDOT)

The 24-hour traffic volume distribution along Kalanianaole Highway at the traffic count station shows a variation in travel patterns throughout the day, with prominent morning and afternoon commuter peak periods. Detailed 24-hour counts are included in Appendix A.

Along Kalanianaole Highway, between Inoaole Street and Tinker Road, during the morning peak hour of 7:15 AM - 8:15 AM, there were approximately 450 vehicles travelling westbound and 440 vehicles travelling eastbound for a total of 890 vehicles. During the afternoon peak hour of 3:45 PM - 4:45 PM, there were approximately 545 vehicles travelling westbound and 529 vehicles travelling eastbound for a total of 1,074 vehicles. The 24-hr volume distribution at this location is presented in Figure 4.

Along Kalanianaole Highway, between Waimanalo Bay State Recreation Area and Aloiloi Street, during the morning peak hour of 7:15 AM - 8:15 AM, there were approximately 483 vehicles travelling westbound and 355 vehicles travelling eastbound for a total of 838 vehicles. During the afternoon peak hour of 3:30 PM - 4:30 PM, there were approximately 492 vehicles travelling westbound and 545 vehicles travelling eastbound for a total of 1,037 vehicles. The 24-hr volume distribution at this location is presented in Figure 5.

b) Intersection Peak Hour Volumes

Manual intersection turning movement traffic counts were taken at the four study intersections during the peak periods: 1) Kalanianaole Highway and Poalima Street, 2) Poalima Street and Hihimanu Street, 3) Hihimanu Street and Waikupanaha Street and 4) Kalanianaole Highway and Hihimanu Street. Counts were collected on Tuesday, May 7, 2019 and included tabulation of passenger vehicles, heavy trucks, pedestrians, and bicycles. The Existing (2019) peak hour volumes are shown in Figure 6. Detailed peak period counts are included in Appendix A.

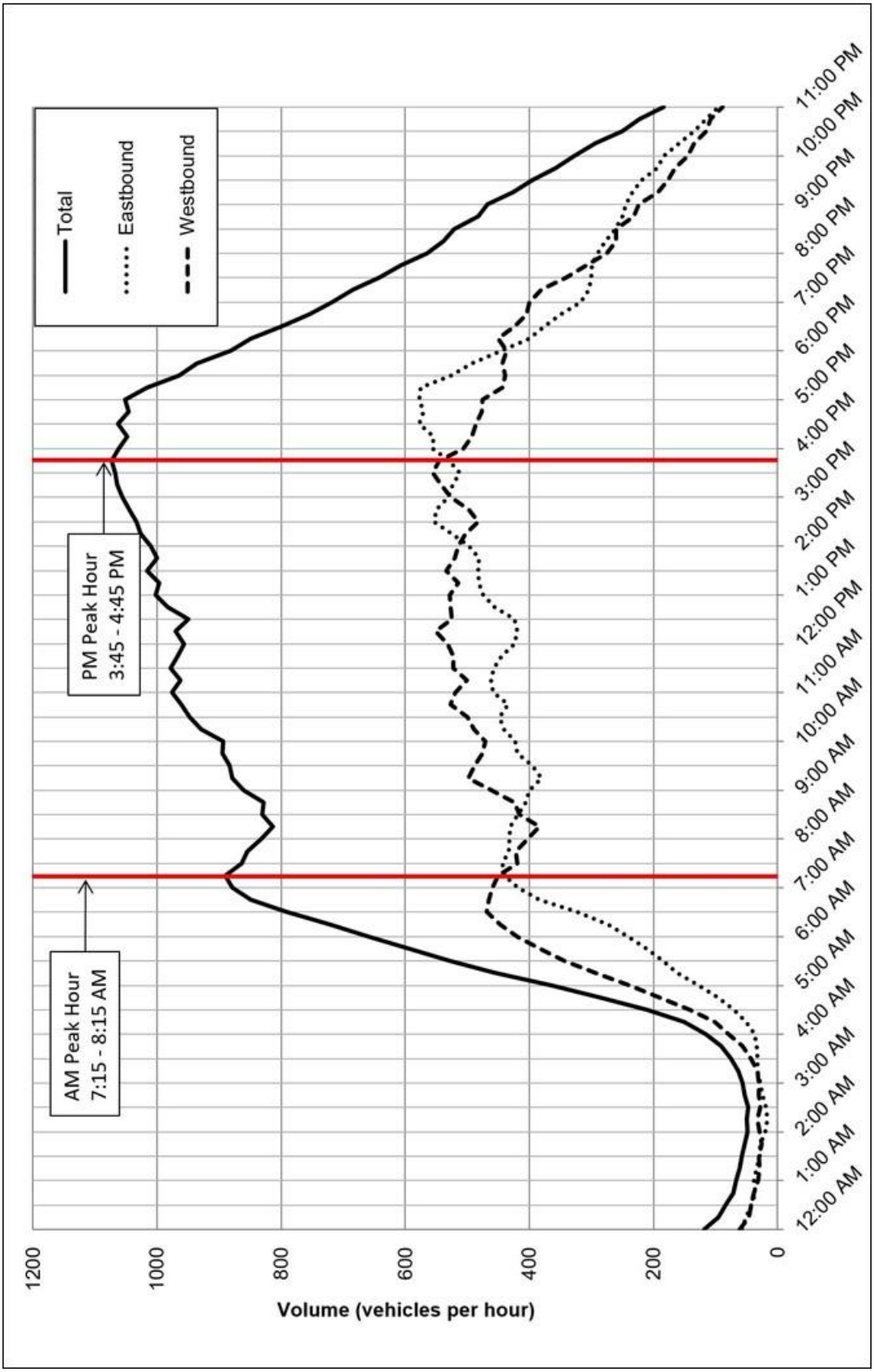


Figure 4: Kalanianaole Hwy (Inoaole St and Tinker Rd), 24-Hour Volume Distribution (2016)

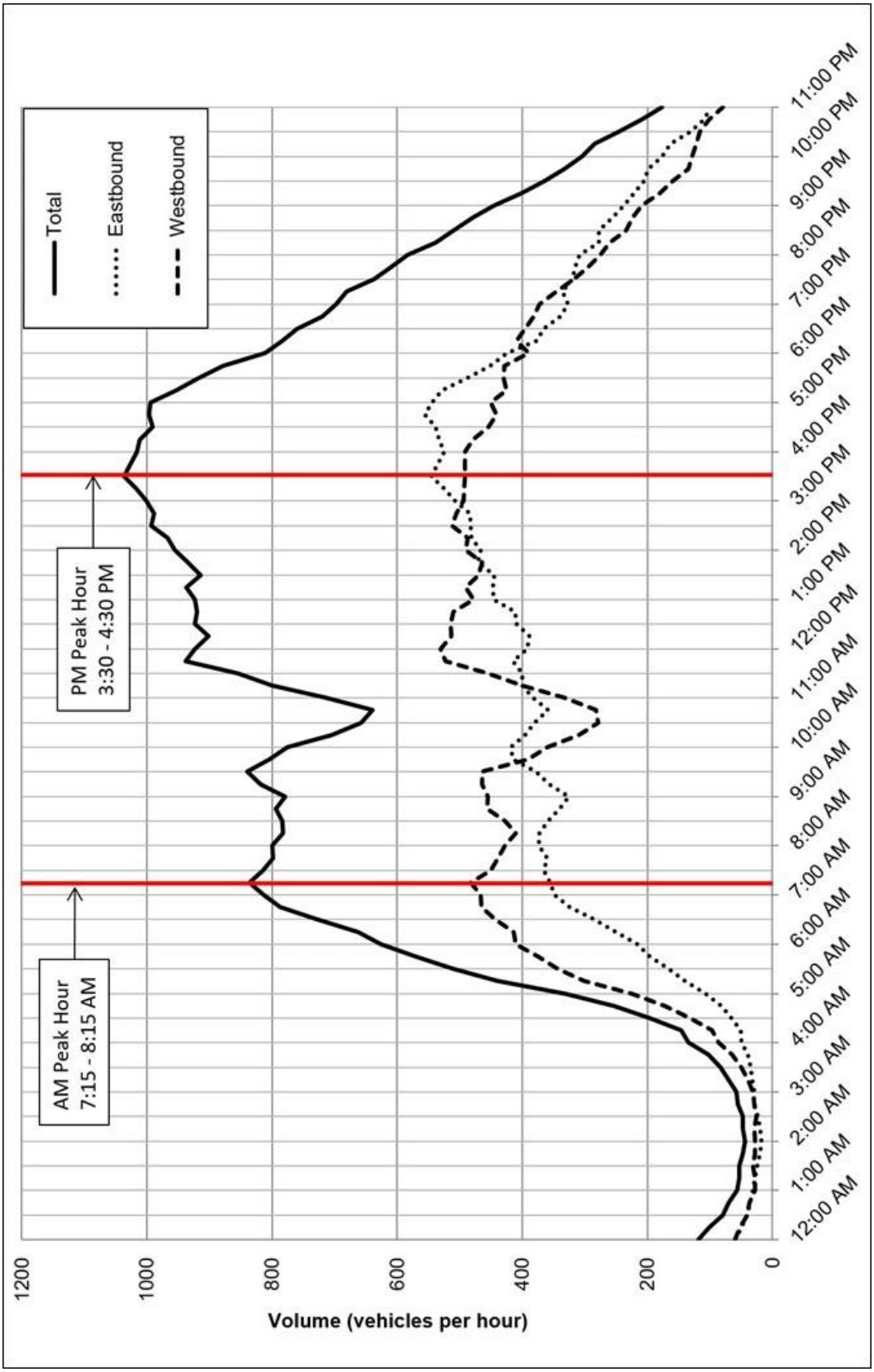


Figure 5: Kalanianaole Hwy (Waimanalo Bay State Recreation Area and Aloiloi St), 24-Hour Volume Distribution (2016)

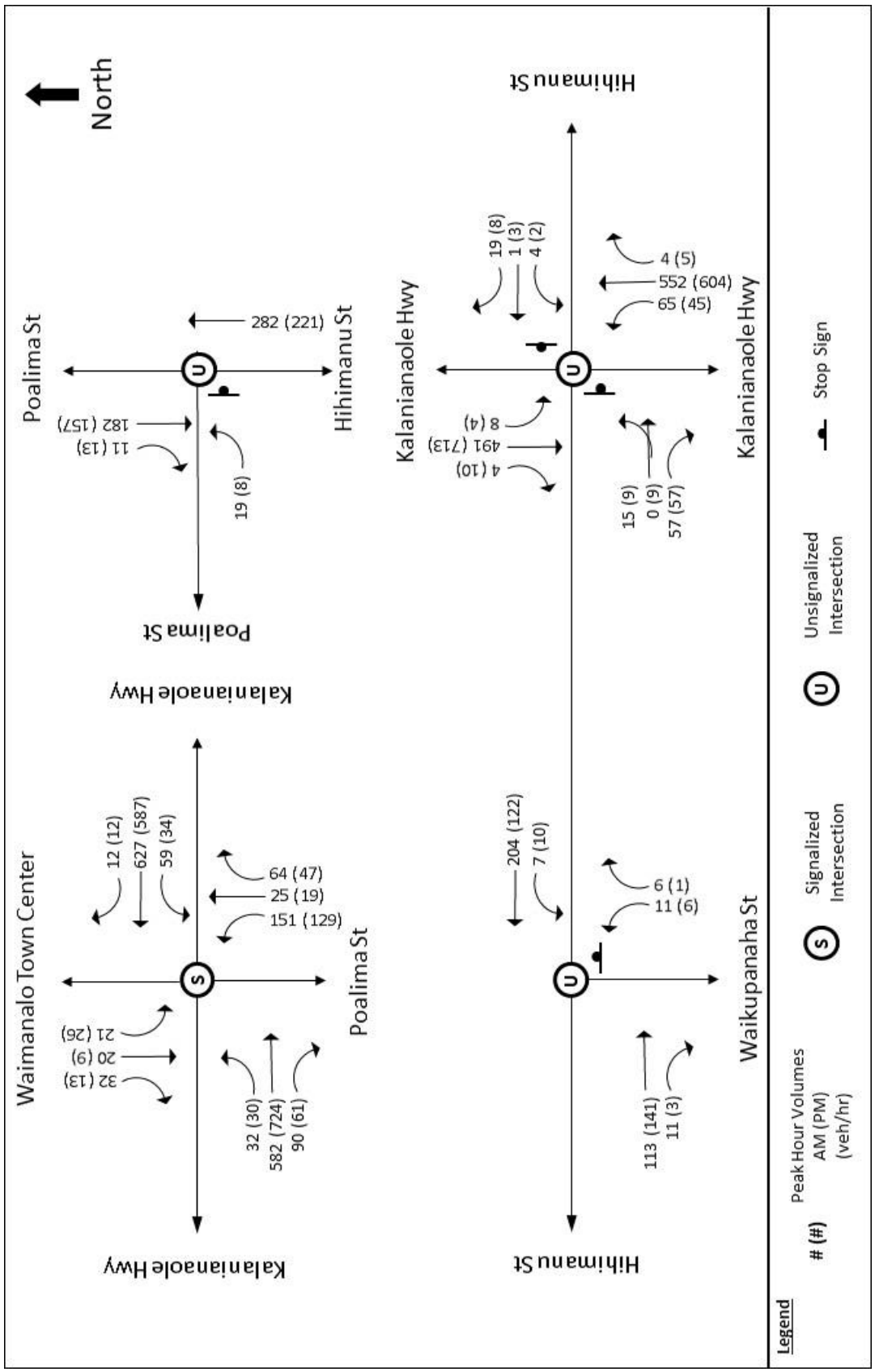


Figure 6: Existing 2019 Peak Hour Volumes

2. Bus Transit Volumes

The City and County of Honolulu bus transit service, TheBus, runs Route 57, Route 69 (former route 77) and Route 89 along Kalanianaole Highway in the project area. The closest bus stops to the proposed project site are located at intersection of Kalanianaole Highway with Hihimanu Street, 0.5 mile away from the project location. Route 57 connects Sea Life Park with Ala Moana Center via Waimanalo and Kailua. This route runs between Kailua–Waimanalo, from 4:50 AM to 11:40 PM. Route 69 (former Route 77) connects Waimanalo with Downtown Honolulu via Kailua running during weekdays only. This route runs between Kailua–Waimanalo, from 5:45 AM to 6:10 PM. Route 89 connects Waimanalo with Kaneohe via Kailua running only during weekdays. This route runs between Kailua–Waimanalo, from 5:45 AM to 6:45 AM and 4:45 PM to 5:50 PM. Appendix B includes the detailed bus route schedule and map for these routes.

3. Pedestrian and Bicycle Volumes

Sidewalks are present along Kalanianaole Highway between Poalima Street and Waimanalo Elementary and Intermediate Schools. There is notable pedestrian and bike activity near Waimanalo Elementary and Intermediate Schools. A total of 26 pedestrians and 2 bicycles were observed at the intersection of Kalanianaole Highway and Poalima Street during the AM peak hour and 23 pedestrians and 6 bicycles during the PM peak hour. At the Poalima Street and Hihimanu Street intersection, 11 pedestrians and 3 bicycles were counted during the AM peak hour, and 7 pedestrians and 6 bicycles were counted during the PM peak hour. At the Hihimanu Street and Waikupanaha Street intersection, 3 bicycles were counted during the AM peak hour, and 2 pedestrians and 8 bicycles were counted during the PM peak hour. At the Kalanianaole Highway and Hihimanu Street intersection, 23 pedestrians and 3 bicycles were counted during the AM peak hour, and 6 pedestrians were counted during the PM peak hour.

A raised sidewalk is present along the north side of Hihimanu Street from Poalima Street to Ahiki Street, providing a safe connection for foot traffic to the schools.

C. Level of Service

1. Methodology

Level of service (LOS) is an operational analysis rating system used in traffic engineering to measure the effectiveness of roadway operating conditions. There are six LOS ranging from A to F. LOS A is defined as being the least interrupted flow conditions with little or no delays, whereas LOS F is defined as conditions where extreme delays exist. Guidelines from the *Statewide Uniform Design Manual for Streets and Highways* (HDOT, 1980) and *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011) state that an appropriate peak hour LOS for an urban arterial is LOS C or D. Intersection LOS and delay were determined for the AM and PM peak hours using *Synchro 10* traffic analysis software and analyzed using *HCM* 6th Edition (TRB, 2016) methodologies.

As stated in the *Highway Capacity Manual* (*HCM*) 6th Edition (TRB, 2016), LOS for a two-way stop controlled (TWSC) intersection is determined by the measured control delay (see Table 2) *and is defined for each minor movement, not for the intersection as a whole*. Vehicles traveling along the major, free-flow road of a TWSC intersection proceed through with minimal delay or no delay at all. Those vehicles

approaching the intersection along the minor movement are controlled by a stop sign and thus experience delay attributable to the volume of vehicles passing along the free-flow road and the gaps available.

Table 2: LOS Criteria for Unsignalized Intersections

Average Control Delay (sec/veh)	LOS by v/c Ratio	
	<=1.0	>1.0
≤ 10.0	A	F
>10 and ≤15	B	F
>15 and ≤25	C	F
>25 and ≤35	D	F
>35 and ≤50	E	F
>50	F	F

Source: *HCM* (TRB, 2016)

The LOS analysis for signalized intersections is based on average total vehicle delay based on the methodologies of the *HCM* (TRB, 2016), as shown in Table 3. High numbers of vehicles passing the intersection, long cycle lengths, inappropriate signal phasing, or poor signal progression can result in long delays, and consequently poor LOS. LOS for signalized intersections can be calculated for individual movements and can also be expressed as average overall delay for the intersection as a whole.

Table 3: LOS Criteria for Signalized Intersections

Average Control Delay (sec/veh)	LOS by v/c Ratio	
	<=1.0	>1.0
≤ 10.0	A	F
>10 and ≤20	B	F
>20 and ≤35	C	F
>35 and ≤55	D	F
>55 and ≤80	E	F
>80	F	F

Source: *HCM* (TRB, 2016)

Another measure of intersection delay is the volume to capacity (v/c) ratio. This is the ratio of the volume of traffic utilizing the intersection compared to the maximum volume of vehicles that can be accommodated by the intersection during a specific period of time. A v/c ratio under 0.85 means the intersection is operating under capacity and excessive delays are not experienced. An intersection is operating near its capacity when v/c ratios range from 0.85 to 0.95. Unstable flows are expected when the v/c ratio is between 0.95 and 1.0. Any v/c ratio greater than or equal to 1.0 indicates that the intersection is operating at or above capacity which results in a LOS F. A traffic movement can have a poor LOS but low v/c which suggests that the traffic volumes along that movement are low but have to wait a long time to make the movement. This is common for low volume protected turn movements or side streets that have to wait through a long cycle length for their split to come up.

2. Intersection Level of Service Results

Existing intersection and movement LOS and average delay (in seconds per vehicle) were determined for the AM and PM weekday peak hours. The signalized intersection of Kalanianaole Highway and Poalima Street has overall intersection LOS B with all the movements LOS C or better for AM and PM peak hours, which suggests acceptable operations. All movements at the stop sign controlled intersections resulted in appropriate LOS of D or better for both AM and PM peak hours. The Levels of Service for all the movements are shown in Table 4. Detailed analysis reports are provided in Appendix C.

Table 4: Existing 2019 Intersection Level of Service

Intersection		Control	AM			PM		
Approach	**Movement**		**Delay (s)**	**v/c**	**LOS**	**Delay (s)**	**v/c**	**LOS**
Kalanianaole Hwy and Poalima St			**12.70**	**-**	**B**	**10.40**	**-**	**B**
Eastbound	**L**	**Signal**	12.80	0.09	B	8.70	0.06	A
	TR		12.00	0.71	B	9.80	0.69	A
Westbound	**L**		15.70	0.19	B	12.60	0.10	B
	TR		10.40	0.65	B	7.10	0.52	A
Northbound	**LTR**		19.20	0.58	B	20.80	0.49	C
Southbound	**LTR**		15.70	0.17	B	18.00	0.12	B
Hihimanu St and Poalima St								
Eastbound	**L**	**TWSC**	12.40	0.04	B	11.20	0.02	B
Hihimanu St and Waikupanaha St								
Westbound	**L**	**TWSC**	7.70	0.01	A	7.90	0.01	A
Northbound	**LR**		10.90	0.03	B	10.50	0.01	B
Hihimanu St and Kalanianaole Hwy								
Eastbound	**LTR**	**TWSC**	19.70	0.23	C	29.70	0.35	D
Westbound	**LTR**		18.10	0.08	C	28.90	0.08	D
Northbound	**L**		8.70	0.07	A	9.80	0.06	A
Southbound	**L**		8.70	0.01	A	8.80	0.00	A

III. FUTURE CONDITIONS

A. Surrounding Area Conditions

Waimanalo Elementary and Intermediate School

The Department of Education is planning to build a new stand-alone facility as a part of Science, Technology and Media program. This new development is not expected to increase student enrollments, thereby no additional trips are expected. The facility is expected to be ready for occupancy by spring 2020.

Kalanianaole Highway Improvements Phase 2

The State of Hawaii Department of Transportation (HDOT) proposed improvements on Kalanianaole Highway to make the highway operate more efficiently, more safely and to be more user-friendly to pedestrians and other highway users. Phase 2 improvements are proposed along a four mile stretch of the highway, from Poalima Street to the vicinity of Makai Pier, under the Federal Aid Project NH-072-1 (059). Construction work is expected to begin in early 2020 and is likely to end in late 2020/early 2021.

No other significant developments or construction projects are expected in the project area that would significantly affect the roadway geometrics or traffic volumes at the study intersections. This is based on research completed on August 2nd 2019 at the State of Hawaii Office of Environmental Quality Control (OEQC) website and the Statewide Transportation Improvements Program (STIP).

B. Volumes

1. Future Without Project Volumes

The project study area is experiencing modest, steady growth. Although no major developments are anticipated in the vicinity of DHHL's Waikupanaha proposed location, a background growth rate of 2% per year was assumed, to account for additional traffic at the study intersections. The estimated future volumes without the project for the year 2022 are shown in Figure 7.

2. Project Related Volumes

The proposed development site plan shows the 30-acre agricultural site divided into 36 subsistence agricultural lots. Each agricultural lot will include at most one dwelling unit. The trips generated due to agriculture land use[1] are minimal and most of them are internal to the development; the rest of the trips are expected to occur during non-peak hours. Hence only the trips generated due to the 36 dwelling units are included in the analysis.

Trips generated from the proposed development were estimated using nationally accepted land use rates from *Trip Generation*, 10th Edition (ITE, 2016). ITE defines Single Family Housing [210] as follows: "includes all single-family detached homes on individual lots." The analysis used dwelling unit as the independent variable to estimate new trips expected from the proposed project. The estimates for new trips generated

[1] Trips generated for agricultural land use are not listed in ITE Trip Generation Manual.

by the project are shown in Table 5.

The proposed project has two driveways connecting with Waikupanaha Street. Since Waikupanaha Street is a dead end street, residents are expected to use the driveway closer to the intersection of Waikupanaha Street and Hihimanu Street as the primary access. Hence 80% of the trips generated are included in the analysis of Driveway 1 (the closer intersection to Hihimanu Street) and 20% are included in the analysis of Driveway 2 - even though both of them will be built to the same standards. The volumes of entering and exiting vehicles were estimated and distributed according to existing traffic patterns. The resulting project-related peak hour volumes are shown in Figure 8.

Table 5: Estimated Trips Generated by Project

	AM		PM	
Land Use [ITE Code]	**Average Rate**		**Average Rate**	
Single Family Housing [210]	0.71 (X) + 4.80		0.96 (X) + 0.20	
36 Dwelling Units (X)	30		38	
	In	**Out**	**In**	**Out**
	25%	75%	63%	37%
	7	23	24	14

3. Future With Project Volumes

Project related trips were added to the Future Without Project volumes to estimate Future With Project peak hour volumes. The volumes for future with project conditions for 2022 are shown in Figure 9.

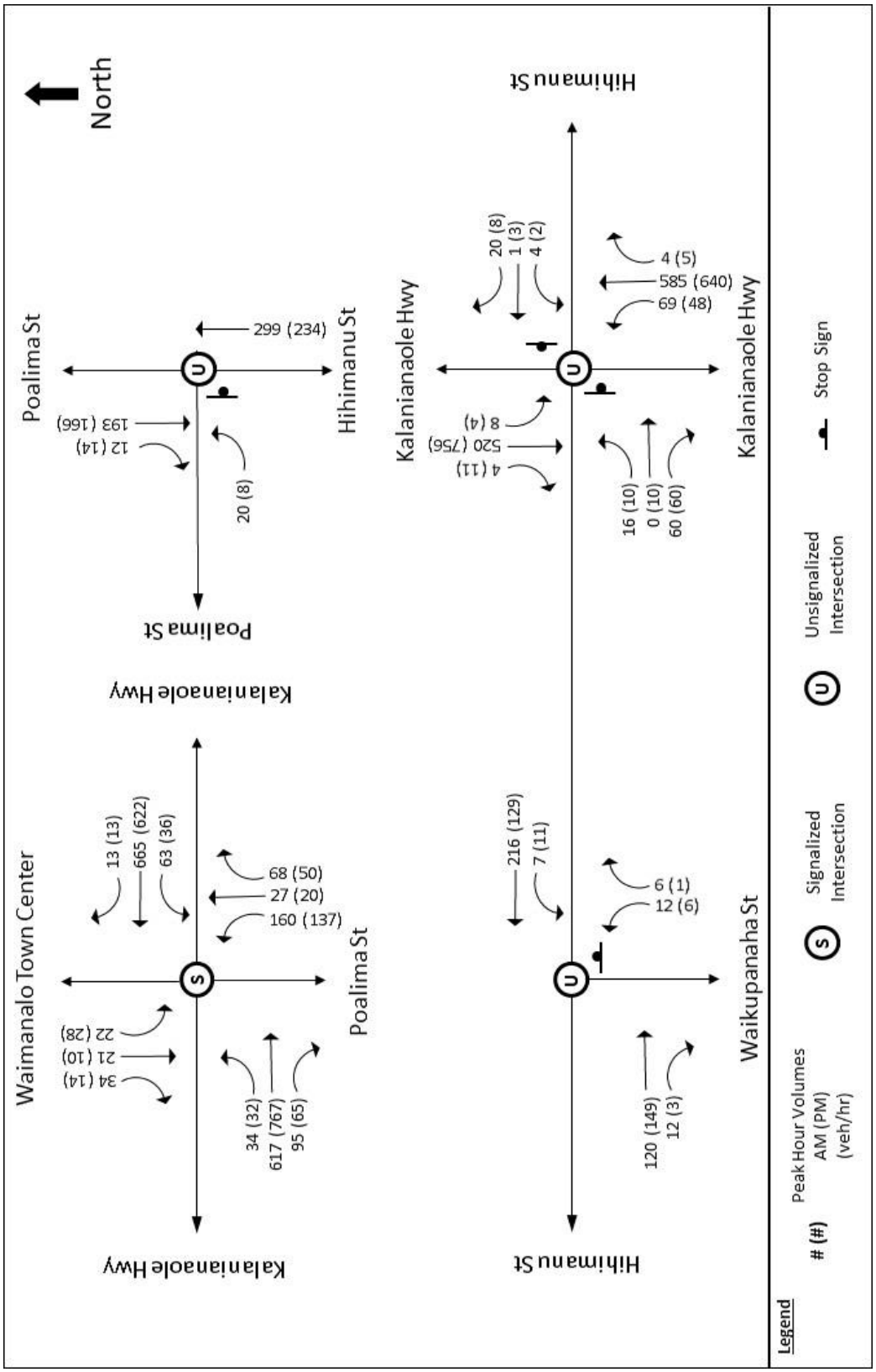


Figure 7: Future 2022 Without Project Peak Hour Volumes

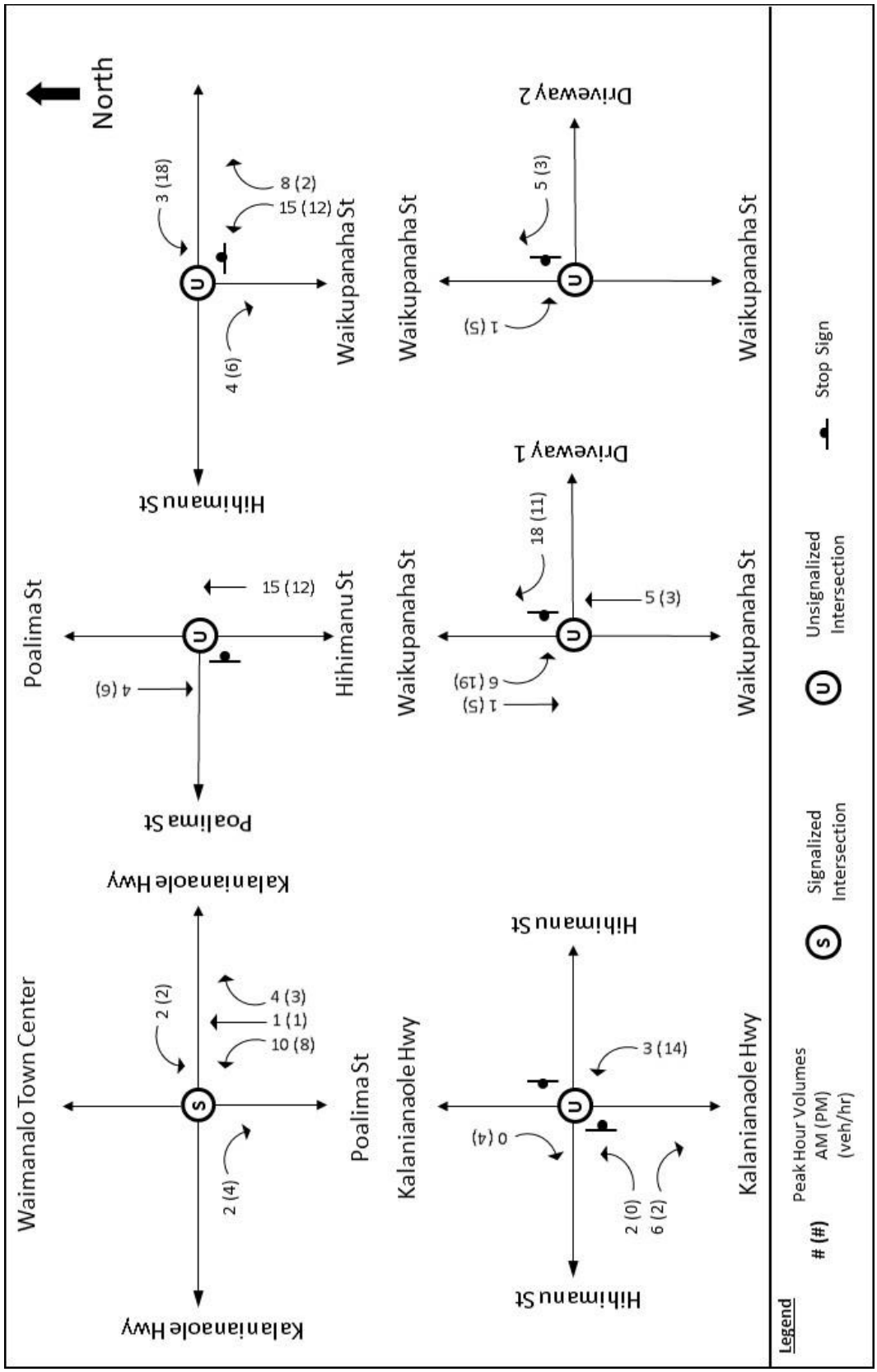


Figure 8: Project-Related Peak Hour Trips

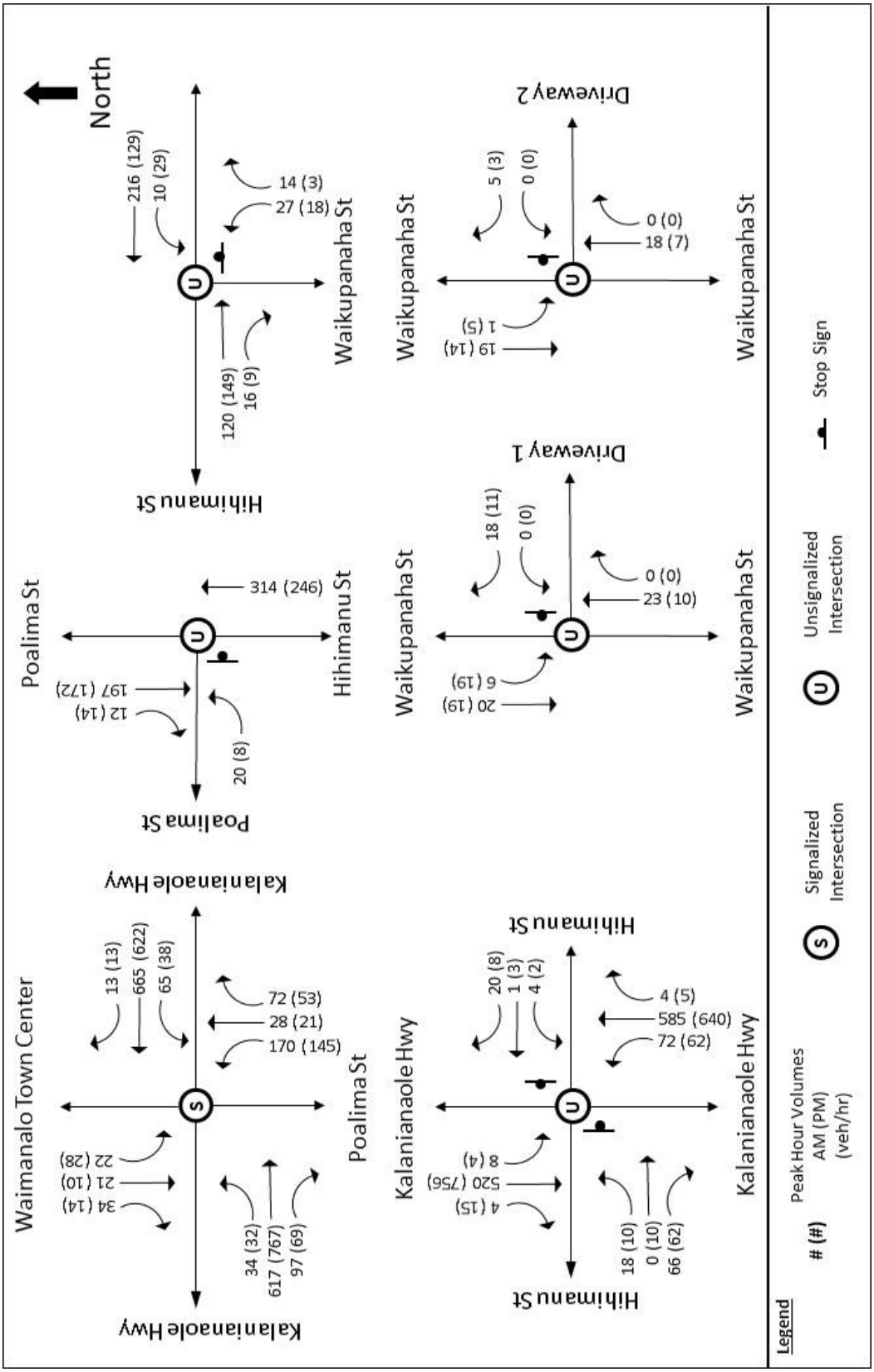


Figure 9: Future 2022 With Project Peak Hour Volumes

C. Future Level of Service

1. Intersection LOS Results for Future without project conditions

Using the Volumes from Figure 7, the Levels of Service were determined for Future 2022 Without Project. The signalized intersection of Kalanianaole Highway and Poalima Street is expected to have overall intersection LOS B with all the movements LOS C or better for AM and PM peak hours, which suggests acceptable operations. For the stop controlled intersection at Kalanianaole Highway and Hihimanu Street, during the PM peak hour, the eastbound lane is operating at LOS E and has v/c of 0.44 (< 1), due to high through volumes on Kalanianaole Highway. All other movements at the stop sign controlled intersections resulted in appropriate LOS of D or better for both AM and PM peak hours. The results are shown in Table 6. Detailed analysis reports are provided in Appendix D.

Table 6: Future 2022 Without Project Intersection Level of Service

Intersection		Control	AM			PM		
Approach	Movement		Delay (s)	v/c	LOS	Delay (s)	v/c	LOS
Kalanianaole Hwy and Poalima St			**14.30**	**-**	**B**	**11.30**	**-**	**B**
Eastbound	**L**	**Signal**	14.80	0.11	B	9.60	0.07	A
	TR		14.30	0.77	B	11.20	0.73	B
Westbound	**L**		18.70	0.23	B	14.60	0.11	B
	TR		12.00	0.70	B	7.70	0.55	A
Northbound	**LTR**		18.90	0.60	B	20.90	0.51	C
Southbound	**LTR**		15.30	0.17	B	17.90	0.12	B
Hihimanu St and Poalima St								
Eastbound	**L**	**TWSC**	12.70	0.05	B	11.40	0.02	B
Hihimanu St and Waikupanaha St								
Westbound	**L**	**TWSC**	7.70	0.01	A	7.90	0.01	A
Northbound	**LR**		11.10	0.04	B	10.70	0.01	B
Hihimanu St and Kalanianaole Hwy								
Eastbound	**LTR**	**TWSC**	21.80	0.27	C	37.40	0.44	E
Westbound	**LTR**		19.30	0.09	C	33.00	0.10	D
Northbound	**L**		8.80	0.07	A	10.00	0.07	B
Southbound	**L**		8.80	0.01	A	9.00	0.01	A

2. Intersection LOS Results for Future With project conditions

A similar analysis was performed for Future 2022 With Project conditions, using the volumes from Figure 9. The signalized intersection of Kalanianaole Highway and Poalima Street is expected to have overall intersection LOS B with all the movements LOS C or better for AM and PM peak hours, which suggests acceptable operations. For the stop controlled intersection at Kalanianaole Highway and Hihimanu Street, during the PM peak hour, the eastbound and westbound lanes are operating at LOS E and have v/c ratios of 0.46 and 0.10, respectively, due to high through volumes on Kalanianaole Highway. All other movements at the stop sign controlled intersections resulted in appropriate LOS of C or better for both

AM and PM peak hours. The results are shown in Table 7. Both proposed Driveways 1 and 2 are expected to have LOS A for all movements, even in the AM and PM peak hours. Detailed analysis reports are provided in Appendix E.

Table 7: Future 2022 With Project Intersection Level of Service

Intersection		Control	AM			PM		
Approach	Movement		Delay (s)	v/c	LOS	Delay (s)	v/c	LOS
Kalanianaole Hwy and Poalima St			**15.00**	**-**	**B**	**12.00**	**-**	**B**
Eastbound	**L**	**Signal**	15.60	0.11	B	10.20	0.07	B
	TR		15.20	0.78	B	12.70	0.77	B
Westbound	**L**		20.00	0.25	C	15.70	0.13	B
	TR		12.60	0.71	B	8.40	0.58	A
Northbound	**LTR**		19.00	0.61	B	18.80	0.50	B
Southbound	**LTR**		15.10	0.17	B	16.00	0.11	B
Hihimanu St and Poalima St								
Eastbound	**L**	**TWSC**	13.00	0.05	B	11.60	0.02	B
Hihimanu St and Waikupanaha St								
Westbound	**L**	**TWSC**	7.70	0.01	A	8.00	0.03	A
Northbound	**LR**		11.50	0.09	B	11.30	0.04	B
Hihimanu St and Kalanianaole Hwy								
Eastbound	**LTR**	**TWSC**	22.90	0.30	C	39.40	0.46	E
Westbound	**LTR**		19.60	0.10	C	35.10	0.10	E
Northbound	**L**		8.90	0.07	A	10.20	0.09	B
Southbound	**L**		8.80	0.01	A	9.00	0.01	A
Waikupanaha St and Driveway 1								
Westbound	**LR**	**TWSC**	8.50	0.02	A	8.40	0.01	A
Southbound	**L**		7.30	0.00	A	7.30	0.01	A
Waikupanaha St and Driveway 2								
Westbound	**LR**	**TWSC**	8.40	0.01	A	8.40	0.00	A
Southbound	**L**		7.30	0.00	A	7.30	0.00	A

3. Mitigation

With at most 31 dwellings, it is not expected that the new trips from the proposed development will have a significant impact on traffic. No roadway or intersection improvements will be needed to accommodate the traffic expected from the development.

IV. COMPLETE STREETS MEASURES

The State of Hawaii passed legislation in 2009 that required each county to establish a Complete Streets policy. The City and County of Honolulu has adopted a Complete Streets Design Manual to provide guidance "to plan and design streets that adhere to the legal framework established by the provision of Section 264-20.5, Hawaii Revised Statutes (Act 54 SLH 2009) and Ordinance 12-15, City and County of Honolulu."

According to Section 2.6 and Table 2-1 of the Complete Streets Design Manual, Hihimanu Street and Waikupanaha Street best fit the description of Rural Roads. "*Rural Roads are roads that are sparsely developed and connect developed areas or connect to other Rural Roads. Rural Roads often serve as farm roads. They are distinguished from highways in that they are owned and maintained by the County and generally carry much less traffic. Vehicle volumes and speeds are typically low on Rural Roads which allow for people on foot and people on bicycles to share the road. Where subdivisions are developed with neighborhoods in rural areas, the streets within them are classified as those above*.[2]" ADT counts on Hihimanu Street and Waikupanaha Street are not available, but assuming the peak hour count is 8-10% of the ADT, Hihimanu Street's estimated "Future With Project" ADT is 4000 veh/day, and Waikupanaha Street's estimated "Future With Project" ADT is around 800 veh/day.

Bicycles

The DHHL Waikupanaha development is in a rural area with sparse development. There is currently no special designation for bike traffic on Hihimanu Street or Waikupanaha Street. There is, however, an existing Bike Route on Kalanianaole Highway. The 2012 Oahu Bike Plan shows Proposed Bike Routes on Hihimanu Street (between Ahiki Street and Kalanianaole Highway) and along Ahiki Street between the south segment[3] of Waikupanaha Street and Kalanianaole Highway. (See Figure 10.) There is a Draft Oahu Bike Plan Update (2019) which shows a similar plan for Proposed Bike Routes, except the Hihimanu Street route goes further to the west, to Poalima Street all the way back up to Kalanianaole Highway.

A Bike Route is "a travel way section that has been designated as a recommended bicycle touring route and is often accompanied by signage." Probably the most applicable section for a Rural Road is the Shared Roadway. A Shared Roadway is a street in which people on bicycles ride in the same travel lanes as other traffic. Due to the low speed limits (15-25 mph) and low volumes on Hihimanu Street and Waikupanaha Street, shared roadways are appropriate bicycle treatments.

Pedestrians and crosswalks

The Complete Streets Design Manual states that Rural Roads do not have to comply with the four-zone sidewalk system, but they still need a reasonably safe place for people on foot. "This can be in in the form of a wide, paved shoulder (6-10 feet), a wide graded shoulder (min 5 feet wide), or a combination of both." Consideration should be given to providing shoulders on Waikupanaha Street for foot traffic.

[2] City and County of Honolulu Complete Streets Manual, 2016, page 27.
[3] Waikupanaha Street is disconnected/gated between the south segment and the proposed DHHL development

The existing crosswalks on Kalanianaole Highway at Hihimanu Street and Poalima Street should be maintained. In other study intersection locations, according to Figure 5-3 in the Complete Streets Design Manual, the pedestrian traffic is not expected to meet the minimum pedestrian volume threshold of 20 pedestrians per hour in any one hour, or 60 pedestrians in any consecutive 4 hour period. Therefore, no additional crosswalks are planned.

V. SUMMARY

Department of Hawaiian Homelands (DHHL) has acquired a 30 acre agriculture parcel in Waimanalo, on the island of Oahu in Hawaii. It is located on Waikupanaha Street, which connects to Hihimanu Street, which connects to Kalanianaole Highway. Two driveway accesses are planned. The 30 acre parcel will be divided into at least 31 subsistence lots for DHHL beneficiaries; each lot will include a dwelling and area for farming. The development will be broken up into multiple phases, with the full build out comprising 31 parcels. The development is expected to generate approximately 30 new trips in the AM peak hour (7 entering and 23 exiting) and 38 new trips in the PM peak hour (24 entering and 14 exiting).

Four intersections were selected for analysis. In 2019, during the existing AM and PM weekday peak hours, the signalized study intersection (Kalanianaole Highway and Poalima Street) is functioning acceptably, with overall intersection LOS B. All movements have LOS C or better. All three stop-controlled intersections (Hihimanu Street and Poalima Street, Hihimanu Street and Waikupanaha Street, and Hihimanu Street and Kalanianaole Highway) are functioning without significant delay and well under capacity. All individual movements have LOS C or better, with the exception of the Hihimanu Street eastbound and westbound approaches to Kalanianaole Highway, which have LOS D in the PM peak hour.

An annual traffic growth rate of 2% was applied to existing peak hour traffic volumes to forecast future peak hour volumes. The expected overall intersection LOS for 'Future Without Project' in 2022 is still LOS B for the signalized intersection of Kalanianaole Highway and Poalima Street during the AM and PM peak hours. All movements are expected to have LOS C or better. All three stop-controlled intersections (Hihimanu Street and Poalima Street, Hihimanu Street and Waikupanaha Street, and Hihimanu Street and Kalanianaole Highway) are expected to be functioning without significant delay and well under capacity. All individual movements are expected to have LOS C or better, with the exception of the Hihimanu Street eastbound and westbound approaches to Kalanianaole Highway, which are expected to have LOS E and D, respectively, in the PM peak hour (average delays of 37 and 33 seconds).

The expected overall intersection LOS for 'Future With Project' in 2022 is still LOS B for the signalized intersection of Kalanianaole Highway and Poalima Street during the AM and PM peak hours. All movements are expected to have LOS C or better. All three stop-controlled study intersections (Hihimanu Street and Poalima Street, Hihimanu Street and Waikupanaha Street, and Hihimanu Street and Kalanianaole Highway) are expected to be functioning without significant delay and well under capacity. The two proposed driveways will have low volumes of traffic in the AM and PM peak hours and therefore all movements are expected to be at LOS A. All individual movements are expected to have LOS C or better, with the exception of the Hihimanu Street eastbound and westbound approaches to Kalanianaole Highway, which are expected to have LOS E in the PM peak hour (average delays of 35 to 39 seconds).

It is recommended that Waikupanaha Street has a wide shoulder or a sidewalk so that pedestrians have safe accommodations.

VI. REFERENCES

American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Highways and Streets*, 2011.

Institute of Transportation Engineers. *Trip Generation, 10th Edition: An ITE Informational Report*, September, 2017.

Office of Environmental Quality Control. *EA and EIS Online Library*, Accessed August 2019. <http://oeqc.doh.hawaii.gov/default.aspx>.

State of Hawaii, Department of Transportation. *Federal-Aid Functional Classification Update: Policy and Procedures*, December, 2012.

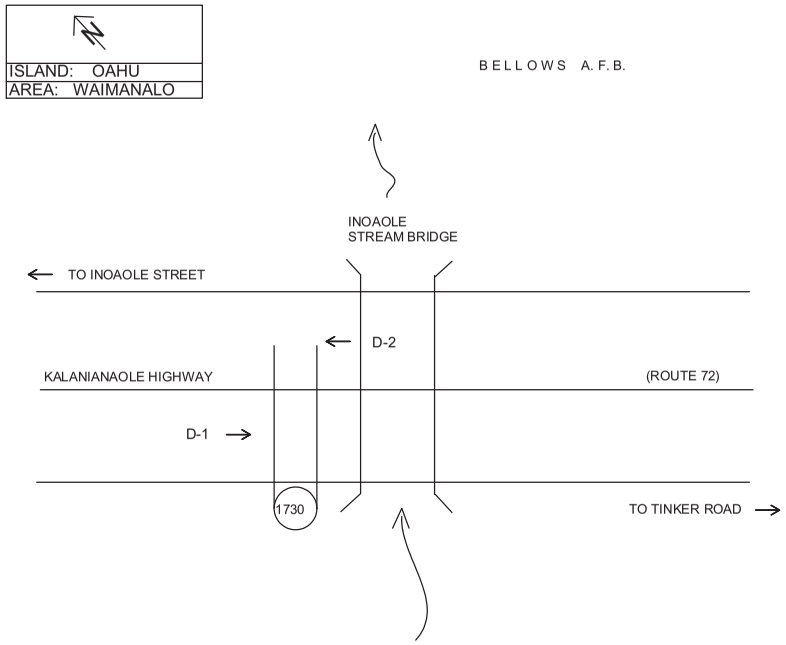
State of Hawaii, Department of Transportation. *Historical Traffic Station Maps,* 2016.

State of Hawaii, Department of Transportation. *Statewide Transportation Improvements Program*, Accessed August 2019. <http://hawaii.gov/dot/highways/STIP>.

State of Hawaii, Department of Transportation. *Statewide Uniform Design Manual for Streets and Highways*, 1980.

Transportation Research Board, National Research Council. *Highway Capacity Manual*, Washington, D.C., 6th Edition.

APPENDIX A
24-Hour and Peak Hour Traffic Counts



Station No:	B72 0072 00388		
Station Location:			
Kalanianaole Highway bet Inoaole St & Tinker Rd (rd to Bellows Airfield)			
Station Mileage:	3.99	GPS Coord (Latitude):	21.34574 N
		GPS Coord (Longitude):	157.71095 W
Begin Survey (Date/Time):	5-16-16 0000	End Survey (Date/Time):	5-19-16 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	Field Crew	Module No.:	

HPMS DATA

Segment Description:

KALANIANAOLE HIGHWAY - BEGINNING OF 12' LANES TO ROAD TO BELLOWS A.F.B. (ADT CHANGE)

Segment Begin LRS	3.88	Segment End LRS	4.08	Length	0.20

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile		
						D-1 = Direction to End of Route	
						D-2 = Direction to Beginning of Route	
KALANIANAOLE HIGHWAY	S	14	3	72	3.99	D-1	TO AINAKOA AVENUE
						D-2	TO KAILUA ROAD

Sketch By: GN Date: 2/2/2005 SLD: 2003

Run Date: 2017/07/19

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**
2016 Program Count - Summary

Site ID: B72007200388 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 14700
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 72
Location: Kalanianaole Hwy btwn Inoaole St _Tinker Rd (Rd to Bellows Airfield)

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 05/17/2016															
12:00-12:15	19	20	39	06:00-06:15	57	87	144	12:00-12:15	117	125	242	06:00-06:15	122	104	226
12:15-12:30	20	15	35	06:15-06:30	57	107	164	12:15-12:30	115	157	272	06:15-06:30	94	123	217
12:30-12:45	11	17	28	06:30-06:45	61	113	174	12:30-12:45	91	146	237	06:30-06:45	105	105	210
12:45-01:00	11	10	21	06:45-07:00	72	131	203	12:45-01:00	109	132	241	06:45-07:00	111	92	203
01:00-01:15	5	7	12	07:00-07:15	104	127	231	01:00-01:15	115	141	256	07:00-07:15	72	114	186
01:15-01:30	10	4	14	07:15-07:30	106	139	245	01:15-01:30	114	119	233	07:15-07:30	81	103	184
01:30-01:45	4	12	16	07:30-07:45	134	106	240	01:30-01:45	139	141	280	07:30-07:45	78	96	174
01:45-02:00	11	3	14	07:45-08:00	124	104	228	01:45-02:00	116	114	230	07:45-08:00	80	89	169
02:00-02:15	7	5	12	08:00-08:15	118	108	226	02:00-02:15	102	138	240	08:00-08:15	64	87	151
02:15-02:30	5	8	13	08:15-08:30	103	106	209	02:15-02:30	112	141	253	08:15-08:30	82	54	136
02:30-02:45	3	6	9	08:30-08:45	130	110	240	02:30-02:45	122	124	246	08:30-08:45	81	58	139
02:45-03:00	3	6	9	08:45-09:00	125	88	213	02:45-03:00	123	126	249	08:45-09:00	57	59	116
03:00-03:15	5	10	15	09:00-09:15	106	90	196	03:00-03:15	139	126	265	09:00-09:15	58	59	117
03:15-03:30	8	5	13	09:15-09:30	92	133	225	03:15-03:30	136	114	250	09:15-09:30	63	59	122
03:30-03:45	8	5	13	09:30-09:45	98	119	217	03:30-03:45	124	139	263	09:30-09:45	67	38	105
03:45-04:00	5	9	14	09:45-10:00	91	139	230	03:45-04:00	127	146	273	09:45-10:00	46	68	114
04:00-04:15	7	12	19	10:00-10:15	92	125	217	04:00-04:15	144	140	284	10:00-10:15	49	33	82
04:15-04:30	11	14	25	10:15-10:30	120	120	240	04:15-04:30	118	142	260	10:15-10:30	39	34	73
04:30-04:45	10	20	30	10:30-10:45	129	89	218	04:30-04:45	132	116	248	10:30-10:45	43	26	69
04:45-05:00	10	28	38	10:45-11:00	89	131	220	04:45-05:00	148	97	245	10:45-11:00	39	38	77
05:00-05:15	22	33	55	11:00-11:15	115	163	278	05:00-05:15	122	136	258	11:00-11:15	28	35	63
05:15-05:30	28	61	89	11:15-11:30	123	119	242	05:15-05:30	150	123	273	11:15-11:30	20	30	50
05:30-05:45	43	72	115	11:30-11:45	121	141	262	05:30-05:45	136	114	250	11:30-11:45	23	21	44
05:45-06:00	43	84	127	11:45-12:00	128	107	235	05:45-06:00	143	104	247	11:45-12:00	25	14	39

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:00 AM to 08:00 AM		
AM - PEAK HR VOLUME	468	476	944
AM - K FACTOR (%)			6.20
AM - D (%)	49.58	50.42	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM	06:30 AM to 07:30 AM	
AM - PEAK HR VOLUME	482	510	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM		
PM - PEAK HR VOLUME	513	567	1080
PM - K FACTOR (%)			7.09
PM - D (%)	47.50	52.50	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:45 PM to 05:45 PM	03:30 PM to 04:30 PM	
PM - PEAK HR VOLUME	556	567	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	487	530	1017
AM - K FACTOR (%)			6.68
AM - D (%)	47.89	52.11	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM		
PM - PEAK HR VOLUME	513	567	1080
PM - K FACTOR (%)			7.09
PM - D (%)	47.50	52.50	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	11:00 AM to 12:00 PM		
PEAK HR VOLUME	487	530	1017
DIRECTIONAL PEAK			
PEAK HR TIME	11:15 AM to 12:15 PM	12:15 PM to 01:15 PM	
PEAK HR VOLUME	489	576	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,495	2,802	5,297
AM 12-HR PERIOD (00:00-12:00)	2,804	3,268	6,072
PM 6-HR PERIOD (12:00-18:00)	2,994	3,101	6,095
PM 12-HR PERIOD (12:00-24:00)	4,521	4,640	9,161
24 HOUR PERIOD	7,325	7,908	15,233
D (%)	48.09	51.91	100.00

Run Date: 2017/07/19

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**
2016 Program Count - Summary

Site ID: B72007200388 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 14700
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 72
Location: Kalanianaole Hwy btwn Inoaole St _Tinker Rd (Rd to Bellows Airfield)

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 05/18/2016															
12:00-12:15	24	15	39	06:00-06:15	56	92	148	12:00-12:15	106	131	237	06:00-06:15	142	77	219
12:15-12:30	18	7	25	06:15-06:30	45	103	148	12:15-12:30	103	142	245	06:15-06:30	116	128	244
12:30-12:45	15	13	28	06:30-06:45	65	105	170	12:30-12:45	109	115	224	06:30-06:45	104	130	234
12:45-01:00	6	15	21	06:45-07:00	68	98	166	12:45-01:00	96	114	210	06:45-07:00	94	112	206
01:00-01:15	14	7	21	07:00-07:15	74	108	182	01:00-01:15	99	153	252	07:00-07:15	102	94	196
01:15-01:30	11	11	22	07:15-07:30	95	115	210	01:15-01:30	114	128	242	07:15-07:30	81	96	177
01:30-01:45	8	8	16	07:30-07:45	114	104	218	01:30-01:45	125	125	250	07:30-07:45	80	102	182
01:45-02:00	10	8	18	07:45-08:00	84	116	200	01:45-02:00	126	133	259	07:45-08:00	62	105	167
02:00-02:15	4	5	9	08:00-08:15	104	107	211	02:00-02:15	125	130	255	08:00-08:15	82	81	163
02:15-02:30	7	9	16	08:15-08:30	107	88	195	02:15-02:30	118	144	262	08:15-08:30	71	68	139
02:30-02:45	6	6	12	08:30-08:45	95	103	198	02:30-02:45	139	113	252	08:30-08:45	75	73	148
02:45-03:00	3	11	14	08:45-09:00	80	91	171	02:45-03:00	151	109	260	08:45-09:00	67	68	135
03:00-03:15	1	8	9	09:00-09:15	114	89	203	03:00-03:15	144	119	263	09:00-09:15	64	79	143
03:15-03:30	8	3	11	09:15-09:30	91	124	215	03:15-03:30	149	131	280	09:15-09:30	57	62	119
03:30-03:45	11	10	21	09:30-09:45	104	111	215	03:30-03:45	132	126	258	09:30-09:45	67	37	104
03:45-04:00	8	9	17	09:45-10:00	103	114	217	03:45-04:00	109	149	258	09:45-10:00	66	44	110
04:00-04:15	7	9	16	10:00-10:15	88	131	219	04:00-04:15	125	135	260	10:00-10:15	52	42	94
04:15-04:30	6	16	22	10:15-10:30	93	116	209	04:15-04:30	143	132	275	10:15-10:30	51	55	106
04:30-04:45	11	24	35	10:30-10:45	122	116	238	04:30-04:45	158	128	286	10:30-10:45	40	26	66
04:45-05:00	10	34	44	10:45-11:00	111	113	224	04:45-05:00	142	122	264	10:45-11:00	52	34	86
05:00-05:15	19	32	51	11:00-11:15	100	129	229	05:00-05:15	145	112	257	11:00-11:15	23	19	42
05:15-05:30	28	49	77	11:15-11:30	105	139	244	05:15-05:30	157	136	293	11:15-11:30	22	21	43
05:30-05:45	31	67	98	11:30-11:45	103	119	222	05:30-05:45	139	111	250	11:30-11:45	20	17	37
05:45-06:00	37	73	110	11:45-12:00	119	120	239	05:45-06:00	158	114	272	11:45-12:00	27	19	46

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM		
AM - PEAK HR VOLUME	397	442	839
AM - K FACTOR (%)			5.59
AM - D (%)	47.32	52.68	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM	07:00 AM to 08:00 AM	
AM - PEAK HR VOLUME	409	443	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:30 PM to 05:30 PM		
PM - PEAK HR VOLUME	602	498	1100
PM - K FACTOR (%)			7.33
PM - D (%)	54.73	45.27	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:30 PM to 05:30 PM	03:45 PM to 04:45 PM	
PM - PEAK HR VOLUME	602	544	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	10:30 AM to 11:30 AM		
AM - PEAK HR VOLUME	438	497	935
AM - K FACTOR (%)			6.23
AM - D (%)	46.84	53.16	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:30 PM to 05:30 PM		
PM - PEAK HR VOLUME	602	498	1100
PM - K FACTOR (%)			7.33
PM - D (%)	54.73	45.27	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	02:00 PM to 03:00 PM		
PEAK HR VOLUME	533	496	1029
DIRECTIONAL PEAK			
PEAK HR TIME	02:00 PM to 03:00 PM	01:00 PM to 02:00 PM	
PEAK HR VOLUME	533	539	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,240	2,651	4,891
AM 12-HR PERIOD (00:00-12:00)	2,543	3,100	5,643
PM 6-HR PERIOD (12:00-18:00)	3,112	3,052	6,164
PM 12-HR PERIOD (12:00-24:00)	4,729	4,641	9,370
24 HOUR PERIOD	7,272	7,741	15,013
D (%)	48.44	51.56	100.00

Run Date: 2017/07/19

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section

Vehicle Classification Data Summary
2016

Site ID: B72007200388 **Route No:** 72 **Date From:** 2016/05/17 0:00
Town: Oahu **Direction:** +MP **Date To:** 2016/05/18 23:45
Location: Kalanianaole Hwy btwn Inoaole St _Tinker Rd (Rd to Bellows Airfield)

Functional Classification: 14 URBAN:PRINCIPAL ARTERIAL - OTHER
REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	420	1.39%	841
PC	23000	76.04%	46000
2A-4T	4058	13.42%	8116
LIGHT VEHICLE TOTALS	27478	90.85%	54957
HEAVY VEHICLES			
Bus	1406	4.65%	3515
SINGLE UNIT TRUCK			
2A-6T	842	2.78%	1684
3A-SU	109	0.36%	327
4A-SU	5	0.02%	20
SINGLE-TRAILER TRUCKS			
4A-ST	305	1.01%	1220
5A-ST	23	0.08%	115
6A-ST	2	0.01%	12
MULTI-TRAILER TRUCKS			
5A-MT	67	0.22%	335
6A-MT	1	0.00%	6
7A-MT	9	0.03%	63
HEAVY VEHICLE TOTALS	2769	9.15%	7297
CLASSIFIED VEHICLES TOTALS	30247 (A)	100.00%	62254 (B)
UNCLASSIFIED VEHICLES TOTALS	-1	-0.00%	

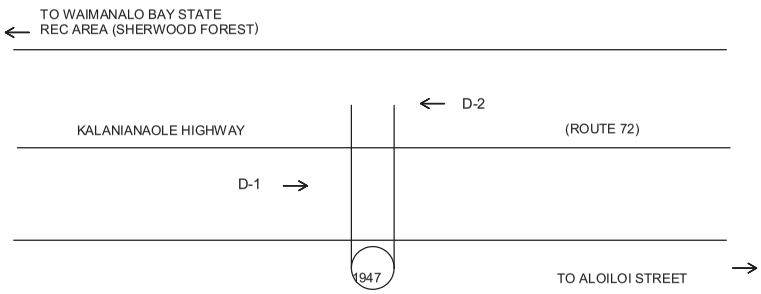
AXLE CORRECTION FACTOR (A/C) = 0.972

ROADTUBE EQUIVALENT(B/2) = 31127 (C)

PEAK HOUR VOLUME : 1085 2016/05/18 16:00	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
SINGLE UNIT TRUCKS (TYPE 4-7)	88	(65A-1) 8.11%	1181	14700	(65A-2) 8.03%	7.38%
COMBINATION (TYPE 8-13)	19	(65B-1) 1.75%	203		(65B-2) 1.38%	7.38%

ISLAND: OAHU
AREA: WAIMANALO

WAIMANALO BAY STATE
REC AREA (SHERWOOD FOREST)



Station No:	B72 0072 00434		
Station Location:	Kalanianaole Highway bet rd to Waimanalo Bay Rec area & Aloiloi Street		
Station Mileage:	4.49	GPS Coord (Latitude):	21.342239 N
		GPS Coord (Longitude):	157.706417 W
Begin Survey (Date/Time):	5-16-16 0000	End Survey (Date/Time):	5-19-16 0000
Survey Method:	LOOP **HOSE** OTHER	Survey Type:	VOL **CLASS** SPEED OTHER
Survey Crew:	Field Crew	Module No.:	

HPMS DATA
Segment Description:
KALANIANAOLE HIGHWAY - BELLOWS AFB MAIN GATE TO WAILEA STREET

Segment Begin LRS	4.34	Segment End LRS	4.58	Length	0.24

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile		D-1 = Direction to End of Route / D-2 = Direction to Beginning of Route
KALANIANAOLE HIGHWAY	S	14	3	72	4.49	D-1	TO AINAKOA AVENUE
						D-2	TO KAILUA ROAD

Sketch By: EPJ Date: 1/10/2012 SLD: 2009

Run Date: 2017/07/19

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**

2016 Program Count - Summary

Site ID: B72007200434 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 13700
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 72
Location: Kalanianaole Hwy btwn Rd to Waimanalo Bay Rec area _Aloiloi St

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 05/17/2016															
12:00-12:15	13	21	34	06:00-06:15	42	99	141	12:00-12:15	95	121	216	06:00-06:15	120	82	202
12:15-12:30	19	12	31	06:15-06:30	41	101	142	12:15-12:30	80	131	211	06:15-06:30	97	121	218
12:30-12:45	15	11	26	06:30-06:45	50	97	147	12:30-12:45	106	127	233	06:30-06:45	115	105	220
12:45-01:00	14	15	29	06:45-07:00	58	114	172	12:45-01:00	71	137	208	06:45-07:00	85	76	161
01:00-01:15	9	10	19	07:00-07:15	73	90	163	01:00-01:15	106	106	212	07:00-07:15	76	120	196
01:15-01:30	8	8	16	07:15-07:30	83	137	220	01:15-01:30	116	138	254	07:15-07:30	91	86	177
01:30-01:45	10	9	19	07:30-07:45	108	111	219	01:30-01:45	114	128	242	07:30-07:45	76	94	170
01:45-02:00	4	6	10	07:45-08:00	83	118	201	01:45-02:00	129	104	233	07:45-08:00	73	76	149
02:00-02:15	5	7	12	08:00-08:15	67	134	201	02:00-02:15	103	128	231	08:00-08:15	86	84	170
02:15-02:30	0	4	4	08:15-08:30	96	89	185	02:15-02:30	111	111	222	08:15-08:30	77	79	156
02:30-02:45	5	6	11	08:30-08:45	82	109	191	02:30-02:45	127	120	247	08:30-08:45	76	62	138
02:45-03:00	5	3	8	08:45-09:00	95	104	199	02:45-03:00	118	140	258	08:45-09:00	69	51	120
03:00-03:15	4	5	9	09:00-09:15	107	111	218	03:00-03:15	114	111	225	09:00-09:15	54	56	110
03:15-03:30	6	4	10	09:15-09:30	98	98	196	03:15-03:30	94	142	236	09:15-09:30	65	45	110
03:30-03:45	10	8	18	09:30-09:45	78	141	219	03:30-03:45	139	111	250	09:30-09:45	52	42	94
03:45-04:00	6	7	13	09:45-10:00	93	105	198	03:45-04:00	151	97	248	09:45-10:00	51	41	92
04:00-04:15	15	19	34	10:00-10:15	117	114	231	04:00-04:15	138	129	267	10:00-10:15	46	29	75
04:15-04:30	10	19	29	10:15-10:30	95	119	214	04:15-04:30	135	125	260	10:15-10:30	46	41	87
04:30-04:45	11	23	34	10:30-10:45	122	76	198	04:30-04:45	128	110	238	10:30-10:45	48	33	81
04:45-05:00	17	27	44	10:45-11:00	97	139	236	04:45-05:00	126	116	242	10:45-11:00	38	33	71
05:00-05:15	15	29	44	11:00-11:15	84	124	208	05:00-05:15	145	100	245	11:00-11:15	30	22	52
05:15-05:30	22	60	82	11:15-11:30	92	141	233	05:15-05:30	129	118	247	11:15-11:30	20	22	42
05:30-05:45	32	54	86	11:30-11:45	101	97	198	05:30-05:45	132	111	243	11:30-11:45	22	11	33
05:45-06:00	43	79	122	11:45-12:00	106	126	232	05:45-06:00	129	116	245	11:45-12:00	24	10	34

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2		PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM			PM - PEAK HR TIME	03:30 PM to 04:30 PM		
AM - PEAK HR VOLUME	341	500	841	PM - PEAK HR VOLUME	563	462	1025
AM - K FACTOR (%)			5.93	PM - K FACTOR (%)			7.23
AM - D (%)	40.55	59.45	100.00	PM - D (%)	54.93	45.07	100.00
DIRECTIONAL PEAK				DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM	07:15 AM to 08:15 AM		PM - PEAK HR TIME	03:30 PM to 04:30 PM	04:00 PM to 05:00 PM	
AM - PEAK HR VOLUME	354	500		PM - PEAK HR VOLUME	563	480	

AM PERIOD (00:00-12:00)				PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	10:00 AM to 11:00 AM			PM - PEAK HR TIME	03:30 PM to 04:30 PM		
AM - PEAK HR VOLUME	431	448	879	PM - PEAK HR VOLUME	563	462	1025
AM - K FACTOR (%)			6.20	PM - K FACTOR (%)			7.23
AM - D (%)	49.03	50.97	100.00	PM - D (%)	54.93	45.07	100.00

NON-COMMUTER PERIOD (09:00-15:00)				6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
TWO DIRECTIONAL PEAK				AM 6-HR PERIOD (06:00-12:00)	2,068	2,694	4,762
PEAK HR TIME	01:15 PM to 02:15 PM			AM 12-HR PERIOD (00:00-12:00)	2,366	3,140	5,506
PEAK HR VOLUME	462	498	960	PM 6-HR PERIOD (12:00-18:00)	2,836	2,877	5,713
DIRECTIONAL PEAK				PM 12-HR PERIOD (12:00-24:00)	4,373	4,298	8,671
PEAK HR TIME	01:45 PM to 02:45 PM	12:00 PM to 01:00 PM		24 HOUR PERIOD	6,739	7,438	14,177
PEAK HR VOLUME	470	516		D (%)	47.53	52.47	100.00

Run Date: 2017/07/19

Hawaii Department of Transportation
Highways Division **Highways Planning Survey Section**

2016 Program Count - Summary

Site ID: B72007200434 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 13700
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 72
Location: Kalanianaole Hwy btwn Rd to Waimanalo Bay Rec area _Aloiloi St

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 05/18/2016															
12:00-12:15	21	8	29	06:00-06:15	46	107	153	12:00-12:15	120	145	265	06:00-06:15	137	90	227
12:15-12:30	13	24	37	06:15-06:30	60	89	149	12:15-12:30	99	135	234	06:15-06:30	92	112	204
12:30-12:45	11	14	25	06:30-06:45	70	95	165	12:30-12:45	104	138	242	06:30-06:45	98	98	196
12:45-01:00	11	12	23	06:45-07:00	63	117	180	12:45-01:00	106	127	233	06:45-07:00	100	93	193
01:00-01:15	7	4	11	07:00-07:15	82	123	205	01:00-01:15	102	123	225	07:00-07:15	88	89	177
01:15-01:30	5	3	8	07:15-07:30	91	113	204	01:15-01:30	106	130	236	07:15-07:30	76	122	198
01:30-01:45	5	10	15	07:30-07:45	89	122	211	01:30-01:45	99	129	228	07:30-07:45	83	81	164
01:45-02:00	11	4	15	07:45-08:00	86	116	202	01:45-02:00	119	96	215	07:45-08:00	89	73	162
02:00-02:15	4	6	10	08:00-08:15	100	113	213	02:00-02:15	107	127	234	08:00-08:15	95	72	167
02:15-02:30	5	14	19	08:15-08:30	99	95	194	02:15-02:30	107	114	221	08:15-08:30	59	74	133
02:30-02:45	2	8	10	08:30-08:45	104	102	206	02:30-02:45	139	125	264	08:30-08:45	74	67	141
02:45-03:00	6	6	12	08:45-09:00	102	107	209	02:45-03:00	119	111	230	08:45-09:00	79	58	137
03:00-03:15	9	10	19	09:00-09:15	59	101	160	03:00-03:15	126	139	265	09:00-09:15	68	70	138
03:15-03:30	6	7	13	09:15-09:30	69	119	188	03:15-03:30	125	134	259	09:15-09:30	68	56	124
03:30-03:45	11	11	22	09:30-09:45	70	128	198	03:30-03:45	131	121	252	09:30-09:45	55	68	123
03:45-04:00	4	7	11	09:45-10:00	76	104	180	03:45-04:00	134	132	266	09:45-10:00	59	39	98
04:00-04:15	5	13	18	10:00-10:15	110	115	225	04:00-04:15	135	119	254	10:00-10:15	46	39	85
04:15-04:30	7	14	21	10:15-10:30	114	99	213	04:15-04:30	124	149	273	10:15-10:30	53	21	74
04:30-04:45	18	26	44	10:30-10:45	99	48	147	04:30-04:45	121	122	243	10:30-10:45	46	27	73
04:45-05:00	15	29	44	10:45-11:00	78	8	86	04:45-05:00	139	113	252	10:45-11:00	29	34	63
05:00-05:15	7	25	32	11:00-11:15	98	5	103	05:00-05:15	144	122	266	11:00-11:15	34	31	65
05:15-05:30	25	43	68	11:15-11:30	88	14	102	05:15-05:30	140	106	246	11:15-11:30	16	27	43
05:30-05:45	29	76	105	11:30-11:45	78	32	110	05:30-05:45	154	94	248	11:30-11:45	27	19	46
05:45-06:00	39	83	122	11:45-12:00	118	122	240	05:45-06:00	112	132	244	11:45-12:00	23	13	36

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2		PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM			PM - PEAK HR TIME	03:30 PM to 04:30 PM		
AM - PEAK HR VOLUME	366	464	830	PM - PEAK HR VOLUME	524	521	1045
AM - K FACTOR (%)			5.95	PM - K FACTOR (%)			7.50
AM - D (%)	44.10	55.90	100.00	PM - D (%)	50.14	49.86	100.00
DIRECTIONAL PEAK				DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	06:45 AM to 07:45 AM		PM - PEAK HR TIME	04:45 PM to 05:45 PM	03:00 PM to 04:00 PM	
AM - PEAK HR VOLUME	405	475		PM - PEAK HR VOLUME	577	526	

AM PERIOD (00:00-12:00)				PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM			PM - PEAK HR TIME	03:30 PM to 04:30 PM		
AM - PEAK HR VOLUME	366	464	830	PM - PEAK HR VOLUME	524	521	1045
AM - K FACTOR (%)			5.95	PM - K FACTOR (%)			7.50
AM - D (%)	44.10	55.90	100.00	PM - D (%)	50.14	49.86	100.00

NON-COMMUTER PERIOD (09:00-15:00)				6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
TWO DIRECTIONAL PEAK				AM 6-HR PERIOD (06:00-12:00)	2,049	2,194	4,243
PEAK HR TIME	11:45 AM to 12:45 PM			AM 12-HR PERIOD (00:00-12:00)	2,325	2,651	4,976
PEAK HR VOLUME	441	540	981	PM 6-HR PERIOD (12:00-18:00)	2,912	2,983	5,895
DIRECTIONAL PEAK				PM 12-HR PERIOD (12:00-24:00)	4,506	4,456	8,962
PEAK HR TIME	01:45 PM to 02:45 PM	12:00 PM to 01:00 PM		24 HOUR PERIOD	6,831	7,107	13,938
PEAK HR VOLUME	472	545		D (%)	49.01	50.99	100.00

Run Date: 2017/07/19

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section

Vehicle Classification Data Summary
2016

Site ID:	B72007200434	**Route No:**	72	**Date From:**	2016/05/17 0:00
Town:	Oahu	**Direction:**	+MP	**Date To:**	2016/05/18 23:45
Location:	Kalanianaole Hwy btwn Rd to Waimanalo Bay Rec area _Aloiloi St				

Functional Classification: 14 URBAN:PRINCIPAL ARTERIAL - OTHER

REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	315	1.12%	630
PC	24088	85.68%	48176
2A-4T	1604	5.71%	3208
LIGHT VEHICLE TOTALS	26007	92.50%	52014
HEAVY VEHICLES			
Bus	1123	3.99%	2807
SINGLE UNIT TRUCK			
2A-6T	591	2.10%	1182
3A-SU	97	0.35%	291
4A-SU	2	0.01%	8
SINGLE-TRAILER TRUCKS			
4A-ST	235	0.84%	940
5A-ST	11	0.04%	55
6A-ST	2	0.01%	12
MULTI-TRAILER TRUCKS			
5A-MT	41	0.15%	205
6A-MT	2	0.01%	12
7A-MT	4	0.01%	28
HEAVY VEHICLE TOTALS	2108	7.50%	5540
CLASSIFIED VEHICLES TOTALS	28115 (A)	100.00%	57554 (B)
UNCLASSIFIED VEHICLES TOTALS	0	0.00%	

AXLE CORRECTION FACTOR (A/C) = 0.977

ROADTUBE EQUIVALENT(B/2) = 28777 (C)

PEAK HOUR VOLUME : 1042 2016/05/18 15:00	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
SINGLE UNIT TRUCKS (TYPE 4-7)	80	(65A-1) 7.68%	906	13700	(65A-2) 6.61%	7.61%
COMBINATION (TYPE 8-13)	9	(65B-1) 0.86%	147		(65B-2) 1.07%	7.61%

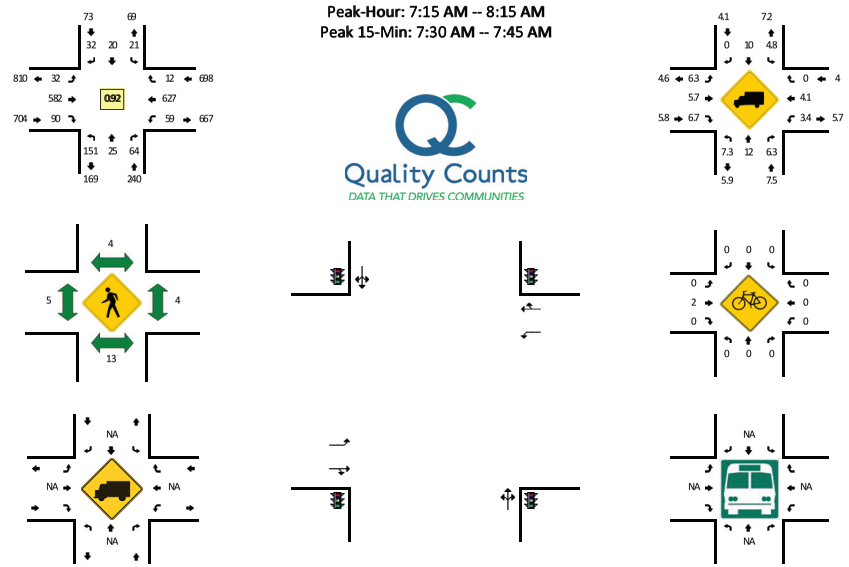
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Poalima St -- Kalaniana'ole Hwy
CITY/STATE: Waimanalo, HI

QC JOB #: 14952901
DATE: Wed, May 8 2019

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



15-Min Count Period Beginning At	Poalima St (Northbound)				Poalima St (Southbound)				Kalaniana'ole Hwy (Eastbound)				Kalaniana'ole Hwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	32	5	9	0	2	6	6	0	7	118	14	0	7	162	7	0	375	
7:15 AM	37	7	7	0	8	6	6	0	8	144	21	0	8	176	3	0	431	
7:30 AM	36	6	17	0	7	2	12	0	6	169	25	0	14	165	6	0	465	
7:45 AM	39	5	22	0	1	9	6	0	9	155	22	0	23	140	0	0	431	1702
8:00 AM	39	7	18	0	5	3	8	0	9	114	22	0	14	146	3	0	388	1715
8:15 AM	33	6	10	0	6	3	7	0	9	121	18	0	7	173	2	0	395	1679
8:30 AM	40	2	4	0	2	4	3	0	1	125	20	0	3	129	6	0	339	1553
8:45 AM	25	8	7	0	5	2	5	0	10	112	24	0	3	143	8	0	352	1474

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	144	24	68	0	28	8	48	0	24	676	100	0	56	660	24	0	1860
Heavy Trucks	12	0	4		4	0	0		0	36	0		0	16	0		72
Pedestrians		0				4				8				8			20
Bicycles	0	0	0		0	0	0		0	2	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:02 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

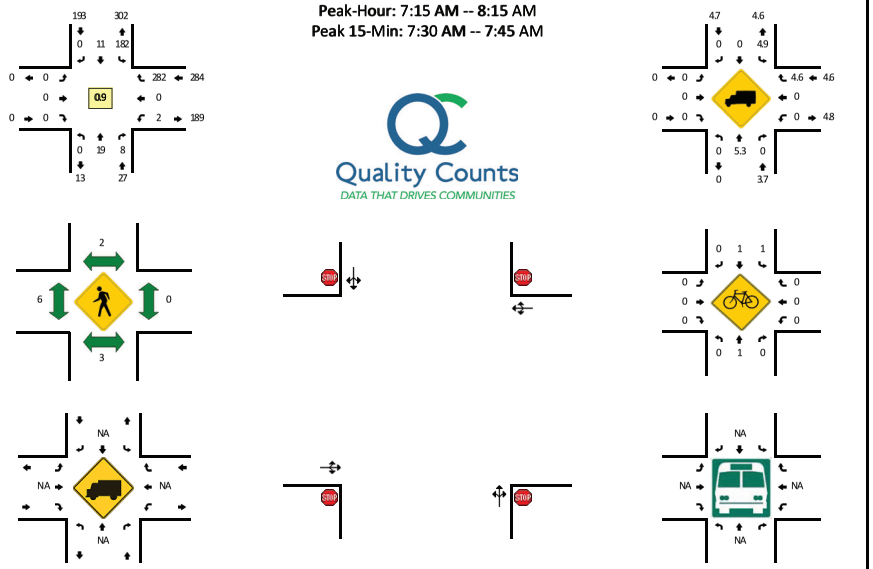
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Poalima St -- Hihimanu St
CITY/STATE: Waimanalo, HI

QC JOB #: 14952903
DATE: Tue, May 7 2019

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



15-Min Count Period Beginning At	Poalima St (Northbound)				Poalima St (Southbound)				Hihimanu St (Eastbound)				Hihimanu St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	5	2	0	29	1	0	0	0	0	0	0	2	0	48	0	87	
7:15 AM	0	8	3	0	43	2	0	0	0	0	0	0	0	0	81	0	137	
7:30 AM	0	4	1	0	38	3	0	1	0	0	0	0	1	0	92	0	140	
7:45 AM	0	6	2	0	55	1	0	0	0	0	0	0	0	0	60	0	124	488
8:00 AM	0	1	2	0	45	5	0	0	0	0	0	0	1	0	49	0	103	504
8:15 AM	0	5	1	0	33	0	0	0	0	0	0	0	0	0	56	0	95	462
8:30 AM	1	2	1	0	32	2	0	0	0	0	1	0	0	0	36	0	75	397
8:45 AM	0	5	0	0	30	2	0	0	0	0	0	0	0	0	27	1	65	338

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	16	4	0	152	12	0	4	0	0	0	0	4	0	368	0	560
Heavy Trucks	0	0	0		8	0	0		0	0	0		0	0	16		24
Pedestrians		4				4				4				0			12
Bicycles	0	1	0		1	1	0		0	0	0		0	0	0		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:02 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

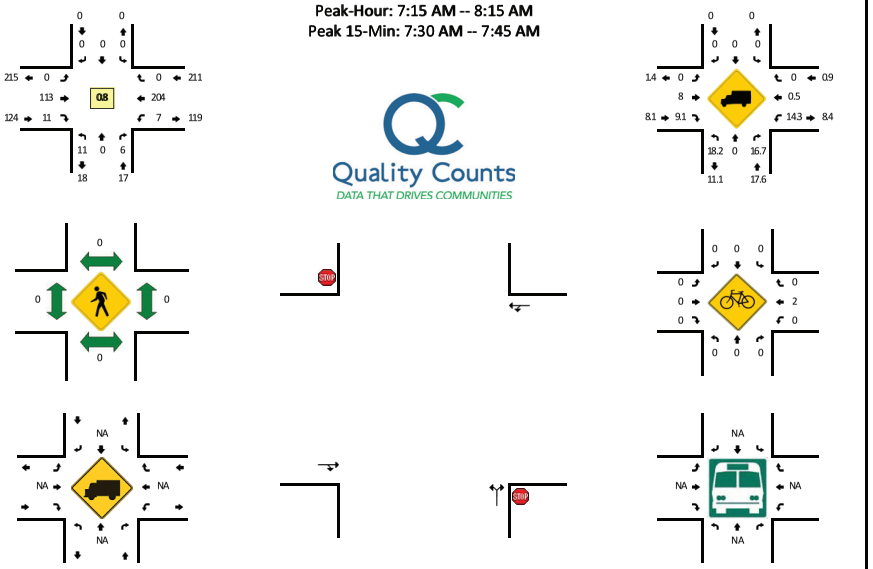
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Waikupanaha St -- Hihimanu St
CITY/STATE: Waimanalo Beach, HI

QC JOB #: 14952905
DATE: Tue, May 7 2019

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



15-Min Count Period Beginning At	Waikupanaha St (Northbound)				Waikupanaha St (Southbound)				Hihimanu St (Eastbound)				Hihimanu St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	2	0	0	0	0	0	0	24	0	0	2	26	0	0	56	
7:15 AM	0	0	2	0	0	0	0	0	0	28	1	0	2	72	0	0	105	
7:30 AM	4	0	1	0	0	0	0	0	0	32	2	0	2	69	0	0	110	
7:45 AM	2	0	0	0	0	0	0	0	0	26	2	0	1	40	0	0	71	342
8:00 AM	5	0	3	0	0	0	0	0	0	27	6	0	2	23	0	0	66	352
8:15 AM	3	0	0	0	0	0	0	0	0	16	3	0	0	23	0	0	45	292
8:30 AM	2	0	1	0	0	0	0	0	0	16	1	0	2	18	0	0	40	222
8:45 AM	2	0	1	0	0	0	0	0	0	18	1	0	1	18	0	0	41	192

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	4	0	0	0	0	0	0	128	8	0	8	276	0	0	440
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:02 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

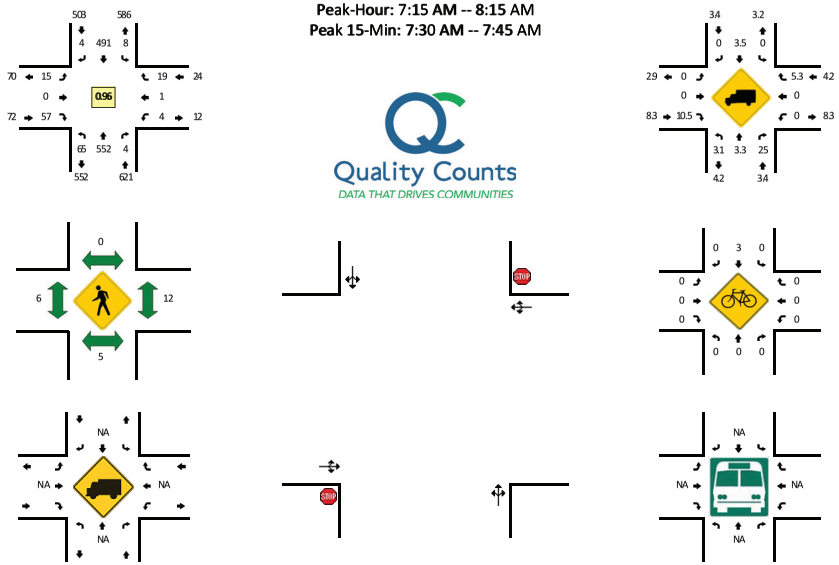
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Kalaniana'ole Hwy -- Hihimanu St
CITY/STATE: Waimanalo Beach, HI

QC JOB #: 14952907
DATE: Tue, May 7 2019

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



15-Min Count Period Beginning At	Kalaniana'ole Hwy (Northbound)				Kalaniana'ole Hwy (Southbound)				Hihimanu St (Eastbound)				Hihimanu St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	171	0	0	0	91	6	0	2	0	10	0	1	1	7	0	295	
7:15 AM	21	153	1	0	1	115	1	0	5	0	11	0	1	1	7	0	317	
7:30 AM	21	132	0	0	3	123	2	0	8	0	21	0	0	0	9	0	319	
7:45 AM	14	133	3	0	2	122	1	0	1	0	10	0	3	0	1	0	290	1221
8:00 AM	9	134	0	0	2	131	0	0	1	0	15	0	0	0	2	0	294	1220
8:15 AM	6	138	1	0	1	115	3	0	2	1	10	0	1	1	3	0	282	1185
8:30 AM	8	103	0	0	0	106	1	0	6	0	7	0	1	0	1	0	233	1099
8:45 AM	8	122	2	0	0	90	2	0	1	0	15	0	1	1	3	0	245	1054

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	84	528	0	0	12	492	8	0	32	0	84	0	0	0	36	0	1276
Heavy Trucks	0	24	0		0	8	0		0	0	12		0	0	0		44
Pedestrians		20				0				16				24			60
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:02 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

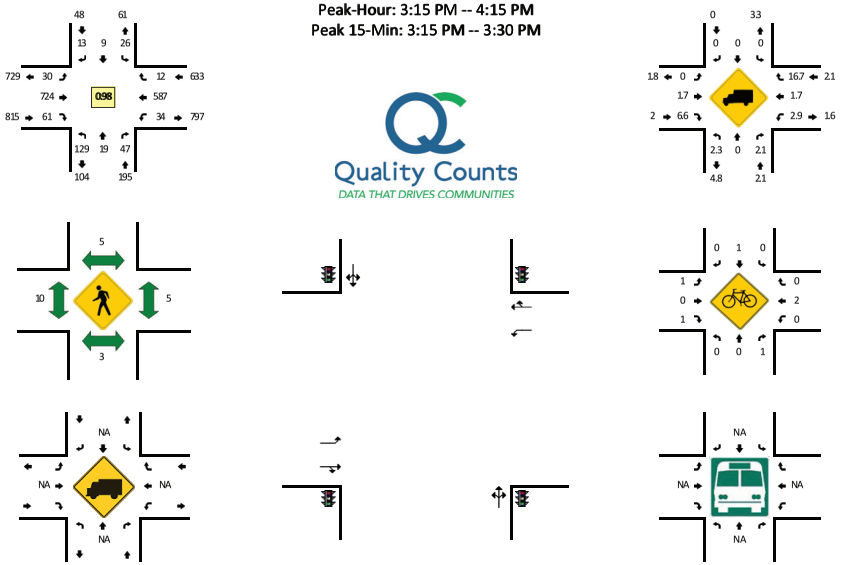
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Poalima St -- Kalaniana'ole Hwy
CITY/STATE: Waimanalo, HI

QC JOB #: 14952902
DATE: Wed, May 8 2019

Peak-Hour: 3:15 PM -- 4:15 PM
Peak 15-Min: 3:15 PM -- 3:30 PM



15-Min Count Period Beginning At	Poalima St (Northbound)				Poalima St (Southbound)				Kalaniana'ole Hwy (Eastbound)				Kalaniana'ole Hwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	24	1	13	0	10	6	3	0	7	173	13	0	6	169	4	0	429	
3:15 PM	34	1	13	0	7	1	4	0	10	178	19	0	10	153	0	0	430	
3:30 PM	29	2	13	0	5	1	3	0	9	187	13	0	5	148	6	0	421	
3:45 PM	28	7	9	0	10	4	3	0	7	182	10	0	8	149	2	0	419	1699
4:00 PM	38	9	12	0	4	3	3	0	4	177	19	0	11	137	4	0	421	1691
4:15 PM	17	6	12	0	3	4	8	0	3	187	17	0	8	146	4	0	415	1676
4:30 PM	26	3	15	0	5	6	7	0	6	167	13	0	6	128	2	0	384	1639
4:45 PM	29	2	18	0	8	1	8	0	8	179	18	0	8	135	1	0	415	1635
5:00 PM	20	5	10	0	5	2	7	0	9	163	26	0	11	145	3	0	406	1620
5:15 PM	22	5	8	0	10	2	3	0	8	189	16	0	7	134	0	0	404	1609
5:30 PM	14	7	13	0	6	5	5	0	6	165	25	0	10	144	1	0	401	1626
5:45 PM	23	4	9	0	6	3	5	0	7	171	34	0	9	126	2	0	399	1610

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	136	4	52	0	28	4	16	0	40	712	76	0	40	612	0	0	1720
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	4	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:27 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

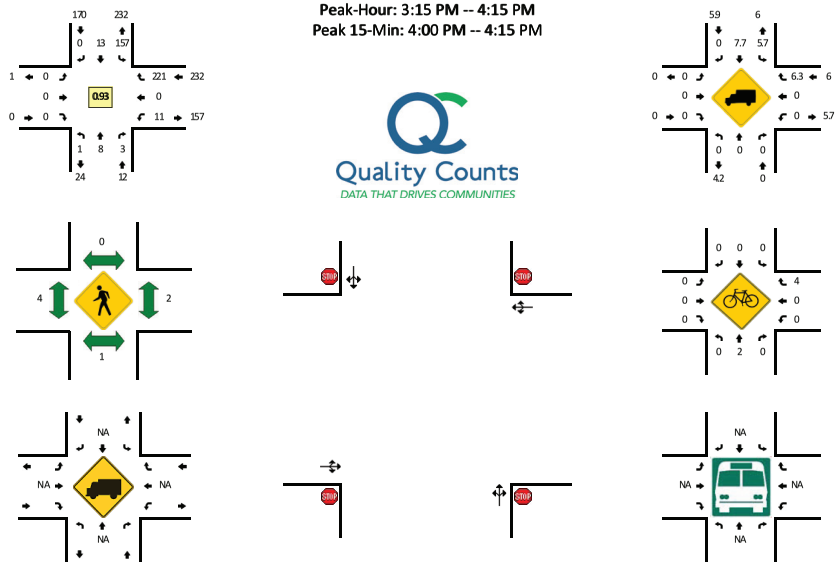
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Poalima St -- Hihimanu St
CITY/STATE: Waimanalo, HI

QC JOB #: 14952904
DATE: Tue, May 7 2019

Peak-Hour: 3:15 PM -- 4:15 PM
Peak 15-Min: 4:00 PM -- 4:15 PM



Quality Counts
DATA THAT DRIVES COMMUNITIES

15-Min Count Period Beginning At	Poalima St (Northbound)				Poalima St (Southbound)				Hihimanu St (Eastbound)				Hihimanu St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	4	0	0	42	2	0	1	0	0	0	0	1	0	35	0	85	
3:15 PM	1	3	0	0	41	2	0	0	0	0	0	0	2	0	54	0	103	
3:30 PM	0	3	0	0	36	3	0	0	0	0	0	0	4	0	54	0	100	
3:45 PM	0	1	1	0	39	3	0	3	0	0	0	0	1	0	52	0	100	388
4:00 PM	0	1	2	0	38	5	0	0	0	0	0	0	4	0	61	0	111	414
4:15 PM	0	1	4	0	50	1	0	0	0	0	0	0	0	0	44	0	100	411
4:30 PM	0	2	1	0	52	3	0	0	0	0	0	0	1	0	40	0	99	410
4:45 PM	0	3	1	0	61	3	0	0	0	0	0	0	1	0	46	1	116	426
5:00 PM	0	0	2	0	47	3	0	0	0	0	0	0	5	0	43	0	100	415
5:15 PM	0	6	2	0	45	7	0	1	0	0	0	0	1	0	42	0	104	419
5:30 PM	0	1	1	0	51	3	0	1	0	0	0	0	1	0	30	0	88	408
5:45 PM	0	2	0	0	60	2	0	0	0	0	0	0	1	0	46	1	112	404

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	4	8	0	152	20	0	0	0	0	0	0	16	0	244	0	444
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	0	12		16
Pedestrians		0				0				8				4			12
Bicycles	0	2	0		0	0	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:27 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

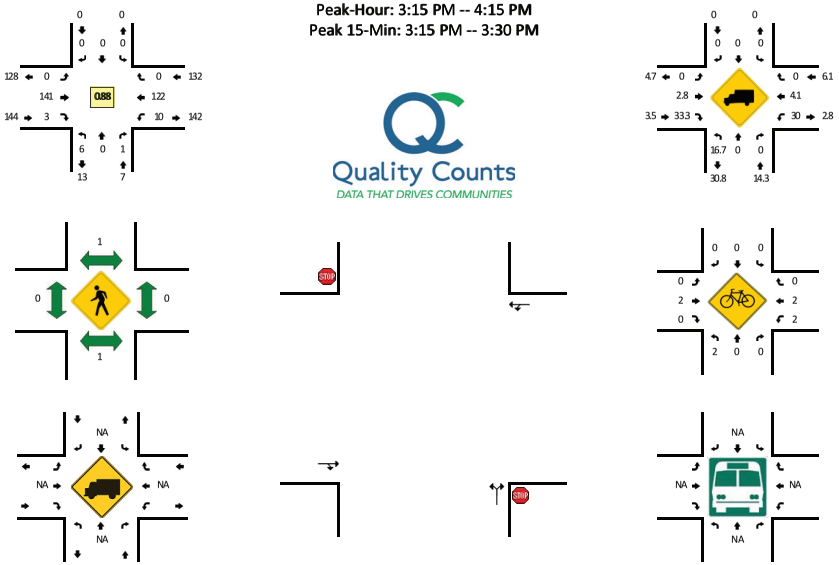
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Waikupanaha St -- Hihimanu St
CITY/STATE: Waimanalo Beach, HI

QC JOB #: 14952906
DATE: Tue, May 7 2019

Peak-Hour: 3:15 PM -- 4:15 PM
Peak 15-Min: 3:15 PM -- 3:30 PM



Quality Counts
DATA THAT DRIVES COMMUNITIES

15-Min Count Period Beginning At	Waikupanaha St (Northbound)				Waikupanaha St (Southbound)				Hihimanu St (Eastbound)				Hihimanu St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	2	0	0	0	0	0	0	0	0	30	2	0	1	42	0	1	78	
3:15 PM	2	0	0	0	0	0	0	0	0	36	1	0	3	38	0	0	80	
3:30 PM	0	0	0	0	0	0	0	0	0	35	2	0	2	27	0	0	66	
3:45 PM	2	0	0	0	0	0	0	0	0	37	0	0	2	26	0	0	67	291
4:00 PM	2	0	1	0	0	0	0	0	0	33	0	0	3	31	0	0	70	283
4:15 PM	0	0	4	0	0	0	0	0	0	38	2	0	0	29	0	0	73	276
4:30 PM	1	0	1	0	0	0	0	0	0	38	3	0	0	39	0	0	82	292
4:45 PM	1	0	2	0	0	0	0	0	0	34	1	1	1	20	0	0	60	285
5:00 PM	2	0	1	0	0	0	0	0	0	36	0	0	1	27	0	0	67	282
5:15 PM	2	0	2	0	0	0	0	0	0	31	2	0	0	35	0	0	72	281
5:30 PM	2	0	1	0	0	0	0	0	0	33	2	0	2	25	0	0	65	264
5:45 PM	1	0	2	0	0	0	0	0	0	29	0	0	0	29	0	0	61	265

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	0	0	0	0	0	0	0	144	4	0	12	152	0	0	320
Heavy Trucks	4	0	0		0	0	0		0	4	0		4	8	0		20
Pedestrians		4				0				0				0			4
Bicycles	2	0	0		0	0	0		0	0	0		2	0	0		4
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:27 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

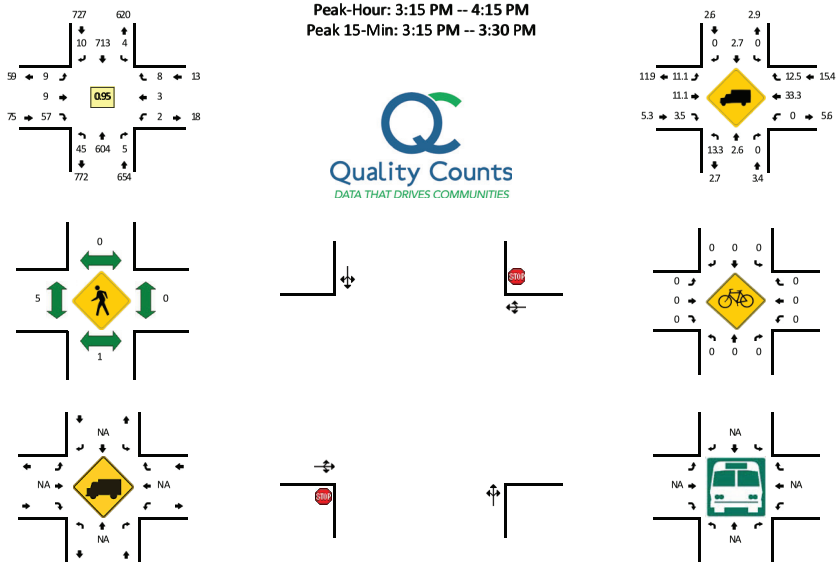
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Kalaniana'ole Hwy -- Hihimanu St
CITY/STATE: Waimanalo Beach, HI

QC JOB #: 14952908
DATE: Tue, May 7 2019

Peak-Hour: 3:15 PM -- 4:15 PM
Peak 15-Min: 3:15 PM -- 3:30 PM



Quality Counts
DATA THAT DRIVES COMMUNITIES

15-Min Count Period Beginning At	Kalaniana'ole Hwy (Northbound)				Kalaniana'ole Hwy (Southbound)				Hihimanu St (Eastbound)				Hihimanu St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	13	157	2	0	2	174	1	0	0	0	13	0	2	1	0	0	365	
3:15 PM	14	174	1	0	2	174	1	0	4	1	11	1	0	0	2	0	385	
3:30 PM	12	156	1	0	0	185	2	0	3	2	17	0	1	1	1	0	381	
3:45 PM	7	126	2	0	1	171	4	0	0	2	16	0	1	1	3	0	334	1465
4:00 PM	12	148	1	0	1	183	3	0	1	4	13	0	0	1	2	0	369	1469
4:15 PM	13	141	3	0	4	179	4	0	3	0	12	0	4	0	1	0	364	1448
4:30 PM	12	144	1	0	2	187	6	0	2	0	18	0	0	1	3	0	376	1443
4:45 PM	4	126	1	0	1	169	1	0	3	1	16	0	1	1	0	0	324	1433
5:00 PM	12	116	3	0	1	175	1	0	5	0	14	0	0	0	1	0	328	1392
5:15 PM	15	132	2	0	2	170	3	0	4	2	10	0	1	0	0	0	341	1369
5:30 PM	11	123	0	0	1	176	1	0	3	2	11	0	0	0	0	0	328	1321
5:45 PM	11	107	1	0	0	161	0	0	2	1	16	0	1	0	1	0	301	1298

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	56	696	4	0	8	696	4	0	16	4	44	4	0	0	8	0	1540
Heavy Trucks	8	24	0		0	24	0		4	0	0		0	0	0		60
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/16/2019 9:27 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

APPENDIX B
Bus Route Schedule and Map

Route 67 Honolulu - Kailua - Waimanalo - Sea Life Park Effective 8/18/19

Weekday: Westbound: Via Pali Hwy to Kailua/Sea Life Park Eastbound: Via Pali Hwy to Ala Moana Ctr

Ala Moana Ctr Kona St (#426)	Downtown Alakea King (#743)	Downtown Alakea Hotel (#744)	Kailua Hamakua (#1125)	Enchanted Lake Keolu Hele (#1136)	Kalanianaole Kanapuu (#1143)	Waimanalo Kalanianaole Nalu (#1311)	Waimanalo Nalu Kalanianaole (#1172)	Sea Life Park (#186)
B	Z	a	X	V	U	T	T	S
.....	446a	448a	513a	521a	525a	.....	545a	553a
.....	515a	517a	543a	551a	555a	.....	612a	620a
.....	545a	547a	613a	622a	627a	.....	643a	651a
602a	615a	617a	643a	652a	657a	.....	713a	721a
630a	643a	645a	713a	722a	727a	.....	743a	751a
656a	711a	713a	743a	752a	757a	.....	813a	821a
726a	741a	743a	813a	822a	837a	.....	853a	901a
756a	811a	813a	843a	852a	902a	.....	918a	926a
826a	841a	843a	913a	923a	928a	.....	944a	952a
854a	910a	912a	943a	953a	958a	.....	1015a	1022a
924a	940a	942a	1013a	1023a	1028a	.....	1045a	1052a
953a	1009a	1011a	1043a	1053a	1058a	.....	1115a	1122a
1024a	1040a	1042a	1113a	1123a	1128a	.....	1145a	1152a
1055a	1112a	1114a	1143a	1153a	1158a	.....	**1215p**	**1222p**
1125a	1142a	1144a	**1213p**	**1223p**	**1228p**	.....	**1245p**	**1252p**
1155a	**1212p**	**1214p**	**1243p**	**1253p**	**1258p**	.....	**115p**	**123p**
1225p	**1242p**	**1244p**	**113p**	**123p**	**128p**	.....	**145p**	**153p**
1254p	**111p**	**113p**	**143p**	**153p**	**158p**	.....	**216p**	**224p**
123p	**140p**	**142p**	**213p**	**223p**	**228p**	.....	**246p**	**254p**
151p	**208p**	**210p**	**243p**	**253p**	**258p**	.....	**317p**	**326p**
220p	**237p**	**239p**	**313p**	**323p**	**329p**	.....	**348p**	**357p**
247p	**305p**	**307p**	**343p**	**353p**	**359p**	.....	**417p**	**427p**
316p	**334p**	**336p**	**413p**	**423p**	**429p**	.....	**447p**	**457p**
339p	**357p**	**359p**	**438p**	**448p**	**454p**	.....	**511p**	**521p**
357p	**417p**	**419p**	**458p**	**508p**	**514p**	.....	**531p**	**541p**
417p	**437p**	**439p**	**518p**	**528p**	**534p**	.....	**551p**	**601p**
438p	**458p**	**500p**	**538p**	**548p**	**554p**	.....	**610p**	**619p**
500p	**518p**	**520p**	**558p**	**608p**	**613p**	.....	**629p**	**638p**
526p	**544p**	**546p**	**618p**	**628p**	**633p**	.....	**649p**	**658p**
550p	**607p**	**609p**	**638p**	**648p**	**653p**	.....	**708p**	**716p**
644p	**659p**	**701p**	**729p**	**738p**	**743p**	**756p**	.....	.....
745p	**800p**	**802p**	**829p**	**838p**	**843p**	**856p**	.....	.....
847p	**901p**	**903p**	**929p**	**938p**	**943p**	**956p**	.....	.....
948p	**1001p**	**1003p**	**1029p**	**1038p**	**1043p**	**1056p**	**1102p**-Nakini/Ala Koa	
1050p	**1103p**	**1105p**	**1130p**	**1138p**	**1142p**	**1155p**	1201a-Nakini/Ala Koa	

Sea Life Park (#186)	Waimanalo Kalanianaole Nalu (#1311)	Waimanalo Nalu Kalanianaole (#1223)	Enchanted Lake Keolu Hele (#1253)	Kailua Oneawa (#1271)	Downtown Bishop Hotel (#834)	Ala Moana Ctr Kona St (#425)
S	T	T	U	V	W	Y	B
.....	◆ 504a	505a	520a	524a	534a	600a	621a
.....	◆ 538a	539a	554a	558a	609a	640a	701a
.....	◆ 556a	557a	613a	618a	629a	700a	723a
611a	.....	617a	633a	638a	649a	723a	746a
630a	.....	636a	652a	657a	709a	745a	807a
648a	.....	654a	712a	717a	729a	804a	824a
706a	.....	713a	732a	737a	749a	821a	841a
726a	.....	733a	752a	757a	809a	839a	859a
751a	.....	758a	817a	822a	834a	904a	924a
821a	.....	828a	847a	852a	904a	933a	953a
853a	.....	900a	918a	922a	934a	1003a	1023a
924a	.....	930a	948a	952a	1004a	1033a	1053a
955a	.....	1001a	1018a	1022a	1034a	1103a	1123a
1025a	.....	1031a	1048a	1052a	1104a	1133a	1153a
1055a	.....	1101a	1118a	1122a	1134a	**1203p**	**1224p**
1125a	.....	1131a	1148a	1152a	**1204p**	**1232p**	**1253p**
1155a	.....	**1201p**	**1218p**	**1222p**	**1234p**	**102p**	**123p**
1225p	.....	**1231p**	**1248p**	**1252p**	**104p**	**132p**	**153p**
1255p	.....	**101p**	**118p**	**122p**	**134p**	**202p**	**223p**
125p	.....	**131p**	**148p**	**152p**	**204p**	**233p**	**254p**
155p	.....	**201p**	**218p**	**222p**	**234p**	**303p**	**325p**
225p	.....	**231p**	**248p**	**252p**	**304p**	**336p**	**358p**
254p	.....	**300p**	**317p**	**321p**	**334p**	**406p**	**430p**
324p	.....	**330p**	**347p**	**351p**	**404p**	**437p**	**501p**
355p	.....	**401p**	**417p**	**421p**	**434p**	**506p**	**531p**
425p	.....	**431p**	**447p**	**451p**	**504p**	**534p**	**559p**
456p	.....	**502p**	**518p**	**522p**	**534p**	**604p**	**625p**
526p	.....	**532p**	**548p**	**552p**	**604p**	**632p**	**653p**
556p	.....	**602p**	**618p**	**622p**	**634p**	**702p**	**721p**
626p	.....	**632p**	**648p**	**652p**	**704p**	**731p**	**750p**
657p	.....	**703p**	**719p**	**723p**	**734p**	**801p**	**820p**
.....	**818p**	**819p**	**835p**	**839p**	**849p**	**916p**	**935p**
.....	**918p**	**919p**	**935p**	**939p**	**949p**	**1016p**	**1035p**
.....	**1018p**	**1019p**	**1035p**	**1039p**	**1049p**	**1115p**	**1134p**

Route 67 Destination Signs

Westbound to Sea Life Park: 67 Sea Life Park via Kailua
Westbound to Waimanalo: 67 Waimanalo via Kailua
Eastbound to Ala Moana Center: 67 Ala Moana Center via Kailua

Route 67 Symbol

◆ - Begins service at Kalanianaole/Nakini 2 minutes earlier

NOTE - Numbers next to timepoints are **HEA** (Honolulu Estimated Arrival) stop numbers.
Go to the **HEA** website at http://hea.thebus.org.

Bold indicates PM service.
Schedule to change without notice.
All buses are lift and bicycle rack equipped.

Route 67 Honolulu - Kailua - Waimanalo - Sea Life Park Effective 8/18/19

Saturday: Westbound: Via Pali Hwy to Kailua/Sea Life Park Eastbound: Via Pali Hwy to Ala Moana Ctr

Ala Moana Ctr Kona St (#426)	Downtown Alakea King (#743)	Downtown Alakea Hotel (#744)	Kailua Hamakua (#1125)	Enchanted Lake Keolu Hele (#1136)	Kalanianaole Kanapuu (#1143)	Waimanalo Kalanianaole Nalu (#1311)	Waimanalo Nalu Kalanianaole (#1172)	Sea Life Park (#186)
B	Z	a	X	V	U	T	T	S
.....	455a	456a	522a	530a	534a	.....	548a	555a
.....	539a	540a	606a	614a	618a	.....	632a	639a
.....	612a	613a	641a	649a	653a	.....	707a	714a
.....	642a	643a	711a	720a	724a	.....	738a	745a
.....	712a	713a	740a	749a	753a	.....	808a	815a
730a	742a	743a	811a	820a	825a	.....	841a	848a
800a	815a	817a	847a	856a	901a	.....	917a	924a
830a	845a	847a	918a	927a	932a	.....	948a	955a
900a	915a	917a	948a	957a	1002a	.....	1018a	1027a
930a	945a	947a	1018a	1028a	1033a	.....	1049a	1058a
1000a	1015a	1017a	1048a	1058a	1103a	.....	1122a	1131a
1030a	1045a	1047a	1117a	1127a	1132a	.....	1151a	**1200p**
1100a	1115a	1117a	1147a	1157a	**1202p**	.....	**1221p**	**1230p**
1130a	1145a	1147a	**1217p**	**1227p**	**1232p**	.....	**1251p**	**100p**
1200p	**1216p**	**1218p**	**1248p**	**1258p**	**103p**	.....	**122p**	**131p**
1230p	**1246p**	**1248p**	**118p**	**128p**	**133p**	.....	**152p**	**201p**
100p	**116p**	**118p**	**148p**	**158p**	**203p**	.....	**222p**	**232p**
130p	**146p**	**148p**	**219p**	**229p**	**234p**	.....	**253p**	**303p**
200p	**216p**	**218p**	**249p**	**259p**	**304p**	.....	**323p**	**333p**
230p	**246p**	**248p**	**318p**	**328p**	**333p**	.....	**352p**	**402p**
300p	**317p**	**319p**	**349p**	**359p**	**404p**	.....	**422p**	**431p**
330p	**347p**	**349p**	**419p**	**429p**	**434p**	.....	**452p**	**501p**
400p	**417p**	**419p**	**449p**	**459p**	**504p**	.....	**521p**	**530p**
430p	**447p**	**449p**	**519p**	**529p**	**534p**	.....	**551p**	**600p**
501p	**516p**	**518p**	**548p**	**558p**	**603p**	.....	**619p**	**627p**
544p	**559p**	**601p**	**629p**	**639p**	**644p**	.....	**700p**	**707p**
647p	**702p**	**703p**	**729p**	**739p**	**744p**	**757p**	.....	.....
747p	**802p**	**803p**	**829p**	**839p**	**844p**	**857p**	.....	.....
849p	**902p**	**903p**	**929p**	**939p**	**944p**	**957p**	.....	.....
949p	**1002p**	**1003p**	**1029p**	**1037p**	**1042p**	**1055p**	**1101p**-Nakini/Ala Koa	
1048p	**1100p**	**1101p**	**1126p**	**1134p**	**1139p**	**1152p**	**1158p**-Nakini/Ala Koa	

Sea Life Park (#186)	Waimanalo Kalanianaole Nalu (#1311)	Waimanalo Nalu Kalanianaole (#1223)	Enchanted Lake Keolu Hele (#1253)	Kailua Oneawa (#1271)	Downtown Bishop Hotel (#834)	Ala Moana Ctr Kona St (#425)
S	T	T	U	V	W	Y	B
559a	.....	604a	621a	625a	635a	659a	718a
629a	.....	634a	651a	655a	705a	731a	750a
659a	.....	704a	721a	725a	735a	801a	820a
729a	.....	734a	751a	755a	805a	831a	850a
759a	.....	804a	821a	825a	835a	901a	922a
829a	.....	834a	851a	855a	905a	932a	953a
857a	.....	903a	920a	924a	935a	1002a	1025a
927a	.....	933a	950a	954a	1005a	1032a	1055a
955a	.....	1001a	1019a	1023a	1035a	1102a	1126a
1025a	.....	1031a	1049a	1053a	1105a	1132a	1156a
1053a	.....	1059a	1118a	1122a	1135a	**1202p**	**1224p**
1122a	.....	1129a	1148a	1152a	**1205p**	**1232p**	**1254p**
1152a	.....	1159a	**1218p**	**1222p**	**1235p**	**102p**	**124p**
1222p	.....	**1229p**	**1248p**	**1252p**	**105p**	**133p**	**155p**
1251p	.....	**1258p**	**117p**	**121p**	**135p**	**203p**	**225p**
121p	.....	**128p**	**147p**	**151p**	**205p**	**233p**	**255p**
151p	.....	**158p**	**217p**	**221p**	**235p**	**303p**	**324p**
221p	.....	**228p**	**247p**	**251p**	**305p**	**333p**	**354p**
252p	.....	**259p**	**317p**	**321p**	**335p**	**403p**	**423p**
323p	.....	**329p**	**347p**	**351p**	**405p**	**433p**	**453p**
353p	.....	**359p**	**417p**	**421p**	**435p**	**503p**	**522p**
423p	.....	**429p**	**447p**	**451p**	**505p**	**532p**	**551p**
454p	.....	**500p**	**518p**	**522p**	**535p**	**602p**	**621p**
525p	.....	**531p**	**549p**	**553p**	**605p**	**631p**	**650p**
559p	.....	**605p**	**620p**	**624p**	**635p**	**701p**	**720p**
714p	.....	**720p**	**735p**	**739p**	**749p**	**815p**	**833p**
.....	**820p**	**821p**	**835p**	**839p**	**849p**	**914p**	**932p**
.....	**919p**	**920p**	**934p**	**938p**	**948p**	**1012p**	**1030p**
.....	**1019p**	**1020p**	**1034p**	**1038p**	**1048p**	**1112p**	**1130p**

Route 67 Destination Signs

Westbound to Sea Life Park: 67 Sea Life Park via Kailua
Westbound to Waimanalo: 67 Waimanalo via Kailua
Eastbound to Ala Moana Center: 67 Ala Moana Center via Kailua

NOTE - Numbers next to timepoints are **HEA** (Honolulu Estimated Arrival) stop numbers.
Go to the **HEA** website at http://hea.thebus.org.

Bold indicates PM service.
Schedule to change without notice.
All buses are lift and bicycle rack equipped.

Route 67 Honolulu - Kailua - Waimanalo - Sea Life Park

Effective 8/18/19

Sunday: Westbound: Via Pali Hwy to Kailua/Sea Life Park — Eastbound: Via Pali Hwy to Ala Moana Ctr

Ala Moana Ctr Kona St (#426) B	Downtown Alakea King (#743) Z	Downtown Alakea Hotel (#744) a	Kailua Hamakua (#125) X	Enchanted Lake Kooloa Hele (#1139) V	Kalanianaole Kanepuu (#1143) U	Waimanalo Kalanianaole Nalu (#1311) T	Waimanalo Nalu Kalanianaole (#1172) T	Sea Life Park (#186) S
530a	542a	543a	609a	616a	620a	.....	634a	641a
600a	612a	613a	639a	646a	650a	.....	704a	711a
630a	642a	643a	709a	717a	721a	.....	735a	742a
700a	712a	713a	740a	748a	752a	.....	806a	814a
730a	742a	743a	810a	818a	823a	.....	837a	845a
800a	812a	813a	840a	848a	853a	.....	908a	916a
830a	842a	843a	910a	919a	924a	.....	939a	947a
900a	913a	914a	942a	951a	956a	.....	1011a	1021a
930a	943a	944a	1012a	1021a	1026a	.....	1041a	1051a
1000a	1014a	1015a	1044a	1053a	1058a	.....	1115a	1125a
1030a	1044a	1045a	1114a	1124a	1129a	.....	1146a	1156a
1100a	1114a	1115a	1144a	1154a	1159a	.....	**1217p**	**1226p**
1130a	1144a	1145a	**1214p**	**1224p**	**1229p**	.....	**1247p**	**1256p**
1200p	**1214p**	**1215p**	**1244p**	**1254p**	**1259p**	.....	**117p**	**125p**
1230p	**1244p**	**1245p**	**114p**	**124p**	**129p**	.....	**147p**	**155p**
100p	**114p**	**115p**	**144p**	**154p**	**159p**	.....	**216p**	**224p**
130p	**144p**	**145p**	**214p**	**224p**	**229p**	.....	**246p**	**254p**
200p	**215p**	**216p**	**244p**	**254p**	**259p**	.....	**315p**	**323p**
230p	**245p**	**246p**	**314p**	**324p**	**329p**	.....	**345p**	**353p**
300p	**315p**	**316p**	**344p**	**354p**	**359p**	.....	**415p**	**423p**
330p	**345p**	**346p**	**414p**	**424p**	**429p**	.....	**445p**	**453p**
400p	**415p**	**416p**	**444p**	**454p**	**459p**	.....	**514p**	**522p**
430p	**445p**	**446p**	**514p**	**524p**	**529p**	.....	**544p**	**552p**
500p	**515p**	**516p**	**543p**	**553p**	**558p**	.....	**613p**	**623p**
530p	**545p**	**546p**	**614p**	**624p**	**629p**	.....	**644p**	**654p**
641p	**655p**	**656p**	**729p**	**738p**	**743p**	**756p**	.....	.....
747p	**801p**	**802p**	**829p**	**838p**	**843p**	**856p**	.....	.....
849p	**902p**	**903p**	**929p**	**938p**	**943p**	**956p**	**1002p**-Kal/Ala Koa	

State Holiday

.....	446a	448a	513a	521a	525a	.....	545a	553a
.....	515a	517a	543a	551a	555a	.....	612a	620a
.....	545a	547a	613a	622a	627a	.....	643a	651a
602a	615a	617a	643a	652a	657a	.....	713a	721a
630a	643a	645a	713a	722a	727a	.....	743a	751a
656a	711a	713a	743a	752a	757a	.....	813a	821a
726a	741a	743a	813a	822a	837a	.....	853a	901a
756a	811a	813a	843a	852a	902a	.....	918a	926a
826a	841a	843a	913a	923a	928a	.....	944a	952a
854a	910a	912a	943a	953a	958a	.....	1015a	1022a
924a	940a	942a	1013a	1023a	1028a	.....	1045a	1052a
953a	1009a	1011a	1043a	1053a	1058a	.....	1115a	1122a
1024a	1040a	1042a	1113a	1123a	1128a	.....	1145a	1152a
1055a	1112a	1114a	1143a	1153a	1158a	.....	**1215p**	**1222p**
1125a	1142a	1144a	**1213p**	**1223p**	**1228p**	.....	**1245p**	**1252p**
1155a	**1212p**	**1214p**	**1243p**	**1253p**	**1258p**	.....	**115p**	**123p**
1225p	**1242p**	**1244p**	**113p**	**123p**	**128p**	.....	**145p**	**153p**
1254p	**111p**	**113p**	**143p**	**153p**	**158p**	.....	**216p**	**224p**
123p	**140p**	**142p**	**213p**	**223p**	**228p**	.....	**246p**	**254p**
151p	**208p**	**210p**	**243p**	**253p**	**258p**	.....	**317p**	**326p**
220p	**237p**	**239p**	**313p**	**323p**	**329p**	.....	**348p**	**357p**
247p	**305p**	**307p**	**343p**	**353p**	**359p**	.....	**417p**	**427p**
316p	**334p**	**336p**	**413p**	**423p**	**429p**	.....	**447p**	**457p**
339p	**357p**	**359p**	**438p**	**448p**	**454p**	.....	**511p**	**521p**
357p	**417p**	**419p**	**458p**	**508p**	**514p**	.....	**531p**	**541p**
417p	**437p**	**439p**	**518p**	**528p**	**534p**	.....	**551p**	**601p**
438p	**458p**	**500p**	**538p**	**548p**	**554p**	.....	**610p**	**619p**
500p	**518p**	**520p**	**558p**	**608p**	**613p**	.....	**629p**	**638p**
526p	**544p**	**546p**	**618p**	**628p**	**633p**	.....	**649p**	**658p**
550p	**607p**	**609p**	**638p**	**648p**	**653p**	.....	**708p**	**716p**
644p	**659p**	**701p**	**729p**	**738p**	**743p**	**756p**	.....	.....
745p	**800p**	**802p**	**829p**	**838p**	**843p**	**856p**	.....	.....
847p	**901p**	**903p**	**929p**	**938p**	**943p**	**956p**	.....	.....
948p	**1001p**	**1003p**	**1029p**	**1038p**	**1043p**	**1056p**	**1102p**-Nakini/Ala Koa	
1050p	**1103p**	**1105p**	**1130p**	**1138p**	**1142p**	**1155p**	1201a-Nakini/Ala Koa	

Sea Life Park (#186) S	Waimanalo Kalanianaole Nalu (#1311) T	Waimanalo Nalu Kalanianaole (#1223) T	Kalanianaole Kanapuu (#1253) U	Enchanted Lake Kooloa Hele (#1259) V	Kailua Oneawa (#1271) W	Downtown Bishop Hotel (#824) Y	Ala Moana Ctr Kona St (#425) B
600a	.....	606a	624a	628a	638a	702a	720a
630a	.....	636a	654a	658a	708a	732a	750a
700a	.....	707a	722a	726a	736a	800a	818a
730a	.....	737a	752a	756a	806a	831a	849a
800a	.....	806a	822a	826a	836a	901a	919a
830a	.....	836a	852a	856a	907a	933a	951a
900a	.....	906a	923a	927a	938a	1004a	1022a
930a	.....	936a	953a	957a	1009a	1035a	1053a
1000a	.....	1006a	1023a	1027a	1039a	1105a	1123a
1030a	.....	1036a	1053a	1057a	1109a	1135a	1153a
1100a	.....	1106a	1123a	1127a	1139a	**1205p**	**1224p**
1130a	.....	1136a	1153a	1157a	**1210p**	**1236p**	**1255p**
1200p	.....	**1207p**	**1224p**	**1228p**	**1241p**	**107p**	**126p**
1230p	.....	**1237p**	**1254p**	**1258p**	**112p**	**138p**	**157p**
100p	.....	**107p**	**124p**	**128p**	**142p**	**208p**	**227p**
130p	.....	**137p**	**154p**	**158p**	**212p**	**238p**	**257p**
200p	.....	**207p**	**224p**	**228p**	**242p**	**308p**	**327p**
230p	.....	**237p**	**254p**	**258p**	**312p**	**338p**	**357p**
300p	.....	**306p**	**323p**	**327p**	**341p**	**407p**	**426p**
330p	.....	**336p**	**353p**	**357p**	**410p**	**437p**	**456p**
400p	.....	**406p**	**423p**	**427p**	**440p**	**507p**	**525p**
430p	.....	**436p**	**453p**	**457p**	**510p**	**537p**	**555p**
500p	.....	**506p**	**523p**	**527p**	**540p**	**607p**	**625p**
530p	.....	**536p**	**553p**	**557p**	**608p**	**634p**	**652p**
602p	.....	**608p**	**624p**	**638p**	**649p**	**714p**	**732p**
714p	.....	**720p**	**735p**	**739p**	**749p**	**814p**	**831p**
.....	**821p**	**822p**	**836p**	**840p**	**849p**	**914p**	**930p**
.....	**922p**	**923p**	**937p**	**941p**	**949p**	**1014p**	**1030p**

State Holiday

.....	◆ 504a	505a	520a	524a	534a	600a	621a
.....	◆ 538a	539a	554a	558a	609a	640a	701a
.....	◆ 556a	557a	613a	618a	629a	700a	723a
611a	.....	617a	633a	638a	649a	723a	746a
630a	.....	636a	652a	657a	709a	745a	807a
648a	.....	654a	712a	717a	729a	804a	824a
706a	.....	713a	732a	737a	749a	821a	841a
726a	.....	733a	752a	757a	809a	839a	859a
751a	.....	758a	817a	822a	834a	904a	924a
821a	.....	828a	847a	852a	904a	933a	953a
853a	.....	900a	918a	922a	934a	1003a	1023a
924a	.....	930a	948a	952a	1004a	1033a	1053a
955a	.....	1001a	1018a	1022a	1034a	1103a	1123a
1025a	.....	1031a	1048a	1052a	1104a	1133a	1153a
1055a	.....	1101a	1118a	1122a	1134a	**1203p**	**1224p**
1125a	.....	1131a	1148a	1152a	**1204p**	**1232p**	**1253p**
1155a	.....	**1201p**	**1218p**	**1222p**	**1234p**	**102p**	**123p**
1225p	.....	**1231p**	**1248p**	**1252p**	**104p**	**132p**	**153p**
1255p	.....	**101p**	**118p**	**122p**	**134p**	**202p**	**223p**
125p	.....	**131p**	**148p**	**152p**	**204p**	**233p**	**254p**
155p	.....	**201p**	**218p**	**222p**	**234p**	**303p**	**325p**
225p	.....	**231p**	**248p**	**252p**	**304p**	**336p**	**358p**
254p	.....	**300p**	**317p**	**321p**	**334p**	**406p**	**430p**
324p	.....	**330p**	**347p**	**351p**	**404p**	**437p**	**501p**
355p	.....	**401p**	**417p**	**421p**	**434p**	**506p**	**531p**
425p	.....	**431p**	**447p**	**451p**	**504p**	**534p**	**559p**
456p	.....	**502p**	**518p**	**522p**	**534p**	**604p**	**625p**
526p	.....	**532p**	**548p**	**552p**	**604p**	**632p**	**653p**
556p	.....	**602p**	**618p**	**622p**	**634p**	**702p**	**721p**
626p	.....	**632p**	**648p**	**652p**	**704p**	**731p**	**750p**
657p	.....	**703p**	**719p**	**723p**	**734p**	**801p**	**820p**
.....	**818p**	**819p**	**835p**	**839p**	**849p**	**916p**	**935p**
.....	**918p**	**919p**	**935p**	**939p**	**949p**	**1016p**	**1035p**
.....	**1018p**	**1019p**	**1035p**	**1039p**	**1049p**	**1115p**	**1134p**

Route 67 Destination Signs

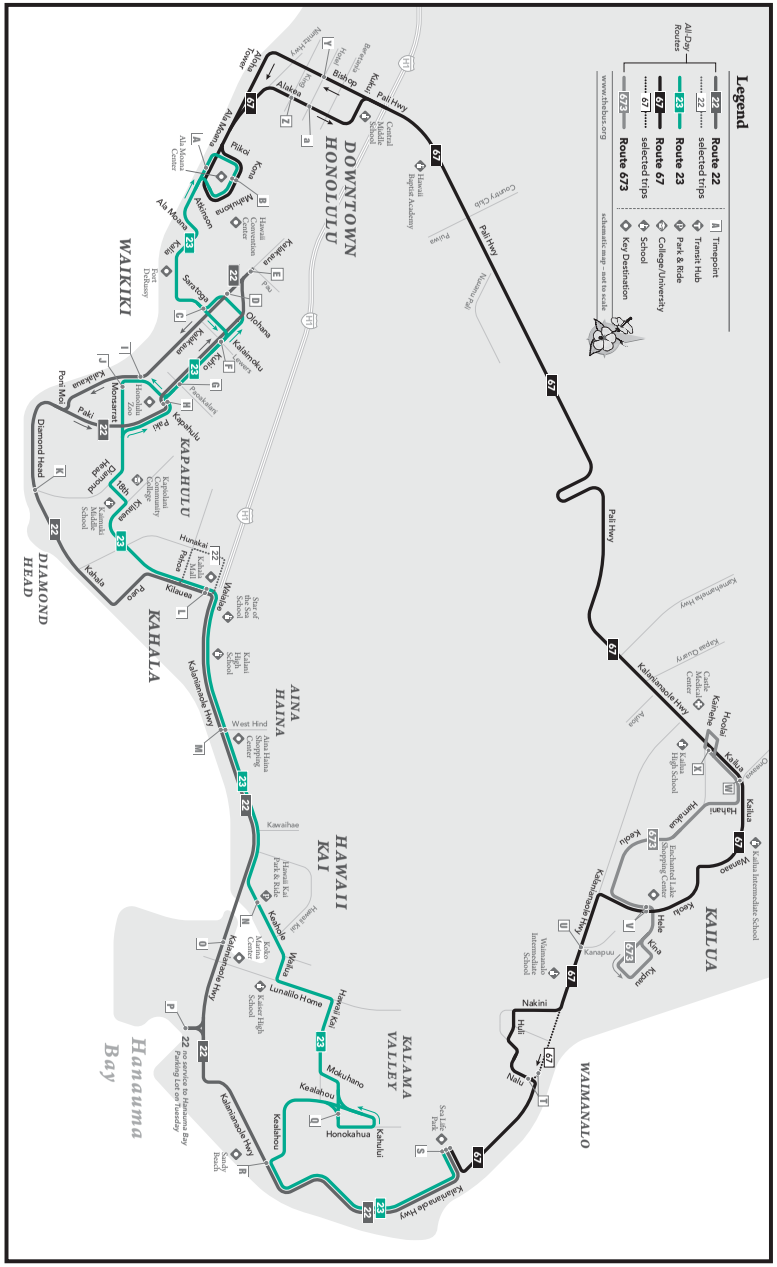
Westbound to Sea Life Park: 67 Sea Life Park via Kailua
Westbound to Waimanalo: 67 Waimanalo via Kailua
Eastbound to Ala Moana Center: 67 Ala Moana Center via Kailua

Route 67 Symbol

◆ - Begins service at Kalanianaole/Nakini 2 minutes earlier

NOTE - Numbers next to timepoints are **HEA** (Honolulu Estimated Arrival) stop numbers.
Go to the **HEA** website at http://hea.thebus.org.

Bold indicates PM service.
Schedule to change without notice.
All buses are lift and bicycle rack equipped.


Legend
Route 22 selected trips
Route 23
Route 67 selected trips
Route 673
Timepoint
Transit Hub
Park & Ride
College/University
School
Key Destination
All Day Routes
www.thebus.org
schematic map - not to scale
DOWNTOWN HONOLULU
WAIKIKI
KAPAHULU
KAHALA
DIAMOND HEAD
AINA HAINA
HAWAII KAI
KALAMA VALLEY
KAILUA
WAIMANALO
Hanauma Bay
Pali Hwy
Kalanianaole Hwy
Kailua Rd
Kailua Intermediate School
Sea Life Park
Nakini
Kailua
Waimanalo
Kalaheo
Kailua Beach Park
Lanikai
Kailua Beach
Kaneohe Bay Drive
Kaneohe
Kailua Town
Ala Moana Center
Ala Moana
Kona St
Alakea
Bishop
Punchbowl
Beretania
Nuuanu
Pali Hwy
Wyllie
Nimitz Hwy
Ala Moana
Kapiolani
Kalakaua
Kuhio
Saratoga
Ala Moana
Kalakaua
Kapiolani
Kuhio
Kalakaua
Monsarrat
Paki
Kapahulu
Kilauea
Kalaniana'ole Hwy
Hunakai
Wailupe
Kuliouou
Kalaniana'ole Hwy
West Hind
Kawaihae
Kealaolou
Kealaiki
Wailua
Lunalilo Home
Hawaii Kai
Mokuhano
Kealahou
Kealaiki
Honokahua
Kahului
Kalaniana'ole Hwy
Sandy Beach
Kalaniana'ole Hwy
Nalu
Kanapuu
Kalaniana'ole Hwy
Kailua
Hahani
Kaneohe
Hoolai
Kailua
Kailua
Kailua

Route 69 Kaneohe - Waimanalo - Sea Life Park

Effective 8/18/19

Weekday/State Holiday: Eastbound to Sea Life Park

Kaneohe Kawa Mehana Mauka (#4600) H	Kaneohe Kamehameha Likelike (#1765) K	Kailua Kalanianaole Kailua (#1120) V	Waimanalo Kalanianaole Nalu (#1311) Q	Waimanalo Nalu Kalanianaole (#1172) Q	Sea Life Park (#186) R
638a	645a	655a	.....	717a	722a
738a	746a	800a	.....	824a	829a
838a	846a	857a	.....	921a	926a
938a	946a	957a	.....	1021a	1026a
1038a	1047a	1058a	.....	1124a	1129a
1138a	1147a	1158a	.....	**1223p**	**1229p**
1238p	**1247p**	**1258p**	.....	**122p**	**128p**
138p	**147p**	**158p**	.....	**225p**	**231p**
238p	**247p**	**258p**	.....	**325p**	**331p**
338p	**347p**	**403p**	.....	**431p**	**437p**
438p	**447p**	**503p**	.....	**528p**	**534p**
538p	**547p**	**600p**	.....	**624p**	**630p**
638p	**646p**	**659p**	.....	**721p**	**727p**
738p	**745p**	**756p**	**821p**	.....	.....
838p	**845p**	**856p**	**921p**	.....	.....
938p	**945p**	**956p**	**1021p**	**1027p**-Kal/Ala Koa	

Saturday

638a	645a	654a	.....	714a	719a
738a	745a	755a	.....	817a	822a
838a	846a	856a	.....	920a	925a
938a	946a	956a	.....	1021a	1027a
1038a	1048a	1058a	.....	1124a	1130a
1138a	1147a	1157a	.....	**1226p**	**1231p**
1238p	**1247p**	**1257p**	.....	**126p**	**131p**
138p	**146p**	**156p**	.....	**223p**	**229p**
238p	**246p**	**256p**	.....	**323p**	**329p**
338p	**346p**	**355p**	.....	**420p**	**426p**
438p	**446p**	**455p**	.....	**521p**	**526p**
538p	**546p**	**555p**	.....	**619p**	**624p**
638p	**646p**	**655p**	.....	**717p**	**722p**
738p	**746p**	**755p**	**820p**	.....	.....
838p	**845p**	**854p**	**919p**	**925p**-Kal/Ala Koa	

Sunday

638a	646a	654a	.....	714a	719a
738a	745a	753a	.....	814a	819a
838a	846a	854a	.....	916a	922a
938a	946a	955a	.....	1018a	1024a
1038a	1046a	1055a	.....	1120a	1126a
1138a	1146a	1155a	.....	**1222p**	**1228p**
1238p	**1247p**	**1256p**	.....	**123p**	**129p**
138p	**146p**	**155p**	.....	**221p**	**227p**
238p	**246p**	**255p**	.....	**321p**	**327p**
338p	**346p**	**355p**	.....	**420p**	**426p**
438p	**446p**	**455p**	.....	**518p**	**524p**
538p	**546p**	**555p**	.....	**617p**	**623p**
638p	**646p**	**655p**	.....	**716p**	**722p**
738p	**745p**	**754p**	**819p**	.....	.....
838p	**845p**	**854p**	**919p**	**925p**-Kal/Ala Koa	

Weekday/State Holiday: Westbound to Kaneohe

Sea Life Park (#186) R	Waimanalo Kalanianaole Nalu (#1311) Q	Waimanalo Nalu Kalanianaole (#1223) Q	Kailua Kalanianaole Kailua (#1276) V	Kaneohe Kamehameha Likelike (#1475) K	Kaneohe Kawa Mehana Mauka (#4600) H
630a	.....	636a	657a	708a	715a
730a	.....	737a	801a	811a	819a
830a	.....	837a	900a	910a	918a
930a	.....	936a	959a	1009a	1017a
1030a	.....	1036a	1059a	1109a	1117a
1130a	.....	1136a	1158a	**1208p**	**1216p**
1230p	.....	**1236p**	**1258p**	**108p**	**116p**
130p	.....	**136p**	**158p**	**208p**	**216p**
230p	.....	**236p**	**259p**	**312p**	**322p**
Wed SD **233p**	.....	**239p**	**303p**	**304p**-Auloa/Kal Hwy	
MUTF SD **313p**	.....	**319p**	**343p**	**344p**-Auloa/Kal Hwy	
330p	.....	**336p**	**359p**	**413p**	**422p**
430p	.....	**436p**	**458p**	**510p**	**518p**
530p	.....	**536p**	**557p**	**608p**	**616p**
630p	.....	**636p**	**657p**	**707p**	**715p**
730p	.....	**736p**	**756p**	**806p**	**814p**
.....	**836p**	**837p**	**858p**	**908p**	**916p**
.....	**936p**	**937p**	**957p**	**1007p**	**1015p**

Saturday

630a	.....	635a	657a	706a	714a
730a	.....	735a	757a	807a	816a
830a	.....	835a	858a	908a	917a
930a	.....	935a	958a	1009a	1018a
1030a	.....	1035a	1058a	1109a	1119a
1130a	.....	1137a	**1201p**	**1212p**	**1222p**
1230p	.....	**1237p**	**100p**	**111p**	**121p**
130p	.....	**137p**	**201p**	**212p**	**221p**
230p	.....	**237p**	**301p**	**312p**	**321p**
330p	.....	**337p**	**400p**	**411p**	**420p**
430p	.....	**436p**	**459p**	**510p**	**519p**
530p	.....	**536p**	**559p**	**609p**	**618p**
630p	.....	**636p**	**656p**	**705p**	**713p**
730p	.....	**736p**	**756p**	**805p**	**813p**
.....	**838p**	**839p**	**900p**	**909p**	**916p**

Sunday

630a	.....	636a	659a	708a	715a
730a	.....	737a	757a	807a	815a
830a	.....	836a	857a	907a	916a
930a	.....	936a	958a	1008a	1017a
1030a	.....	1036a	1058a	1108a	1117a
1130a	.....	1136a	1158a	**1208p**	**1217p**
1230p	.....	**1237p**	**1259p**	**109p**	**118p**
130p	.....	**137p**	**159p**	**209p**	**218p**
230p	.....	**237p**	**259p**	**309p**	**318p**
330p	.....	**336p**	**358p**	**408p**	**417p**
430p	.....	**436p**	**459p**	**509p**	**518p**
530p	.....	**536p**	**557p**	**607p**	**616p**
630p	.....	**636p**	**656p**	**705p**	**713p**
730p	.....	**736p**	**756p**	**805p**	**812p**
.....	**837p**	**838p**	**859p**	**908p**	**915p**

Route 69 Destination Signs

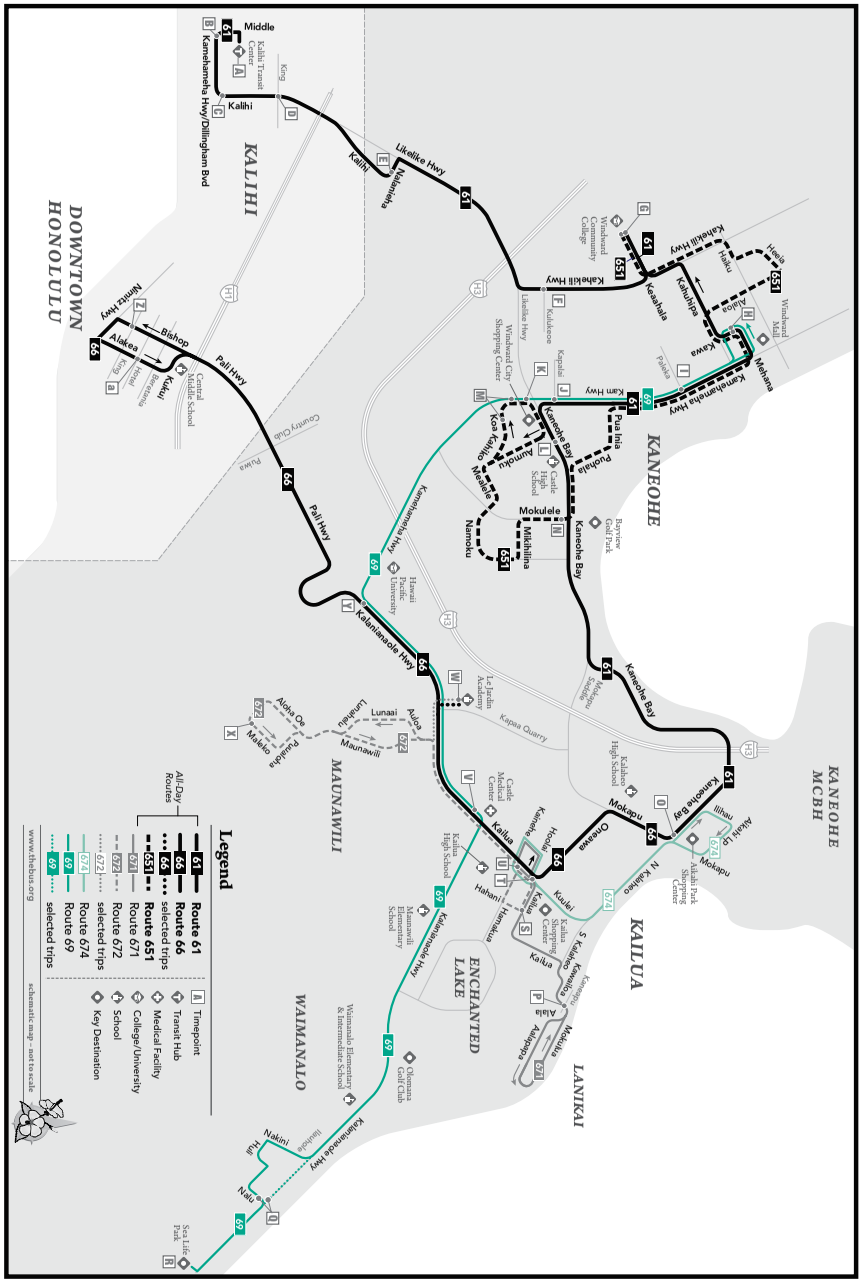
Eastbound to Sea Life Park: 69 SEA LIFE PARK
Eastbound to Waimanalo: 69 WAIMANALO VIA KAILUA
Westbound to Kaneohe: 69 WINDWARD MALL

Route 69 Symbols

Wed SD - Wednesday School Day Operation
MUTF SD - Monday, Tuesday, Thursday, Friday School Day Operation

NOTE - Numbers next to timepoints are **HEA** (Honolulu Estimated Arrival) stop numbers.
Go to the **HEA** website at http://hea.thebus.org.

Bold indicates PM service.
Schedule to change without notice.
All buses are lift and bicycle rack equipped.



Route 89 - Waimanalo Express

Effective 8/18/19

A.M. Weekday Only: Waimanalo to Downtown Honolulu

Kalanianaole Nakini (#1160)	Natu Kalanianaole (#1223)	Nakini Alii Kona (#4335)	Kalanianaole Olomana Golf Course (#1232)	Kalanianaole Kailua (#1276)	Pali Vineyard (#1279)	Alapai King (#161)	Beretania Punchbowl (#45)
r	R	Q	P	O	M	F	H
540a	542a	546a	556a	602a	621a	631a	633a
618a	620a	624a	634a	644a	709a	719a	721a
State Holiday							
540a	542a	546a	556a	601a	618a	626a	628a

P.M. Weekday Only: To Waimanalo

Alapai Transit Center (#2288)	Beretania Punchbowl (#737)	Bishop Hotel (#834)	Pali Vineyard (#1116)	Pali Kam Hwy (#1118)	Kalanianaole Kailua (#1120)	Nakini Ilauhole (#4586)	Kalanianaole Nakini (#1236)
G	H	K	M	N	O	q	r
405p	407p	410p	420p	436p	444p	503p	511p
445p	447p	450p	502p	520p	526p	543p	551p
State Holiday							
445p	447p	449p	457p	510p	516p	533p	541p

Route 89 Destination Signs

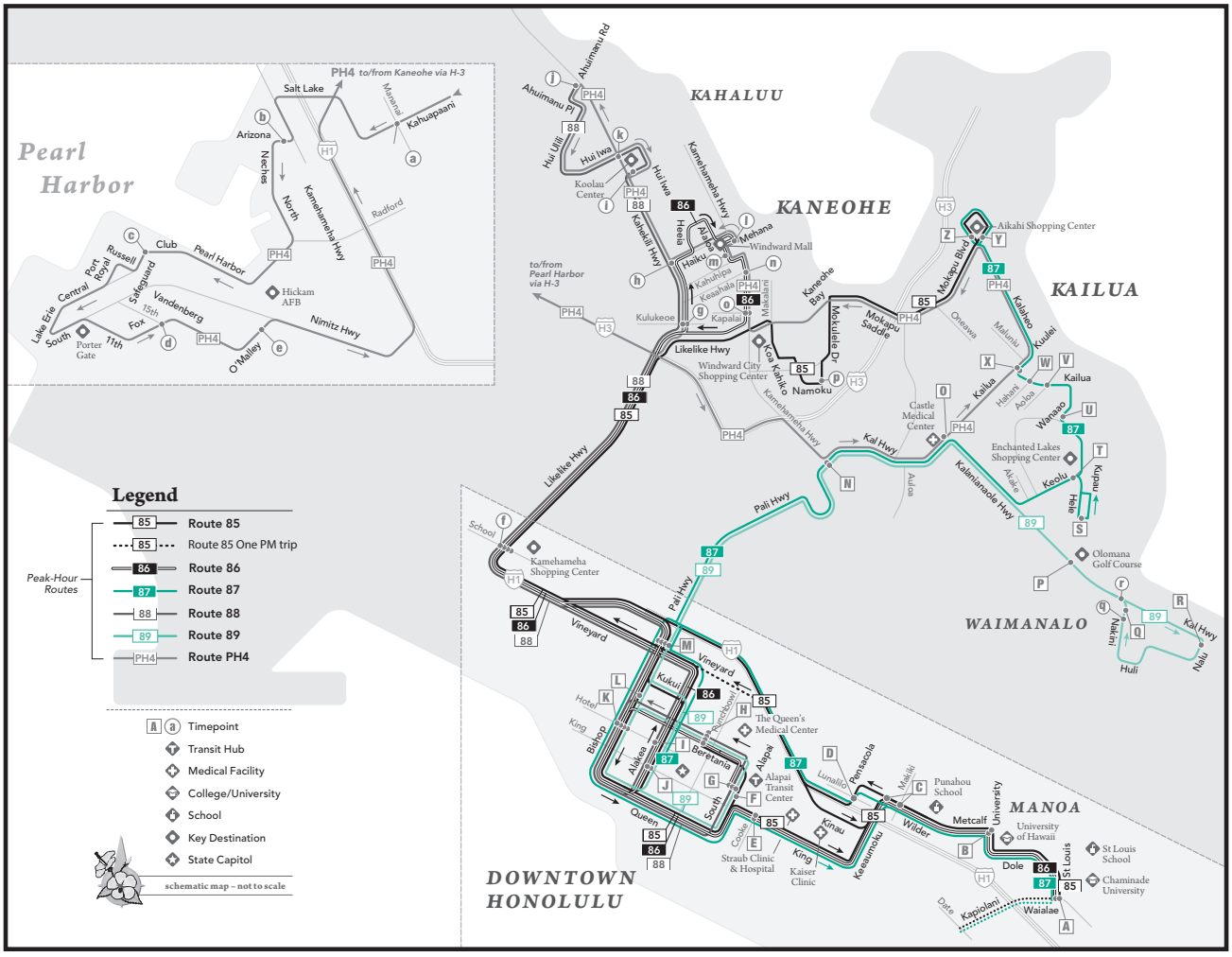
AM:

To Downtown 89 DOWNTOWN EXPRESS

PM:

To Waimanalo 89 WAIMANALO EXPRESS

Bold indicates PM service.
Schedule to change without notice.
All buses are lift and bicycle rack equipped.



APPENDIX C
Analysis Reports Existing (2019) Conditions

HCM 6th Signalized Intersection Summary — 2019 AM

1: Poalima St & Kalanianaole Hwy — 07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	582	90	59	627	12	151	25	64	21	20	32
Future Volume (veh/h)	32	582	90	59	627	12	151	25	64	21	20	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1856	1841	1841	1722	1722	1722	1752	1752	1752
Adj Flow Rate, veh/h	35	633	98	64	682	13	164	27	70	23	22	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	3	4	4	12	12	12	10	10	10
Cap, veh/h	376	886	137	343	1047	20	306	52	90	162	146	170
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	724	1523	236	717	1800	34	791	215	369	296	598	695
Grp Volume(v), veh/h	35	0	731	64	0	695	261	0	0	80	0	0
Grp Sat Flow(s),veh/h/ln	724	0	1759	717	0	1834	1374	0	0	1589	0	0
Q Serve(g_s), s	1.8	0.0	15.4	3.6	0.0	13.2	7.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.0	0.0	15.4	19.0	0.0	13.2	9.0	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.02	0.63		0.27	0.29		0.44
Lane Grp Cap(c), veh/h	376	0	1024	343	0	1067	449	0	0	478	0	0
V/C Ratio(X)	0.09	0.00	0.71	0.19	0.00	0.65	0.58	0.00	0.00	0.17	0.00	0.00
Avail Cap(c_a), veh/h	376	0	1024	343	0	1067	660	0	0	708	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.3	0.0	7.7	14.5	0.0	7.3	18.0	0.0	0.0	15.5	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	4.3	1.2	0.0	3.1	1.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	5.1	0.6	0.0	4.4	2.7	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.8	0.0	12.0	15.7	0.0	10.4	19.2	0.0	0.0	15.7	0.0	0.0
LnGrp LOS	B	A	B	B	A	B	B	A	A	B	A	A
Approach Vol, veh/h		766			759			261			80	
Approach Delay, s/veh		12.0			10.8			19.2			15.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.1		34.6		17.1		34.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		20.9		30.1		20.9		30.1				
Max Q Clear Time (g_c+I1), s		11.0		17.4		4.0		21.0				
Green Ext Time (p_c), s		1.1		4.5		0.3		3.6				

Intersection Summary												
HCM 6th Ctrl Delay			12.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	0	0	282	182	11
Future Vol, veh/h	19	0	0	282	182	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	2	5	5	2
Mvmt Flow	21	0	0	313	202	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	521	-	-	0	-	0
Stage 1	208	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.45	-	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	-	-	-	-	-
Pot Cap-1 Maneuver	510	0	0	-	-	-
Stage 1	820	0	0	-	-	-
Stage 2	735	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	510	-	-	-	-	-
Mov Cap-2 Maneuver	510	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	735	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	510	-	-
HCM Lane V/C Ratio	-	0.041	-	-
HCM Control Delay (s)	-	12.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	113	11	7	204	11	6
Future Vol, veh/h	113	11	7	204	11	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	8	9	14	2	18	17
Mvmt Flow	141	14	9	255	14	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	155	0	421	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	-	-	4.24	-	6.58	6.37
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.326	-	3.662	3.453
Pot Cap-1 Maneuver	-	-	1355	-	560	861
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1355	-	556	861
Mov Cap-2 Maneuver	-	-	-	-	556	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	731	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	635	-	-	1355	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	10.9	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	57	4	1	19	65	552	4	8	491	4
Future Vol, veh/h	15	0	57	4	1	19	65	552	4	8	491	4
Conflicting Peds, #/hr	0	0	5	5	0	0	6	0	12	12	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	11	2	2	5	3	3	25	2	4	2
Mvmt Flow	16	0	59	4	1	20	68	575	4	8	511	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1259	1262	524	1289	1262	589	521	0	0	591	0	0
Stage 1	535	535	-	725	725	-	-	-	-	-	-	-
Stage 2	724	727	-	564	537	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.31	7.12	6.52	6.25	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.399	3.518	4.018	3.345	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	170	536	141	170	503	1040	-	-	985	-	-
Stage 1	529	524	-	416	430	-	-	-	-	-	-	-
Stage 2	417	429	-	510	523	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	149	530	113	149	497	1034	-	-	974	-	-
Mov Cap-2 Maneuver	128	149	-	113	149	-	-	-	-	-	-	-
Stage 1	475	515	-	371	384	-	-	-	-	-	-	-
Stage 2	361	383	-	445	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	18.1	0.9	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1034	-	-	320	299	974	-	-
HCM Lane V/C Ratio	0.065	-	-	0.234	0.084	0.009	-	-
HCM Control Delay (s)	8.7	0	-	19.7	18.1	8.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	724	61	34	587	12	129	19	47	26	9	13
Future Volume (veh/h)	30	724	61	34	587	12	129	19	47	26	9	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	0.98		0.98	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	739	62	35	599	12	132	19	48	27	9	13
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	2	2	2	2	2	2	2	2
Cap, veh/h	499	1077	90	368	1156	23	288	48	72	252	88	86
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	809	1701	143	673	1826	37	881	239	356	740	436	425
Grp Volume(v), veh/h	31	0	801	35	0	611	199	0	0	49	0	0
Grp Sat Flow(s),veh/h/ln	809	0	1844	673	0	1863	1477	0	0	1601	0	0
Q Serve(g_s), s	1.2	0.0	15.4	1.9	0.0	9.8	5.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.0	0.0	15.4	17.3	0.0	9.8	6.6	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.02	0.66		0.24	0.55		0.27
Lane Grp Cap(c), veh/h	499	0	1167	368	0	1179	408	0	0	426	0	0
V/C Ratio(X)	0.06	0.00	0.69	0.10	0.00	0.52	0.49	0.00	0.00	0.12	0.00	0.00
Avail Cap(c_a), veh/h	499	0	1167	368	0	1179	685	0	0	703	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.5	0.0	6.5	12.1	0.0	5.5	19.9	0.0	0.0	17.9	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	3.3	0.5	0.0	1.6	0.9	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	4.9	0.3	0.0	3.0	2.2	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	0.0	9.8	12.6	0.0	7.1	20.8	0.0	0.0	18.0	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		832			646			199			49	
Approach Delay, s/veh		9.8			7.4			20.8			18.0	
Approach LOS		A			A			C			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.5		39.0		15.5		39.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5		34.5		21.5		34.5				
Max Q Clear Time (g_c+I1), s		8.6		17.4		3.2		19.3				
Green Ext Time (p_c), s		0.9		5.8		0.2		3.9				

Intersection Summary	
HCM 6th Ctrl Delay	10.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	0	221	157	13
Future Vol, veh/h	8	0	0	221	157	13
Conflicting Peds, #/hr	4	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	6	6	8
Mvmt Flow	9	0	0	238	169	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	418	-	-	0	-	0
Stage 1	176	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	591	0	0	-	-	-
Stage 1	855	0	0	-	-	-
Stage 2	798	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	591	-	-	-	-	-
Mov Cap-2 Maneuver	591	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	591	-	-
HCM Lane V/C Ratio	-	0.015	-	-
HCM Control Delay (s)	-	11.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	141	3	10	122	6	1
Future Vol, veh/h	141	3	10	122	6	1
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	33	30	4	17	0
Mvmt Flow	160	3	11	139	7	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	164	0	324	163
Stage 1	-	-	-	-	163	-
Stage 2	-	-	-	-	161	-
Critical Hdwy	-	-	4.4	-	6.57	6.2
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.47	-	3.653	3.3
Pot Cap-1 Maneuver	-	-	1261	-	640	887
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	833	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1260	-	634	886
Mov Cap-2 Maneuver	-	-	-	-	634	-
Stage 1	-	-	-	-	830	-
Stage 2	-	-	-	-	826	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	661	-	-	1260	-
HCM Lane V/C Ratio	0.012	-	-	0.009	-
HCM Control Delay (s)	10.5	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	9	57	2	3	8	45	604	5	4	713	10
Future Vol, veh/h	9	9	57	2	3	8	45	604	5	4	713	10
Conflicting Peds, #/hr	0	0	1	1	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	11	11	4	2	33	13	13	3	2	2	3	2
Mvmt Flow	9	9	60	2	3	8	47	636	5	4	751	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1508	1505	763	1533	1508	639	767	0	0	641	0	0
Stage 1	770	770	-	733	733	-	-	-	-	-	-	-
Stage 2	738	735	-	800	775	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.24	7.12	6.83	6.33	4.23	-	-	4.12	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.12	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.12	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.336	3.518	4.297	3.417	2.317	-	-	2.218	-	-
Pot Cap-1 Maneuver	95	116	401	95	103	457	799	-	-	943	-	-
Stage 1	380	397	-	412	384	-	-	-	-	-	-	-
Stage 2	396	412	-	379	366	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	84	104	399	69	92	457	795	-	-	943	-	-
Mov Cap-2 Maneuver	84	104	-	69	92	-	-	-	-	-	-	-
Stage 1	344	392	-	374	349	-	-	-	-	-	-	-
Stage 2	350	374	-	312	362	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.7	28.9	0.7	0
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	795	-	-	223	164	943	-	-
HCM Lane V/C Ratio	0.06	-	-	0.354	0.083	0.004	-	-
HCM Control Delay (s)	9.8	0	-	29.7	28.9	8.8	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.5	0.3	0	-	-

APPENDIX D
Analysis Reports Future (2022) Without Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	617	95	63	665	13	160	27	68	22	21	34
Future Volume (veh/h)	34	617	95	63	665	13	160	27	68	22	21	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1856	1841	1841	1722	1722	1722	1752	1752	1752
Adj Flow Rate, veh/h	37	671	103	68	723	14	174	29	74	24	23	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	3	4	4	12	12	12	10	10	10
Cap, veh/h	335	870	134	299	1026	20	317	54	94	165	151	178
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	696	1525	234	689	1799	35	795	211	367	297	589	697
Grp Volume(v), veh/h	37	0	774	68	0	737	277	0	0	84	0	0
Grp Sat Flow(s),veh/h/ln	696	0	1760	689	0	1834	1372	0	0	1582	0	0
Q Serve(g_s), s	2.1	0.0	17.5	4.3	0.0	14.9	7.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.0	0.0	17.5	21.8	0.0	14.9	9.6	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.02	0.63		0.27	0.29		0.44
Lane Grp Cap(c), veh/h	335	0	1003	299	0	1046	464	0	0	494	0	0
V/C Ratio(X)	0.11	0.00	0.77	0.23	0.00	0.70	0.60	0.00	0.00	0.17	0.00	0.00
Avail Cap(c_a), veh/h	335	0	1003	299	0	1046	675	0	0	725	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	8.5	16.9	0.0	8.0	17.7	0.0	0.0	15.1	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	5.7	1.8	0.0	4.0	1.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.2	0.8	0.0	5.2	2.8	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	0.0	14.3	18.7	0.0	12.0	18.9	0.0	0.0	15.3	0.0	0.0
LnGrp LOS	B	A	B	B	A	B	B	A	A	B	A	A
Approach Vol, veh/h		811			805			277			84	
Approach Delay, s/veh		14.3			12.5			18.9			15.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	17.7	34.0	17.7	34.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	29.5	21.5	29.5
Max Q Clear Time (g_c+I1), s	11.6	19.5	4.1	23.8
Green Ext Time (p_c), s	1.2	4.2	0.3	2.7

Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	0	0	299	193	12
Future Vol, veh/h	20	0	0	299	193	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	5	2	2	5
Mvmt Flow	22	0	0	332	214	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	553	-	-	0	-	0
Stage 1	221	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.45	-	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	-	-	-	-	-
Pot Cap-1 Maneuver	489	0	0	-	-	-
Stage 1	809	0	0	-	-	-
Stage 2	720	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	489	-	-	-	-	-
Mov Cap-2 Maneuver	489	-	-	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	489	-	-
HCM Lane V/C Ratio	-	0.045	-	-
HCM Control Delay (s)	-	12.7	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	12	7	216	12	6
Future Vol, veh/h	120	12	7	216	12	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	8	9	14	2	18	17
Mvmt Flow	150	15	9	270	15	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	165	0	446	158
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	-	-	4.24	-	6.58	6.37
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.326	-	3.662	3.453
Pot Cap-1 Maneuver	-	-	1344	-	541	850
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1344	-	537	850
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	720	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	612	-	-	1344	-
HCM Lane V/C Ratio	0.037	-	-	0.007	-
HCM Control Delay (s)	11.1	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	60	4	1	20	69	585	4	8	520	4
Future Vol, veh/h	16	0	60	4	1	20	69	585	4	8	520	4
Conflicting Peds, #/hr	0	0	5	5	0	0	6	0	12	12	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	11	2	2	5	3	3	25	2	4	2
Mvmt Flow	17	0	63	4	1	21	72	609	4	8	542	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1332	1335	555	1364	1335	623	552	0	0	625	0	0
Stage 1	566	566	-	767	767	-	-	-	-	-	-	-
Stage 2	766	769	-	597	568	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.31	7.12	6.52	6.25	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.399	3.518	4.018	3.345	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	131	154	514	125	154	481	1013	-	-	956	-	-
Stage 1	509	507	-	395	411	-	-	-	-	-	-	-
Stage 2	395	411	-	490	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	113	133	509	98	133	476	1007	-	-	945	-	-
Mov Cap-2 Maneuver	113	133	-	98	133	-	-	-	-	-	-	-
Stage 1	451	498	-	348	362	-	-	-	-	-	-	-
Stage 2	336	362	-	423	497	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.8	19.3	0.9	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	293	277	945	-	-
HCM Lane V/C Ratio	0.071	-	-	0.27	0.094	0.009	-	-
HCM Control Delay (s)	8.8	0	-	21.8	19.3	8.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.1	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	767	65	36	622	13	137	20	50	28	10	14
Future Volume (veh/h)	32	767	65	36	622	13	137	20	50	28	10	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	0.98		0.98	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	783	66	37	635	13	140	20	51	29	10	14
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	2	2	2	2	2	2	2	2
Cap, veh/h	467	1067	90	330	1146	23	295	48	74	254	91	88
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	782	1701	143	644	1825	37	891	229	357	732	437	420
Grp Volume(v), veh/h	33	0	849	37	0	648	211	0	0	53	0	0
Grp Sat Flow(s),veh/h/ln	782	0	1844	644	0	1863	1478	0	0	1589	0	0
Q Serve(g_s), s	1.4	0.0	17.5	2.3	0.0	10.9	5.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.3	0.0	17.5	19.8	0.0	10.9	7.1	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.02	0.66		0.24	0.55		0.26
Lane Grp Cap(c), veh/h	467	0	1157	330	0	1169	417	0	0	433	0	0
V/C Ratio(X)	0.07	0.00	0.73	0.11	0.00	0.55	0.51	0.00	0.00	0.12	0.00	0.00
Avail Cap(c_a), veh/h	467	0	1157	330	0	1169	679	0	0	696	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.4	0.0	7.1	13.9	0.0	5.8	19.9	0.0	0.0	17.7	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	4.1	0.7	0.0	1.9	1.0	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	5.7	0.4	0.0	3.4	2.4	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.0	11.2	14.6	0.0	7.7	20.9	0.0	0.0	17.9	0.0	0.0
LnGrp LOS	A	A	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		882			685			211			53	
Approach Delay, s/veh		11.1			8.1			20.9			17.9	
Approach LOS		B			A			C			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	16.0	39.0	16.0	39.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	34.5	21.5	34.5
Max Q Clear Time (g_c+I1), s	9.1	19.5	3.4	21.8
Green Ext Time (p_c), s	0.9	5.9	0.2	3.9

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	0	234	166	14
Future Vol, veh/h	8	0	0	234	166	14
Conflicting Peds, #/hr	4	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	6	6	8
Mvmt Flow	9	0	0	252	178	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	442	-	-	0	-	0
Stage 1	186	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	573	0	0	-	-	-
Stage 1	846	0	0	-	-	-
Stage 2	787	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	573	-	-	-	-	-
Mov Cap-2 Maneuver	573	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	573	-	-
HCM Lane V/C Ratio	-	0.015	-	-
HCM Control Delay (s)	-	11.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	149	3	11	129	6	1
Future Vol, veh/h	149	3	11	129	6	1
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	33	30	4	17	0
Mvmt Flow	169	3	13	147	7	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	173	0	345	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	173	-
Critical Hdwy	-	-	4.4	-	6.57	6.2
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.47	-	3.653	3.3
Pot Cap-1 Maneuver	-	-	1251	-	622	877
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1250	-	615	876
Mov Cap-2 Maneuver	-	-	-	-	615	-
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	813	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	642	-	-	1250	-
HCM Lane V/C Ratio	0.012	-	-	0.01	-
HCM Control Delay (s)	10.7	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	10	60	2	3	8	48	640	5	4	756	11
Future Vol, veh/h	10	10	60	2	3	8	48	640	5	4	756	11
Conflicting Peds, #/hr	0	0	1	1	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	11	11	4	2	33	13	13	3	2	2	3	2
Mvmt Flow	11	11	63	2	3	8	51	674	5	4	796	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1599	1596	808	1627	1600	677	813	0	0	679	0	0
Stage 1	815	815	-	779	779	-	-	-	-	-	-	-
Stage 2	784	781	-	848	821	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.24	7.12	6.83	6.33	4.23	-	-	4.12	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.12	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.12	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.336	3.518	4.297	3.417	2.317	-	-	2.218	-	-
Pot Cap-1 Maneuver	81	102	378	82	90	434	768	-	-	913	-	-
Stage 1	359	379	-	389	364	-	-	-	-	-	-	-
Stage 2	373	393	-	356	348	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	70	90	376	57	79	434	764	-	-	913	-	-
Mov Cap-2 Maneuver	70	90	-	57	79	-	-	-	-	-	-	-
Stage 1	319	374	-	347	325	-	-	-	-	-	-	-
Stage 2	323	351	-	285	343	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.4	33	0.7	0
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	764	-	-	193	142	913	-	-
HCM Lane V/C Ratio	0.066	-	-	0.436	0.096	0.005	-	-
HCM Control Delay (s)	10	0	-	37.4	33	9	0	-
HCM Lane LOS	B	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	2	0.3	0	-	-

APPENDIX E
Analysis Reports Future (2022) With Project

HCM 6th Signalized Intersection Summary — 2022 W AM

1: Poalima St & Kalanianaole Hwy — 08/01/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	617	97	65	665	13	170	28	72	22	21	34
Future Volume (veh/h)	34	617	97	65	665	13	170	28	72	22	21	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1856	1841	1841	1722	1722	1722	1752	1752	1752
Adj Flow Rate, veh/h	37	671	105	71	723	14	185	30	78	24	23	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	3	4	4	12	12	12	10	10	10
Cap, veh/h	324	855	134	286	1012	20	326	53	97	168	155	185
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	696	1521	238	688	1799	35	805	200	364	300	580	693
Grp Volume(v), veh/h	37	0	776	71	0	737	293	0	0	84	0	0
Grp Sat Flow(s),veh/h/ln	696	0	1759	688	0	1834	1369	0	0	1574	0	0
Q Serve(g_s), s	2.2	0.0	18.1	4.7	0.0	15.4	8.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.6	0.0	18.1	22.9	0.0	15.4	10.3	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.02	0.63		0.27	0.29		0.44
Lane Grp Cap(c), veh/h	324	0	989	286	0	1031	476	0	0	507	0	0
V/C Ratio(X)	0.11	0.00	0.78	0.25	0.00	0.71	0.61	0.00	0.00	0.17	0.00	0.00
Avail Cap(c_a), veh/h	324	0	989	286	0	1031	666	0	0	714	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.8	0.0	9.0	18.0	0.0	8.4	17.7	0.0	0.0	14.9	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	6.2	2.1	0.0	4.2	1.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.6	0.8	0.0	5.5	3.1	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	0.0	15.2	20.0	0.0	12.6	19.0	0.0	0.0	15.1	0.0	0.0
LnGrp LOS	B	A	B	C	A	B	B	A	A	B	A	A
Approach Vol, veh/h		813			808			293			84	
Approach Delay, s/veh		15.2			13.3			19.0			15.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.5		34.0		18.5		34.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5				
Max Q Clear Time (g_c+I1), s		12.3		20.1		4.1		24.9				
Green Ext Time (p_c), s		1.2		4.0		0.3		2.3				

Intersection Summary			
HCM 6th Ctrl Delay			15.0
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	0	0	314	197	12
Future Vol, veh/h	20	0	0	314	197	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	5	2	2	5
Mvmt Flow	22	0	0	349	219	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	575	-	-	0	-	0
Stage 1	226	-	-	-	-	-
Stage 2	349	-	-	-	-	-
Critical Hdwy	6.45	-	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	-	-	-	-	-
Pot Cap-1 Maneuver	475	0	0	-	-	-
Stage 1	805	0	0	-	-	-
Stage 2	707	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	475	-	-	-	-	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	707	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	475	-	-
HCM Lane V/C Ratio	-	0.047	-	-
HCM Control Delay (s)	-	13	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	16	10	216	27	14
Future Vol, veh/h	120	16	10	216	27	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	8	9	14	2	18	17
Mvmt Flow	150	20	13	270	34	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	170	0	456	160
Stage 1	-	-	-	-	160	-
Stage 2	-	-	-	-	296	-
Critical Hdwy	-	-	4.24	-	6.58	6.37
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.326	-	3.662	3.453
Pot Cap-1 Maneuver	-	-	1338	-	534	847
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	720	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1338	-	528	847
Mov Cap-2 Maneuver	-	-	-	-	528	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	712	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	606	-	-	1338	-
HCM Lane V/C Ratio	0.085	-	-	0.009	-
HCM Control Delay (s)	11.5	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	66	4	1	20	72	585	4	8	520	4
Future Vol, veh/h	18	0	66	4	1	20	72	585	4	8	520	4
Conflicting Peds, #/hr	0	0	5	5	0	0	6	0	12	12	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	11	2	2	5	3	3	25	2	4	2
Mvmt Flow	19	0	69	4	1	21	75	609	4	8	542	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1338	1341	555	1373	1341	623	552	0	0	625	0	0
Stage 1	566	566	-	773	773	-	-	-	-	-	-	-
Stage 2	772	775	-	600	568	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.31	7.12	6.52	6.25	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.399	3.518	4.018	3.345	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	130	152	514	123	152	481	1013	-	-	956	-	-
Stage 1	509	507	-	392	409	-	-	-	-	-	-	-
Stage 2	392	408	-	488	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	131	509	95	131	476	1007	-	-	945	-	-
Mov Cap-2 Maneuver	111	131	-	95	131	-	-	-	-	-	-	-
Stage 1	449	498	-	344	359	-	-	-	-	-	-	-
Stage 2	332	358	-	415	497	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.9	19.6	1	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	288	272	945	-	-
HCM Lane V/C Ratio	0.074	-	-	0.304	0.096	0.009	-	-
HCM Control Delay (s)	8.9	0	-	22.9	19.6	8.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	18	23	0	6	20
Future Vol, veh/h	0	18	23	0	6	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	20	25	0	7	22

Major/Minor	Minor1			Major1		Major2
Conflicting Flow All	61	25	0	0	25	0
Stage 1	25	-	-	-	-	-
Stage 2	36	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	945	1051	-	-	1589	-
Stage 1	998	-	-	-	-	-
Stage 2	986	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	941	1051	-	-	1589	-
Mov Cap-2 Maneuver	941	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	982	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1051	1589	-
HCM Lane V/C Ratio	-	-	0.019	0.004	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	18	0	1	19
Future Vol, veh/h	0	5	18	0	1	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	20	0	1	21

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	43	20	0	0	20	0
Stage 1	20	-	-	-	-	-
Stage 2	23	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	968	1058	-	-	1596	-
Stage 1	1003	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	967	1058	-	-	1596	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1058	1596	-
HCM Lane V/C Ratio	-	-	0.005	0.001	-
HCM Control Delay (s)	-	-	8.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	767	69	38	622	13	145	21	53	28	10	14
Future Volume (veh/h)	32	767	69	38	622	13	145	21	53	28	10	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	0.98		0.98	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	783	70	39	635	13	148	21	54	29	10	14
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	2	2	2	2	2	2	2	2
Cap, veh/h	446	1017	91	307	1098	22	315	51	79	272	98	93
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	782	1691	151	641	1825	37	889	230	357	732	442	422
Grp Volume(v), veh/h	33	0	853	39	0	648	223	0	0	53	0	0
Grp Sat Flow(s),veh/h/ln	782	0	1842	641	0	1862	1476	0	0	1596	0	0
Q Serve(g_s), s	1.4	0.0	17.4	2.4	0.0	10.8	5.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.1	0.0	17.4	19.9	0.0	10.8	6.9	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.02	0.66		0.24	0.55		0.26
Lane Grp Cap(c), veh/h	446	0	1108	307	0	1120	444	0	0	463	0	0
V/C Ratio(X)	0.07	0.00	0.77	0.13	0.00	0.58	0.50	0.00	0.00	0.11	0.00	0.00
Avail Cap(c_a), veh/h	446	0	1108	307	0	1120	708	0	0	727	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.9	0.0	7.5	14.9	0.0	6.2	18.0	0.0	0.0	15.9	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	5.2	0.8	0.0	2.2	0.9	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	6.0	0.4	0.0	3.4	2.2	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	0.0	12.7	15.7	0.0	8.4	18.8	0.0	0.0	16.0	0.0	0.0
LnGrp LOS	B	A	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		886			687			223			53	
Approach Delay, s/veh		12.6			8.8			18.8			16.0	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.7		35.0		15.7		35.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		20.5		30.5		20.5		30.5				
Max Q Clear Time (g_c+I1), s		8.9		19.4		3.2		21.9				
Green Ext Time (p_c), s		0.9		4.9		0.2		3.1				

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	0	246	172	14
Future Vol, veh/h	8	0	0	246	172	14
Conflicting Peds, #/hr	4	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	6	6	8
Mvmt Flow	9	0	0	265	185	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	462	-	-	0	-	0
Stage 1	193	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	558	0	0	-	-	-
Stage 1	840	0	0	-	-	-
Stage 2	776	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	558	-	-	-	-	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	840	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	558	-	-
HCM Lane V/C Ratio	-	0.015	-	-
HCM Control Delay (s)	-	11.6	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	149	9	29	129	18	3
Future Vol, veh/h	149	9	29	129	18	3
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	33	30	4	17	0
Mvmt Flow	169	10	33	147	20	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	180	0	388	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	213	-
Critical Hdwy	-	-	4.4	-	6.57	6.2
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.47	-	3.653	3.3
Pot Cap-1 Maneuver	-	-	1243	-	587	874
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	788	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1242	-	569	873
Mov Cap-2 Maneuver	-	-	-	-	569	-
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	599	-	-	1242	-
HCM Lane V/C Ratio	0.04	-	-	0.027	-
HCM Control Delay (s)	11.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	10	62	2	3	8	62	640	5	4	756	15
Future Vol, veh/h	10	10	62	2	3	8	62	640	5	4	756	15
Conflicting Peds, #/hr	0	0	1	1	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	11	11	4	2	33	13	13	3	2	2	3	2
Mvmt Flow	11	11	65	2	3	8	65	674	5	4	796	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1629	1626	810	1658	1632	677	817	0	0	679	0	0
Stage 1	817	817	-	807	807	-	-	-	-	-	-	-
Stage 2	812	809	-	851	825	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.24	7.12	6.83	6.33	4.23	-	-	4.12	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.12	5.83	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.12	5.83	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.336	3.518	4.297	3.417	2.317	-	-	2.218	-	-
Pot Cap-1 Maneuver	78	97	377	78	86	434	765	-	-	913	-	-
Stage 1	358	378	-	375	353	-	-	-	-	-	-	-
Stage 2	360	381	-	355	346	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	66	83	375	52	73	434	761	-	-	913	-	-
Mov Cap-2 Maneuver	66	83	-	52	73	-	-	-	-	-	-	-
Stage 1	308	373	-	324	305	-	-	-	-	-	-	-
Stage 2	301	329	-	282	342	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.4	35.1	0.9	0
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	761	-	-	188	133	913	-	-
HCM Lane V/C Ratio	0.086	-	-	0.459	0.103	0.005	-	-
HCM Control Delay (s)	10.2	0	-	39.4	35.1	9	0	-
HCM Lane LOS	B	A	-	E	E	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	10	0	19	19
Future Vol, veh/h	0	11	10	0	19	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	11	0	21	21

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	74	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	930	1070	-	-	1608	-
Stage 1	1012	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	1070	-	-	1608	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	948	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	3.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1070	1608	-
HCM Lane V/C Ratio	-	-	0.011	0.013	-
HCM Control Delay (s)	-	-	8.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	7	0	5	14
Future Vol, veh/h	0	3	7	0	5	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	8	0	5	15

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	33	8	0	0	8	0
Stage 1	8	-	-	-	-	-
Stage 2	25	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	980	1074	-	-	1612	-
Stage 1	1015	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	977	1074	-	-	1612	-
Mov Cap-2 Maneuver	977	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	995	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	1.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1074	1612	-
HCM Lane V/C Ratio	-	-	0.003	0.003	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

APPENDIX H

Consultation and Comments

(This page intentionally left blank.)

sample

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 20, 2018

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Sir or Madam,

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for the proposed development of Hawaiian Home Lands in Waimānalo on the island of Oʻahu into Subsistence Agricultural Homesteads (SAH) for native Hawaiian beneficiaries. The proposed Waikupanaha Agricultural Lots Project will consolidate and re-subdivide the project site, which encompasses approximately 30 acres. The Project will allow the Department of Hawaiian Home Lands (DHHL) to award agricultural lots to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for SAH lots of not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and cultivate subsistence agriculture on their lots, or (2) actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes. The project site consists of several contiguous parcels identified as Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096, which are located east of Waikupanaha Street. Any areas determined to be unsuitable for development will not be awarded. The layout and configuration of the agricultural lots will also be influenced by existing conditions such as topography and drainage features. Lot sizes will be determined after consultation with native Hawaiian beneficiaries and the general public. At this time, DHHL anticipates that the Waikupanaha subdivision will most likely consist of lots that are no more than one-acre in size. Infrastructure for the Project will be discussed with appropriate State and County agencies and will be designed to comply with applicable regulatory standards that consider the health and safety of residents but are appropriate for a rural area.

No species of plants or animals currently proposed for listing or listed under either the federal or State of Hawaiʻi endangered species statutes were observed during a survey of the project site. Aquatic features and critical habitat are not present in the survey area. The project site does contain buildings and structures associated with observed agricultural activity. Field observations and available land use information suggests that the project site has been altered by land-disturbing activities associated with agriculture, animal husbandry and a quarrying operation. No archaeological features or deposits were identified during a survey of the project site. Cultural Surveys Hawaiʻi, Inc. is currently investigating traditional cultural practices and features associated with the project area.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

sample

We would greatly appreciate input from you or your organization that will assist us and project stakeholders in determining appropriate mitigation measures that may be warranted due to DHHL's project. The enclosed location map is provided for your reference.

You are welcome to provide input on the project at this time. We would greatly appreciate your response to this letter by December 21, 2018.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

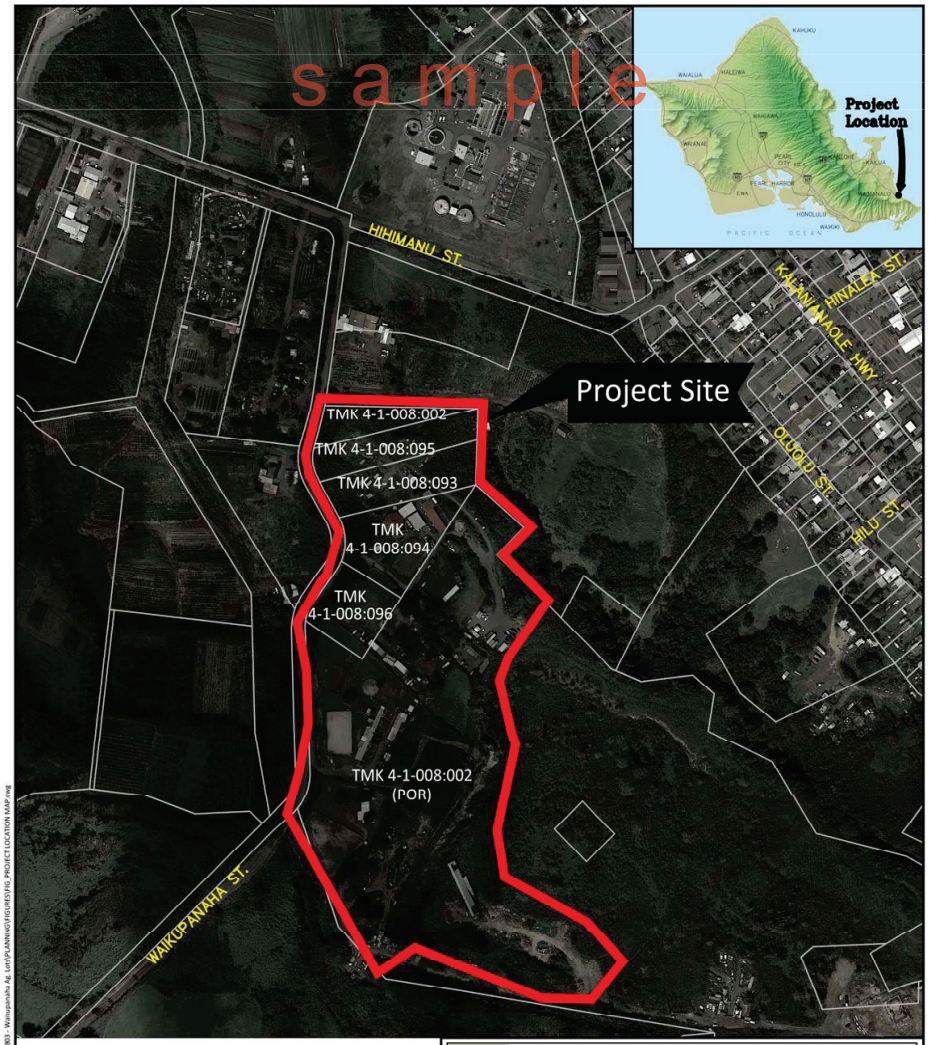
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 596-7790.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

NOVEMBER 2018

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: \\TLCG2013\netshare\1. PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.mxd

sample

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Sir or Madam,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

We would greatly appreciate input from you or your organization that will assist us and project stakeholders in determining appropriate mitigation measures that may be warranted due to DHHL's project. You are welcome to provide input on the project at this time. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

sample

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

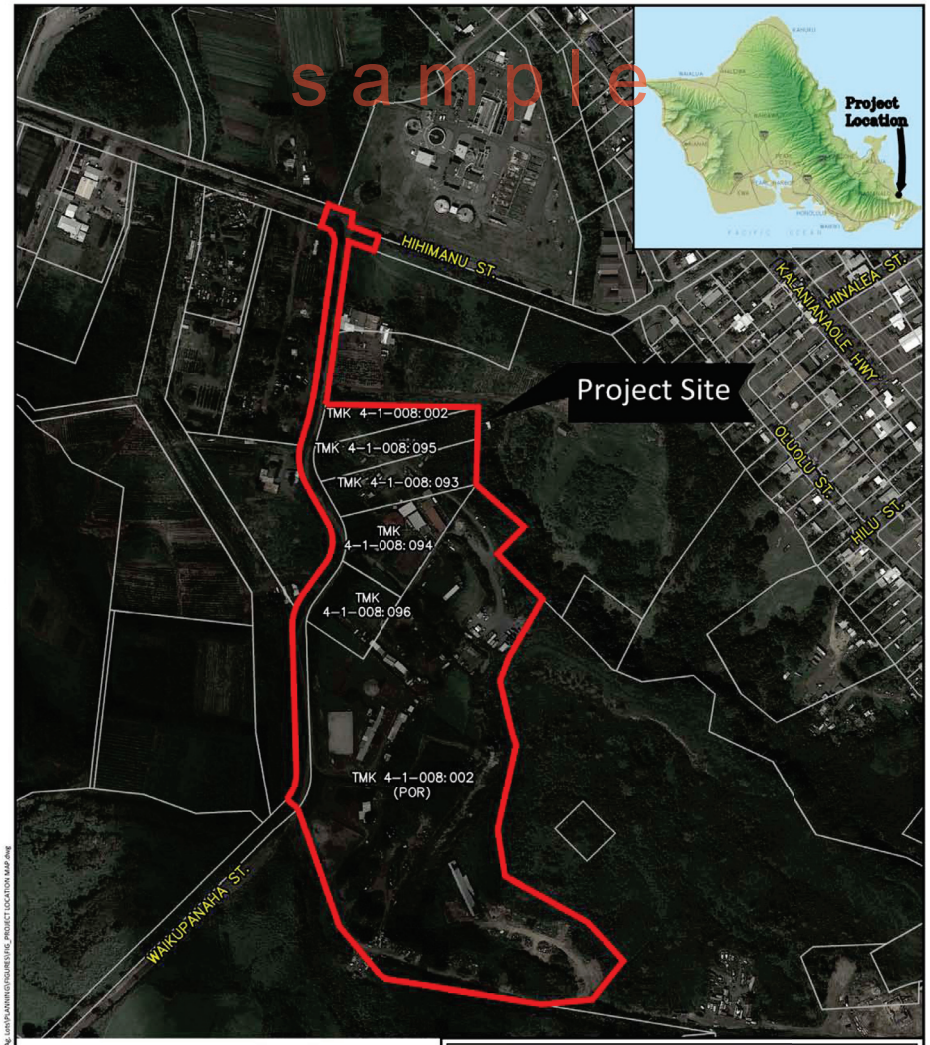
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

MARCH 2019

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: L:\1_PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.dwg

United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2019-TA-0099

December 14, 2018

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawai‘i 96805

Subject: Response to your Request for Technical Assistance

Dear Mr. Ing,

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

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

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

Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect, likely to

adversely affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

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

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

Sincerely,

Aaron Nadig

Digitally signed by Aaron Nadig
Date: 2018.12.14 15:17:04 -10'00'

Island Team Manager
Pacific islands Fish and Wildlife Office

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

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

Plants				
Scientific Name	**Common Name or Hawaiian Name**	**Federal Status**	**Locations**	**May Occur In Project Area**
Abutilon menziesii	Ko‘oloa‘ula	E	O, L, M, H	☐
Achyranthes splendens var. *rotundata*	‘Ewa hinahina	E	O	☐
Bonamia menziesii	No common name	E	K, O, L, M, H	☐
Canavalia pubescens	‘Āwikiwiki	E	Ni, K, L, M	☐
Colubrina oppositifolia	Kauila	E	O, M, H	☐
Cyperus trachysanthos	Pu‘uka‘a	E	K, O	☐
Gouania hillebrandii	No common name	E	Mo, M	☐
Hibiscus brackenridgei	Ma‘o hau hele	E	O, Mo, L, M, H	☐
Ischaemum byrone	Hilo ischaemum	E	K, O, Mo, M, H	☐
Isodendrion pyrifolium	Wahine noho kula	E	O, H	☐
Marsilea villosa	‘Ihi‘ihi	E	Ni, O, Mo	☐
Mezoneuron kavaiense	Uhiuhi	E	O, H	☐
Nothocestrum breviflorum	‘Aiea	E	H	☐
Panicum fauriei var. *carteri*	Carter’s panicgrass	E	Molokini Islet (O), Mo	☐
Panicum niihauense	Lau‘ehu	E	K	☐
Peucedanum sandwicense	Makou	E	K, O, Mo, M	☐
Pleomele (Chrysodracon) hawaiiensis	Halapepe	E	H	☐
Portulaca sclerocarpa	‘Ihi	E	L, H	☐
Portulaca villosa	‘Ihi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	☐
Pritchardia affinis (maideniana)	Loulu	E	H	☐
Pseudognaphalium sandwicensium var. *molokaiense*	‘Ena‘ena	E	Mo, M	☐
Scaevola coriacea	Dwarf naupaka	E	Mo, M	☐
Schenkia (*Centaurium*) *sebaeoides*	‘Āwiwi	E	K, O, Mo, L, M	☐
Sesbania tomentosa	‘Ōhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	☐
Tetramolopium rockii	No common name	T	Mo	☐
Vigna o-wahuensis	No common name	E	Mo, M, L, H, Ka	☐

Location key: O=O‘ahu, K=Kaua‘i, M=Maui, H=Hawai‘i Island, L=Lāna‘i, Mo=Moloka‘i, Ka=Kaho‘olawe, Ni=Ni‘ihau, Le=Lehua

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Ms. Mary Abrams, Field Supervisor
Department of the Interior
Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850-0056

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference 01EPIF00-2019-TA-0099

Dear Ms. Abrams,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your department's letter dated 12/14/18 (reference 01EPIF00-2019-TA-0099) that was transmitted via email on 12/17/18 and for providing us with your protected species list with regards to the project area. We acknowledge your statement that the list is not comprehensive and should only be used for general guidance. The determination in the flora and fauna survey report that will be appended to the EA suggests that the project would not displace any federal or State of Hawaiʻi listed species of plants or insects since the project site is devoid of these protected resources. There is no designated critical habitat area within the project site.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

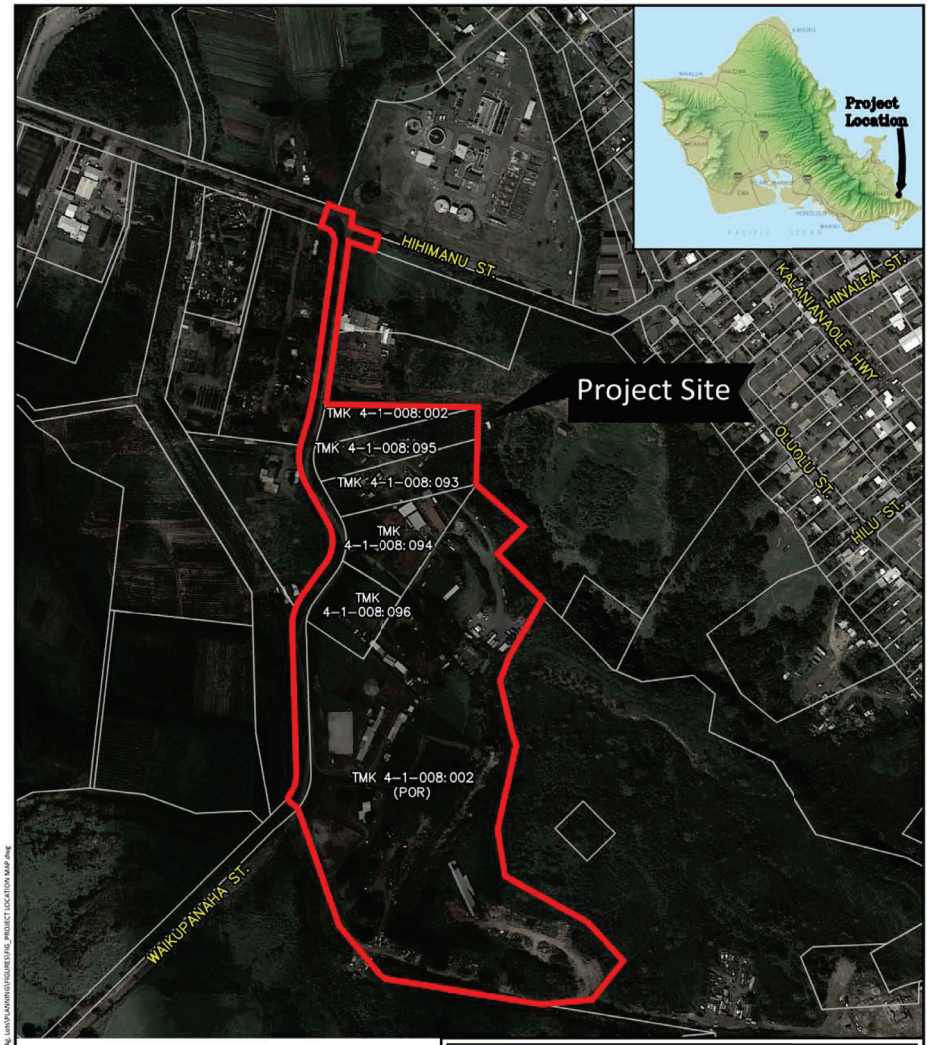
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

MARCH 2019

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: L:\1_PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.dwg

DAVID Y. IGE
GOVERNOR

RODERICK K. BECKER
COMPTROLLER

AUDREY HIDANO
DEPUTY COMPTROLLER

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

(P) 1611.8

DEC 31 2018

01-04-19P01:52 RCVD

MEMORANDUM

TO: Darrell Ing, Project Manager
Department of Hawaiian Home Lands

FROM: Keith S. Kogachi
Public Works Administrator

SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupahana Agricultural Lots Project in Waimanalo Ahupuaa, Koolaupoko District, Oahu Island
Tax Map Keys: (1) 4-1-008:002 (portion), 093, 094, 095, and 096

Thank you for the opportunity to provide comments for the subject project. The proposed project does not impact any Department of Accounting and General Services' existing facilities in the area, and we have no comments to offer at this time.

If you should have any questions or require further information, please contact Mr. Dennis Chen of our Planning Branch at 586-0491, or at dennis.yk.chen@hawaii.gov .

c: Ms. Claire Oshiro, Environmental Planner, The Limtiaco Consulting Group

DAVID Y. IGE
GOVERNOR

CURT T. OTAGURO
COMPTROLLER

AUDREY HIDANO
DEPUTY COMPTROLLER

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

(P)19.139

JUL 16 2019

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 JUL 17 PM 1:22

MEMORANDUM

TO: Darrell Ing, Project Manager
Department of Hawaiian Home Lands

FROM: Gayle S. Takasaki
Acting, Planning Branch Chief

SUBJECT: Pre-Assessment Consultation
Preparation of the Environmental Assessment for
Proposed Waikupanaha Agricultural Lots Project
Waimanalo Ahupuaa, Koolaupoko District, Oahu, Hawaii
TMK: (1) 4-1-008:002 (por.) 093, 094, 095, and 096
Reference (P) 1611.8

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

If you have any questions, your staff may call Ms. Dora Choy of the Planning Branch at 586-0488.

DC:mo
c: Ms. Claire Oshiro, Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Ms. Gayle S. Takasaki, Acting Planning Branch Chief
State of Hawaii
Department of Accounting and General Services
Public Works Division, Planning Branch
P.O. Box 119
Honolulu, HI 96810

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference (P)19.139

Dear Ms. Takasaki,

Thank you for the letter of no comment dated July 16, 2019. We acknowledge the statement that the Project does not impact any of your agency's projects or existing facilities.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

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

December 19, 2018

Ms. Jobie Masagatani
Chairperson
Hawaiian Homes Commission
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805

Attention: Mr. Darrell Ing, Project Manager

Dear Chairperson Masagatani:

Subject: Pre-Assessment Consultation Preparation of an Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project
Waimanalo, Oahu
TMK: 4-1-08: por. 2, 93, 94, 94, and 96
Area: approximately 30 acres

This is in response to a letter (dated November 20, 2018) from The Limtiaco Consulting Group who is requesting our comments on the subject project.

The Department of Hawaiian Home Lands (DHHL) is proposing to consolidate and resubdivide five parcels in eastern Waimanalo comprising about 30 acres into Subsistence Agricultural Homesteads that are likely to be no more than one acre each. Lessees will be required to, within three years:

1. Reside and cultivate subsistence agriculture on their lots, or
2. Actively cultivate food crops or raise small livestock or both for subsistence agriculture purposes.

The properties appear to have "buildings and structures associated with observed agricultural activity." (Letter, top of page 2) We recommend that the Environmental Assessment fully describe the affected agricultural activities and what is to become of them should the proposed project move forward.

The location of the proposed project is near to but not serviced by the Department of Agriculture's (DOA) Waimanalo Irrigation System (WIS) service area. The WIS ends near the southwest corner of the proposed project. If DHHL is contemplating connecting to the WIS to provide irrigation water for tenants engaged in agricultural production, we recommend that Mr. Kirk Saiki, P.E., Manager of the DOA Agriculture Infrastructure Branch be contacted immediately at 973-9468.

Sincerely,

Scott E. Enright, Chairperson
Board of Agriculture

c: ARMD/AIB

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Scott Enright, Chairperson
State of Hawaii
Department of Agriculture, Office of the Chairperson
1428 South King Street
Honolulu, HI 96814

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Chairperson Enright,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your department's letter dated 12/19/18. The removal of existing buildings and structures is expected to be necessary to accomplish the project. The EA will describe the likely outcome with respect to the continuation of existing agricultural activities at other sites if DHHL's current permittees divulge their intentions during the consultation process.

Thank you also for the information you provided with regards to the Waimanalo Irrigation System (WIS). We appreciate that our engineers may contact Mr. Kirk Saiki as they investigate the potential for providing irrigation water to tenants by connecting to the WIS.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

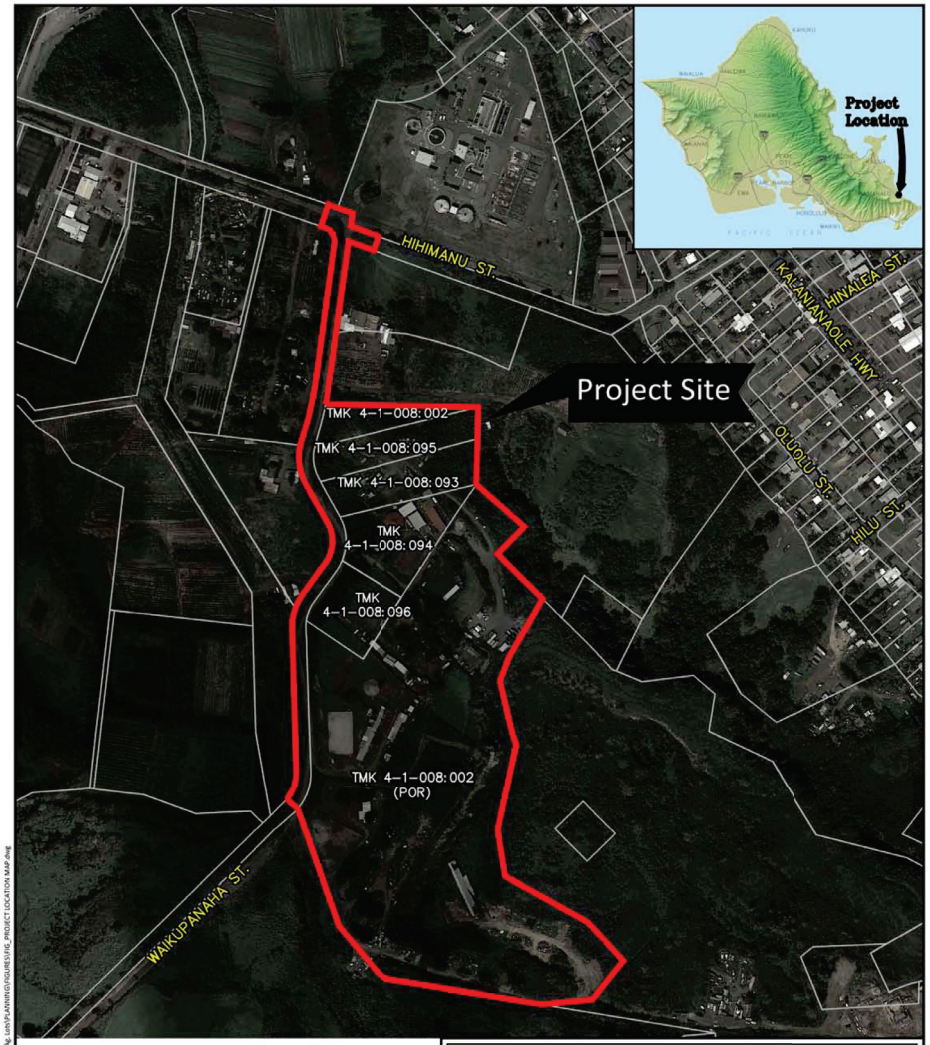
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

MARCH 2019

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: L:\1_PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.dwg

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

12-27-18P02:06 RCVD

December 19, 2018

Department of Hawaiian Home Lands
Attention: Mr. Darrell Ing, Project Manager
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

SUBJECT: **Waikupanaha Agricultural Lots Project**

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division, (b) Land Division – Oahu District, (c) Division of Aquatic Resources, and (d) Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files
Claire Oshiro, The Limtiaco Consulting Group

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
18 NOV 26 AM 11:31

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 21, 2018

MEMORANDUM

18 NOV 26 PM 01:53 ENGINEERING

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 & 096
APPLICANT: Department of Hawaiian Home Lands

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **December 19, 2018**.

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

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

Signed: Carty S. Chang, Chief Engineer
Print Name:
Date: 12/11/18

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Pre-Assessment Consultation for the Proposed Waikupanaha Agricultural Lots Project, Waimanalo, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 & 096

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

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

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

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

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 12/11/18

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 21, 2018

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 & 096
APPLICANT: Department of Hawaiian Home Lands

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **December 19, 2018**.

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

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

Signed: Darlene Bryant-Takamatsu

Print Name: Darlene Bryant-Takamatsu
Date: 11/23/18

Attachments
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

RECEIVED
NOV 23 2018
Division of Aquatic Resources
DAR 5826

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 21, 2018

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 & 096
APPLICANT: Department of Hawaiian Home Lands

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **December 19, 2018**.

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

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

Signed:
Print Name: Brian J. Neilson Acting DAR Administrator
Date: 12-14-18

Attachments
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

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

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

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

Date: 12/12/2018
DAR # 5826

MEMORANDUM
TO: Brian J. Neilson
Acting DAR Administrator

FROM: Justin Goggins JG, Aquatic Biologist

SUBJECT: Pre-Assessment Consultation for the Proposed Waikupanaha Agriculture Lots Project

Request Submitted by: Department of Hawaiian Home Lands

Location of Project: Waimanalo Ahupua'a Ko'olaupoko District, Oahu Island

Brief Description of Project:

The Limtiaco Consulting Group, Inc. is preparing an Environmental Assessment for the proposed development of Hawaiian Home Lands in Waimanalo into Subsistence Agricultural Homesteads (SAH) for native Hawaiian beneficiaries. The proposed Waikupanaha Agriculture Lots Project will consolidate and re-subdivide the project site, which encompasses approximately 30 acres. The Project will allow the Department of Hawaiian Home Lands (DHHL) to award agricultural lots to beneficiaries on its Agricultural Wait list and to promote self-sufficiency through farming opportunities.

Comments:
☐ No Comments ☒ Comments Attached

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

Comments Approved: Date: 12-14-18
Brian J. Neilson
Acting DAR Administrator

DAR# 5826

Comments

The Division of Aquatic Resources (DAR) is in general support of this project and recognizes the importance of providing subsistence property for people on the Agriculture wait list. DAR's goal is to protect and manage the state's aquatic resources that could be impacted by construction and agriculture projects. As such, efforts should be made by the applicant to ensure that activities are conducted in such a manner as to minimize harm to surrounding aquatic habitats to the greatest extent possible by employing Best Management Practices.

DAR's primary concern is sediment run-off into nearby streams, ditches and subsequently into the ocean. DAR recommends that the project operators utilize erosion control and land-based sources of pollution (LBSP) barrier measures at all development sites where there is the opportunity for sediment discharge into nearby waters (e.g. any site where there will be excavation, grading, or sediment/pollutant producing activities). These measures could include many types of barriers (e.g. sediment barriers/bags, silt screens, environmental socks, petroleum absorption diapers, etc.) that limits the amount of sediment or LBSP (e.g. petroleum products, chemicals, debris, etc.) to the maximum extent practicable.

Another good practice would be to keep all unearthed or loose soil covered by native vegetation (grass, shrubs and trees) to minimize rain and wind erosion. Rain and wind can carry large amounts of soil to the coastline even on gentle slopes. Such introduction of soil and nutrients could result in sedimentation or nutrification which may negatively impact or even kill aquatic organisms and associated habitats.

DAR recommends that the applicant take steps to plant native vegetation that actively retain surface storm-water run-off and sediment during precipitation events. Planting an effective vegetated buffer, down slope and between agriculture plots site will help capture soil and pollutants and absorb excess surface runoff from precipitation before they reach the shoreline.

DAR# 5826

Comments

One of the most effective native soil stabilizer plants with water and sediment retention capabilities is Pohinahina (Vitex rotundifolia). Others include `aki`aki (Sporobolus virginicus), Pa`u o Hi`iaka (Jaquemontia sandwicense), Pohuehue (Ipomoea pes-capre). The former species will act as a barrier much like a gravel berm, whereas the latter species are low growing and hearty enough for walking on. In addition, the applicant could consult with CTAHR for alternative vegetation options or consult the following literature:

University of Hawaii
College of Tropical Agriculture & Human Resources
Dept. of Natural Resources and Environmental Management
1910 East-West Road
Honolulu, HI 96822
(808) 956-7774
www.ctahr.hawaii.edu/nrem/

Thank you for providing DAR the opportunity to comment on the proposed project. DAR respectfully request the opportunity to review and comment on the Environmental Assessment when it is completed.

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

2018 NOV 23 A 11:04

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT
2018 NOV 23 PM 2:51

2018 NOV 23 A 11:05

November 21, 2018

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 & 096
APPLICANT: Department of Hawaiian Home Lands

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **December 19, 2018**.

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

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

Signed: /s/ Jeffrey T. Pearson, P.E.

Print Name: Deputy Director
Date: December 12, 2018

Attachments
cc: Central Files

FILE ID: RFD.4989.3
DOC ID: 20651

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

BRUCE S. ANDERSON, PH.D.
WILLIAM D. BALFOUR, JR.
KAMANA BEAMER, PH.D.
MICHAEL G. BUCK
NEIL J. HANNAHS
PAUL J. MEYER

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

December 12, 2018

REF: RFD.4989.3

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: Jeffrey T. Pearson, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Pre-Assessment Consultation for the Proposed Waikupanaha Agricultural Lots Project

FILE NO.: RFD.4989.3
TMK NO.: (1) 4-1-008:002 (por.), 093, 094, 095 & 096

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

- [ ] 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- [ ] 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- [ ] 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- [ ] 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- [ ] 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- [ ] 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- [ ] 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- [X] 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- [X] 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- [ ] 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

- [X] OTHER: The Draft Environmental Assessment should discuss the projected water demands for the project, both potable and non-potable, and provide the calculations used to estimate demands. The report should identify the proposed water source(s) to support the project, and include a discussion of the potential impacts on water resources and other public trust uses of water, and describe any proposed mitigation measures. Water conservation and efficiency measures to be implemented should also be discussed.

  The report should discuss the consistency of proposed potable and non-potable water needs with the State Water Projects Plan (2017) and the impact of the proposed development on the existing water reservation established for DHHL through Administrative Rule 13-171-62.

If you have any questions, please contact Lenore Ohye of the Planning Branch at 587-0216 or Dean Uyeno of the Stream Protection and Management Branch at 587-0234.

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

LD 1209

August 05, 2019

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Via email: darrell.h.ing@hawaii.gov

Dear Mr. Ing:

SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed **Waikupanaha Agricultural Lots Project at** Waimanalo Ahupua'a, Koolaupoko District, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095, and 096

Thank you for the opportunity to review and comment on the above subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed a copy of your request dated 07/08/2019, which replaced your request of 11/20/2018, to DLNR's Divisions for their review and comments. The attached DLNR comments supplement those of 12/19/2018.

Enclosed are responses received from the (a) Engineering Division, (b) Commission on Water Resource Management, and (c) Land Division – Oahu District on the subject matter. Should you have any questions, please feel free to contact Barbara Lee at (808) 587-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files
Claire Oshiro, The Limtiaco Consulting Group, Inc. *via email: claire@tlcghawaii.com*

LD 1209

RECEIVED
LAND DIVISION
2019 JUL -9 AM 11:01
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Russell Y. Tsuji, Administrator
Department of Land and Natural Resources, Land Division
Kalanimoku Building
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Tsuji,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of O'ahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its O'ahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawai'i Revised Statutes and Title 11, Chapter 200, Hawai'i Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawai'i Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your department's letter dated 12/19/18 and for collecting the comments from several divisions.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Engineering Division
The EA will include a section that discusses the Flood Hazard Zone designations from FEMA's Flood Insurance Rate Map that are applicable to the project. Proposed wastewater service will be a gravity sewer system with a connection to the City's existing wastewater collection system along Hihimanu Street. The project will connect to the existing municipal water system along Hihimanu Street. Our engineers will be investigating the potential for providing irrigation water to tenants by connecting to the State's Waimanalo Irrigation System. We acknowledge the statements about providing water demand calculations to Engineering Division.

Land Division - Oahu District
We acknowledge the statement of no comment.

Division of Aquatic Resources (Reference DAR 5826)
We acknowledge the statement of general support for the project. DHHL expects the contractor to implement a storm water management plan that prevents a concentration of sediment discharge into nearby aquatic habitat. The project will utilize Best Management Practices for runoff and erosion control. We appreciate the recommendations pertaining to various land-based sources of pollution barrier measures and the use of native vegetation that retains stormwater runoff.

Commission on Water Resource Management (Reference RFD.4989.3)
The project does not involve diverting any streams. We acknowledge the statements about evaluating potable and non-potable water needs, implementing water conservation and efficiency measures, and discussing the existing water reservation established for DHHL.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager

LD 1209

LEGEND
PROJECT BOUNDARY

North

MARCH 2019
SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I
Project Location Map

FIGURE 1

LD315

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
2019 JUL 24 AM 11:58
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 12, 2019

LD 1209

'19 JUL 12 PM 12:23 ENGINEERING

MEMORANDUM

FROM

TO

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

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed **Waikupanaha Agricultural Lots Project**

LOCATION: Waimanalo Ahupua'a, Koolaupoko District, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095, and 096

APPLICANT: The Limtiaco Consulting Group, Inc. on behalf of the State Department of Hawaiian Home Lands

Transmitted for your review and comments is updated information on the above-referenced subject matter. If you would like to submit comments or update your previous comments based upon the stated clarification, we would appreciate them by **August 1, 2019.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee at 587-0453. Thank you.

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

Signed: _____

Print Name: Carty S. Chang, Chief Engineer

Date: 7/22/19

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji

Ref: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project
Location: Waimanalo, Island of Oahu
TMK(s): (1) 4-1-008:002 (por.), 093, 094, 095 and 096
Applicant: The Limtiaco Consulting Group, Inc. on behalf of the State Department of Hawaiian Home Lands

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

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

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

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

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 7/22/19

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
19 AUG -1 AM 11:40
DEPT. OF LAND AND
NATURAL RESOURCES
STATE OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

LD 1209

July 12, 2019

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT
2019 JUL 12 PM 2:57

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo Ahupua'a, Koolaupoko District, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095, and 096
APPLICANT: The Limtiaco Consulting Group, Inc. on behalf of the State Department of Hawaiian Home Lands

Transmitted for your review and comments is updated information on the above-referenced subject matter. If you would like to submit comments or update your previous comments based upon the stated clarification, we would appreciate them by **August 1, 2019.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee at 587-0453. Thank you.

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

Signed: /s/ M. Kaleo Manuel

Print Name: Deputy Director

Date: July 30, 2019

Attachments
cc: Central Files

FILE ID: RFD.4989.3
DOC ID: 21695

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

BRUCE S. ANDERSON, PH.D.
KAMANA BEAMER, PH.D.
NEIL J. HANNAHS
WAYNE K. KATAYAMA
PAUL J. MEYER

M. KALEO MANUEL
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

July 30, 2019

REF: RFD.4989.3

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: M. Kaleo Manuel, Deputy Director
Commission on Water Resource Management

SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project

FILE NO.: RFD.4989.3
TMK NO.: (1) 4-1-008:002, (por.), 093, 094, 095, and 096

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at

http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

☐ 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.

☐ 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☒ 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.

☒ 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☒ 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☐ OTHER:

If you have any questions, please contact Ayron Strauch of the Commission staff at 587-0234.

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

LD 1209

July 12, 2019

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo Ahupua'a, Koolaupoko District, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095, and 096
APPLICANT: The Limtiaco Consulting Group, Inc. on behalf of the State Department of Hawaiian Home Lands

Transmitted for your review and comments is updated information on the above-referenced subject matter. If you would like to submit comments or update your previous comments based upon the stated clarification, we would appreciate them by **August 1, 2019.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee at 587-0453. Thank you.

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

Signed: Darlene Bryant-Takamatsu
Print Name: Darlene Bryant-Takamatsu
Date: 7/18/19

Attachments
cc: Central Files

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Mr. Russell Y. Tsuji, Administrator
Department of Land and Natural Resources, Land Division
Kalanimoku Building
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference LD 1209

Dear Mr. Tsuji,

Thank you for the letter dated August 5, 2019 (Reference LD 1209) and for collecting the comments from several divisions.

Engineering Division
We appreciate the information pertaining to the Flood Hazard Zone designations from FEMA's Flood Insurance Rate Map and the Flood Hazard Assessment Tool. We acknowledge the statements about the resource development charge and the requirement to provide water demands and calculations to Engineering Division.

Commission on Water Resource Management (Reference RFD.4989.3)
The project does not involve diverting any streams or alter any stream channels.

Land Division - Oahu District
We acknowledge the statement of no comment.

Your agency's participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE

DATE: NOV 2 6 2018 Log # 19316

FROM: MS for David Smith

TO	INITIAL		TO	INITIAL	
		Smith, David	✓		Rubenstine, Tanya
		Atwood, Joshua			Saikevych, Marina
		Bartlett, Randall			Siddiqi, Afsheen
		Berry, Lainie			Sischo, David
		Chee, Marissa			Sprecher, Irene
		Chee, Patrick			Tanaka, Jeff
		Cogswell, James			Terrago, Ruby
		Del Rosario, Michelle			Walker, Michael
		Ersbak, Katie			Wideman, Kylee
		Gallaher, Kirsten			Yuen, Emma
		Hauff, Robert			
		Hee, Kupa'a			
		Honarvar, Shaya			
		Keir, Matthew	FOR		
		King, Cynthia			See Me
		LaHaela Walter, Philipp			Approval
		Laramee, Leah			Signature
		Lau, Rick			Information
		Lee, Amy			Return to:
		Lee, Sharleen			File
		Matsuwaki, Dwight	✓		Approp. Action
		McMillen, Heather			Comments/Recom
		Metzler, Glenn	✓		Draft Reply
		Millay, Mike			Reply Direct
		MyersTremblay, Dietra			Draft (Gov. Ref.)
		Nanbara, Malia			Reply to Chair
		Nishimura, Patrick			
		Omick, Jason			
		Pali, Jan			Hawaii Attn:
		Penn, David			Kamuela Attn:
		Rowland, Moana			Kauai Attn:
					Maui Attn:
			✓		Oahu Attn: Marigold Z.

19316

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 21, 2018

MEMORANDUM

TO: FROM

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

TO:

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for the Proposed **Waikupanaha Agricultural Lots Project**
LOCATION: Waimanalo, Island of Oahu; TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 & 096
APPLICANT: Department of Hawaiian Home Lands

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **December 19, 2018**.

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

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

Signed:
Print Name: **DAVID G. SMITH, Administrator**
Date: 12/20/18

Attachments
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

DEC 2 1 2018

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

ROBERT K. MASUDA
FIRST DEPUTY

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

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

MEMORANDUM

TO: Russell Y. Tsuji, Administrator
Land Division

FROM: for David G. Smith, Administrator

SUBJECT: Comments on Pre-Assessment Consultation for the Proposed Waikapanaha Agricultural Lots Project.

The Division of Forestry and Wildlife has no objections on the pre-consultation for the Draft Environmental Assessment referenced above; however, we would offer recommendations to encourage the Department of Hawaiian Homelands (DHHL) to consider agroforestry in their land use decisions.

Agroforestry is the process of growing trees together with more traditional agricultural crops. Planting of agroforestry trees can provide numerous benefits including increased tree canopy, watershed and improved soil health, and carbon sequestration, among others, while supporting a diversified agricultural system with possibilities for shorter and long-term products. Additionally, the incorporation of agroforestry closely aligns with the traditional forest management practices of native Hawaiians.

We would encourage DHHL to share options for potential agroforestry uses with lessees and would be happy to provide additional information on specific options suitable for the Waimanalo area. The Division's Forest Stewardship Program provides technical and financial assistance for land managers interested in land stewardship, conservation, reforestation, and forest production. This program could support the development of agroforestry systems for DHHL leases; however, the minimum acreage requirement to participate in the program is five acres. Although your project is considering lots sizes of one to three acres, neighboring lessees can work together through an organization such as a homestead association to achieve the five-acre lot size requirement and qualify for the program. Additionally, there are complementary federal program that can support agroforestry that are available for smaller lot sizes.

Should you have any questions, please contract Tanya Rubenstein at (808) 587-0027 or by email at Tanya.Rubenstein@hawaii.gov.

cc: Darrell Ing, DHHL @darrell.h.ing@hawaii.gov
Claire Oshiro, The Limtiaco Group @ claire@tlcghawaii.com

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. David Smith, Administrator
Department of Land and Natural Resources, Division of Forestry and Wildlife
Kalanimoku Building
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Smith,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your department's letter dated 12/21/18 and statement of no objections to the project. We appreciate the recommendations pertaining to agroforestry. DHHL will evaluate incorporating agroforestry into the project in areas where this is practical.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

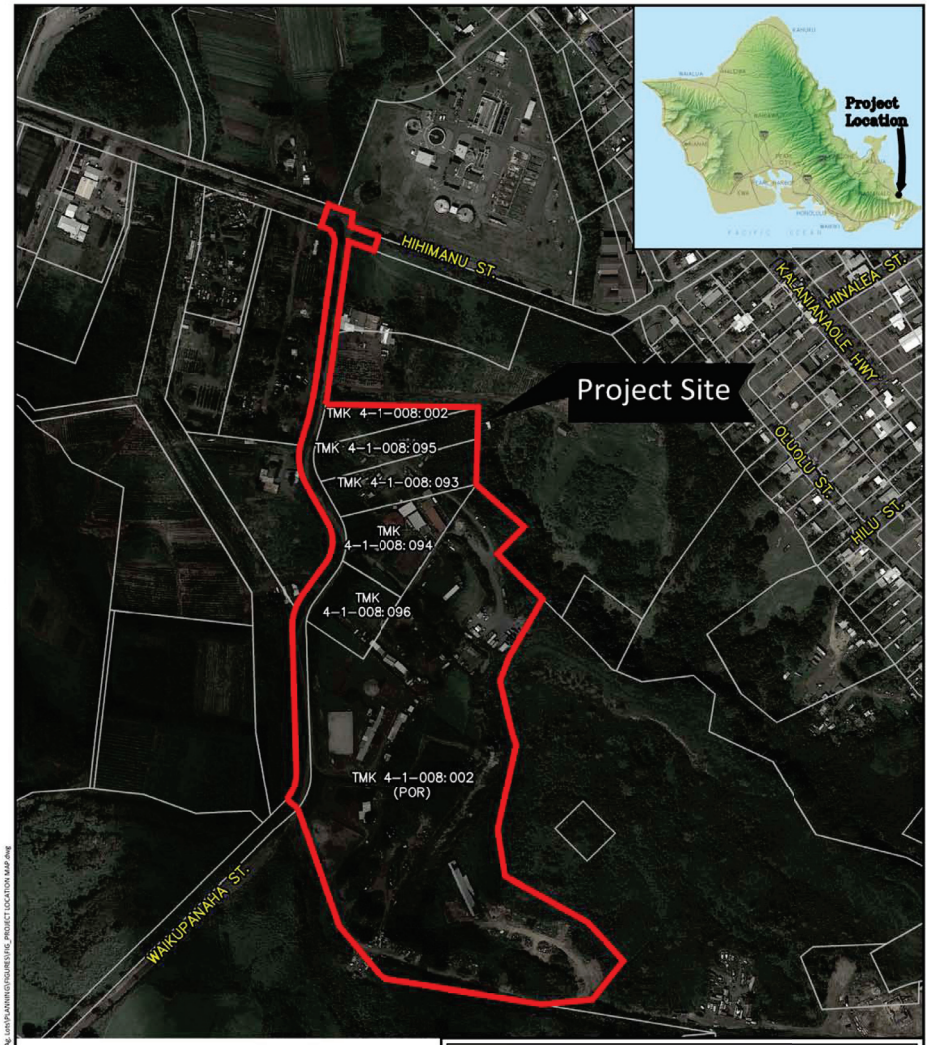
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

MARCH 2019

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: L:\1_PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.dwg

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF HEALTH
SAFE DRINKING WATER BRANCH
ULUAKUPU BLDG. 4
2385 WAIMANO HOME ROAD, SUITE 110
PEARL CITY, HAWAII 96782-1400

In reply, please refer to:
File: SDWB
Ing01.docx

December 18, 2018

Mr. Darrell H. Ing
Project Manager
Department of Hawaiian Home Lands
Po Box 1879
Honolulu, HI 96805
[via darrell.h.ing@hawaii.gov only]

Dear Mr. Ing:

SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupua`a, Koolaupoko District, Oahu Island Tax Map Keys (1) 4-1-008:002 (por.), 093, 094, 095, and 096

The Department of Health (DOH) Safe Drinking Water Branch (SDWB) has reviewed the subject document, dated November 20, 2018, and has the following comments:

1. It is unclear what the drinking water source will be. Please inform SDWB of the source information, when available, so that we may review and comment.

2. This project may qualify as a new public water system. Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules (HAR), Chapter 11-20, "Rules Relating to Public Water Systems."

3. All new public water systems are required to demonstrate and meet minimum capacity requirements prior to their establishment. This requirement involves demonstration that the system will have satisfactory technical, managerial and financial capacity to enable the system to comply with safe drinking water standards and requirements in accordance with HAR Section 11-20-29.5, "Capacity demonstration and evaluation."

4. Projects that propose development of new sources of drinking water serving or proposed to serve a public water system must comply with the terms of HAR Section 11-20-29, "Use of new sources of raw water for public water systems." This section requires that all new public water system sources be approved by the Director of Health (Director) prior to its use. Such approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in HAR Section 11-20-29.

5. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses for all regulated contaminants, performed by a laboratory certified by the State Laboratories Division of the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional parameters may be required by the Director for this submittal or additional tests required upon his or her review of the information submitted.

6. All sources of public water systems must undergo a source water assessment which will delineate a source water protection area. This process is preliminary to the creation of a source water protection plan for that source and activities which will take place to protect the source of drinking water.

7. Projects proposing to develop new public water systems or proposing substantial modifications to existing public water systems must receive approval by the Director prior to construction of the proposed system or modification in accordance with HAR Section 11-20-30, "New and modified public water systems." These projects include treatment, storage and distribution systems of public water systems. The approval authority for projects owned and operated by a County Board or Department of Water or Water Supply has been delegated to them.

8. All public water systems must be operated by certified distribution system and water treatment plant operators as defined by HAR Chapter 11-25, "Rules Relating to Certification of Public Water System Operators."

9. All projects which propose the use of dual water systems or the use of a non-potable water system in proximity to an existing drinking water system to meet irrigation or other needs must be carefully designed and operated to prevent the cross-connection of these systems and prevent the possibility of backflow of water from the non-potable system to the drinking water system. The two (2) systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow prevention devices to avoid contaminating the drinking water supply. In addition, backflow devices must be tested periodically to assure their proper operation. Further, all non-potable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption on non-potable water. Compliance with HAR Chapter 11-21, "Cross-Connection and Backflow Control" is also required.

10. All projects which propose the establishment of a potentially contaminating activity (as identified in the Hawai`i Source Water Assessment Plan) within the source water protection area of an existing source of water for a public water supply should address this potential and activities that will be implemented to prevent or reduce the potential for contamination of the drinking water source.

11. For further information concerning the application of capacity, new source approval, operator certification, source water assessment, backflow/cross-connection prevention or other public water system programs, please contact the SDWB at 586-4258.

From the SDWB Underground Injection Control (UIC) program:

12. Injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting under HAR Chapter 11-23, titled "Underground Injection Control." DOH approval must be first obtained before any injection well construction commences. A UIC permit must be issued before any injection well operation occurs.

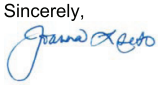
13. Authorization to use an injection well is granted when a UIC permit is issued to the injection well facility. The UIC permit contains discharge and operation limitations, monitoring and reporting requirements, and other facility management and operational conditions. A complete UIC permit application form is needed to apply for a UIC permit.

14. A UIC permit can have a valid duration of up to five (5) years. Permit renewal is needed to keep an expiring permit valid for another term.

15. For further information about the UIC permit and the Underground Injection Control Program, please contact UIC staff of the SDWB at 586-4258.

If there are any questions, please call Ms. Joan S. Corrigan of the SDWB Engineering Section at 586-4258.

Sincerely,



JOANNA L. SETO, P.E., CHIEF
Safe Drinking Water Branch

JC:cw

c: Ms. Claire Oshiro, The Limtiaco Consulting Group [via claire@tlcghawaii.com only]

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Ms. Joanna Seto, P.E., Chief
State of Hawaii, Department of Health
Safe Drinking Water Branch
2835 Waimano Home Road, Uluakupu Building 4, Suite 110
Pearl City, HI 96782

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference SDWB

Dear Ms. Seto, P.E.,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your department's letter dated 12/18/18 (refence SDWB). The project will connect to the existing municipal water system along Hihimanu Street. DHHL does not intend to pursue development of a private water well and water system at this time.

We appreciate the requirements you provided with regards to dual water systems. Our engineers are investigating the potential for providing irrigation water to tenants by connecting to the existing Waimanalo Irrigation System. If a dual water system is provided, it will be properly designed, labeled, and operated to prevent cross-connection and the backflow of water to the drinking water system.

If during design an injection well is incorporated as a part of the proposed improvements, Department of Health approval and the Underground Injection Control permit will be obtained.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

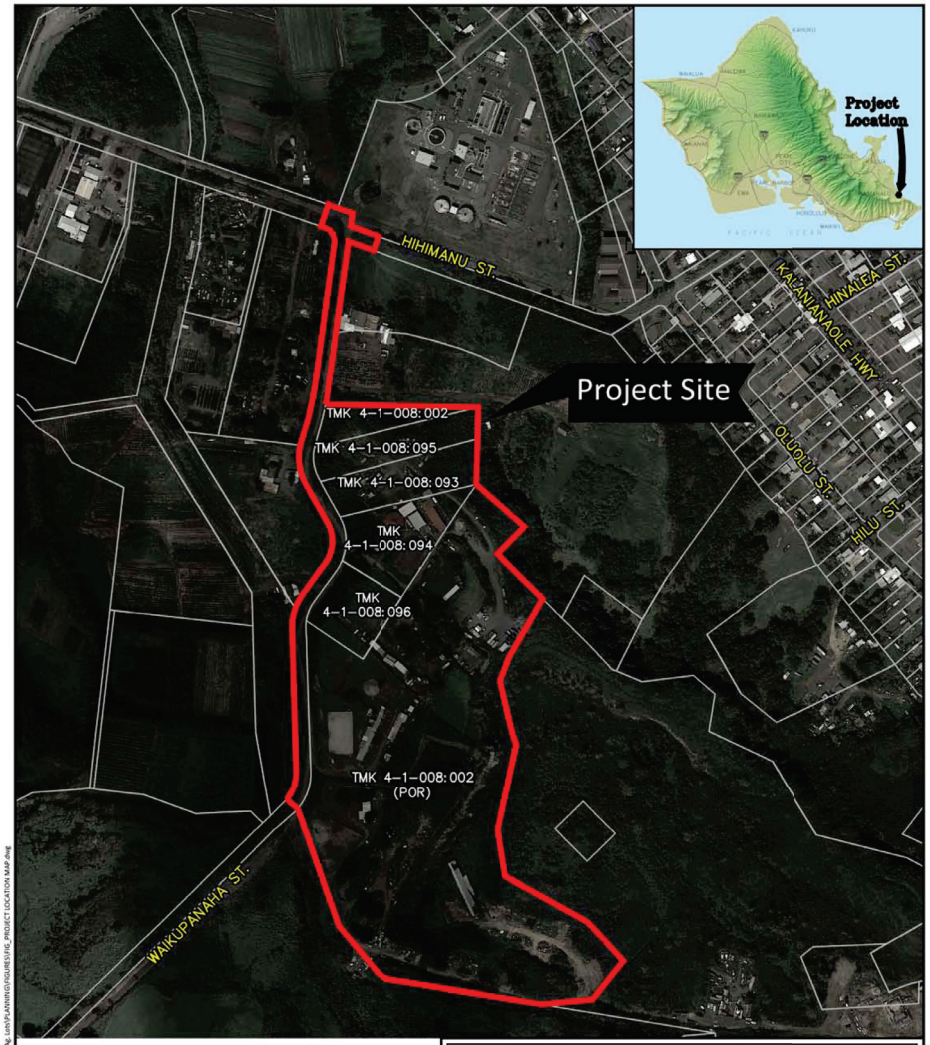
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

MARCH 2019

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: L:\1_PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.dwg

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 JUL 11 AM 8:56

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

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

In reply, please refer to:
File:

July 10, 2019

Mr. Darrell Ing
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, HI 96805

Dear Mr. Ing:

Thank you for your submittal requesting comments to the Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupua'a, Ko'olaupoko District, Oahu.

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

- Chapter 11-46 Community Noise Control

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

Sincerely,

Jeffrey M. Eckerd
Program Manager
Indoor and Radiological Health Branch

C: Claire Oshiro, Environmental Planner, The Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Ms. Sheri Uchima, Branch Chief
State of Hawaii, Department of Health
Indoor and Radiological Health Branch
99-945 Halawa Valley Street
Aiea, HI 96701

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Ms. Uchima,

Thank you for the letter dated July 10, 2019 from your staff. Project activities will comply with the provisions of Hawaiʻi Administrative Rules Title 11, Chapter 46, "Community Noise Control."

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
STP NO. 18-146
HWY-PS 2.9153

January 3, 2019

TO: THE HONORABLE JOBIE MASAGATANI
CHAIR
DEPARTMENT OF HAWAIIAN HOME LANDS

FROM: JADE T. BUTAY
DIRECTOR OF TRANSPORTATION

SUBJECT: REQUEST FOR COMMENTS OF PRE-ASSESSMENT FOR
DRAFT ENVIRONMENTAL ASSESSMENT
WAIKUPANAHA AGRICULTURAL SUBDIVISION LOTS
TMK NO: (1) 4-1-008: 002 (POR), 093, 094, 095 AND 096 – OAHU, HAWAII

The Hawaii Department of Transportation (HDOT) received your request for review of the above referenced project for the preparation of an upcoming Draft Environmental Assessment (DEA) pursuant to Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Hawaii Administrative Rules on the subject project.

The proposed agricultural development totaling 30 acres and owned by the Department of Hawaiian Home Lands will be consolidated and re-subdivided into single, one-acre lots for farm leasing. The primary access points for the development appears to be on Waikupanaha Street, a County road.

The HDOT has the following comments:

1. A Traffic Impact Analysis Report (TIAR) shall be prepared and submitted to HDOT.

   a. The project site is on proximity to the State Kalanianaole Highway, State Route 72; therefore, it should be included in the project study.

   b. Both the TIAR and DEA should include a discussion of any traffic impacts generated by the project as well as other nearby developments onto the State Kalanianaole Highway and shall mitigate its traffic impacts at no cost to the State.

2. The DEA should provide additional details if there are any ancillary uses such as a farmer's market or agricultural programs open to the public. These should all be accounted for and reflected in the TIAR's trip generation and any anticipated pedestrian patterns.

If you have any questions, please contact Ken Tatsuguchi, Engineering Program Manager, Highways Division, Planning Branch at (808) 587-1830. Please reference file review number PS 2018-117.

c: The Limtiaco Consulting Group (Claire Oshiro)

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Robert Miyasaki, Planning Program Administrator
State of Hawaii
Department of Transportation, Statewide Transportation Planning Office
200 Rodgers Boulevard
Honolulu, HI 96819

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference STP No. 18-146 HWY-PS 2.9153

Dear Mr. Miyasaki,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of O'ahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its O'ahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawai'i Revised Statutes and Title 11, Chapter 200, Hawai'i Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawai'i Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 01/03/19 (reference STP No. 18-146 HWY-PS 2.9153). We acknowledge your department's request for a Traffic Impact Analysis Report (TIAR), which will be submitted to the Hawaii Department of Transportation (HDOT). The TIAR and EA will discuss potential traffic impacts from the project.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

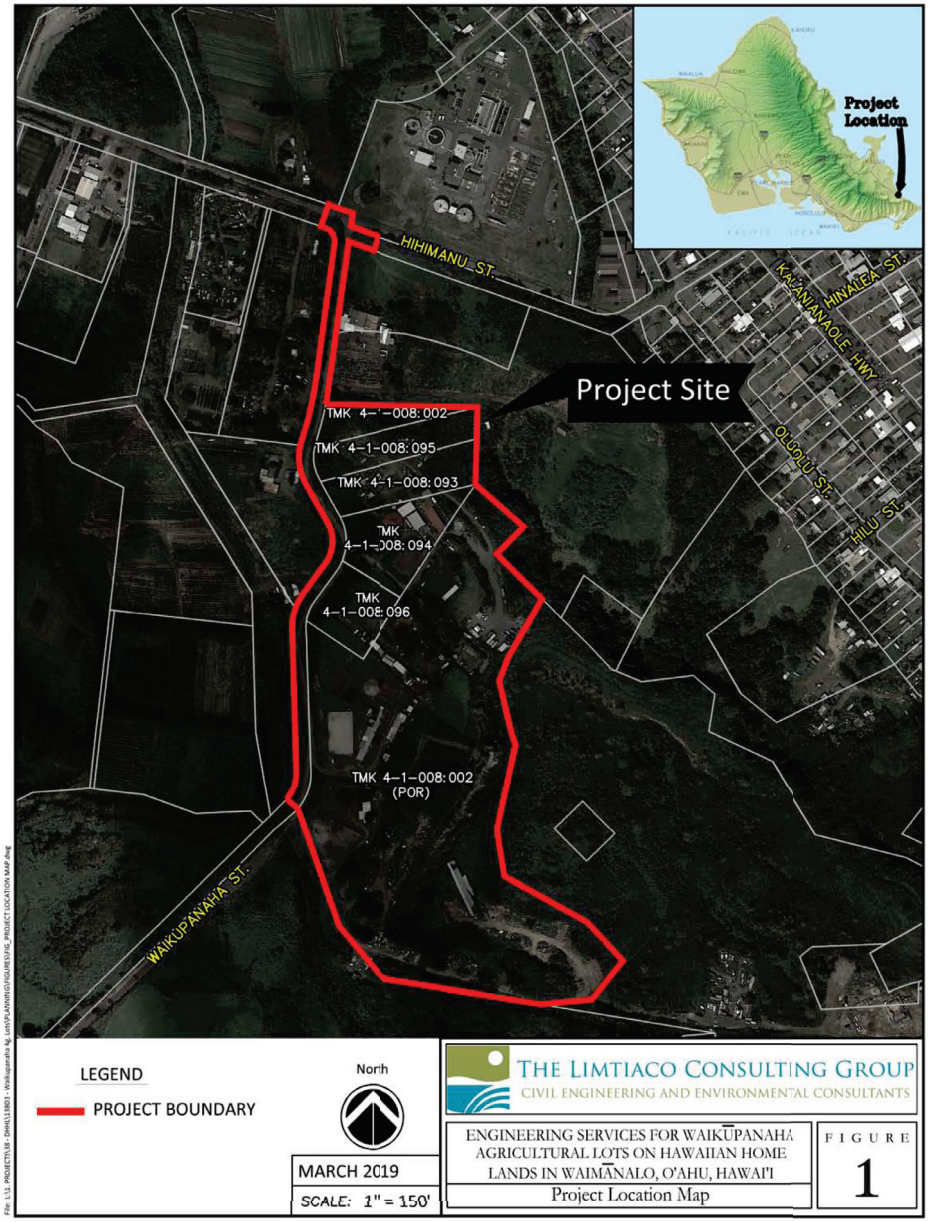
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
STP 19-077
HWY-PS 2.0754

August 21, 2019

08-23-19P 02:31 RCVD

TO: THE HONORABLE WILLIAM AILA
CHAIR OF HAWAIIAN HOME LANDS

FROM: JADE T. BUTAY
DIRECTOR OF TRANSPORTATION

SUBJECT: REQUEST FOR COMMENTS OF PRE-ASSESSMENT FOR
DRAFT ENVIRONMENTAL ASSESSMENT
WAIKUPANAHA AGRICULTURAL SUBDIVISION LOTS
TMK NOS: (1) 4-1-008: 002 (POR), 093, 094, 095 AND 096 – OAHU, HAWAII

The Hawaii Department of Transportation (HDOT) received your additional letter dated July 8, 2019, with further clarifications of the above-referenced project for the preparation of an upcoming Draft Environmental Assessment pursuant to Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Hawaii Administrative Rules on the subject project.

Your latest letter indicates that the proposed agricultural development totaling 30 acres and owned by the Department of Hawaiian Home Lands will be consolidated and re-subdivided into single lots approximately .5 to .75 acres in size for farm leasing. The primary access points for the development appears to be on Waikupanaha Street, a County road.

The HDOT's prior comments No. 1 and 2 of our letter dated January 3, 2019 (see attached HWY-PS 2.9153) remains applicable and valid since the project has not changed significantly as proposed.

If you have any questions, please contact Ken Tatsuguchi, Engineering Program Manager, Highways Division, Planning Branch at (808) 587-1830 or by email at ken.tatsuguchi@hawaii.gov. Please reference file review number PS 2018-117.

Attachment: Letter (HWY-PS 2.9153)

c: The Limtiaco Consulting Group (Claire Oshiro)

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
STP NO. 18-146
HWY-PS 2.9153

January 3, 2019

TO: THE HONORABLE JOBIE MASAGATANI
CHAIR
DEPARTMENT OF HAWAIIAN HOME LANDS

FROM: JADE T. BUTAY
DIRECTOR OF TRANSPORTATION

SUBJECT: REQUEST FOR COMMENTS OF PRE-ASSESSMENT FOR
DRAFT ENVIRONMENTAL ASSESSMENT
WAIKUPANAHA AGRICULTURAL SUBDIVISION LOTS
TMK NO: (1) 4-1-008: 002 (POR), 093, 094, 095 AND 096 – OAHU, HAWAII

The Hawaii Department of Transportation (HDOT) received your request for review of the above referenced project for the preparation of an upcoming Draft Environmental Assessment (DEA) pursuant to Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Hawaii Administrative Rules on the subject project.

The proposed agricultural development totaling 30 acres and owned by the Department of Hawaiian Home Lands will be consolidated and re-subdivided into single, one-acre lots for farm leasing. The primary access points for the development appears to be on Waikupanaha Street, a County road.

The HDOT has the following comments:

1. A Traffic Impact Analysis Report (TIAR) shall be prepared and submitted to HDOT.

   a. The project site is on proximity to the State Kalanianaole Highway, State Route 72; therefore, it should be included in the project study.

   b. Both the TIAR and DEA should include a discussion of any traffic impacts generated by the project as well as other nearby developments onto the State Kalanianaole Highway and shall mitigate its traffic impacts at no cost to the State.

2. The DEA should provide additional details if there are any ancillary uses such as a farmer's market or agricultural programs open to the public. These should all be accounted for and reflected in the TIAR's trip generation and any anticipated pedestrian patterns.

If you have any questions, please contact Ken Tatsuguchi, Engineering Program Manager, Highways Division, Planning Branch at (808) 587-1830. Please reference file review number PS 2018-117.

c: The Limtiaco Consulting Group (Claire Oshiro)

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Mr. Jade T. Butay, Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference STP No. 18-146 HWY-PS 2.9153; STP 19-077, HWY-PS 2.0754

Dear Mr. Butay,

Thank you for the letter dated August 21, 2019 (Reference STP 19-077, HWY-PS 2.0754). The previous response letter in our files is from the Statewide Transportation Planning Office (STP No. 18-146 HWY-PS 2.9153). The Project is a new endeavor by DHHL such that ancillary uses open to the public (e.g., a farmer's market or agricultural program) are unknown at this time.

Your agency's participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

OFFICE OF PLANNING
STATE OF HAWAII

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

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

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

DTS201812201157BE

December 21, 2018 18-DA-18A 08:29 RCVD

To: Jobie Masagatani, Chair
Department of Hawaiian Home Lands

Attention: Darrell Ing, Project Manager

From: Leo R. Asuncion, Director
Office of Planning

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupuaa, Koolaupoko District, Oahu
TMK: (1) 4-1-008:002 (por) and 093-096

Thank you for the opportunity to provide comments on the proposed Waikupanaha Agricultural Lots Project. The pre-consultation review material was transmitted to our office via letter dated November 20, 2018.

It is our understanding the Department of Hawaiian Home Lands (DHHL plans to consolidate and re-subdivide a 30-acre parcel. This will allow DHHL to award agricultural lots to beneficiaries on its agricultural waitlist and to promote self-sufficiency through farming opportunities.

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

1. The Hawaii State Planning Act
Hawaii Administrative Rules (HAR) § 11-200-10(4) requires an Environmental Assessment to provide a general description of the action's technical, economic, social, and environmental characteristics.

In this regard, the Draft EA should provide a discussion on the project and its ability to meet State goals and priorities as detailed in HRS Chapter 226. The analysis on the Hawaii State Planning Act should examine the project's consistency with all three parts of HRS Chapter 226 or clarify where the project conflicts with them. If any of these

statutes are not applicable to the project, the analysis should affirmatively state such determination, along with discussion paragraphs.

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

The proposed action should conform with all the objectives and supporting policies of the Hawaii CZM program, as listed in HRS § 205A-2. Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall give full consideration to ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As this project will require the approval of government agencies, the Draft EA should contain analysis on the project's consistency with HRS § 205A-2.

3. Stormwater Runoff & Erosion Controls
Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; in order to ensure that the surface water and marine resources of the Island of Oahu remain protected, the effects of stormwater inundation, resulting from the proposed land use changes and ultimately future development activities should be evaluated in the Draft EA.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, the potential vulnerability of surface water resources, drainage infrastructure currently in place, soil absorption characteristics of the area, and examining the amount of permeable versus impervious surfaces in the project area. These items should be considered when developing mitigation measures for the protection for surface water resources and the coastal ecosystem, pursuant to HAR § 11-200-10(7).

To assist in the development of stormwater runoff strategies, OP has developed guidance documents on this subject. We recommend consulting these stormwater evaluative tools when developing mitigation approaches for polluted runoff. They offer useful techniques to keep land-based pollutants and sediment in place, while considering the management practices best suited for the topography of the area and the types of contaminants potentially affecting nearby water resources. The evaluative tools that should be considered during this phase of the design process include:

- Hawaii Watershed Guidance provides direction on management measures for agricultural lands that will safeguard watersheds, provide recommendations for erosion and sediment control, and grazing, and controls for irrigation water. http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf

- Stormwater Impact Assessments can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_impact/final_stormwater_impact_assessments_guidance.pdf; and

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

c: Claire Oshiro, Environmental Planner, Limtiaco Consulting Group, Inc.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Leo R. Asuncion, Jr., AICP, Director
State of Hawaii
Department of Business, Economic Development and Tourism, Office of Planning
P. O. Box 2359
Honolulu, HI 96804

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference DTS201812201157BE

Dear Director Asuncion, Jr., AICP,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 12/21/18 (reference DTS201812201157BE), which included itemized comments pertaining to the Hawaii State Planning Act, the Hawaii Coastal Zone program, stormwater runoff and erosion controls.

Hawaii State Planning Act
We are preparing the EA that will include a section that discusses several plans, policies and controls including Hawai 'i Revised Statutes Chapter 226.

Hawaii Coastal Management Program
The EA will include a section that discusses several plans, policies and controls including the objectives and policies of the Coastal Zone Management program. The project site is located inland and is not within the Special Management Area.

Stormwater Runoff and Erosion Controls
The EA will include a discussion of sea level rise inundation areas within the project site utilizing the 3.2 feet scenario for the viewer tool prepared by the National Oceanic and Atmospheric Agency. We acknowledge your comments pertaining to the protection of surface water resources and the coastal ecosystem. The EA will evaluate site characteristics and the project will comply with the applicable State and County regulatory requirements pertaining to stormwater runoff and erosion control. We appreciate your agency's guidance documents and techniques pertaining to stormwater management, erosion and sediment control, and stormwater impacts assessments.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

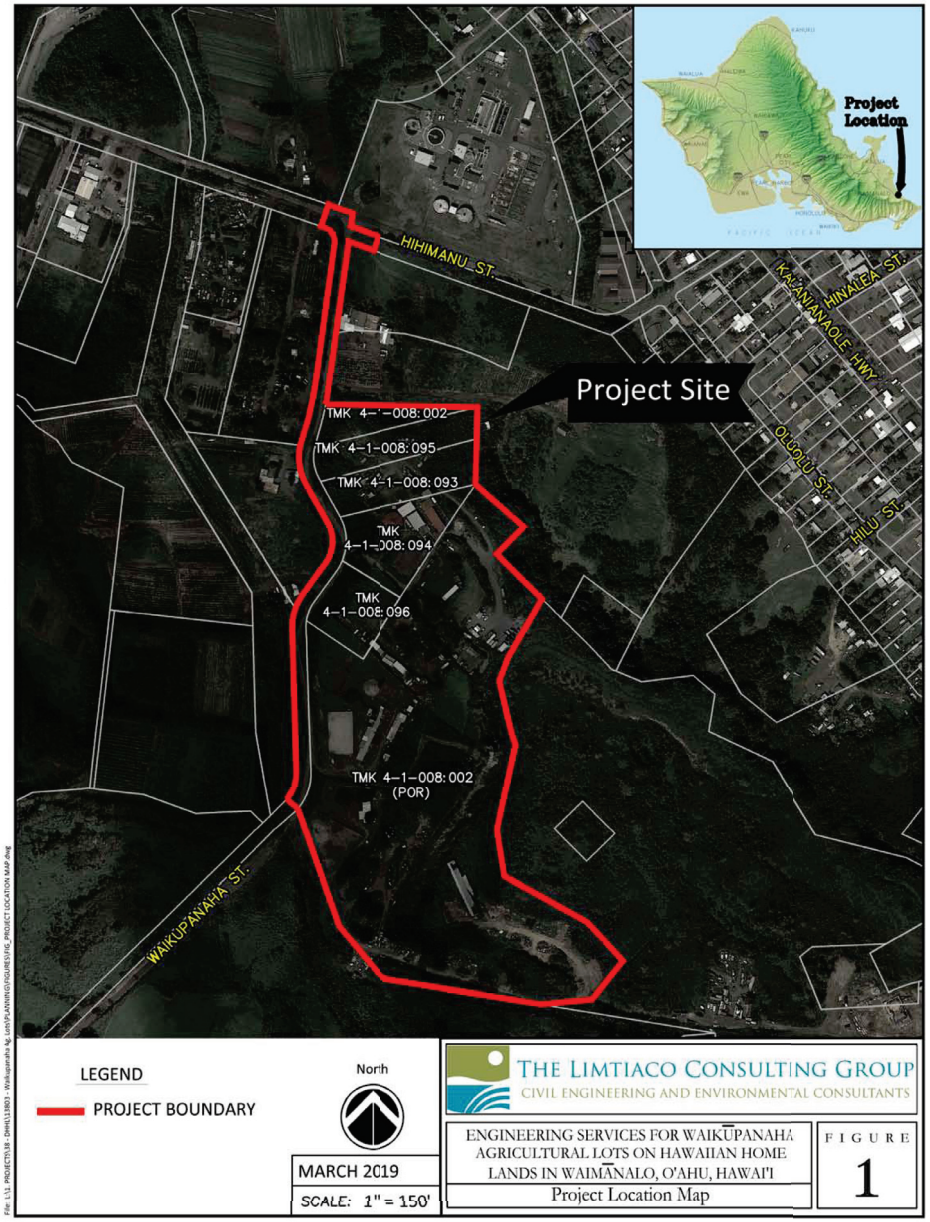
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



BOARD OF WATER SUPPLY

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

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
KAY C. MATSUI
RAY C. SOON
MAX J. SWORD

ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

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

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

December 26, 2018

Mr. Darrell Ing, Project Manager
State of Hawaii
Department of Hawaiian Home Lands
Land Development Division
P.O. Box 1879
Honolulu, Hawaii 96805

12-31-18P12:07 RCVD

Dear Mr. Ing:

Subject: Your Letter Dated November 20, 2018 Requesting Comments on the Environmental Assessment Pre-Consultation for the Proposed Waikupanaha Agriculture Lots Project off Waikupanaha Street
Tax Map Key: 4-1-008: 002, 093, 094, 095, and 096

Thank you for the opportunity to comment on the proposed Subsistence Agricultural Homestead project.

The existing water system cannot provide adequate fire protection to the proposed agricultural development. Our Water System Standards require a fire hydrant to be located within 350 linear feet of agriculture developments and provide a flow of 1,000 gallons per minute. The nearest Board of Water Supply (BWS) fire hydrant is located approximately 1,400 linear feet away from the parcel along Hihimanu Street. Therefore, the developer will be required to extend the water line and install a fire hydrant within 350 linear feet of the parcel along Waikupanaha Street.

The developer should investigate the feasibility of using non-potable water for irrigation of the proposed agricultural lots. If non-potable water is either unavailable or infeasible, a report of the investigation including proposed irrigation demands should be submitted to us before we will consider the use of potable water.

The proposed development will be required to meet BWS cross-connection control and backflow prevention requirements. The requirements will be determined when the building permit application is submitted for our review and approval. If water is required during construction, all connections to the BWS system will require BWS approved reduced pressure principle backflow prevention assemblies.

The construction drawings should be submitted for our approval, and the construction schedule should be coordinated to minimize impact to the water system.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

A second alternative is to construct a private water well and water system. The State Commission on Water Resource Management should be consulted to determine regulatory and permitting requirements.

All proposed developments shall verify with the State Department of Health in regards to wastewater disposal systems that are allowable within the "No Pass Zone".

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

Very truly yours,

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

cc: Claire Oshiro, The Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Ernest Y. W. Lau, P.E., Manager and Chief Engineer
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96813

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Lau, P.E.,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 12/26/18. We appreciate your statements pertaining to fire protection and the City's water system standards. As stated in your letter, the project will require the extension of the water line and the installation of a fire hydrant within 350 linear feet of DHHL's parcels. DHHL does not intend to pursue development of a private water well and water system at this time.

Our engineers will be contacting the Department of Agriculture as they investigate the potential for providing irrigation water to tenants by connecting to the State's Waimanalo Irrigation System (WIS). We appreciate your statement that a report of the investigation and proposed irrigation demands should be submitted to the Board of Water Supply (BWS) for consideration.

The water system infrastructure will be designed in accordance with BWS and the Department of Planning and Permitting standards. The civil drawings will be submitted to City agencies for review as required.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

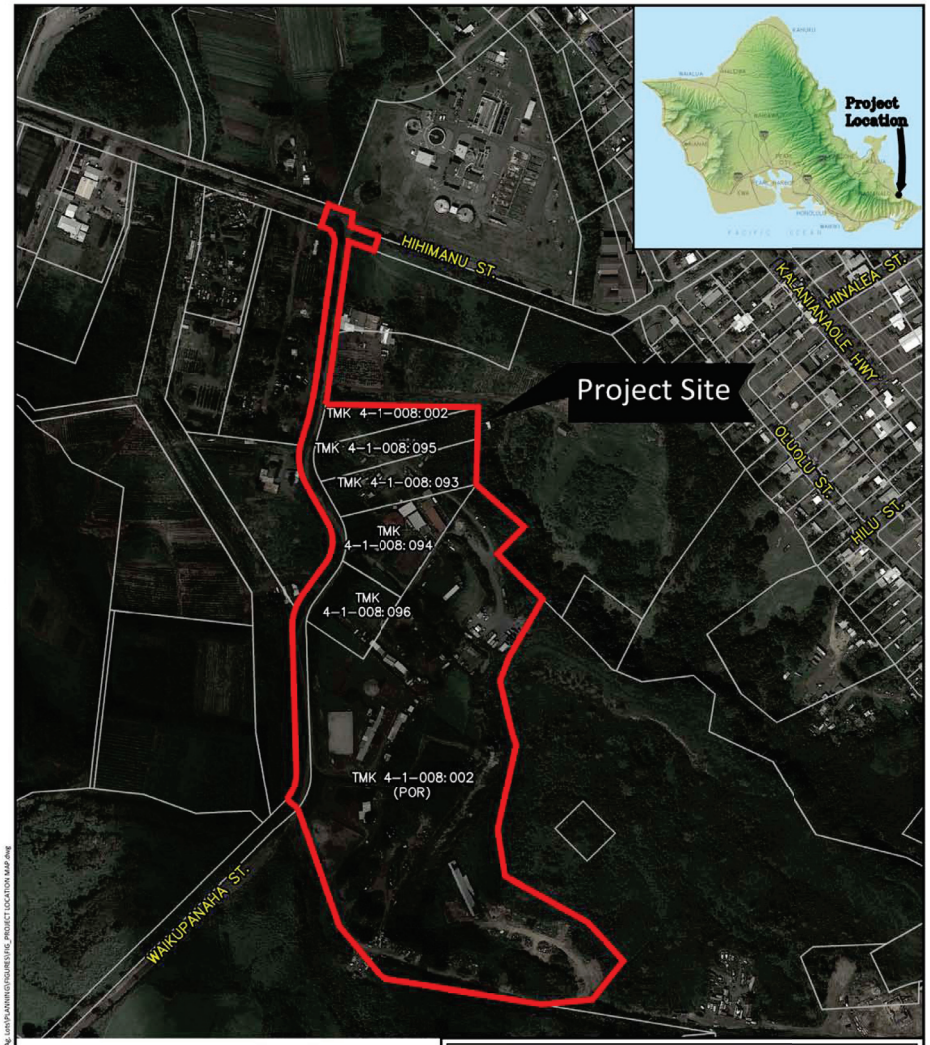
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



LEGEND

PROJECT BOUNDARY

North

MARCH 2019

SCALE: 1" = 150'

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

ENGINEERING SERVICES FOR WAIKŪPANAHA AGRICULTURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMĀNALO, O'AHU, HAWAI'I

Project Location Map

FIGURE 1

File: L:\1_PROJECTS\38 - DHHL\13803 - Waikupanaha Ag. Lots\PLANNING\FIGURES\FIG. PROJECT LOCATION MAP.dwg

BOARD OF WATER SUPPLY

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

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 JUL 30 AM 10: 53

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
KAY C. MATSUI
RAY C. SOON
MAX J. SWORD

ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

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

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

July 29, 2019

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

Subject: Your Letter Dated July 8, 2019 Requesting Comments on the Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo on Waikupanaha Street
Tax Map Key: 4-1-008: 002, 093, 094, 095, 096

Thank you for the opportunity to comment on the proposed Waikupanaha Agricultural Lots Project.

The existing water system cannot provide adequate fire protection to the proposed agricultural development. The Board of Water Supply (BWS) Water System Standards require a fire hydrant to be located within 350 linear feet of each proposed subdivided lot and provide a fire flow of 1,000 gallons per minute for agricultural developments. The nearest BWS fire hydrant is located approximately 1,400 linear feet away from the parcel along Hihimanu Street. Therefore, the developer will be required to install the necessary water system improvements to provide adequate peak hour pressures and fire flows in accordance with the BWS Water System Standards. The construction drawings should be submitted for our approval, and the construction schedule should be coordinated to minimize impact to the water system. However, please be advised that this information is based upon current data, and therefore, the BWS reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

Water laterals are required for all proposed subdivided lots.

Water pipeline easements shall be granted to the BWS for all water mains to be conveyed to the BWS which are located within private properties and roadways that will not be dedicated to the City/County. All proposed water mains should be located within City right-of-ways, or private streets and roads that are built to City standards and maintained by the City and County of Honolulu in accordance with Chapter 14-32: Maintenance of Private Streets and Roads, Revised Ordinances of Honolulu.

The developer should investigate the feasibility of using non-potable water for irrigation of the proposed agricultural lots. If non-potable water is either unavailable or infeasible, a report of the investigation including proposed irrigation demands should be submitted to us before we will consider the use of potable water.

The proposed development will be required to meet BWS cross-connection control and backflow prevention requirements. The requirements will be determined when the building permit application is submitted for our review and approval. If water is required during construction, all connections to the BWS system will require BWS approved reduced pressure principle backflow prevention assemblies.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

A second alternative is to construct a private water well and water system. The State Commission on Water Resource Management should be consulted to determine regulatory and permitting requirements.

All proposed developments shall verify with the State Department of Health in regards to wastewater disposal systems that are allowable within the "No Pass Zone".

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

Very truly yours,

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

cc: Claire Oshiro, The Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Mr. Ernest Y. W. Lau, P.E., Manager and Chief Engineer
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96813

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Lau,

Thank you for the letter dated July 29, 2019. We acknowledge the statements pertaining to fire protection, your agency's water system standards, water laterals and water pipeline easements. The Project will require the extension of the water line and the installation of a fire hydrant within 350 linear feet of DHHL's parcels. DHHL does not intend to pursue development of a private water well and water system at this time.

Our engineers will be contacting the Department of Agriculture as they investigate the potential for providing irrigation water to tenants by connecting to the State's Waimanalo Irrigation System (WIS). We will consult with your agency with regards to the findings of the investigation and proposed irrigation demands.

The water system infrastructure will be designed in accordance with applicable standards. The civil drawings will be submitted to City agencies for review as required.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

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

File

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

December 20, 2018

2018/ELOG-2263(CJ)

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

SUBJECT: Pre-Assessment Consultation
Waikupanaha Agricultural Lots Project
41-146 Waikupanaha Street - Waimanalo
Tax Map Keys 4-1-008: 093, 094, 095, 096 and 002 (por.)

This is in response to your letter, received on November 21, 2018, requesting pre-assessment consultation for an Environmental Assessment (EA) for the Waikupanaha Agricultural Lots Project (Project). The Project involves the consolidation and re-subdivision of approximately 30 acres into Subsistence Agricultural Homestead lots of about one acre each, for the Department of Hawaiian Home Lands (DHHL) to award to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. Our comments are below.

Wastewater Branch:

The property has no sewer service. Privately-owned wastewater treatment systems are under the jurisdiction of the State Department of Health.

Planning Division:

1. The EA for the proposed Waikupanaha Agricultural Lots development in Waimanalo should discuss how the proposed Project conforms to the policies of the Koolaupoko Sustainable Communities Plan, and the Oahu General Plan.

2. The EA for the proposed Waikupanaha Agricultural Lots development in Waimanalo should include an analysis of the possible impacts of climate change and sea level rise on the Project during the life of the proposed structure(s) and operation.

The Draft Environmental Assessment (DEA) should identify whether the subject site is within the 3.2-foot Sea Level Rise Exposure Area as defined by the State of Hawaii Sea Level Rise Vulnerability and Adaptation Report, or within the projected 6-foot Sea Level Rise inundation area as depicted by the National Oceanic and Atmospheric Administration Sea Level Rise Viewer.

If applicable, the DEA should review and address the City and County of Honolulu Climate Change Commission's Sea Level Rise Guidance (June 5, 2018) and Climate Change Brief (June 5, 2018), and the Hawaii Sea Level Rise Vulnerability and Adaptation Report (December 2017).

Resource documents can be found at the following links:
Office of Climate Change, Sustainability and Resiliency website:
https://www.resilientoahu.org/pressconference071618/
Hawaii Climate Adaptation Portal:
http://climateadaptation.hawaii.gov/

Land Use Permits Division:

The zoning lots are in the AG-2 General Agricultural District. In accordance with the Land Use Ordinance (LUO), subdivision lots within the AG-2 Agricultural District require a minimum land area of three acres for major livestock production, and two acres for all other uses. Additionally, the minimum lot width and depth must be 150 feet. However, the DHHL has the authority to exempt its lands from regulation by the LUO. Please be advised that a formal, written declaration of exemption by the DHHL is required.

Should you have any questions, please contact Candi Jefferson, of our Land Use Approval Branch, at (808) 768-8022 or candi.jefferson@honolulu.gov.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

cc: The Limtiaco Consulting Group,
Claire Oshiro, Environmental Planner

Record agency comments for Job 064241584-001 (2018/ELOG-2263)

Process Edit

Record agency comments

Job 064241584-001 (2018/ELOG-2263)

Planning Division Comments - Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupua'a, Ko'olaupoko District, O'ahu Island Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

DINA WONG; FRANZ KRAINTZ	Complete	Recorded	Dec 03, 2018	Dec 03, 2018	Dec 13, 2018 17:45:4

Details

Agency Comments:

1) The Environmental Assessment for the proposed Waikupanaha Agricultural Lots development in Waimanalo should discuss how the proposed project conforms to the policies of the Koolau Poko Sustainable Communities Plan, and the Oahu General Plan.

2) The Environmental Assessment for the proposed Waikupanaha Agricultural Lots development in Waimanalo should include an analysis of the possible impacts of climate change and sea level rise on the project during the life of the proposed structure(s) and operation.

The DEA should identify whether the subject site is within the 3.2-foot Sea Level Rise Exposure Area (SLR-XA) as defined by the State of Hawaii Sea Level Rise Vulnerability and Adaptation Report, or within the projected 6-foot sea level rise inundation area as depicted by the National Oceanic and Atmospheric Administration (NOAA) Sea Level Rise Viewer.

If applicable, the DEA should review and address the City and County of Honolulu Climate Change Commission's Sea Level Rise Guidance (June 5, 2018) and Climate Change Brief (June 5, 2018), and the the Hawai'i Sea Level Rise Vulnerability and Adaptation Report (December 2017).

(Resource documents can be found at: https://www.resilientoahu.org/pressconference071618/ and at the Hawaii Climate Adaptation Portal: http://climateadaptation.hawaii.gov/)

FPK 10DEC2018
DW 13DEC2018

Agency: CPB

Comments:

Reviewed by: Franz Kraintz

Record agency comments for Job 064241584-001 (2018/ELOG-2263)

Process Edit

Record agency comments

Job 064241584-001 (2018/ELOG-2263)

WWB comments

			Scheduled		Actual	
Assigned To	**Status**	**Outcome**	**Start**	**Completed**	**Start**	**Completed**
KEITH MIYASHIRO	Complete	Recorded	Dec 03, 2018			Dec 03, 2018 09:06:5

Details

Agency Comments: Property has no sewer service. Privately owned wastewater treatment systems are under the jurisdiction of the State Department of Health.

Agency: Wastewater Branch

Comments:

Reviewed by: Keith Miuashiro

Jefferson, Candi N

From: Siu-Li, Mario
Sent: Monday, December 17, 2018 11:38 AM
To: Jefferson, Candi N
Cc: Asaoka, Jane; Kwock, Michelle; Nishiura, Sharon N.; Oyama, Kiyomi
Subject: RE: 2018/ELOG-2263

Candi,

We have no comments to offer on the EA pre-assessment.

Thank you.

Mario Siu-Li
Department of Planning & Permitting
City and County of Honolulu
Subdivision Branch
650 South King Street, 8th Floor
Honolulu, Hawaii 96813
Ph: (808) 768-8098

From: Jefferson, Candi N
Sent: Friday, December 14, 2018 3:56 PM
To: Siu-Li, Mario
Cc: Asaoka, Jane; Kwock, Michelle; Nishiura, Sharon N.; Oyama, Kiyomi
Subject: 2018/ELOG-2263

Mario,

Does the Subdivision Branch have comments on the attached EA Pre-assessment proposal?

A request for comments was sent out on 11/28/18 and due today.

Please advise me of your division's review status at your earliest convenience.

Mahalo,

Candi N. Jefferson
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813
Phone: (808) 768-8022
Fax: (808) 768-6743
Email: candi.jefferson@honolulu.gov

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

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

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference 2018/ELOG-2263

Dear Ms. Sokugawa,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 12/20/18 (reference 2018/ELOG-2263) and for collecting the comments from several divisions.

Wastewater Branch
We acknowledge your information that the project site has no sewer service. DHHL does not intend to pursue development of a private wastewater treatment system at this time. Proposed wastewater service will be provided via a new gravity sewer system with a connection to the City's existing wastewater collection system along Hihimanu Street.

Planning Division
The EA will include a section that discusses several plans, policies and controls including the City and County of Honolulu General Plan and the Ko'olau Poko Sustainable Communities Plan. Climate change and sea level rise impacts will be discussed in the section pertaining to natural hazards. We acknowledge your statements about identifying sea level rise exposure areas within the project site utilizing the 3.2 feet scenario for the viewer tool prepared by the National Oceanic and Atmospheric Agency.

Land Use Permits Division
In accordance with ROH Chapter 18, a written declaration of exemption by the DHHL will be submitted in order to exempt the project from regulation by the Land Use Ordinance.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

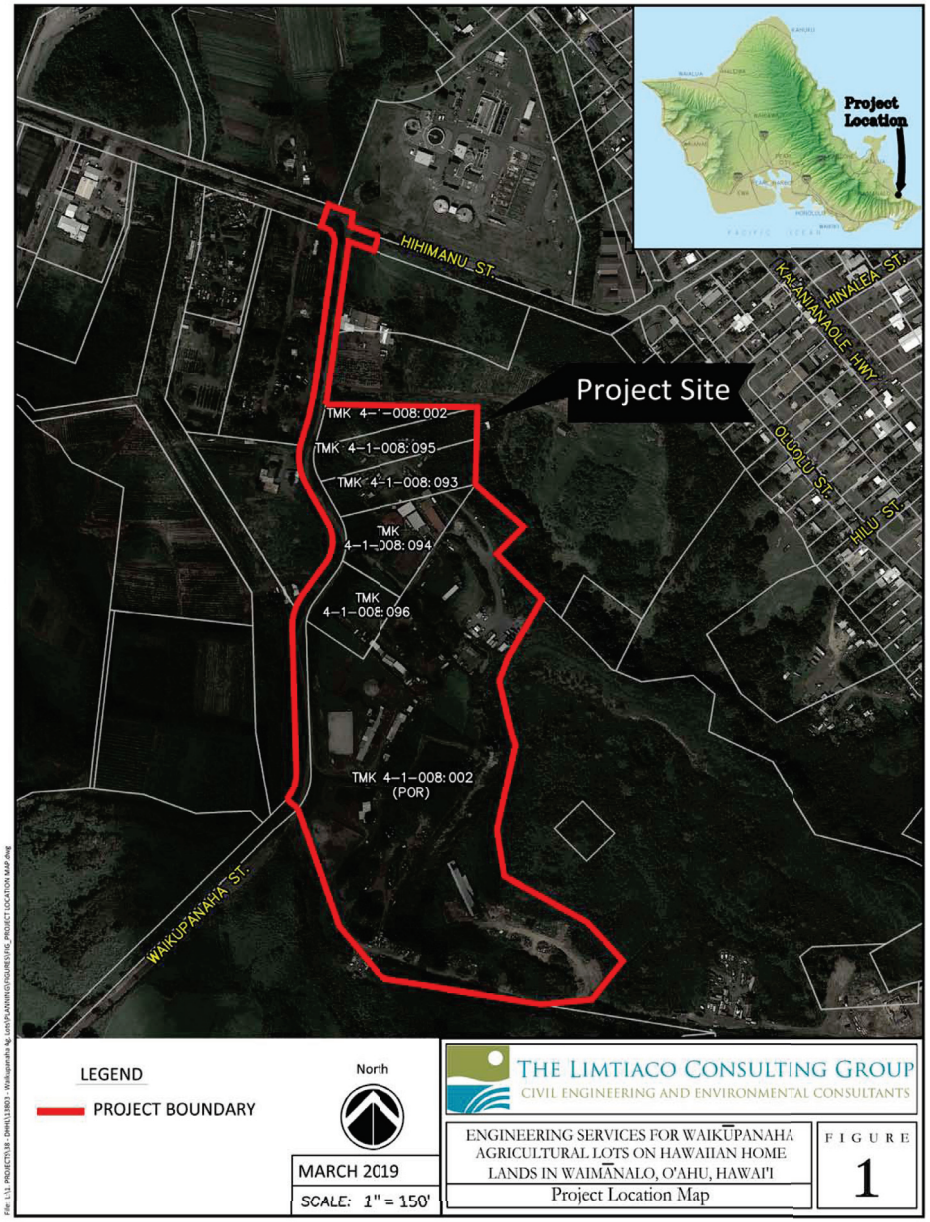
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



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

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

July 29, 2019

2019/ELOG-1332(CJ)

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 AUG 5 AM 10: 16

Dear Mr. Ing:

SUBJECT: Pre-Assessment Consultation
Waikupanaha Agricultural Lots Project
41-146 Waikupanaha Street - Waimanalo
Tax Map Keys 4-1-008: 093, 094, 095, 096 and 002 (por.)

This is in response to your letter, received on July 9, 2019, requesting reconsideration of your November 20, 2018 pre-assessment consultation for an Environmental Assessment (EA) for the Waikupanaha Agricultural Lots Project (Project). The revised Project involves the consolidation and re-subdivision of approximately 30 acres into Subsistence Agricultural Homestead lots of about 0.5 to 0.75 acre each, for the Department of Hawaiian Home Lands (DHHL) to award to beneficiaries on its Agricultural Waitlist and to promote self-sufficiency through farming opportunities. The Project will require right-of-way improvements along Waikupanaha Street which will extend north to Hihimanu Street and include subdivision of an additional 2.5 acres or land from adjacent DHHL-owned parcels. Our comments are below.

Wastewater Branch:

A Sewer Connection Application is required.

Planning Division:

The Department of Planning and Permitting (DPP) comments, contained in a letter to Mr. Darrell Ing, Project Manager for the DHHL, dated December 20, 2018, regarding the Draft EA for the proposed Waikupanaha Agricultural Lots development in Waimanalo, Oahu still apply with the following modifications.

1. In addition to the discussion regarding conformance with the Oahu General Plan and the Koolau Poko Sustainable Communities Plan, the Draft EA should describe the level of self-sufficiency DHHL expects lessees to achieve by residing and cultivating food crops or raising small livestock on homestead lots between approximately 0.5 to 0.75 acres. The emphasis on subsistence agriculture on homestead lots supports state-wide public policies related to increased agricultural self-sufficiency; therefore, the Draft EA should estimate what can be reasonably expected.

2. The Climate Change and Sea Level Rise (SLR) exposure areas discussion in the Draft EA should reference the Hawaii SLR viewer at: https://www.pacioos.hawaii.edu/shoreline/slr-hawaii, not the viewer tool prepared by the National Oceanic and Atmospheric Agency.

3. To address the effects of climate change, please include an analysis of Low Impact Development and conservation best practices that may help mitigate elevated temperatures and evapotranspiration on the Project site pursuant to City and County of Honolulu, Directive 18-2 (dated July 16, 2018).

4. Please also include in the Draft EA the report of Cultural Surveys Hawaii, Inc.'s investigation of traditional cultural practices and features associated with the Project area.

Subdivision Branch:

No comments on pre-assessment for Draft EA. Compliance with subdivision standards to be reviewed when a complete subdivision application is submitted to DPP.

Traffic Review Branch:

The Draft EA should include the existing roadway/traffic conditions and any road improvements needed to support the increase in traffic.

Land Use Permits Division:

The zoning lots are in the AG-1 Restricted Agricultural and AG-2 General Agricultural Districts. In accordance with the Land Use Ordinance (LUO), subdivision lots within the AG-1 Agricultural District require a minimum land area of five acres. Further, subdivision lots within the AG-2 Agricultural District require a minimum land area of three acres for major livestock production, and two acres for all other uses.

Additionally, the minimum lot width and depth must be 150 feet. However, the DHHL has the authority to exempt its lands from regulation by the LUO. Please be informed that a formal, written declaration of exemption by the DHHL is required. Please be advised that the declaration is unrelated to Chapter 18 of the Revised Ordinance of Honolulu, "Fees and Permits for Building, Electrical, Plumbing, and Sidewalk Codes," which is referenced in your letter.

Should you have any questions, please contact Candi Jefferson, of our Land Use Approval Branch, at (808) 768-8022 or candi.jefferson@honolulu.gov.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

cc: The Limtiaco Consulting Group,
Claire Oshiro, Environmental Planner

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

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

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference 2018/ELOG-2263, 2019/ELOG-1332

Dear Ms. Sokugawa,

Thank you for the letter dated July 29, 2019 (Reference 2019/ELOG-1332) and for collecting comments from other divisions.

Wastewater Branch
We acknowledge that a sewer connection application is required.

Planning Division
The Project is a new endeavor by DHHL and the levels of self-sufficiency that lessees will achieve is unknown at this time. We will reference the Hawaii SLR viewer. The statements pertaining to Low Impact Development and conservation best practices are acknowledged. The Cultural Impact Assessment will be included with the Environmental Assessment.

Subdivision Branch
We acknowledge the statement of no comment.

Traffic Review Branch
Road/traffic conditions and improvements will be described in the Environmental Assessment.

Land Use Permits Division
The information about AG-1/AG-2 classifications and the declaration of exemption is appreciated.

Your agency's participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

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

RECEIVED
LAND DEVELOPMENT
DIVISION
2018 DEC 11 PM 12: 34

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

December 6, 2018

Department of Hawaiian Homelands
Attn: Darrell Ing, Project Manager
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing,

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahapua'a, Ko'olaupoko District, Oahu Island
TMK (1) 4-1-008: 002(por.), 093,094,095 and 096

Thank you for the opportunity to review and comment. The Department of Design and Construction has no comments at this time.

If there are any further questions, please contact me at 768-8480.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(757938)

cc: Claire Oshiro, The Limtiaco Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Robert Kroning, P.E., Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Kroning, P.E.,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of O'ahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its O'ahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawai'i Revised Statutes and Title 11, Chapter 200, Hawai'i Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawai'i Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 12/06/18 and statement of no comment.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

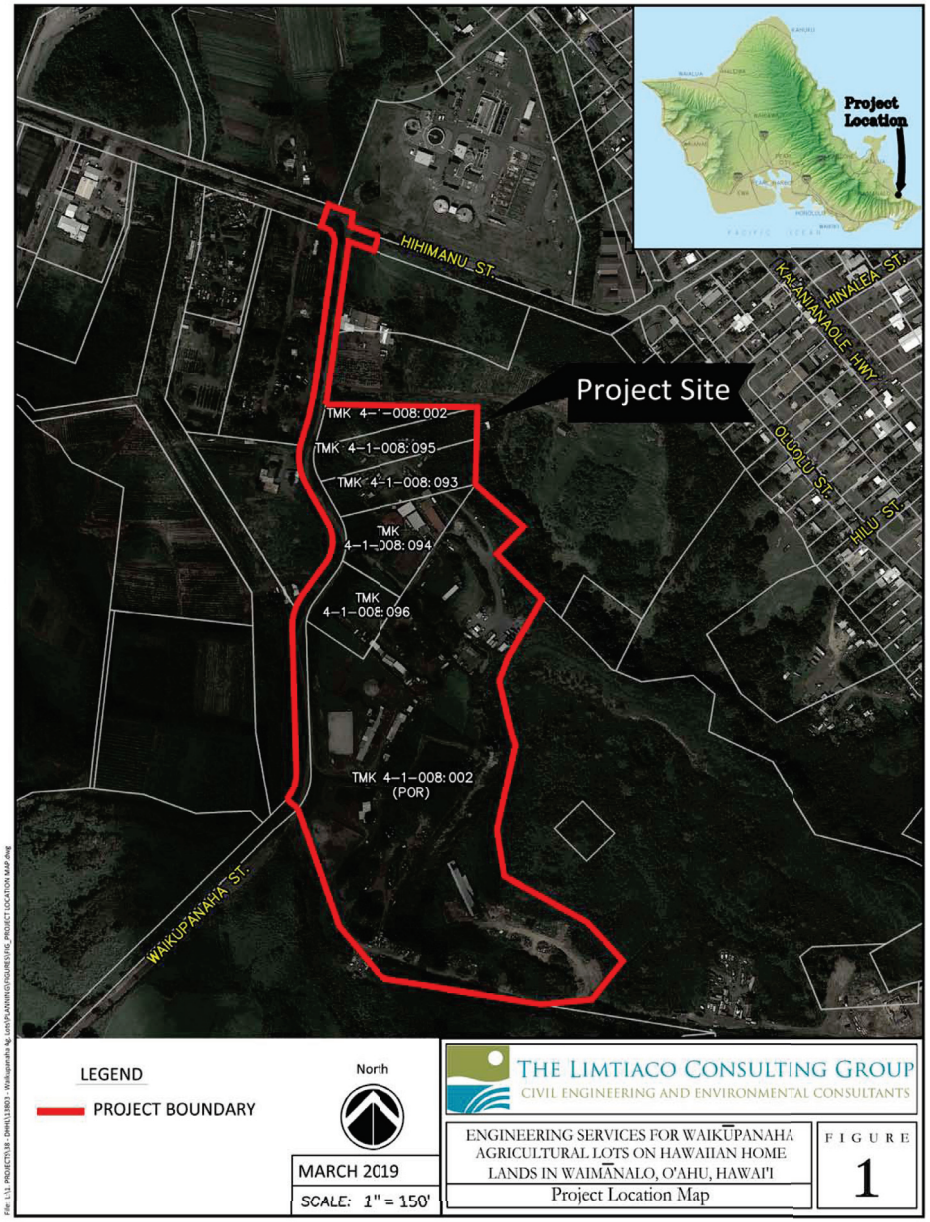
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



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

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 AUG 23 AM 9:0

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 AUG 22 PM 8:56

August 19, 2019

Department of Hawaiian Homelands
ATTN: Darrell Ing, Project Manager
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing.

Subject: Pre- Assessment Consultation, Preparation of the Environmental Assessment for the proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupuaa Koolaupoko District, Oahu Island

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any comments at this time.

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

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(778772)

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Mr. Mark Yonamine, P.E., Acting Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Yonamine,

Thank you for the letter of no comment dated August 19, 2019 from Mr. Kroning.

Your agency's participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

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

KIRK CALDWELL
MAYOR

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

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
PRO 19-070

August 5, 2019

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

SUBJECT: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupuaa, Kololaupoko District, Oahu Island
Tax Map Keys (1) 4-1-008:002 (por), 093, 094, 095, and 096

We have reviewed your Pre-Assessment Consultation letter dated July 8, 2019. Regarding the possibility of connecting to the City's wastewater system, we generally have not planned our systems to provide sewer service to Agricultural-zoned lots. Individual wastewater systems, such as septic systems or small package units, are typically acceptable for Ag lots. Should this development want to consider applying for a sewer connection to the City's system, please be aware of the following:

1. There are no City sewers adjacent to these properties that could accommodate the proposed project. Therefore, the project would need to construct off-site sewer improvements to connect to the City's system, which may require a new sewer line be built to the Waimanalo Wastewater Treatment Plant (WWTP).

2. A Sewer Connection Application should be submitted to the Department of Planning and Permitting, Site Development Division, Wastewater Branch, including wastewater flow projections, to determine if the proposed project can be accommodated by the Waimanalo WWTP.

Should you have any questions regarding these comments, please call Jack Pobuk, Branch Head, CIP Program and Planning, at 768-3464, or Lisa Kimura, Civil Engineer, at 768-3455.

Sincerely,

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

cc: Claire Oshiro, Environmental Planner, The Limitiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Ms. Lori M.K. Kahikina, P.E., Director
City and County of Honolulu
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, HI 96707

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference PRO 19-070

Dear Ms. Kahikina,

Thank you for the letter dated August 5, 2019 (Reference PRO 19-070). We acknowledge the statements that there are no sewers adjacent to DHHL's parcels that could accommodate the Project whereby a new sewer line to the Waimānalo Wastewater Treatment Plant (WWTP) may be required. We also acknowledge that the sewer connection application should be submitted to the Department of Planning and Permitting, Site Development Division, Wastewater Branch to determine if the Project can be accommodated by the Waimānalo WWTP.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 18-742

December 19, 2018

12-24-18A05:32 ARNV

Ms. Claire Oshiro, Environmental Planner
Limtiaco Consulting Group, Inc.
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Ms. Oshiro:

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agriculture Lots Project in Waimanalo Ahupuaa, Koolaupoko District
Tax Map Keys: (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

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

Our comments are as follow:

- Once construction phase commence, install approved Best Management Practices fronting all drainage facilities on Waikupanaha Street.
- During construction and upon completion of project; any damages/deficiencies to Waikupanaha Street shall be corrected to City standards and accepted by the City.

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

Sincerely,

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

cc: Department of Hawaiian Home Lands - Darrell Ing

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

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

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference DRM 18-742

Dear Mr. Sasamura,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 12/19/18 (reference DRM 18-742). DHHL expects its contractor to implement Best Management Practices during construction. The project will be designed and shall provide provisions in accordance with State and County regulations. We appreciate your statement that any damages/deficiencies to Waikupanaha Street from the project must be corrected to City standards and be accepted by the City.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

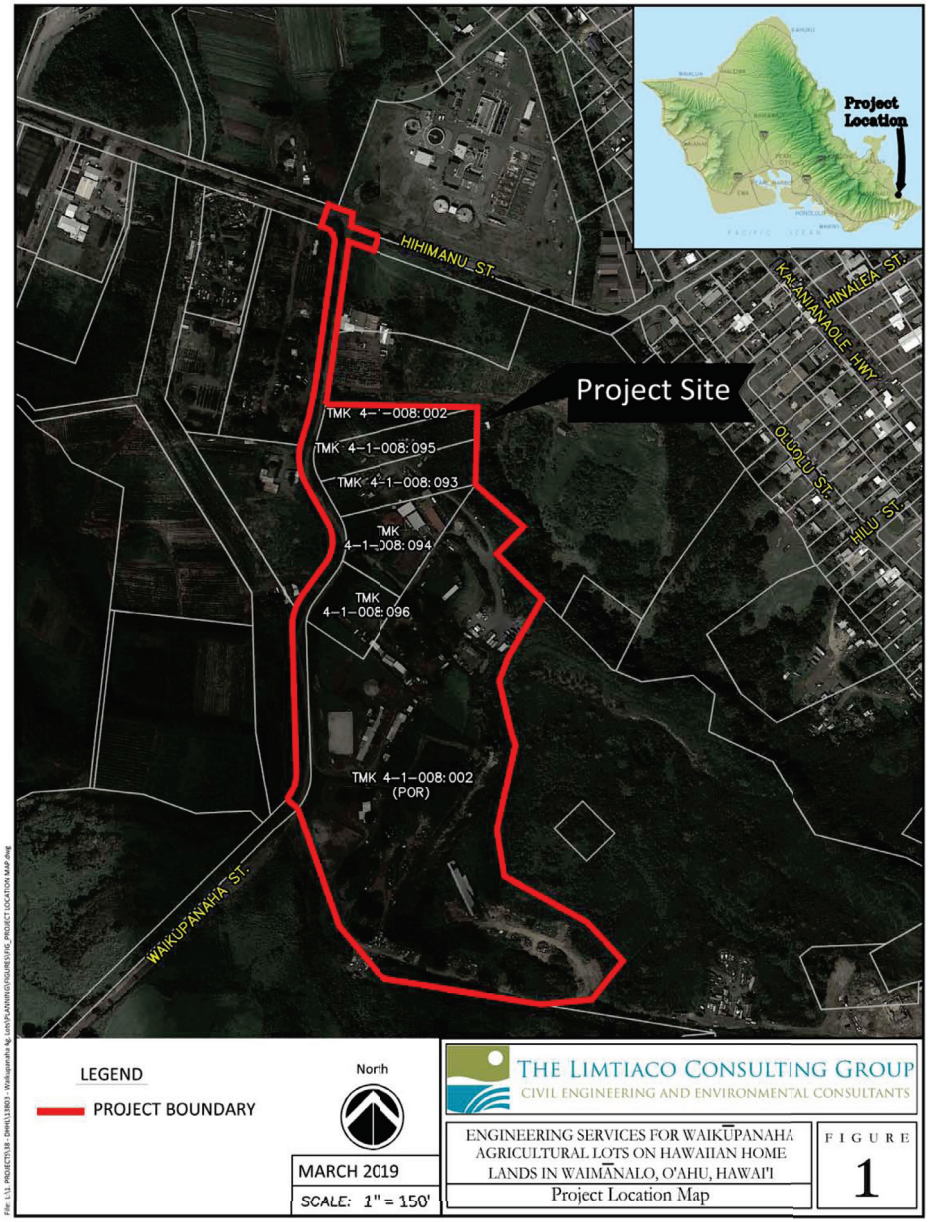
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 Ulu'ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

RECEIVED
LAND DEVELOPMENT
DIVISION
2019 JUL 19 AM 10:47

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 19-405

July 18, 2019

Ms. Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Ms. Oshiro:

Subject: Pre-Assessment Consultation for, Preparation of the Environmental Assessment for the Proposed Waikupanaha Ag Lots Project in Waimanalo, TMKs: (1) 4-1-008:002 (por.), 093, 094, 095 and 096 Reference DRM 18-742

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

In addition to comments on our letter dated December 19, 2018 - (DRM 18-742), Please identify any hydrology and drainage impacts to City roads due to the proposed development.

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

Sincerely,

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

cc: Department of Hawaiian Home Lands - Mr. Darrell Ing

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

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

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference DRM 18-742, DRM 19-405

Dear Mr. Sasamura,

Thank you for the letter dated July 18, 2019 (Reference DRM 19-405). We acknowledge the additional comment about identifying hydrology and drainage impacts to City roads due to the Project.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

DEPARTMENT OF PARKS & RECREATION
CITY AND COUNTY OF HONOLULU
1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

November 28, 2018

RECEIVED
LAND DEVELOPMENT
DIVISION
2018 DEC -7 AM 11:13

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

SUBJECT: Pre-Assessment Consultation
Proposed Waikupanaha Agricultural Lots Project
TAX Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Limtiaco Consulting Group has requested our review and comments at the Pre-Assessment Consultation stage of the Environmental Assessment for the proposed Waikupanaha Agricultural Lots Project in Waimanalo.

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

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

Sincerely,

Michele K. Nekota
Director

MKN:jr
(751934)

cc: Claire Oshiro, the Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Ms. Michele K. Nekota, Director
City and County of Honolulu
Department of Parks and Recreation
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference 751934

Dear Ms. Nekota,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 11/28/18 (reference 751934). We acknowledge the statement of no comment since the project will have no impact on Department of Parks and Recreation programs or facilities.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter. If no further comments are provided, we will remove the Department of Parks and Recreation from further consultation as requested.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

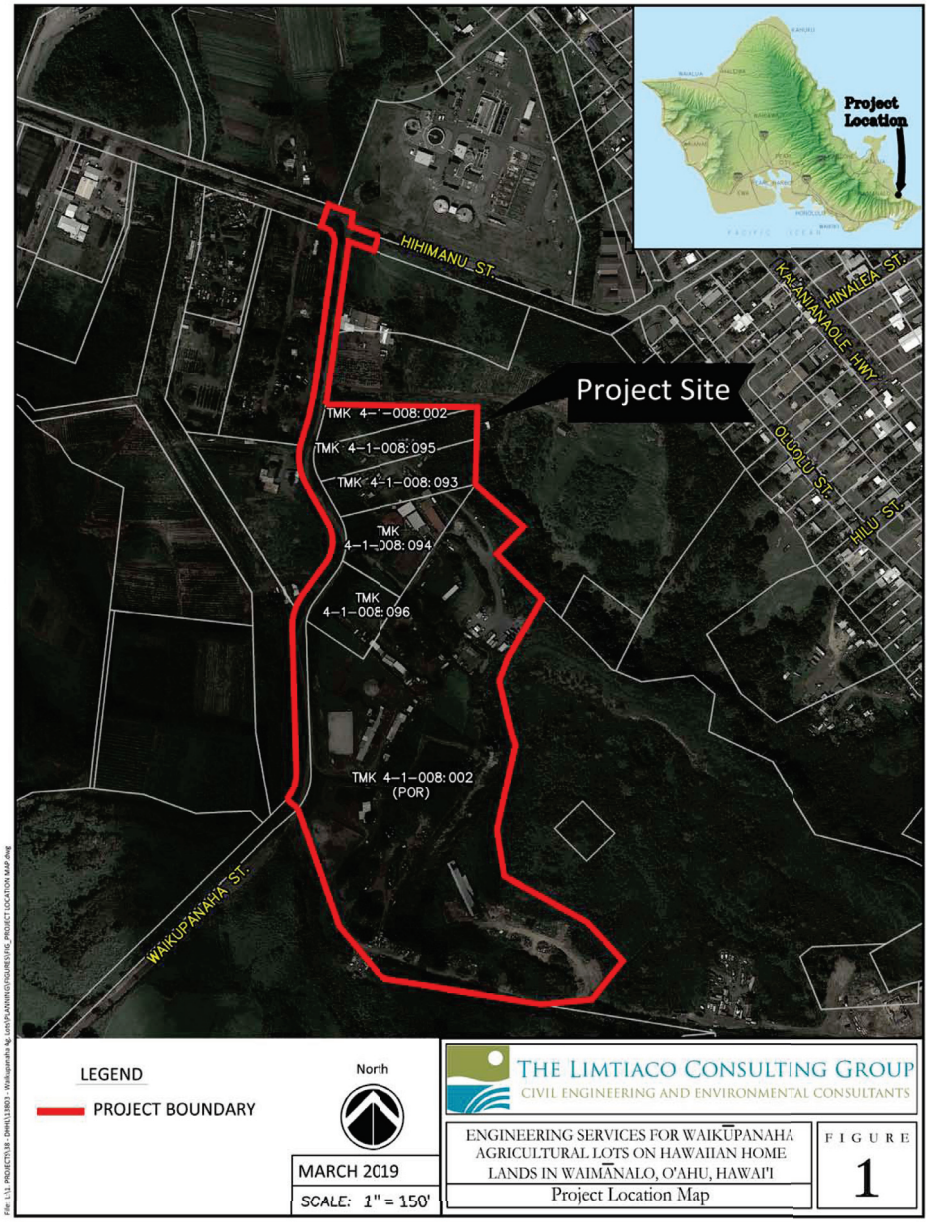
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



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

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP11/18-751930R

December 20, 2018

Mr. Darrell Ing
Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

SUBJECT: Pre-Consultation Draft Environmental Assessment (DEA) for Waikupanaha Agricultural Lots Project, Waimanalo, Oahu, Hawaii

This is in response to a letter that we received from The Limtiaco Consulting Group dated November 20, 2018, requesting our input on the subject project. We have the following comments:

1. **Transportation Impact Assessment (TIA)**. We have the following comments:

   a. The development of 30 acres for subsistence agricultural homesteads lots is estimated to attract more residents and visitors to the site for daily commuting and agricultural activity. A multi-modal TIA should be completed to calculate and examine the changes to vehicle, pedestrian, bicycle, and public transit stress levels from this new facility to the surrounding area and nearby intersections with corresponding improvements to mitigate these impacts by applying Complete Streets principles.

   b. Use person and vehicle trip rates from the Institute of Traffic Engineer's Trip Generation Manual and assign these trips to the transportation system. This will require analysis of crossing treatments using National Cooperative Highway Research Program 562 methodology for pedestrian measures.

   c. The calculated and observational Level of Service (LOS) should be provided.

   d. Define performance measures for use in the study:

      i. V/C ratio targets that are >1 for 1st and/or 2nd highest peak hours;
      ii. Identify where vehicle LOS will not be used;
      iii. Pedestrian LOS;
      iv. Bicycle Level of Traffic Stress; and
      v. Transit Capacity and Quality of Service

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

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

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

   b. Transportation Demand Management strategies to minimize the amount of vehicular trips to the site.

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

   d. Coordinate construction schedules with other nearby properties that have planned developments to ensure minimal impacts on City streets.

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

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

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

7. **Neighborhood Impacts**. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

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

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

Very truly yours,

Wes Frysztacki
Director

cc: Ms. Claire Oshiro, The Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

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

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference TP11/18-751930R

Dear Mr. Frysztacki,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for your department's letter dated 12/20/18 (reference TP11/18-751930R), which included itemized comments pertaining to a transportation impact assessment (TIA), driveway design, traffic management plan (TMP), vehicle/pedestrian/bicycle crossing, Best Management Practice (BMP) controls, roadway damage, neighborhood impacts and the street usage permit.

The completed TIA and TMP will be submitted to the appropriate City departments for review. Access driveways that connect to a City street will be designed and constructed to City standards. We appreciate your expectation pertaining to the use of BMP controls at the construction site to prevent trailing of dirt and debris. Roadway damage caused by the project will be repaired as required during construction.

At this time, bicycle and pedestrian facilities in the project vicinity are limited, which discourages walking and bicycling. None of the City's planned improvements for non-motorized travel are in the vicinity of the project site.

DHHL initiated consultation with agencies and interested parties in November 2018, surveyed its applicants in February 2019, and is providing updated information about its project via this letter to notified agencies, organizations and individuals. We will continue to provide project information and collect feedback as the EA process proceeds.

DHHL's project is not expected to impact bus services provided by Oahu Transit Services, Inc. since the routes and stops in the project vicinity are along Kalaniana'ole Highway. The street usage permit will be obtained by the contractor for work within City streets.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

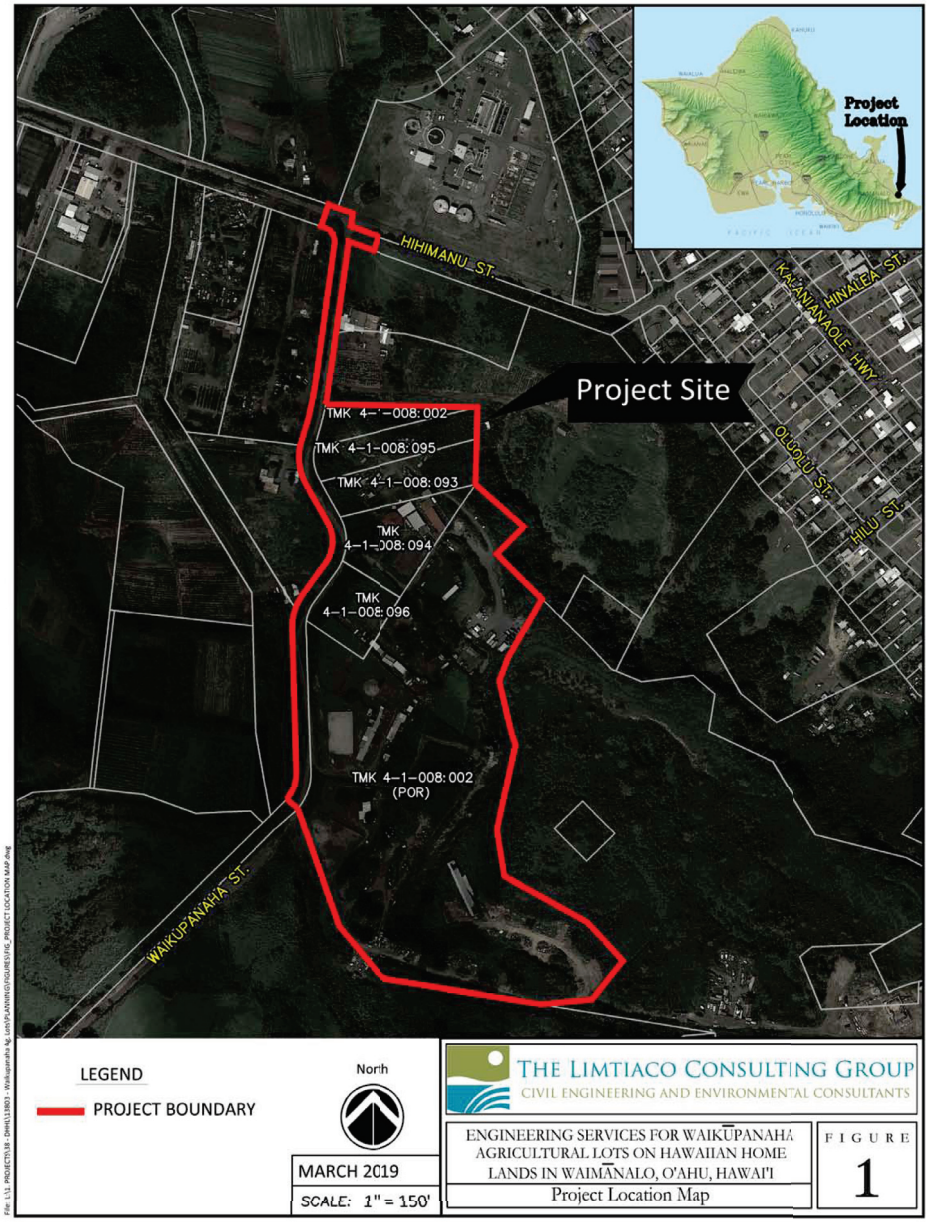
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

RECEIVED
LAND DEVELOPMENT
DIVISION
2018 DEC 20 AM 10: 41

December 17, 2018

Mr. Darrell Ing, Project Manager
Department of Hawaiian Home Lands
State of Hawaii
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment For the Proposed Waikupanaha Agricultural Lots Project in the Waimanalo Ahupuaa
Koolaupoko District, Oahu
Tax Map Keys: 4-1-008: 002 (por.), 093, 094, 095, and 096

In response to your letter dated November 20, 2018, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.)

   A fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the

   required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter

   constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)

3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Sections 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

4. Submit civil drawings to the HFD for review.

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

Sincerely,

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:gl

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Fire Chief Manuel P. Neves
City and County of Honolulu
Fire Department
636 South Street
Honolulu, HI 96813-5007

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Chief Neves,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your department's letter dated 12/17/18 and for including the requirements pertaining to fire department access roads and water supply capacity for fire flow. The project will be designed in accordance with the State's Fire Code. Civil drawings will be submitted to the Honolulu Fire Department for review.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

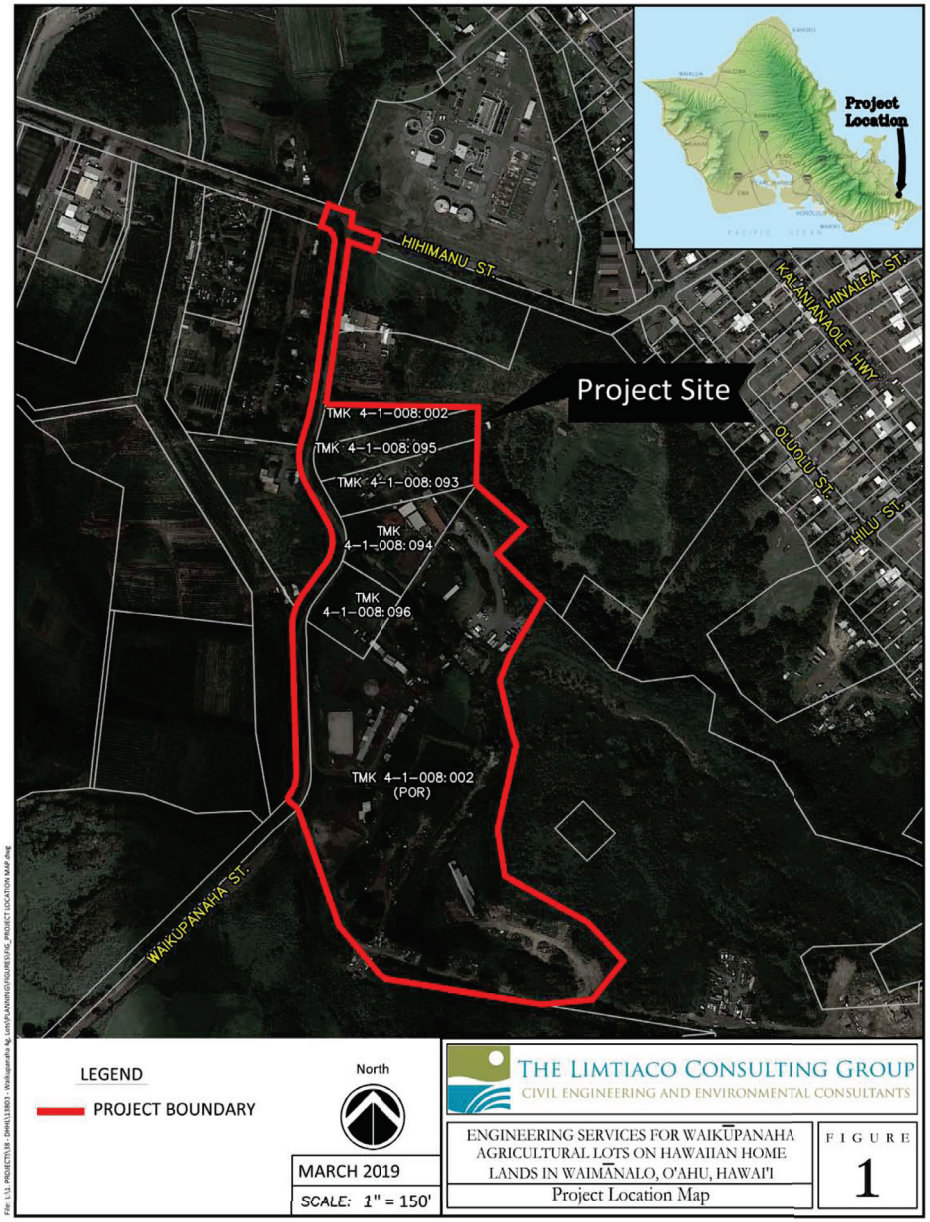
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

July 18, 2019

07-25-19P 02:17 RCVD

Ms. Claire Oshiro
Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, Hawaii 96817

Dear Ms. Oshiro,

Subject: Preassessment Consultation Preparation for Environmental Assessment
Proposed Waikupanaha Agricultural Lots Project
Waimanalo Ahupuaa, Koolaupoko District
Tax Map Keys: 4-1-008: 002 (Portion), 093, 094, 095, and 096

In response to your letter dated July 8, 2019, regarding the abovementioned subject, the Honolulu Fire Department (HFD) requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located no more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.)

   A fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter

constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)

3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Sections 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

4. Submit civil drawings to the HFD for review and approval.

Should you have questions, please contact Acting Battalion Chief Reid Yoshida of our Fire Prevention Bureau at 723-7155 or ryoshida@honolulu.gov.

Sincerely,

WAYNE MASUDA
Acting Assistant Chief

WM/CM:bh

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Fire Chief Manuel P. Neves
City and County of Honolulu
Fire Department
636 South Street
Honolulu, HI 96813-5007

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Chief Neves,

Thank you for the letter dated July 18, 2019 and for including the requirements pertaining to fire department access roads and water supply capacity for fire flow. The project will be designed in accordance with the State's Fire Code. Civil drawings will be submitted to the Honolulu Fire Department for review.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
JONATHON GREMS
DEPUTY CHIEFS

OUR REFERENCE RN-DK

July 31, 2019

2019 AUG -5 AM 10: 16
RECEIVED
LAND DEVELOPMENT
DIVISION

Mr. Darrell Ing, Project Manager
Department of Hawaiian Homelands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

This is in response to a letter from The Limtiaco Consulting Group, Inc., requesting input regarding appropriate mitigation measures for the proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahapuaa, Koolaupoko District, on Oahu. The Honolulu Police Department (HPD) has reviewed the subject letter containing a map and information on the project and would like to recommend some mitigation measures.

The impact of the ingress/egress of construction vehicles and equipment should be evaluated to ensure neighborhood traffic flow is not adversely affected. Should the developer find significant impacts, a traffic mitigation plan, including (but not limited to) flag persons, clear signage, cones, special duty police officers, etc., should be implemented. These measures will ensure safe access to the site for construction vehicles and equipment as well as for motorists and pedestrians in the project vicinity.

The HPD also recommends that the developer and/or contractor obtain the necessary street usage permits from the Department of Transportation Services for the purposes of project parking and transporting equipment to the project area.

Should there be any questions, please call Major Crizalmer Caraang of District 4 (Kaneohe) at 723-8639.

Thank you for the opportunity to review this project.

Sincerely,

ALLAN T. NAGATA
Assistant Chief
Support Services Bureau

cc: Ms. Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group

Serving and Protecting With Aloha

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Chief Susan Ballard
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, HI 96813

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096
Reference RN-DK

Dear Chief Ballard,

Thank you for the letter dated July 31, 2019 (Reference RN-DK) from Assistant Chief Nagata. We acknowledge the statements pertaining to neighborhood traffic flow and the preparation of a traffic mitigation plan. We appreciate the suggested measures that can help to ensure safe access and the information about street usage permits.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 202
HONOLULU, HAWAII 96813-3065
TELEPHONE: (808) 768-5010 • FAX: (808) 768-5011

IKAIKA ANDERSON
Chair and Presiding Officer
Honolulu City Council
COUNCILMEMBER, DISTRICT 3 (WINDWARD O'AHU)
TELEPHONE: (808) 768-5003
EMAIL: ianderson@honolulu.gov
WEB: http://www.honolulu.gov/council3

July 26, 2019

Darrell Ing, Project Manager
Department of Hawaiian Homelands
P.O. Box 1879
Honolulu, Hawai'i 96805
darrell.h.ing@hawaii.gov

Subject: Pre-Assessment Consultation for an Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo

Thank you for the opportunity to review and comment on the Pre-Assessment Consultation for an Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project located in Waimanalo which is part of the Honolulu City Council's 3rd District of Windward O'ahu.

As the Councilmember representing this district, I have no comments at this time but would like to request that notices of public meetings and draft documents continue to be provided so our office can participate in this planning process.

If you have any questions or concerns, please feel free to contact Alan Kekoa Texeira, Community Director for Waimanalo at 808-768-5018 or alan.texeira@honolulu.gov.

Malama pono,

Ikaika Anderson
Council Chair
Councilmember, District 3 (Windward Oahu)

THE LIMTIACO CONSULTING GROUP

CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Councilmember Ikaika Anderson
Honolulu City Council District 3 (Kaneohe, Kailua, Waimanalo)
530 South King Street, Room 202
Honolulu, HI 96813

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Councilmember Anderson,

Thank you for the letter of no comment dated July 26, 2019. We acknowledge the request to be notified of public meetings and draft documents.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Monday, November 26, 2018 4:20 PM
To: darrell.h.ing@hawaii.gov
Cc: Kuwaye, Kristen; Claire Oshiro
Subject: Pre-Assessment Consultation - Proposed Waikupanaha Agricultural Lots Project in Waimanalo

Darrell Ing, Project Manager
DHHL
PO Box 1879
Honolulu, HI 96805

Dear Mr. Ing

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should Hawaiian Electric have existing easements and facilities on the subject property, we will need continued access for maintenance of our facilities. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Waikupanaha Agricultural Lots project comes to fruition, please continue to keep us informed. Further along in the design, we will be better able to evaluate the effects on our system facilities.
If you have any questions, please call me at 1-808-543-7245.

Sincerely,
Rouen Q. W. Liu
Permits Engineer
Tel: (808) 543-7245
Email: Rouen.liu@hawaiianelectric.com

CONFIDENTIALITY NOTICE: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and/or privileged information. Any unauthorized review, use, copying, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender immediately by reply e-mail and destroy the original message and all copies.

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Mr. Kerstan Wong, Manager
Hawaiian Electric Company, Inc.
Engineering Department
P.O. Box 2750
Honolulu, HI 96840-0001

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Wong,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

Thank you for the email transmitted on 11/26/18 to DHHL regarding its proposed project. We acknowledge the statement from your permits engineer that "Hawaiian Electric Company has no objection to the project." Your engineer also states that Hawaiian Electric Company will require continued access to maintain its facilities on the affected parcels.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

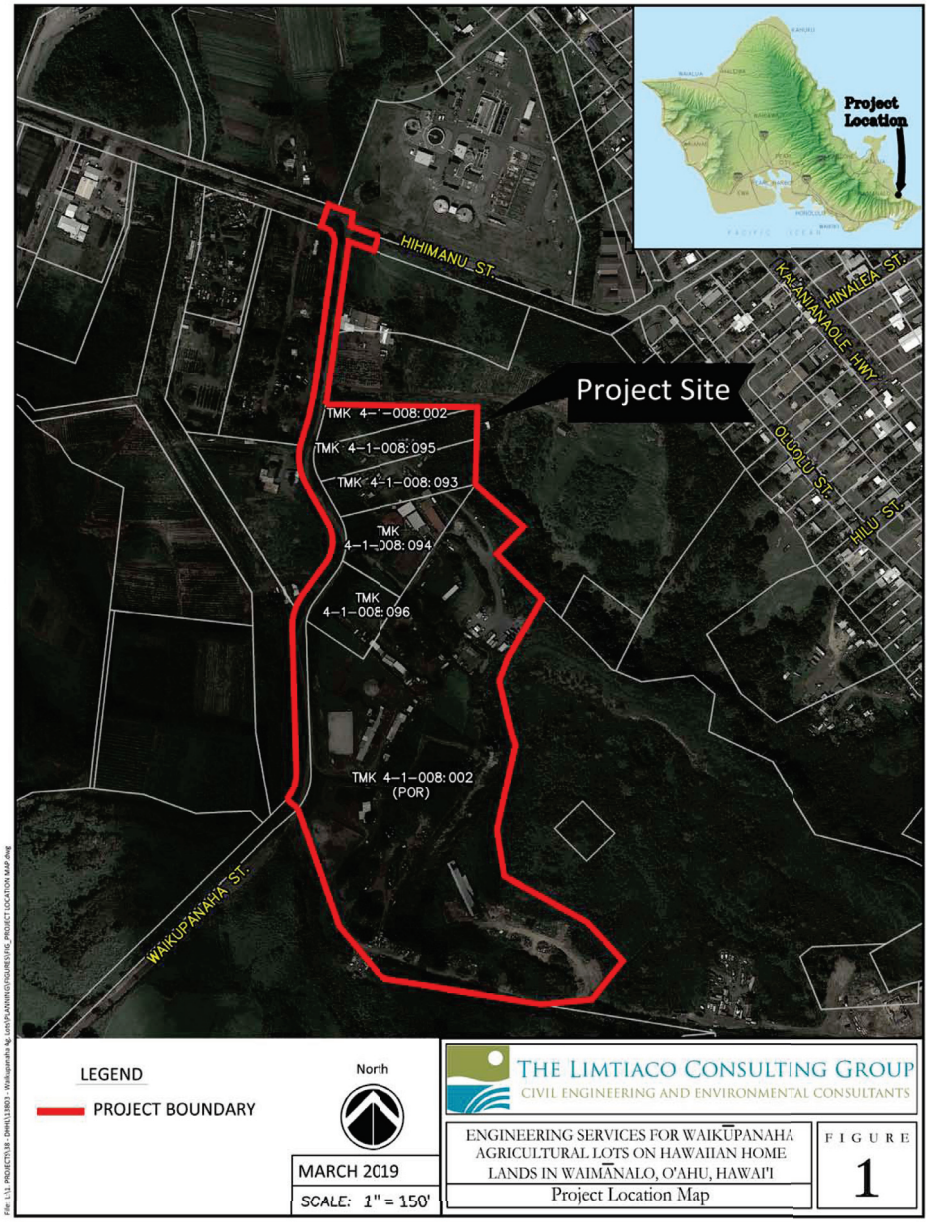
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



Transmittal

Charter COMMUNICATIONS
200 Akamainui Street ◆ Mililani HI 96789
(808) 625 - 2100

Date: *July 17, 2019*

Comment & Review

To: *DEPARTMENT OF HAWAIIAN HOME LANDS*
P.O. BOX 1897
Honolulu, HI 96805

REVIEW AND COMMENT
WAIKUPANAHA AGRICULTURAL LOTS

Attention: *DARREL ING*

LADIES AND GENTLEMEN: We are sending you the following:

- ☐ **Pole / Conduit Application**
- ☐ **Permit Applications**
- ☒ **Copy of Letter**
- ☐ **Preliminary / Final Drawings**
- ☐ **Return Prints**
- ☒ **Other Review/Comment**

Copies	*Sht / Appl. #*	*Description*
1		RESPONSE LETTER
1		CATV System Maps for Reference

The Above is transmitted:

- ☐ **For Your Approval**
- ☐ **For Review and Comment**
- ☒ **For Your Use / Records**
- ☒ **As Requested**
- ☐ **As Approved**
- ☐ **Other** _____

Comments / Remarks:
Enclosed are copies of our maps with our comments

If you have any questions or concerns, please let me know:
stephen.tercino@charter.com or 625-8357 / 465-5122 Thank you.

CC: **Lori Iha**

Signed: **Stephen Tercino**
Title: **OSP ENGINEER**

Charter COMMUNICATIONS

July 17, 2019

DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HI 96805

Attn: DARRELL ING, PROJECT MANAGER

Subject: WAIKUPANAHA AGRICULATURAL LOTS ON HAWAIIAN HOME LANDS IN WAIMANALO, OAHU, HAWAII

Dear Mrs. Darrell Ing,

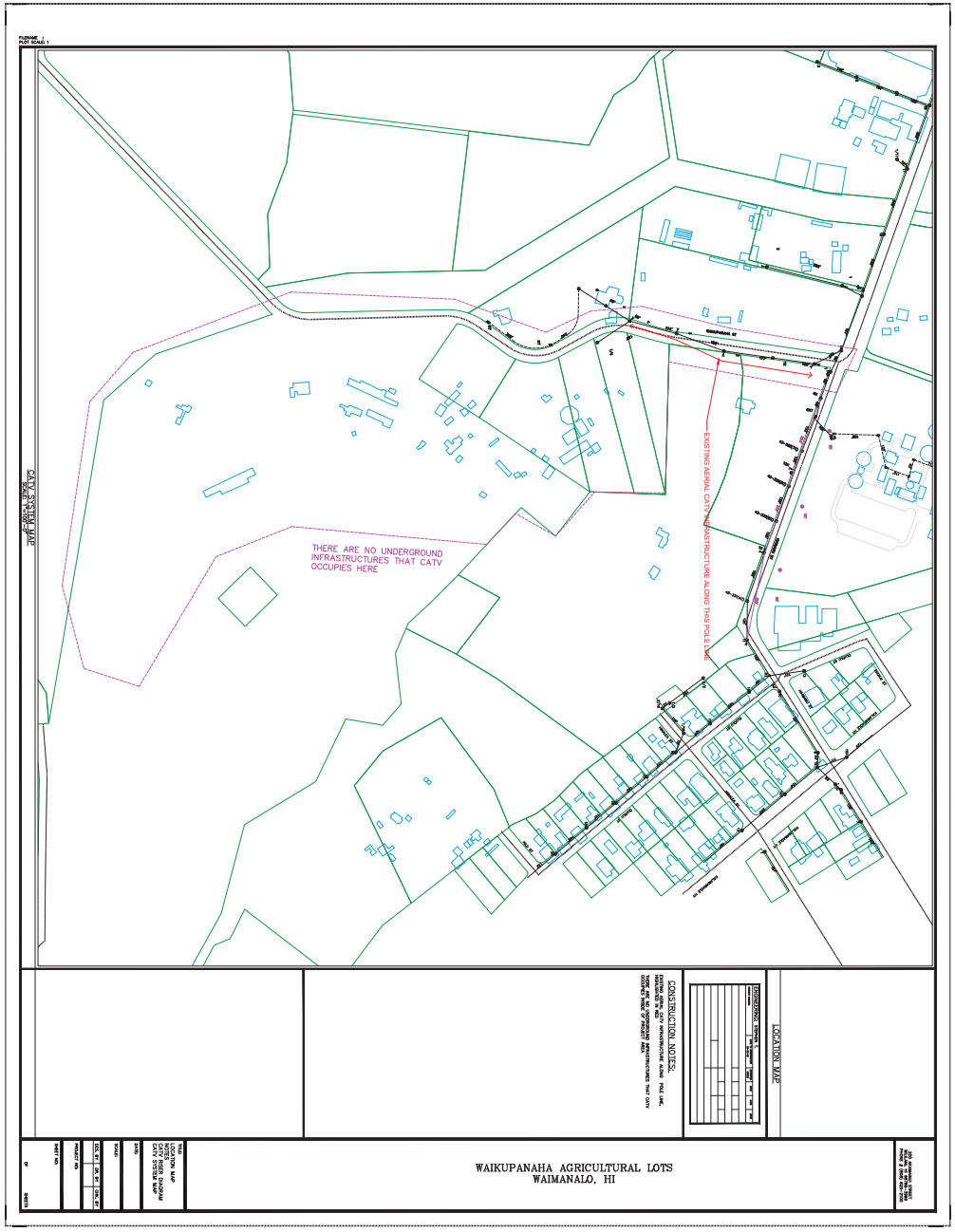
Thank you for the opportunity for Charter Communications to review the above project. Based upon the plans you provided, Charter Communications has the following comments and concerns.

There are no underground infrastructures that CATV occupies inside of the project area. Existing aerial CATV infrastructures along nearby pole line is highlighted in red.

This information has been provided to help minimize delays and prevent damage to existing CATV structures within the project area. Should you have any questions or concerns, please feel free to contact me at 465-5122 or 625-8357, or email me at stephen.tercino@charter.com.

Sincerely,

Stephen Tercino
OSP Engineer



THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Mr. Stephen Tercino, OSP Engineer
Charter Communications
200 Akamainui Stret
Mililani, HI 96789

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Tercino,

Thank you for the letter dated July 17, 2019 and the accompanying map. We acknowledge that Charter Communications has no underground Cable Television (CATV) infrastructure in the project area. Existing overhead CATV infrastructure in the project area is on utility poles that generally follow the alignments of Waikupanaha and Hihimanu Streets.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

HAWAI'I GAS
THE CLEAN ENERGY COMPANY

RECEIVED
LAND DEVELOPMENT
DIVISION

2019 JUL 25 AM 9:13

July 24, 2019

Mr. Darrell Ing
Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Ing:

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimanalo Ahupua'a Ko'olaupoko District, Oahu Island – HAWAII GAS Review

In response to The Limtiaco Consulting Group's letter dated July 8, 2019, it has been determined that the project area is currently clear of utility gas facilities.

Thank you for the opportunity to review the project plans. Should there be any questions, or if additional information is desired, please feel free to contact Talon Choy at (808) 594-5549.

Sincerely,

Hawaii Gas

Keith K. Yamamoto
Manager, Engineering

KKY:krs

cc: Ms. Claire Oshiro, The Limtiaco Consulting Group

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Mr. Keith K. Yamamoto, Manager
The Gas Company, LLC (dba Hawaii Gas)
Engineering Department
P.O. Box 3000
Honolulu, HI 96802-3000

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Mr. Yamamoto,

Thank you for the letter dated July 24, 2019. We acknowledge the statement that the project area is currently clear of utility gas facilities.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro
Environmental Planner

Subject: Cook's Ranch Since 1990

From: Leiala Cook <hawaiipauriders@gmail.com>
Sent: Thursday, December 20, 2018 8:34 PM
To: Young, Ward K <ward.k.young@hawaii.gov>; Ing, Darrell H <darrell.h.ing@hawaii.gov>
Subject: Cook's Ranch Since 1990

Aloha DHHL,

The Hawaiian Home Lands at 41-170 Waikupanaha Street Waimanalo, HI 96795 which at the time was 12 acres of ranch land has been with John & Lita Cook since 1990. My parents hired a gentleman with a heavy equipment bulldozer to clear out all the Koa trees, bushes, rocks and buses that were on the property since Rogers James had the property last.
My parents spent a lot of money clearing out the property and worked daily to build their ranch they always wanted and to help other horse owners. As well as to teach the community and interested pa'u riders who always dreamed to become one day.
Ben Char & June Pires needed to place to keep their horses so my parents were always so kind & help those who needed assistance so my parents placed them in certain areas to house their horses. As years went by Ben Char & June Pires went to DHHL to claim the area my parents allowed them to stay on behind my parents back. DHHL alotted them the property they requested to have so the property was divided in 4 ranches.
The Cook Ranch has always been home of the Hawai'i Pa'u Riders where many Hawaiians from keiki to Kupuna has learned the HawaiianTraditions wether it was pa'u horsemanship, lei making, pa'u draping workshop, hula lessons, oli classes, and much more. The Cook Ohana continues to perpetuate the Hawaiian art of pa'u locally & worldwide. John & Lita Cook has been the Aloha Festivals Equestrian Chairpersons since 1982 with is a passion and to keep the tradition alive that is slowly detiriating due to lack of horses on the island of Oahu. We need to keep the Paniolo life style alive to keep our HawaiianTraditions alive that our ali'i Which is unique in Hawaii.
Since the passing of my mother, Lita Cook, the torch has been handed down to me and it's my kulieana to continue to keep the traditions alive. Since then I have continue to use the Cook's Ranch to teach the knowledge both of my parents has taught me. Next week after Christmas, I will take 17 Hawaiian Pa'u Riders to Pasadena Rose Parade which will be the 40th mainland parade that Hawai'i Pa'u Riders has been invited and participated in. We strive to share the Aloha Spirit worldwide.
It is sad that we, the Cook Ohana has to be removed off the ranch we built and we continue to teach our Hawaiian traditions on this property. I don't understand that you want to kick out one Hawaiian that is doing good for us Hawaiians to bring another Hawaiian on the property. I pray that you keep in consideration to keep the Cook's Ranch alive to continue to do what is our kuleana from our ali'i in perpetuating our Hawaiian Traditions for the next generations to carry on for many generations to come.
Please keep me inform on the next decisions that will be going on with the property. Feel free to contact me at anytime.

Malama Pono,
Leiala Ka'iulani Cook
PO Box 742
Waimanalo, HI. 96795
Ph: (808)561-6580
Email: hawaiipauriders@gmail.com

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Leiala Cook
P.O. Box 742
Waimanalo, HI 96795

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Leiala Cook,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your email transmitted on 12/20/18 to DHHL. We appreciate the information pertaining to your Ohana's endeavor since 1990 to support horse owners. Our understanding is that DHHL commends your commitment to perpetuating *pa'u* horsemanship, *pa'u* draping, lei

making, hula, native Hawaiian plant knowledge and the history of *pa'u*. DHHL is also aware that applicants on the O'ahu agriculture waitlist have indicated their strong preference to receive an agriculture award in Ko'olaupoko and Waimānalo in particular.

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

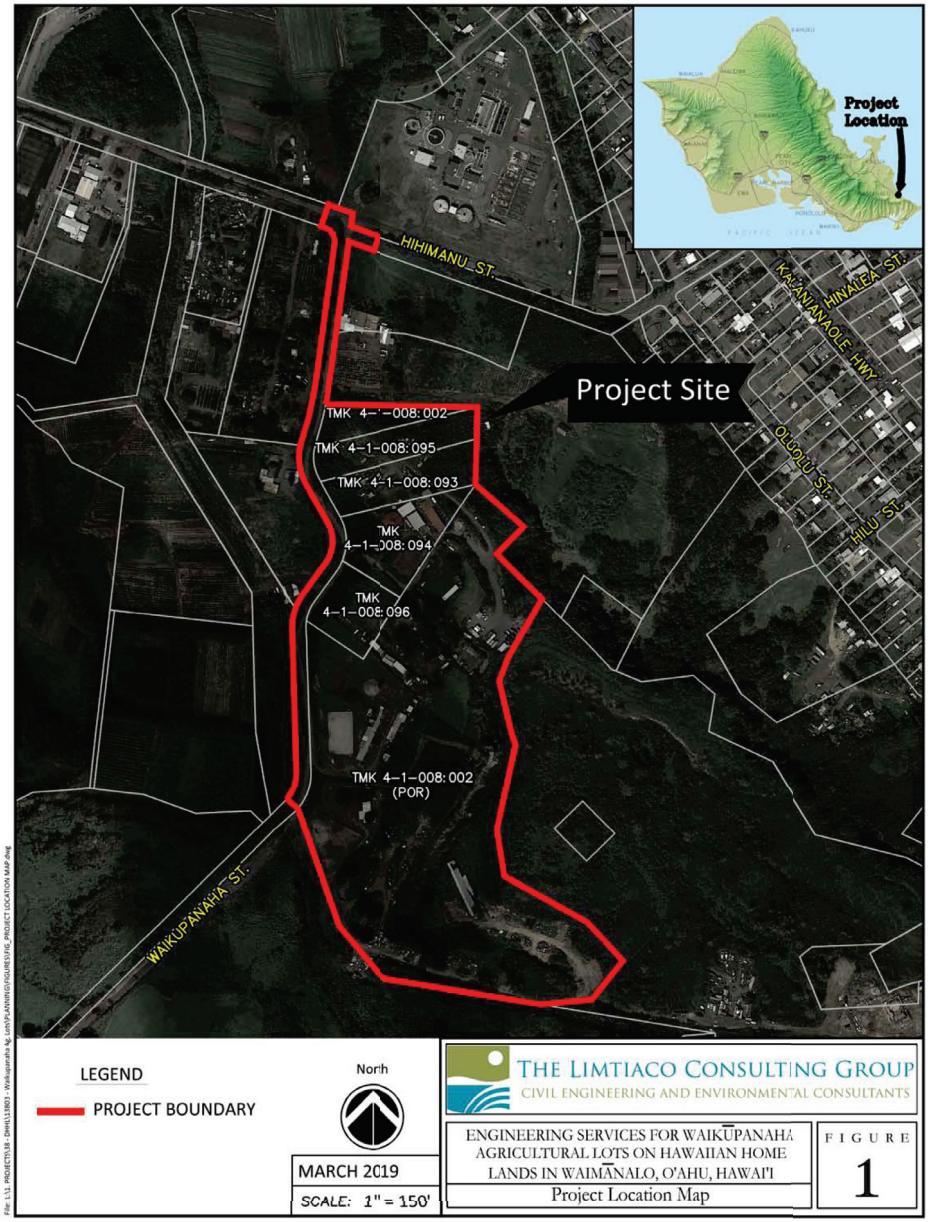
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



Subject: Cooks Ranch 41-139 Waikupanaha St, Waimanalo, HI 96795

From: Tata Law <lawdelsan@gmail.com>
Sent: Thursday, December 20, 2018 10:15 AM
To: Young, Ward K <ward.k.young@hawaii.gov>; Ing, Darrell H <darrell.h.ing@hawaii.gov>
Subject: Cooks Ranch 41-139 Waikupanaha St, Waimanalo, HI 96795

Good Morning Kalei and Darrell,

It was brought to my attention that the Cook's Ranch may need to vacate the property or be down sized. Weather that case may be I want express my past, present, and future affiliation with the Cook Ranch Ohana.

My name is Lawrence Delos Santos I am Heavenly Cook-kamakeeaina significant other. Heavenly is the granddaughter of John and late Lita Cook.

We met back in April 2015 and from then on I have been going to the ranch almost every weekend. I live out in Royal Kunia and the commute takes 45 min without traffic. I point it out because it takes a lot of dedication to drive that far to feed horses and maintain the ranch.

As an electrician for 12 years I fell into the position of upgrading, maintaining, and general yard duties at the ranch. I spent almost $10,000 mostly for maintaining horse stalls, fixing horse tack rooms, upgrading the bathroom, paint, purchasing horse fence panels, lighting with generator, and fixing fences.

The plethora of hard working labor hours is a peice of what this ranch is now and what this ranch can be in the future.

Obviously I got into the hawaiian art of Pa'u riding through Heavenly. I am a member of The Hawaii Pa'u Riders Equestrians Unit. In the last 3 years Heavenly and I rode in 6 parades in 3 different mainland states to perpetuate Pa'u. We once rode in 4 parades in one day in Seattle in April of 2016, with her aunty Cyndi Pa who resides in Seattle, perpetuates Pa'u, that she learned from John and Lita Cook.
I also perpetuated Pa'u with the Hawaii Pa'u Riders at Fort Worth Texas in Jan 2017, and in Portland Oregon Rose Parade this past June.
On New Years Day 2019 we will be riding in the largest rose parade in Pasedena California. We also perpetuate Pa'u riding in local parades as well, such as Kamehameha Parade, Prince Kuhio Parade, Aloha Week Parade, Ewa Beach Christmas Parade, Kaneohe Christmas Parade, and always the Waimanalo Christmas Parade.

Pa'u tought me a lot of the Hawaiian Culture. Born and raised on the Island of Molokai I thought I knew a lot of the Hawaiian culture, boy I was wrong. Just being around Pa'u tought me more of the hawaiian language, hula, native Hawaiian plants, and of course the history of Pa'u.

Through my knowledge, the Hawaii Pa'u Riders is the only group from Hawaii that spreads the aloha, traditions, and culture traveling the world through the Art of Pa'u riding.

To accomplish these milestones we hold once a month meetings, fundraising, hula practice, Pa'u draping workshops, lei making workshops, and horsemanship practice all at Cooks Ranch. It is essential to have the ranch space to let the horses, stretch. roam, mingle, exercise, do horse practices, and be a horse.

Heavenly and I plan to carry on the traditions of Pa'u Riding when it gets passed on to her from her mom Leiala Cook in the future.

I would hate to see all my money spent be worth nothing and numerous hours of hard work to be erased and forgotten.

Please take this letter into consideration and help save the Cook's Ranch.

Without this ranch it wont be possible to show the world a piece of Hawaiian Tradition of Pa'u Riding.

Thank you for your time

Lawrence Delos Santos

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

July 8, 2019

Lawrence Delos Santos and Heavenly Cook-Kamakeeaina
C/O John Manuhoa Cook
P.O. Box 743
Waimanalo, HI 96795

Subject: Pre-Assessment Consultation, Preparation of the Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupuaʻa, Koʻolaupoko District, Oʻahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Lawrence Delos Santos and Heavenly Cook-Kamakeeaina,

This request for your comments replaces the letter dated November 20, 2018. The Department of Hawaiian Home Lands (DHHL) is hereby providing clarification about the proposed development of subsistence agricultural homestead lots in Waimānalo on the island of Oʻahu. This proposed project is expected to create no more than 30 agricultural homestead lots. Each homestead lot will be approximately 0.5 to 0.75 acres in size. DHHL's project will consolidate and re-subdivide several contiguous parcels located along Waikupanaha Street and will require on-site infrastructure and connections to existing nearby municipal infrastructure, which is primarily along Hihimanu Street. The inconsistent width and alignment of Waikupanaha Street will also be addressed as part of the proposed project because portions of the existing roadway encroach into DHHL's parcels. Anticipated project actions including improvements within the rights-of-way along portions of Waikupanaha and Hihimanu Streets may affect approximately 32.5 acres; however, DHHL's jurisdiction applies to its parcels, which encompass approximately 30 acres.

The Limtiaco Consulting Group, Inc. is preparing the Environmental Assessment (EA) for DHHL's project. Completion of the project will allow DHHL to award agricultural lots to beneficiaries on its Oʻahu Agricultural Waitlist. We are soliciting comments on behalf of DHHL for the pre-assessment consultation phase of the EA pursuant to Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules of the Department of Health.

In 2017, DHHL updated its Administrative Rules (Chapters 10-3-24 and 10-3-26, Hawaiʻi Administrative Rules) to allow for the development of agricultural homestead lots of at least 0.5 acres but not more than three acres in size. The rules specify that lessees are required to, within three years: (1) reside and / or (2) actively cultivate food crops or raise small livestock on their homestead lot. The project site includes several contiguous parcels located east of Waikupanaha Street (refer to the enclosed location map). The layout and configuration of the agricultural lots will be influenced by existing conditions such as topography and drainage features. DHHL will work with State and County agencies to identify needed infrastructure, grading and drainage improvements for the project.

Thank you for your email transmitted on 12/20/18 to DHHL. We appreciate the information pertaining to your affiliation with the Cook Ranch Ohana.

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

You are welcome to provide additional input on the project in response to the changes to the project area and the project description. The response deadline is extended to August 5, 2019 due to clarification provided in this letter.

Please send comments to:

Darrell Ing, Project Manager
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805
email: darrell.h.ing@hawaii.gov

And please provide a copy to:

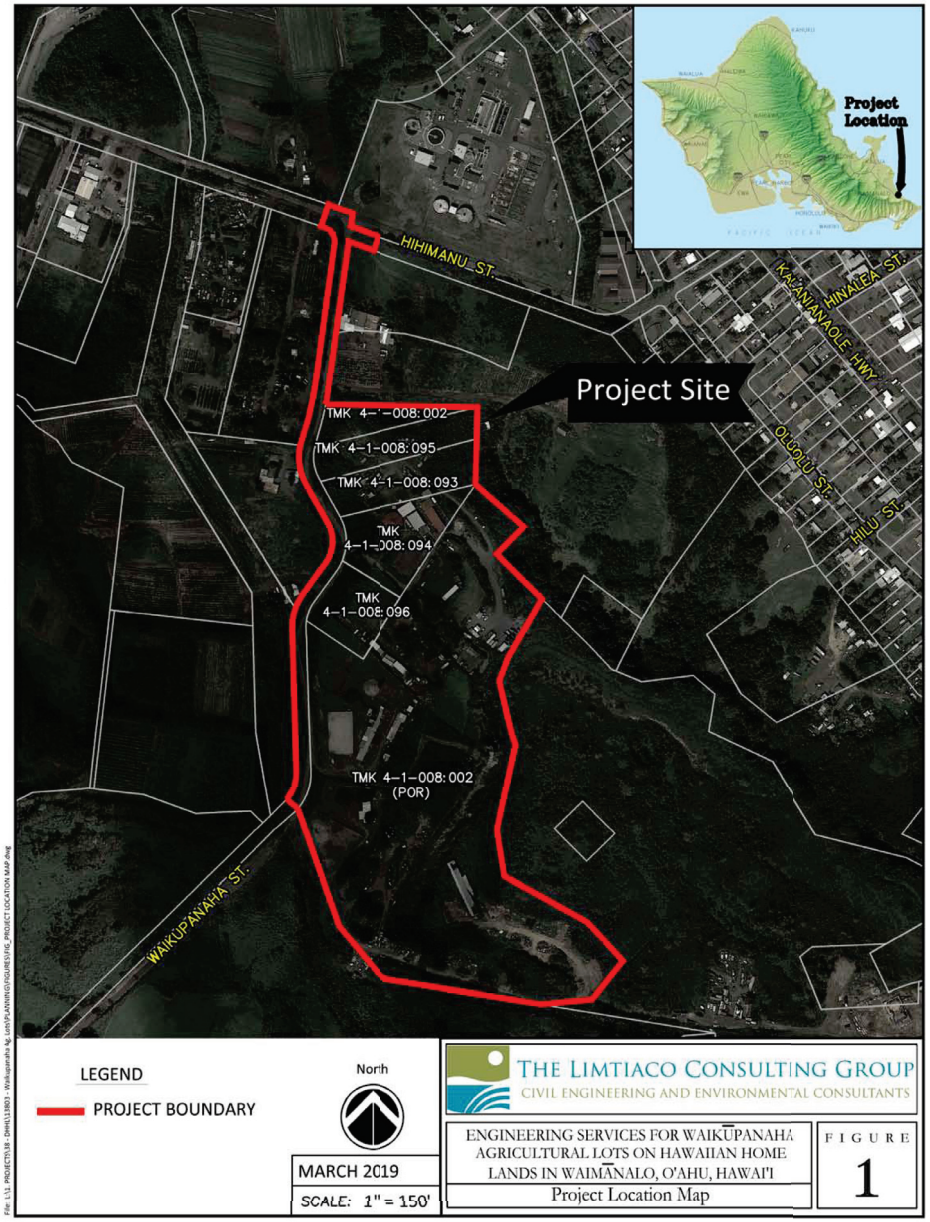
Claire Oshiro, Environmental Planner
The Limtiaco Consulting Group
1622 Kanakanui Street
Honolulu, HI 96817
email: claire@tlcghawaii.com

Thank you for your interest and participation in the environmental review process. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro, Environmental Planner
Project Manager



From: Moke Ramos-Kia Tupua [redacted]
Sent: Monday, September 9, 2019 3:39 PM
To: darrell.h.ing@hawaii.gov; Claire Oshiro
Cc: RKT and Company RKT
Subject: Pre- Assessment Waikupunaha Lots Projects - June & Roy Pires

Aloha Darrell & Claire,

I hope you will still take the time to read and consider my letter. My job requires a lot of traveling and by the time I was able to look at this letter, I am a month behind. Considering the letter states the deadline of August 5th 2019.

I've decided to still take the time to write to you both because of the future of these lots.
Currently, my husband and I are a horse owner of 5 that board at the Pires ranch. Not only do we just board, but we are also care takers (clean, cut tree, fix facility, keep homeless out, weed whack, lawn more, etc). This is not just a ranch, but this is Home to us and our 4 year old son, who has been raised here since he was 8 months old, and to just have this place taken away just breaks my heart.

The continued memories here grows more and more daily. As I was raised from a little girl and seeing my grandmother as a pa'u rider, now my dad travels the world as a pa'u rider, I am now riding as princess for my first time for the island of molokini in the 2019 aloha week floral parade, and I am one of the youngest along side my husband that teaches pa'u riding lessons. I take pride in this movement and the Pires has allowed this culture for me to continue teaching at their ranch with my horses.

I pray that in your hearts you allow us to continue to reside here for many years to come. Already allowing us the chance to share why you should allow us to keep this place speaks volume. We take care of this place like we own it, and that speaks volumes, considering the other ranches that are near us, we are very fortunate to care take this beautiful land, as well as the animals on it.

Please feel free to reach out if you have questions or concerns.

Mahalo
Deanna Ramos-Kia Tupua [redacted]
Moke Ramos-Kia Tupua [redacted]
Tamari'i Ramos-Kia Tupua

(RKT Ohana)

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

November 15, 2019

Deanna, Moke and Tamari'i Ramos-Kia Tupua
(via email only)

Subject: Response to Pre-Assessment Consultation, Environmental Assessment for the Proposed Waikupanaha Agricultural Lots Project in Waimānalo Ahupua'a, Ko'olaupoko District, O'ahu Island
Tax Map Keys (1) 4-1-008: 002 (por.), 093, 094, 095 and 096

Dear Deanna, Moke and Tamari'i Ramos-Kia Tupua:

Thank you for the email transmitted on September 9, 2019. We appreciate the information pertaining to your affiliation with the Pires Ranch.

Your participation in the environmental review process is appreciated. Should you have any questions, please contact me at (808) 687-8750.

Best regards,
The Limtiaco Consulting Group, Inc.

Claire Oshiro

Claire Oshiro
Environmental Planner

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com