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MĀNOA

College of Tropical Agriculture and Human Resources
Office of Planning and Management Systems

Date March 14, 2022

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

Dear Ms. Evans:

SUBJECT: Hawai'i Revised Statutes Chapter 343, Draft Environmental Assessment-Anticipated Finding of No Significant Impact
Waimānalo Research Station Master Plan
Waimānalo, Oʻahu, Hawaiʻi
TMK 4-1-008:103 and 4-1-008:005

The University of Hawaii, College of Tropical Agriculture and Human Resources (CTAHR) hereby transmits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the Waimānalo Research Station Master Plan.

Please publish notice of availability in the March 23, 2022 edition of the Office of Planning and Sustainable Development, Environmental Review Program's (ERP) publication, The Environmental Notice.

A PDF copy of the DEA-AFONSI (searchable) and a Project Location Map have been submitted via ERP's online submittal form.

Should you have any questions, you may contact me at (808) 956-7429 or cell 808-429-3832, or our consultant, HHF Planners, attn. Leslie Kurisaki via email: lkurisaki@hhf.com or phone (808) 457-3182.

Sincerely,

Thomas Lim
Director Planning and Management Office (PMSO)
University of Hawaii, at Manoa
College of Tropical Agriculture and Human Resources

3050 Maile Way, Gilmore Hall 214B, Honolulu, HI 96822
Ph: (808) 956-9113 Fax: (808) 956-9105
Email: pmso@ctahr.hawaii.edu www.ctahr.hawaii.edu

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Enclosure

Cc: Nicholas Comerford, Dean CTAHR
Walter Bowen, CTAHR Associated Dean for Research
Jari Sugano, CTAHR Oahu County Administrator
Michael Shibata, UH Director Strategic Development and Partnership Office
Bruce Masui, UH Associate General Counsel

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Wednesday, March 16, 2022 1:14:24 PM

Action Name

Waimanalo Research Station Master Plan

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

Koʻolaupoko, Oʻahu

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

(1) 4-1-008:103 and 4-1-008:005

Action type

Agency

Other required permits and approvals

Construction and building permits

Proposing/determining agency

University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources (CTAHR)

Agency contact name

Thomas Lim

Agency contact email (for info about the action)

tlim@hawaii.edu

Email address or URL for receiving comments

lkurisaki@hhf.com

Agency contact phone

(808) 956-7429

Agency address

3050 Maile Way
Gilmore Hall 214B
Honolulu, Hawaii 96822
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

HHF Planners

Consultant contact name

Leslie Kurisaki

Consultant contact email

lkurisaki@hhf.com

Consultant contact phone

(808) 457-3182

Consultant address

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813
United States
Map It

Action summary

The UH College of Tropical Agriculture and Human Resources (CTAHR) has prepared a master plan for 283 acres in Waimānalo, located adjacent to the existing Waimānalo Research Station (WRS). The property is the site of the former Meadow Gold Dairies and will be leased from the State Department of Land and Natural Resources. The master plan represents CTAHR's 20+ year vision for the property.

The Project Area will be an extension of the existing WRS, and be used to support CTAHR's Cooperative Extension, research, and educational activities. There will be 3 primary land uses: 1) Animals/livestock; 2) Plants; and 3) Forestry. Another use may be an Education Center near the Waikupanaha Street entry. An archaeological/cultural preserve will be designated around Pueo Heiau and will include a publicly accessible area for community-driven and sponsored projects. The location and acreage of the master plan land uses are flexible, and may be modified in response to future needs and priorities.

Reasons supporting determination

Refer to DEA-AFONSI Chapter 6, Anticipated Determination for reasons supporting the determination of no significant impact.

Attached documents (signed agency letter & EA/EIS)

- Appendices-all.pdf
- Waimanalo-Research-Station-Master-Plan-EA_Draft_2022-March.pdf
- CTAHR-PMSO-letter-to-Office-of-Planning-and-Sustainable-Dev-Envir-PMSO-signed-Mar-14-2022.pdf

Action location map

- CTAHR_Waimanalo_Project-Site_Parcels-Combined.zip
- CTAHR_Waimanalo_Project-Site.zip

Authorized individual

Leslie Kurisaki

Authorization

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

WAIMĀNALO RESEARCH STATION
MASTER PLAN

Draft Environmental Assessment – Anticipated Finding of No Significant Impact

MARCH 2022

Prepared For

University of Hawai'i
College of Tropical Agriculture
and Human Resources (CTAHR)

Prepared By

HHF PLANNERS
places for people

WAIMĀNALO RESEARCH STATION
MASTER PLAN

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A Preliminary Engineering Report, Coffman Engineering, December 2021
B Ino ʻaole Stream Water Quality Measurements and Anticipated Impact Analysis, Element Environmental LLC, 2021
C Natural Resources Assessment, Draft, November 23, 2021
D Draft Archaeological Literature Review and Field Inspection Report, Cultural Surveys Hawaiʻi, December 2021
E Cultural Impact Assessment Report, Honua Consulting, January 2022
F Phase I Environmental Site Assessment, EnviroServices & Training Center, LLC, September 2020

G Draft Traffic Impact Analysis Report, Austin, Tsutsumi & Associates, Inc., November 11, 2021

H Waimānalo Community Survey 2021

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Acronyms and Abbreviations

AFONSI	Anticipated Finding of No Significant Impact
AIS	Archaeological Inventory Survey
ALISH	Agricultural Lands of Importance to the State of Hawaiʻi
APE	Area of Potential Effect
ARMD	Agricultural Resources Management Division
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
BWS	Board of Water Supply
CAA	Clean Air Act
CDP	Census Data Place
CES	Cooperative Extension Services
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIA	Cultural Impact Assessment
CSH	Cultural Surveys Hawaiʻi, Inc.
CTAHR	College of Tropical Agriculture and Human Resources
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Area
CWA	Clean Water Act
DA	Department of the Army
DAR	Division of Aquatic Resources
dB	decibel
dBA	Sound pressure level (“A” weighting filter)
DBEDT	State of Hawaiʻi Department of Business, Economic Development and Tourism
DHHL	Department of Hawaiian Home Lands
DLNR	State of Hawaiʻi Department of Land and Natural Resources
DOE	State of Hawaiʻi Department of Education
DOFAW	Division of Forestry and Wildlife
DOH	State of Hawaiʻi Department of Health
DP	Development Plans
DPP	Department of Planning and Permitting
E2	Element Environmental LLC
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
ERP	Environmental Review Program
ESA	Environmental Site Assessment
ESA	Endangered Species Act
ETC	EnviroServices & Training Center LLC
FCS	Family and Consumer Sciences

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
gpd	Gallons per Day
gpm	Gallons per Minute
HAR	Hawaiʻi Administrative Rules
HECO	Hawaiian Electric Company
HCM	Highway Capacity Manual
HDOA	State of Hawaiʻi Department of Agriculture
HDOT	State of Hawaiʻi Department of Transportation
HFD	Honolulu Fire Department
HICRIS	Hawaiʻi Cultural Resource Information System
HPD	Honolulu Police Department
HRHP	Hawaiʻi Register of Historic Places
HRS	Hawaiʻi Revised Statutes
HRS	Hawaiʻi Revised Statutes
HT	Hawaiian Telcom
HNFAS	Human Nutrition, Food and Animal Sciences
IAL	Important Agricultural Lands
IWDP	Industrial Wastewater Discharge Permit
KKNOW	Ke Kula Nui ʻo Waimānalo
kV	kilovolt
LBSP	Land Based Sources of Pollution
Ldn	day-night average sound level
LEED	Leadership in Energy and Environmental Design
$L_{eq(h)}$	Maximum hourly equivalent sound levels
LID	low impact development
LOS	Level-of-Service
LRFI	Literature Review and Field Inspection
LSB	Land Study Bureau
LUC	Land Use Commission
LUO	Land Use Ordinance
LUST	leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MGD	Meadow Gold Dairies
mgd	million gallons per day
MHPCS	Mālama Honua Public Charter School
MOU	Memorandum of Understanding
mph	miles per hour
MSL	mean seal level
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria

NHO	Native Hawaiian Organization
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Services
NREM	Natural Resources and Environmental Management
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
OHWM	ordinary high water mark
PCS	Public Charter School
PEPS	Plant and Environmental Protection Sciences
PER	Preliminary Engineering Report
PI	Principal investigator
PV	photovoltaic
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental condition
ROH	Revised Ordinances of Honolulu
SCP	Sustainable Communities Plans
SCS	Soil Conservation Service
SF	Square Feet or Square Foot
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Places
SLR	sea level rise
SLH	Session Laws of Hawaiʻi
SMA	Special Management Area
TCP	traditional cultural properties
TEZ	Tsunami Evacuation Zone
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
TPSS	Tropical Plant and Soil Sciences
TSS	total suspended solids
UH	University of Hawaiʻi
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VES	vapor encroachment screening
WIS	Waimānalo Irrigation System
WLC	Waimānalo Learning Center
WMLH	Waimānalo rainfall station

WQR	water quality rules
WQV	water quality volume
WRS	Waimānalo Research Station
WWTP	Wastewater Treatment Plant
XTEZ	Extreme Tsunami Evacuation Zone

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1 Introduction

The University of Hawaiʻi College of Tropical Agriculture and Human Resources (CTAHR) is preparing a master plan for the use of 283 acres in Waimānalo, Oʻahu, Hawaiʻi. The Project Area is adjacent to the existing Waimānalo Research Station (WRS) and is the site of the former Meadow Gold Dairies (MGD). CTAHR envisions the Project Area as an extension of the 127-acre WRS, located on the adjacent property. A master plan has been prepared for the proposed WRS, and the plan will represent CTAHR's 20+ year vision for the Project Area.

1.1 Purpose of the Environmental Assessment

This Draft Environmental Assessment (EA) and Anticipated Finding of No Significant Impact is prepared in accordance with Chapter 343 Hawaiʻi Revised Statutes (HRS), as amended, and Title 11, Chapter 200.1, Hawaiʻi Administrative Rules (HAR), Environmental Impact Statement Rules. An EA is required due to the use of public funds as defined in Section 11-200.1-9(1)(A).

This Draft EA analyzes the potential environmental and socioeconomic consequences of the Proposed Action and reasonable alternatives. The intent of the Draft EA is to provide sufficient analysis for determining whether the Proposed Action will have a significant effect on the environment, thereby requiring preparation of an environmental impact statement, or a Finding of No Significant Impact (FONSI) pursuant to Chapter 343 HRS. A FONSI determination is anticipated.

1.2 Project Summary

PROJECT NAME	Waimānalo Research Station Master Plan
PROPOSING AGENCY	University of Hawaiʻi at Mānoa, College of Tropical Agriculture and Human Resources (CTAHR) 3050 Maile Way, Gilmore Hall 202 Honolulu, Hawaiʻi 96822
LANDOWNER	State of Hawaiʻi, Department of Land and Natural Resources
PROPOSED ACTION	The University of Hawaii College of Tropical Agriculture and Human Resources (CTAHR) proposes to implement a 20+ year master plan for use of 283-acres ("Project Area") adjacent to its existing Waimānalo Research Station (WRS). The Project Area will be an extension of the existing WRS and part of CTAHR's network of agricultural experiment stations throughout the State. The proposed research station will provide a venue for CTAHR staff, faculty and students to study, learn and conduct research, as well as support CTAHR's Cooperative Extension activities. CTAHR intends to secure a long-term lease for the property from the State of Hawaii, Department of Land and Natural Resources (DLNR). The proposed WRS will include three primary land uses: (1) Plants (2) Animals/Livestock (sheep, goats, swine, poultry) (3) Forestry Other land uses include education/extension, and an archaeological/cultural preserve around an existing heiau. The location and acreage of these uses (except for the archaeological/cultural preserve) within the property are flexible and may be modified in response to user needs and changing conditions.
LOCATION	Waimānalo, Oʻahu, Hawaiʻi

TAX MAP KEY (TMK) PARCELS	(1) 4-1-008:103 (1) 4-1-008:005
PROJECT AREA	Approximately 283 acres
STATE LAND USE DISTRICT	Agricultural District
DEVELOPMENT PLAN (DP) DESIGNATION	Koʻolau Poko Sustainable Communities Plan Land Use Designation: Agricultural Area
ZONING	AG-1, Restricted Agricultural District, and AG-2, General Agricultural District
SPECIAL MANAGEMENT AREA (SMA)	Not within SMA
FLOOD ZONE DESIGNATION	Zone D (unstudied areas) and Zone X (areas determined to be outside of the 0.2% annual chance floodplain)
PERMITS AND APPROVALS REQUIRED	HRS Chapter 343, Hawaiʻi Environmental Policy Act compliance Section 6E-8 Historic Preservation Review Board of Land & Natural Resources approval Building, engineering and construction permits
DETERMINING AGENCY	University of Hawaiʻi at Mānoa, College of Tropical Agriculture and Human Resources (CTAHR) 3050 Maile Way, Gilmore Hall 202 Honolulu, Hawaiʻi 96822
ANTICIPATED CHAPTER 343 HRS DETERMINATION	Finding of No Significant Impact (FONSI)
CONSULTANT CONTACT	Scott Ezer, Principal HHF Planners 733 Bishop Street, Suite 2590 Honolulu, Hawaiʻi 96813 sezer@hhf.com; (808) 457-3158

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2 Project Description and Alternatives

2.1 Project Location

The Project Area, identified as TMK 4-1-008:103 and 4-1-008:005 (Figures 2-1 and 2-2), is a 283-acre State-owned property in Waimānalo Valley, in Waimānalo, on the windward side of Oʻahu. The rural community of Waimānalo is located approximately 17 miles from downtown Honolulu.

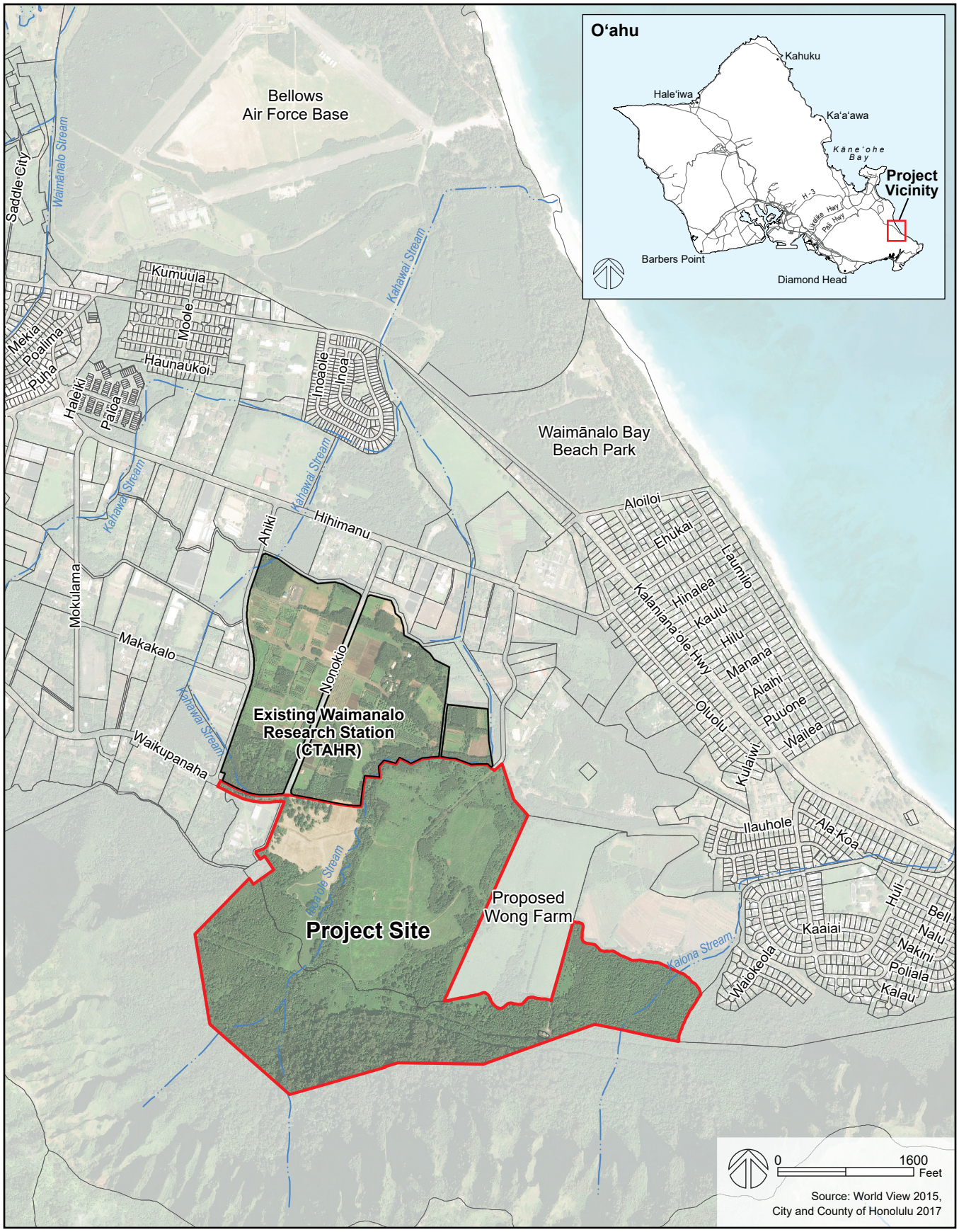
The Project Area is surrounded by agricultural lands on three sides, and by the base of the Koʻolau mountains on the south. Its northern boundary abuts the existing Waimānalo Research Station, operated by the University of Hawaiʻi's College of Tropical Agriculture and Human Resources (CTAHR). The Project Area has been vacant and fallow for the past 20 years. Prior to that, the area was used for ranching and dairy farming for over 50 years.

Vehicle access to the property from Kalanianaʻole Highway is via Hihimanu and Waikupanaha Streets, both rural, two-lane roads through agricultural lands.

2.2 Description of the Project Area

Between 1997 and 2001, the Project Area was leased by the State of Hawaiʻi to Meadow Gold Dairies (MGD) for its dairy operations. After closing its Waimānalo operations in 2001, Meadow Gold completed a thorough remediation and clean-up of the property, in accordance with its lease and State of Hawaiʻi Department of Health (DOH) regulations. The remediation effort, which was completed in 2002, was complicated by several factors, including the discovery of construction debris and asbestos containing material that had been dumped on site without authorization by a previous lessee. Meadow Gold Dairies was also left with remediating approximately 21 acres of the property that had been subleased over a 15-year period to Universal Synergenics (Unisyn). This area was used by Unisyn for a waste conversion operation. Prior to its closure, Unisyn's operation became the subject of a number of lawsuits due in part to strong odors generated by its waste conversion activities. When Unisyn went out of business in 1999, it was unable to complete the clean-up of its subleased land, and master lessee Meadow Gold was tasked with finishing the job. The DOH gave Meadow Gold final approval for its clean-up activities in 2003. The property has remained undeveloped and minimally maintained over the past 20 years.

The area shown on Figure 2-2 as the "Proposed Wong Farm" was part of the original MGD site but is not part of the current Project Area. This area is the planned relocation site for another State lessee which is being displaced for a 200-unit, Department of Hawaiian Home Lands subdivision. The Wong Farm will be relocating from its current site immediately to the east. CTAHR will obtain an easement through the Wong Farm parcel to provide vehicular access to the far eastern end of the future research station. A more detailed history of the property is provided in Chapter 4 of this EA.

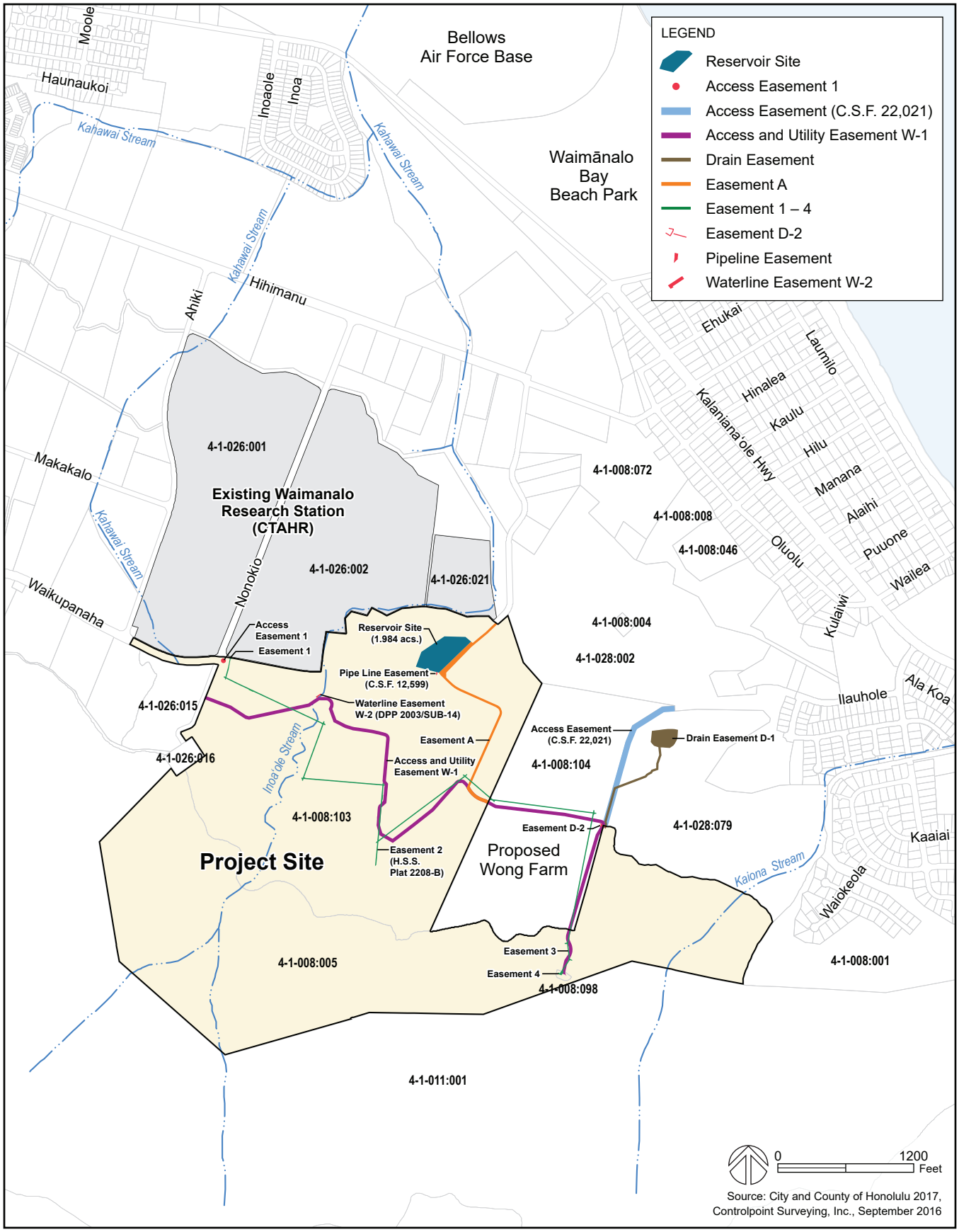


Site Location Map

Figure 2-1

Waimānalo Research Station Master Plan

Draft Environmental Assessment
University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR)



TMK and Easements

Figure 2-2

Waimānalo Research Station Master Plan

Draft Environmental Assessment
University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR)

As shown in Figures 2-2 and 2-3, there are several encumbrances and easements within the Project Area. on TMK parcel 4-1-008:103, including a 1.98-acre reservoir ("Wing King Reservoir") that has been set aside to the Department of Agriculture under Governor's Executive Order no. 1598. "Easement A," shown extending south from Waikupanaha Road, provides access to both the reservoir and the Proposed Wong Farm (i.e., Wong Farm relocation site). The map also shows various access and utility easements (Easement W-1, W-2 and 2) within the Project Area boundaries.

The State's Waimānalo Well III site is located within the mauka areas of the property. As shown in the TMK map in Figure 2, the well site is a separate TMK parcel (4-1-008:098) and is not part of the Project Area. An access easement provides access to the well. This easement will also be used by CTAHR to access the eastern most, and mauka portion of the Project Areas.

2.3 CTAHR Background

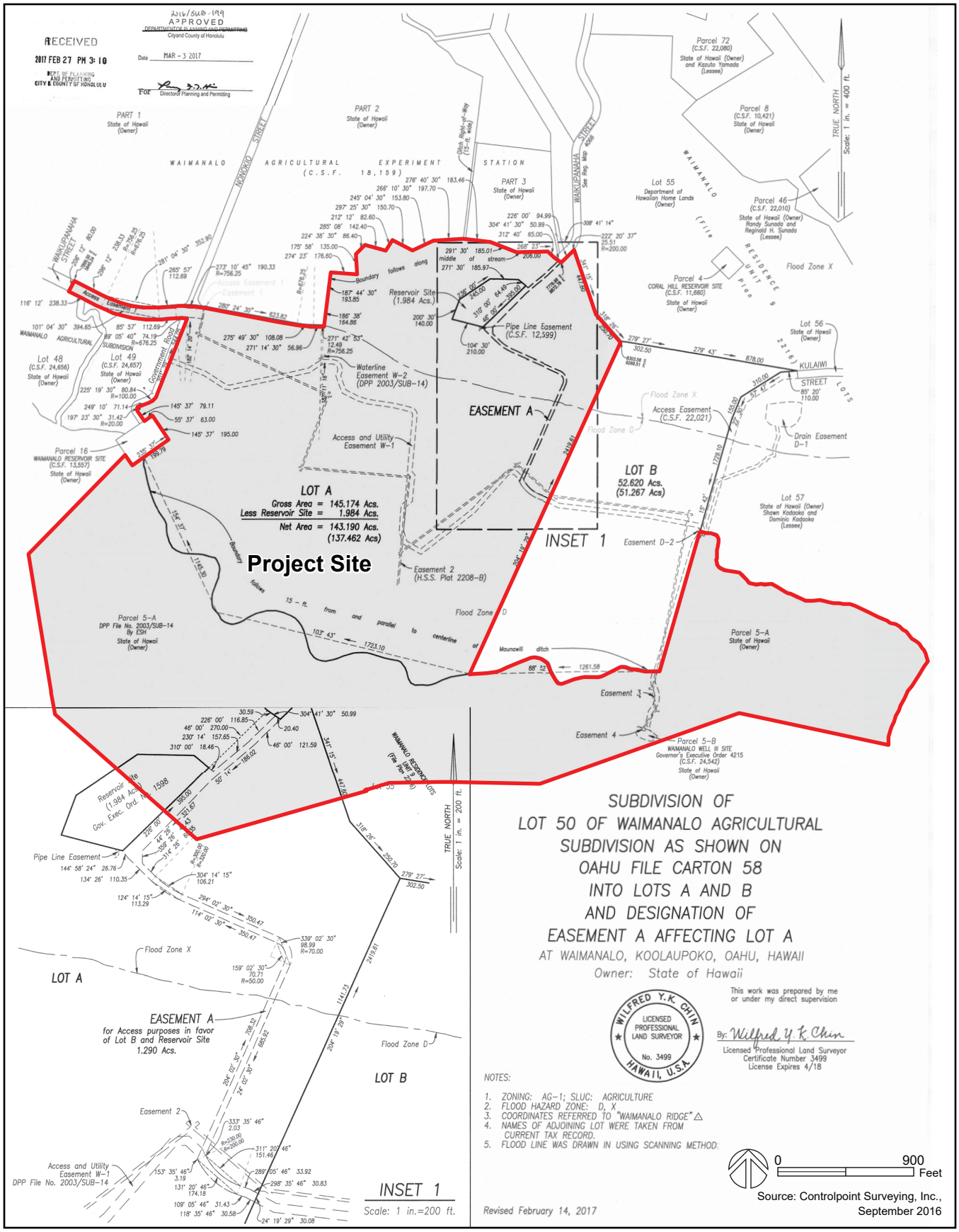
CTAHR, the project proponent, was established with the founding of the University of Hawaiʻi in 1907. CTAHR is a leading academic institution in tropical agriculture, biological engineering, food science and human nutrition, fashion design and merchandising, biotechnology, natural resources and environmental management, and family resources.

As part of a land grant university, CTAHR embraces the land-grant system's three-part mission of 1) agricultural teaching; 2) research, and 3) extension. CTAHR students are provided the opportunity to study in an environment that blends these three components, combining science education and addressing contemporary issues. Hawaiʻi's unique geographic location, ecological diversity, and multicultural population provide students with a living laboratory. Faculty members bring the unique perspective of emerging research issues to the classroom.

Through its research activities, CTAHR promotes the advancement of life sciences and applications for productive sustainable agriculture. Research investigations cover plant and animal physiology; plant, insect, microbial, aquacultural, bioreactor and environmental biotechnology; diseases, insects, and parasites; agronomy; soils; food science; food processing; resources and environmental management; ecosystems services; biological engineering; bioremediation; biochemistry; human and animal nutrition; breeding and genetics; and culture, production, economics, marketing, and quality of life for individuals and families.

The Cooperative Extension Service (CES) is CTAHR's outreach component, and provides off-campus, noncredit educational programs focused on advancing agriculture in Hawaiʻi, protecting the environment, and strengthening families and communities. CES provides science-based information and education in agriculture, natural resources, and human resources.

As the third major component of land grant universities, along with instruction and research, CES is a partnership between federal, state and local governments. It is part of the Cooperative Extension System, the world's largest non-traditional education system which is found all 50 states and U.S. Territories.



Subdivision Map

Figure 2-3

Waimānalo Research Station Master Plan

Draft Environmental Assessment
University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR)

In Hawaiʻi, each county's extension program is overseen by a CTAHR administrator who is responsible for all CTAHR resources and activities in the county. Most of the extension agents and many of the specialists are University of Hawaiʻi faculty members who work from off-campus extension offices. Educational workshops and short courses cover topics in agriculture, home economics, family living, 4-H and other youth activities, nutrition, and health.

Popular extension programs and services on O'ahu include the Master Gardener's Program, Urban Garden Centers, UH Seed Laboratory Program and Agricultural Diagnostic Service Center (ADSC). Of note, the UH Seed Laboratory Program produces and sell seeds of vegetable and papaya cultivars that were developed by the college to thrive in Hawai'i's growing conditions. The ADSC provides plant disease identification, plant tissue analysis, soil testing, feed and forage analysis, and insect pest identification services to Hawai'i's agricultural community.

2.3.1 Existing Waimānalo Research Station (WRS)

The existing Waimānalo Research Station (WRS) was established by the University of Hawaiʻi in 1950 on abandoned sugar cane land. It encompasses 127 acres and includes a modest cluster of buildings, including an office/laboratory, general storage building, tractor/chemical storage building, cottage, and open storage shed.

The WRS is part of a larger network of agricultural experimental stations and Cooperative Extension offices throughout the State. The research stations provide a venue for CTAHR staff, faculty, and students to study, learn and conduct research. The stations also support CTAHR's Cooperative Extension activities.

Over its history, the WRS has made significant contributions to local agriculture. Crop improvement has long been a strong focus of the station and many vegetable, fruit and ornamental crops have been developed and released to the farming community. Important crops developed at the WRS include the "Hawaiian Supersweet" varieties of sweet corn, which are well adapted for sustainable production in the tropics and can be grown without the use of pesticides. Current research and activities at WRS include breeding and selecting food crops for sustainable local production, apiculture (Bee Program), bioenergy crops, certified organic agriculture, aquaponics and beginner farmer training (GoFarm Hawaiʻi).

In 2012, CTAHR initiated the Waimānalo Learning Center (WLC), where thousands of community members are welcomed to the WRS each year to improve awareness of the station's research activities. The WLC also supports *ʻaina*-based education for local children and families.

2.3.2 CTAHR Departments

The College of Tropical Agriculture and Human Resources, based at the University of Hawaiʻi at Mānoa campus, is comprised of six departments, each with its own academic focus and research priorities. During the master planning process, interviews were conducted with representatives from four of the departments, who identified potential activities at the future research station.

2.3.2.1 Human Nutrition, Food and Animal Sciences (HNFAS)

The Department of Human Nutrition, Food and Animal Sciences (HNFAS) enhances nutrition and health by educating people and developing and disseminating science-based information to promote sustainable food production and animal systems appropriate for the Pacific Region. The HNFAS department's objectives are:

1. Ensure sustainable and profitable agricultural and food production systems.
2. Enhance research and instruction through the fundamental understanding of animal/human physiology.
3. Foster an integrated and interdisciplinary approach to learning that prepares students to be effective and productive citizens and life-long learners in a global society.
4. Have a safe and secure food system.
5. Have a healthy well-nourished population in the Pacific Region.

Potential Research Station Activities

Potential activities within the Project Area to support HNFAS include small scale, sustainable animal farming, silvopasture (combining forestry and grazing of domesticated animals), traditional grazing, and areas to test sustainable and profitable agricultural and food production. Local food security is an issue of high interest.

2.3.2.2 Natural Resources and Environmental Management (NREM)

The Department of Natural Resources and Environmental Management (NREM) emphasizes management of natural resources, and managing agricultural and forestry systems, watersheds, and landscapes in an ecologically sound manner. NREM's vision is to discover and extend innovative, integrated solutions for sustainable natural resource use and environmental management for the tropics and beyond.

Potential Research Station Activities

Portions of the Project Area may be used for native forest restoration and watershed management. Research and demonstration activities that could be pursued include agroforestry, soil and water conservation practices, biodiversity, invasive species and wildfire management research, best management practices for animal wastes, home wastewater treatment, stormwater management, rainwater catchment, solar and wind power, organic gardening, and composting. The existing heiau and agricultural terraces within the Project Area provide an opportunity to incorporate cultural and archaeological issues and activities.

2.3.2.3 Tropical Plant and Soil Sciences (TPSS)

The mission of the Department of Tropical Plant and Soil Science (TPSS) is to develop and deliver science-based information on tropical agriculture systems that are economically viable, environmentally sound, and supportive of healthy communities. TPSS focuses on important plant and soil issues with the goal of responsible management of land, water, and crops.

Potential Research Station Activities

Potential research station activities include biotechnology and production technologies to enhance and sustain food production, assure a safe food supply and development of environmentally sound production and soil restoration systems. TPSS representatives are also interested in cooperative efforts with NREM, HNFAS and the Natural Resource Conservation Service to evaluate best management practices, storm water management, and large-scale agroforestry.

2.3.2.4 Plant and Environmental Protection Sciences (PEPS)

The Department of Plant and Environmental Protection Sciences (PEPS) brings together experts in several fields, such as plant pathology, entomology, weed science and integrated pest management who use innovate research and cutting-edge tools to preserve food security and environmental functioning.

PEPS is home to many important extension and outreach programs to address the pest management pressures of Hawaiʻi's subtropical climate. It also hosts the UH Honeybee Project which is developing practical treatment options for local beekeepers and establishing a research program that focuses on maintenance and improvement of health of the Hawaiian honeybees.

Potential Research Station Activities

The future research station could provide areas to support PEPS current and future research and extension activities. Some of the ideas raised by PEPS representatives included areas to support apiary activities, potential cacao plot and processing areas, and pest management research.

2.3.2.5 Other CTAHR Departments

CTAHR's Molecular Biosciences and Bioengineering (MBBE) department is involved in teaching, innovation and application of modern technology for agricultural and industrial development in Hawaiʻi. It teaches Biological Engineering, Biochemistry, Molecular and Cell Biology, Bioinformatics, and Biotechnology, with the understanding that together, these subjects support the foundation for new technologies to advance human needs.

Faculty conduct innovative research on crops, snails, and microalgae, isolate novel and useful bioactive molecules, and make improvements in these molecules using recombinant technology and biochemical methods. They also work for developing disease resistance in Hawaiʻi's agriculturally important plants like papaya and forestry trees—*Acacia koa* and giant Leucaena.

The sixth CTAHR department is Family and Consumer Sciences (FCS) which has two academic programs, Human Development and Family Studies and Fashion Design and Merchandising. Its mission is to contribute to developing resilient families, businesses, and communities. FCS supports the Center on the Family, which conducts applied and basic research on family issues, and generates and disseminates research-based information that improves the quality of life for Hawaiʻi's families. This department is not expected to have a presence at the future Waimānalo Research Station.

2.4 Purpose and Need for Action

The Proposed Action will allow CTAHR to utilize 283 acres of State land adjacent to the existing Waimānalo Research Station. The proposed research station is envisioned to operate as an extension of the existing station, with integrated functions and activities. The Proposed Action is needed to support the continuation of CTAHR's tripartite mission of instruction, research, and extension services over the next 20+ years. The expanded area will provide greater flexibility to address pressing policy issues facing the State of Hawaiʻi, including food security and self-sufficiency; climate change adaptation and mitigation; and greenhouse gas sequestration in agriculture and forest systems. An expanded agricultural station will allow CTAHR researchers to take advantage of increased federal funding that will become available over the next decade, in support of food self-sufficiency, clean energy, and climate resilience. The Proposed Action will enable CTAHR to re-envision its role in supporting Hawaiʻi agriculture, as the industry evolves in response to the local and global economy.

In 2016, Governor David Ige announced the Sustainable Hawaiʻi initiative, which established ambitious goals for the public and private sectors to move the State toward sustainability. These goals include doubling local food production by 2020; implementing a biosecurity plan to address invasive species; protecting priority watersheds; effectively managing nearshore ocean waters; and achieving 100% renewable electricity by year 2045. Much of the activity envisioned within the Project Area will directly support these sustainability goals.

An expanded Waimānalo Research Station will provide opportunities for closer collaboration between CTAHR's research and extension staffs, resulting in research topics that are more applicable and practical. CTAHR extension agents and farmers will be able to interact and exchange ideas with researchers. The expanded acreage will also provide the flexibility for more efficient and integrated use of both properties and may open new opportunities such as marketing of farm products to establish an agribusiness program for CTAHR students.

The additional acreage satisfies an immediate need to accommodate activities displaced from the former Waialeʻe Livestock Experiment Station on the north shore of Oʻahu. The 35-acre Waialeʻe facility once housed more than 5,000 poultry, 300 swine and 200 cattle, and was used extensively by CTAHR for research and instructional activities. A replacement site is needed to allow these activities to resume. The Waimānalo location provides a site within reasonable distance to the UH Mānoa campus, unlike the north shore location which required a two-hour commute for CTAHR students and researchers. Animal-designated areas of the new station will allow CTAHR to continue and expand small animal research, instruction, and extension activities involving poultry, swine, and sheep. There are no current plans to bring cattle to the research station.

Another immediate need that will be addressed is the addition of cultivable land to support GoFarm Hawaiʻi, CTAHR's popular farmer training program. GoFarm is one of the largest beginning farmer training programs in the nation and is currently based at the existing WRS. Demand for the program far exceeds its current capacity. Additional land at the new station will allow increased participation in this program, supporting the next generation of Hawaiʻi farmers (see Section 2.5.2.4 below).

2.5 Proposed Action

Figure 2-4 shows the Conceptual Land Use Map for the project, illustrating the general types of uses that are envisioned at the MGD site. Three primary land uses are proposed, based on discussions with CTAHR representatives: 1) Animals, 2) Plants and 3) Forestry. A general description of these and other proposed land use components follows.

2.5.1 Animal Areas

2.5.1.1 Proposed Activities

Areas of the concept plan designated for animals will accommodate small animals now that the Waialeʻe Livestock Experiment Station, the animal research station on the north shore, is no longer in operation. The MGD site will allow CTAHR to continue and expand its domestic animal research, teaching and extension activities on multiple species. The plan shows the level areas on the eastern and western sides of the property designated for animals. These areas would include space for grazing, pasture, shelters, and support facilities. CTAHR faculty have indicated their desire to use the site for small ruminants (sheep, goats) and non-ruminants (swine and poultry). There are no immediate plans to raise cattle at Waimānalo, as two other CTAHR locations with established supporting facilities are seen as more appropriate for this activity.

There is also great interest in pursuing silvopasture (combining trees, plants, and livestock as an integrated managed system). For example, combining sheep/goats and forestry, or poultry and forestry using chicken tractors (i.e., portable chicken coops on wheels) would be appropriate. CTAHR also maintains an improved selection of trees that are used as high-protein livestock forage in integrated grazing systems.

2.5.1.2 Number of Animals on Site

The estimated number of animals on the property is 20 sheep and/or goats (combination of the two); 150 pigs; and 30 chickens. CTAHR currently does not plan to include cows on site.

The maximum number of animals envisioned on the MGD site is 60 to 70 sheep and/or goats; 300 pigs; and 50 chickens. It is also possible that future research needs and the status of CTAHR's other animal research stations require that cows be included. At most, there would be 100 head of cattle at the site.

Figure 2-4

Conceptual Land Uses

Waimānalo Research Station Master Plan

Draft Environmental Assessment
University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR)

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2.5.1.3 Estimated Number of People and Vehicles

The property will not be used as an animal production farm, and all activities will be associated with CTAHR research. For this reason, there will not be a high volume of traffic to and from the site. CTAHR faculty and graduate students will regularly be on site, with an estimate of 4 principal investigators (PI) and a maximum of 6 students daily. Individuals or small groups may come to the site. Regular classes will not be conducted on site, although classes (of approximately 50 students) may come once or twice a semester for a field visit. At these times, students will be encouraged to carpool.

2.5.1.4 Structures on Site

Structures in the Animal-designated areas will include fenced paddocks, shelters, handling systems, support facilities (feed processing, storage), areas for veterinary care, and structures where learning and research activities can be conducted (e.g., conference rooms, classrooms, meeting rooms, wet labs). These structures may be permanent or semi-permanent (e.g., portable).

Because an on-site manager will be critical for security and research management, there eventually will be a small residence for the station manager, location to be determined.

2.5.1.5 Other Issues

Management of animal wastes is important, and CTAHR intends to incorporate composting, bioenergy, and other sustainable waste management techniques, and/or install an inoculated deep litter poultry house design (https://www.ctahr.hawaii.edu/oc/freepubs/pdf/SA-17.pdf).

2.5.2 Plant Areas

2.5.2.1 Proposed Activities

Concept plan areas designated for Plants (agriculture, horticulture, and agroforestry) are located in the central part of the property. The topography in these locations ranges from 0% to 20% slope, which is suitable for ornamental and food crop production and tree orchards.

Plant-designated areas may be used by CTAHR researchers to grow fruit and vegetable crops, ornamental flowers, lawn and turf products, bioenergy crops, and related agroforestry systems with trees and crops grown in integrated systems. Research activities may include testing for and breeding improved crop varieties, integrated pest management, long-term soil health management, integrated food production research, composting, fruit and multi-purpose tree evaluation, vegetable research, soil science and others. Research projects are envisioned to be small scale in scope rather than large scale.

The area identified as Integrated Food Research Production, located at the north (makai) side of the property, will support CTAHR research activities regarding food production.

2.5.2.2 Estimated Number of People and Vehicles

The Plant-designated areas will be used for research and education, and not commercial scale production. During a typical weekday, up to 3 CTAHR principal investigators and approximately 2 to 4 graduate students per PI will be on site conducting research. Regular university classes will not be

conducted on site, although classes (approximately 50 students) may come once or twice a semester for a field visit. These student visitors will be encouraged to carpool.

CTAHR may sponsor large, one-day community events on the property that generate traffic. These events are expected to be held no more than 2 or 3 times annually and bring up to 100 passenger vehicles to the property. These events could include open house events for State legislators, the college community or industry stakeholders. Advance notice to the surrounding community will be given and if needed, traffic management personnel will be present. Event parking will remain on the property (and/or the adjacent research station if needed) and will not overflow into the community.

2.5.2.3 Structures on Site

Structures in the Plant-designated areas of the property will include fencing, covered structures or sheds for storing equipment, tools, and machinery, and a shed for fuel tanks and small maintenance vehicles. There may be short-term storage facilities for crops. It is also critical to have a washing station to clean harvested materials or produce for further processing, or vehicular wash down for invasive species or pathogen contaminates. A covered area that allows for partial shading and drying would be important for food curing, and organic material mulching storage. Small scale protective “hoop” green houses for food crop seedling varieties and ornamental horticulture requiring protection from pest and pathogens would be present.

There may be small covered habitable structures, either permanent or semi-permanent, where learning and research activities can be conducted (e.g., offices, conference rooms, classroom/meeting rooms, or re-purposed shipping containers for temporary overnight staff/student residence, etc.).

To support these activities, there will need to be irrigation water, as well as potable water and electricity or photovoltaic panels for wash stations, cold storage facilities, and office and meeting areas.

2.5.2.4 Go Farm Hawaiʻi

Up to 24 acres of the Plant-designated areas will be used by GoFarm Hawaiʻi. This successful farmer development program is part of the CTAHR Cooperative Extension Service. The goal of GoFarm is to develop successful commercial farmers and skilled agricultural workers. The program consists of a sequential series of training sessions that cover farming and agricultural skills, as well as the business and entrepreneurial aspects of farming.

GoFarm Hawaiʻi currently accepts about 10 to 12 new participants annually, although program demand far exceeds these numbers. Program expansion is partly limited by the physical space it occupies at the existing WRS (approximately 12 acres). In addition to conducting educational programs on site, about 7.5 acres is devoted to participant plots, each 1/4 to 1 acre in size. The plots are leased for up to three years, after which the farmers must find their own land off-site. The new research station will be used for expansion or possibly relocation of the entire GoFarm program. Additional acreage could allow longer leases for program participants, encouraging these entrepreneurs to invest in their agricultural businesses and in longer cycle crops.

The proximity of CTAHR and GoFarm activities can nurture the growing interest in integrating agriculture and animal raising, and foster collaboration between agricultural researchers and farmers. Cooperative projects also illustrate the practical applications of CTAHR research, strengthening connections between the university and the community.

Proposed Activities

Future GoFarm areas will require irrigation water, potable water and electricity or photovoltaic panels for wash stations, and power for cold storage facilities. Separate areas are proposed for educational space and incubation space. It is estimated that the educational area (approximately 6 acres) will include a demonstration plot, 15 student plots, a communal crop area, and nursery (potable water, 20'x30' screened structure). A shared wash station will require potable water and electricity or photovoltaic panels. There will also be shared cold storage, and shared equipment and tool and tractor storage. A covered area (about 40'x40') with potable water and electricity/solar is proposed for outdoor classrooms and rest areas. Restrooms could be portable toilets but will ideally be attached to the wash station.

Estimated Number of People and Vehicles

Use of the educational area will be daily during sunlight hours. About 20 people will come and go throughout the day. Workshops, held up to 15 times a year, will have about 30 to 40 people driving to the site. There may be occasional field trip visits with about 40 people, 5 to 10 times a year. Adult visitors typically arrive by personal vehicle and school groups arrive by chartered bus. Larger delivery vehicles come twice a month and a restroom service vehicle comes weekly.

GoFarm's incubation area (5 to 15 acres) will include up to 15 incubation plots (between ¼ and 1 acre) with irrigation water. Use of the incubation area will be daily during sunlight hours, with an average of 1 to 4 people per plot, coming and going throughout the day. There may be field trips or events with up to 40 visitors, either driving or if school groups, coming by bus. These field trips or events may average 1 to 2 per year per plot. Larger delivery vehicles come twice a month to fields and to the wash station and cold storage area twice a month per plot. Restroom service vehicles come weekly.

Structures on Site

There will be shared restrooms and wash stations (with potable water and electricity/solar), and shared cold storage, equipment and tool storage (separate from the educational area facilities). Restrooms could be portable toilets but would ideally be attached to the wash station. Each plot may have their own structure, shed, and/or container for nursery and storage (typically 10'x40').

2.5.3 Forestry Areas

2.5.3.1 Proposed Activities

The steeper, mauka lands, with terrain ranging between 20% to 40%+ slopes, are designated for forestry. Forestry research activities may include native forest restoration, wildlife ecology and management, timber management, watershed management, invasive species management, and wildfire management. There are opportunities to work with the State Department of Land and Natural

Resources Division of Forestry and Wildlife (DLNR DOFAW) to develop models of forest management to achieve various objectives.

CTAHR faculty are involved with agroforestry, which combines forestry and agriculture. Agroforestry is defined as the "intentional integration of trees and shrubs into crop and animal farming systems to create environmental, economic and social benefits" (USDA 2021). Growing trees or shrubs around or among crops or pastureland can result in environmental and economic benefits, including control of runoff and erosion, more efficient use of resources, higher overall yields, and diversified risks.

2.5.3.2 Estimated Number of People and Vehicles

During a typical weekday, up to 2 CTAHR principal investigators (PI) and approximately 2 to 4 graduate students per PI will be on site conducting research. Regular university classes will not be conducted on site, although classes (approximately 50 students) may come once or twice a semester for a field visit. These student visitors will be encouraged to carpool or be van transported.

2.5.3.3 Structures on Site

Other than fencing, there will be no permanent structures built in the steep, Forestry-designated areas. CTAHR researchers working in the forestry areas may use storage facilities, offices, meeting space and classrooms in other areas of the property. There will also be infrastructure or utilities improvements.

2.5.4 Other Areas

2.5.4.1 Main Entry and Education Center

Proposed Activities

The main entry to the property is located at the proposed extension of Waikupanaha Street on the western side of the project site. An area near the entry is designated for an Education Center. This general area will also function as a foci for station management, access control and public interface.

At this time, the Education Center designation is a placeholder for a venue where educational and demonstration programs can take place. Specific programs are to be determined. The area could host extension programs for the community, and support program partnerships with local schools, including the Mālama Honua Public Charter School (PCS).

CTAHR faculty have expressed interest in establishing programs and internships for high school students. This would provide agricultural learning opportunities for local youth, and perhaps motivate them to attend CTAHR after graduation.

Number of People and Vehicles

The future WRS is expected to include a station manager and 8-10 full-time employees, who would be on-site daily. Offices and other facilities supporting station staff would be located near the entry.

The number of people and vehicles associated with the Education Center area will vary depending on the specific educational programs and activities planned. Some ongoing community programs will

continue, such as the Master Gardener programs which involve 20 people, once a week for 6 months out of the year.

Structures on Site

There will be structures built near the Waikupanaha Street entry for a station management office, access control, and support for maintenance and security activities.

Structures to support the Education Center are still to be determined. They could include a new permanent structure designed to showcase the projects and activities that are being conducted on the property with a multi-media auditorium, demonstration lab, small cafeteria with certified kitchen and faculty offices. Or it could be a series of pre-fabricated, temporary structures with interior spaces customized to research project needs.

2.5.4.2 Riparian Management Zone

Proposed Activities

The areas on either side of Inoaʻole Stream, which runs through the property in a mauka-makai direction, are designated as a Riparian Management Zone. This riparian zone may be used for testing Best Management Practices (BMPs) for natural resource conservation associated with agricultural production, water quality monitoring, and stormwater management, or stream biodiversity studies. Ongoing stream water quality monitoring could be done in partnership with local students. That said, because Inoaʻole Stream is an intermittent stream, these types of activities will be limited.

Structures on Site

No permanent structures are envisioned in this area.

2.5.4.3 Entomology/Plant Pathology Area

Proposed Activities

The concept plan shows an area along Inoaʻole Stream for Entomology/Plant Pathology studies. In reality, entomology-related research could occur wherever appropriate. For example, research into insect and pathogen colonization on trees could be conducted in Forestry or Plant-designated areas. A location with semi-permanent insect containment cages could be established, as well as areas that could be used for various open experiments.

An apiary supporting current CTAHR research on honeybees could be incorporated into orchard (Plant-designated) areas. Ongoing research in plant diseases and pest management could be supported through establishment of field trial areas. Current CTAHR researchers also expressed interest in establishing areas to collect specimens for plant pathology research, a long-term no-till plot, and termite sites for urban pest management research.

Another potential activity is an agrosecurity area to support dogs being trained to detect plant diseases. This can be integrated with a turf and landscape tree system to allow for research related to turf and landscape pest management. An area designated for an IR-4 Program (specialty crop pesticide registration program) is needed with a buffer zone to avoid pesticide drift. In a separate area, growing of

native plants to rear native, threatened insects would be essential in understanding long term reasons for their decline. This would include long-term plantings of various native trees and shrubs (Koa, raufvolfia, nothocestrum, etc.) and then controlled releases of native insects on them. This work would have to be clear of any spray zone for pesticide use.

Structures on Site

Permanent, semi-permanent or temporary structures to support research activities may be constructed, depending on the activities proposed. Agrosecurity dog training would require construction of kennels and fenced training areas.

2.5.4.4 Archaeological/Cultural Preserve

Proposed Activities

This general area includes the Pueo Heiau and other cultural sites located on the foothill near Inoaʻole Stream. Based on the results of a previous archaeological inventory survey, the plan will designate a publicly accessible archaeological preserve to protect these cultural resources. Potential activities in this area will be designated to allow for community-driven, community-sponsored projects that may include restoration of the heiau and agricultural terraces, biocultural restoration activities such as development of indigenous agricultural and natural resource management systems, and educational and cultural programs.

A Memorandum of Understanding (MOU) for Cooperation and Exchange between CTAHR and Ke Kula Nui ʻo Waimānalo (KKNOW) was executed in early 2021. The parties agreed to cooperate on activities concerning native cultural and educational activities associated with the cultural preserve at Pueo Heiau.

There are many ways projects in other areas of the station can partner with community-driven projects in this area, e.g., the production and evaluation of Hawaiian taro varieties currently being maintained as a living collection on the Waimānalo station and the cultivation and integration of culturally important plants in the forestry section.

Number of People and Vehicles

The number of people participating in cultural activities at any one time and visitation rules will be determined by CTAHR and KKNOW. Non-CTAHR visitors may be required to register while on-site and the number of visitors controlled to ensure security and minimal impact to the cultural resources. It is estimated that participation will be limited to 25 people at any given time to ensure proper cultural protection protocols are followed. Volunteers who work more than 15 days per calendar year at the archeological and cultural preserve are required to be registered as a UH volunteer and undergo training to ensure the preservation and protection of this culturally important site.

Structures on Site

No permanent structures are envisioned in the Archaeological/Cultural Preserve area. As part of the Pueo Heiau restoration, a Hale is being considered. All plans will be finalized with UH before modification can be made and all structures would need to obtain UH approval first. At this current time, the MOU only covers passive conservation efforts in partnership with KKNOW.

2.5.4.5 Potential CTAHR Tenants

There is a possibility that CTAHR will lease portions of the property to other compatible tenants for a limited time period. One potential tenant is the Therapeutic Horsemanship of Hawaii, a non-profit that specializes in riding instruction for special needs individuals. This organization is currently located in Waimānalo and is seeking a larger site.

2.5.5 Circulation

The circulation network within the property would consist of agriculture roads built with gravel base course and ford crossings over streams and irrigation ditches. This is consistent with the primary intent of the site as an agricultural use. The primary point of entry to the site would be an extension of Waikupanaha Street at the intersection of Nonokio Street, on the western side of the project site. From this point the road would travel east and cross Inoaʻole Stream at the existing ford crossing. This road would intersect the existing segment of Waikupanaha Street.

Before the Waikupanaha road extension crosses Inoaʻole Stream, a road heading mauka would provide access to the archaeological preserve. On the eastern side of Inoaʻole Stream, the road would extend Waikupanaha up mauka to provide access to the agricultural fields and forestry areas. Access to the forestry area on the eastern side of the property would be provided by an easement along the boundary of the Wong Farm parcel and leads to the Board of Water Supply's Waimānalo Well III facility. This easement will also be used to access the far eastern mauka portion of the Project Area.

Rather than construct a bridge or culvert over Inoaʻole Stream, the plan recommends using an existing ford crossing. Although Inoaʻole Stream appears to be intermittent through the property, in major rainfall events, the stream has the potential to overtop the crossing and prevent safe access to the agricultural fields. However, in such situations, access to the agricultural fields would be provided by the secondary access gate on the eastern side of Waikupanaha Street.

2.6 Project Phasing

Improvements within the master plan area will be phased as research funds become available for various activities. It is highly unlikely that the entire site will be completely "built out" as shown in the plan anytime soon. Rather, the plan provides a guide for development over the next 20 to 25 years, and its intent is to direct future activities to the most appropriate location as they are implemented. The phasing of these land uses will depend on current and future initiatives pursued by CTAHR faculty and students, the availability of funding and research grants, and on a broader scale, the future needs of the local agricultural and farming industries.

2.7 Alternatives Considered

This section describes the alternatives to the Proposed Action, which is the expansion of the existing Waimānalo Research Station on the 283-acre area.

2.7.1 No-Action Alternatives

The "No Action" alternative assumes the status quo. Under this alternative, CTAHR would not lease or utilize the 283-acre, former Meadow Gold site. The property, owned by the State, would remain in its current, unused state, but could be leased to another state agency in the future. CTAHR's existing Waimānalo Agricultural Research Station would continue to operate and would be limited to ongoing activities. Expansion of programs or the pursuit of new research initiatives or demonstration projects would be limited by the physical limits of the existing research station.

GoFarm activities would continue but with no increase in the number of acres available for program participants. Small ruminant programs formerly located on the Waialeʻe Research Station in Haleiwa would not have a venue, and would need relocate to another research station on Oʻahu or possibly the neighbor islands.

The No Action alternative does not preclude the State Department of Land and Natural Resources from using the site or leasing it to another State agency in the future.

2.7.2 Other Land Uses

Other alternatives are to use the 283-acre Project Area for an entirely different use, rather than as an extension of the existing WRS. Alternative use of the property could include use as a dairy farm or cattle ranch; residential development; or direct lease to private farmers.

2.7.2.1 Commercial Dairy or Cattle Ranch

Although used as a commercial dairy for over 30 years (1967 to 2001), a return to a dairy or cattle ranch is not compatible with or desired by the surrounding community. Many Waimānalo residents have expressed strong negative opinions about odors from the Meadow Gold Dairies during its operation, and especially from the biowaste operations run by Unisyn during the 1980s and 1990s. The economic feasibility of a commercial dairy or cattle ranch at the site are questionable, and managing odors and waste management will be challenging. Moreover, operation of a commercial dairy or ranch operation is not compatible with CTAHR's mission which focuses on teaching, research, and extension.

2.7.2.2 Housing Development

Another land use eliminated from consideration was residential development. Although there is a need for affordable housing on Oʻahu, housing development is outside of CTAHR's mission and its area of expertise. Housing development in Waimānalo is being actively pursued by the State's Department of Hawaiian Home Lands (DHHL), one of the major landowners in the area, with nearly 2,000 acres in land holdings (DHHL, August 2008). In the vicinity of the Project Area, the DHHL is proposing to acquire the Wong Farm, located east of the property. As shown in Figure 2-2, the parcel adjacent to the Project Area will be a relocation site for the Wong Farm, which is being displaced by the DHHL project.

The Project Area is in the State's Agricultural District, designated as an Agricultural area in the Koʻolau Poko Sustainable Communities Plan, and zoned for agriculture use by the City and County of Honolulu. Residential development is not an appropriate use of the property.

2.7.2.3 Direct Lease to Private Farmers

Another alternative that was considered but dismissed is direct lease to private farmers. The land within the Project Area is needed to expand research and extension activities at the Waimānalo Research Station over the next 20+ years. Use of the property by private farmers would hamper CTAHR's ability to fulfill its missions. CTAHR research covers a variety of subjects that address food production and food systems, soil and water conservation, invasive species management, forestry, wildfire management, and disease resistance for Hawaiʻi's important crops. These research activities require large, dedicated, and controlled land areas, and is not compatible with use by multiple private farmers.

Lease to private farmers would result in more and active agricultural use, requiring a larger investment in infrastructure (water, roads, etc.). This could result in a greater environmental impact than the proposed plan.

CTAHR will, however, continue to support local farmers through its research, extension, and education activities. Up to 25 acres of the property is expected to be used by GoFarm Hawaiʻi, and these areas may include individual plots leased to program participants and graduates.

2.7.3 Other Uses Within the Research Station

Alternatives to the Proposed Action include adding or substituting different uses and activities to those currently proposed. CTAHR has contemplated use of the 183-acre Project Area since the property was vacated by MGD nearly 20 years ago. During this time, a variety of activities have been suggested for the site. Earlier CTAHR planning efforts in 2004 and 2012 proposed a number of activities, some of which are no longer a high priority or desirable today.

For example, research station uses that were previously proposed include a large animal research and education facility; an agribusiness incubator with certified kitchen; a community healthy living center; housing for CTAHR faculty and staff; an agribusiness incubator facility; wind turbines; solar farm; and constructed wetlands. None of these facilities are currently proposed for the site.

That said, over the next 20+ years--the life of the master plan—CTAHR research and extension activity will change, in response to local and global events; government policies; university priorities; quantity and types of funding available; and faculty research interests.

The impact of the global COVID-19 pandemic is an example of how public priorities can shift in response to unexpected events. The pandemic has further illuminated the importance of food self-sufficiency and other goals of the State's Sustainable Hawaiʻi Initiative. The burgeoning impact of climate change and the need for adaptation and mitigation strategies will influence CTAHR research priorities. The anticipated influx of federal funds for infrastructure and strengthening social and economic resilience could also influence future initiatives. It is difficult to predict exactly what research and extension activities will occur over the duration of this master plan.

CTAHR is currently undertaking a larger strategic planning process, which will establish priorities for the college in the coming decades. This effort encompasses all CTAHR programs and facilities throughout the State, including the Waimānalo Research Station. While a dramatic shift in direction at the WRS is

not anticipated, current and future activities at the station will be influenced by the overarching strategic plan.

The Waimānalo Research Station conceptual plan is not intended to provide a definitive list of activities that are allowed within the expanded research station. Instead, the intent is that the plan be a flexible, living document providing broad guidance on future uses within the property that will continue to support CTAHR's overall mission.

3 Natural and Physical Environment

This chapter focuses on the natural and physical environment, including geography, topography, soils, climate, natural hazards (including climate change), water resources, and biological resources. It describes the existing environment, potential project impacts and proposed mitigation. The discussion of environmental impacts includes both direct and indirect impacts. Direct impacts are those caused by the Proposed Action and occur at the same place and time. Indirect effects may occur later in time or farther in distance but are still reasonably foreseeable. The analysis in this chapter also identifies possible cumulative environmental impacts. Cumulative impacts are defined as the results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

3.1 Climate

3.1.1 Existing Conditions

The Waimānalo area enjoys the typical subtropical climate of Oʻahu. Temperatures in the area are generally mild and uniform, with monthly average temperatures ranging from 70 degrees Fahrenheit in January to 78 degrees Fahrenheit in August. Average annual rainfall in the Waimānalo watershed various with elevation and ranges from approximately 40 inches at sea level to approximately 100 inches in the Koʻolau Mountain range. The general project area has an average rainfall of approximately 55 inches per year. There is a seasonal variation in rainfall.

The wet season generally extends from November through April and the dry season extends from May through October. Prevailing winds are northeasterly trade winds which occur approximately 70 percent of the time. Trade wind frequency ranges from about 45 percent in January to more than 90 percent in July. High winds can occur during the winter months.

3.1.2 Potential Impacts and Mitigation

The Proposed Action will have no effect on immediate climate conditions and no mitigation is required. The larger relationship of the Proposed Action to global climate change and sea level rise is discussed in Section 3.3, Natural Hazards.

3.2 Physical Setting

The makai areas of the 283-acre Waimānalo Research Station (WRS) Project Area have been extensively disturbed over decades of historic and modern agriculture. The site currently sits bare, with various fallow fields and unpaved access roads. All previous structures on the site have been demolished and removed as part of the site remediation effort undertaken by Meadow Gold Dairies (the previous occupant of the property) after conclusion of their operations. The Project Area is currently undeveloped and overgrown with trees and shrubs.

3.2.1 Topography

Located at the base of the Koʻolau Mountains, the elevation of the project site slopes gradually upward from makai (north) to mauka (south) into the valley. The valley terrain slopes up sharply just beyond the mauka property boundary, and the ridge rises to approximately 2,225 feet mean sea level (MSL).

Elevations within the site range from approximately 30 feet MSL at the makai end of the site to 460 feet MSL at the mauka-most sections, with an average slope of 6 to 10 percent. Topography is steep in these mauka areas as shown in Figure 3-1.

3.2.2 Soils

Several major soil evaluation systems have been developed in Hawaiʻi over last 50+ years. There are three primary soil suitability studies that describe the physical attributes of soils and their suitability for agricultural production. These include the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service's (NRCS) Soil Survey; the University of Hawaiʻi, Land Study Bureau (LSB) Detailed Land Classification; and the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawaiʻi (ALISH).

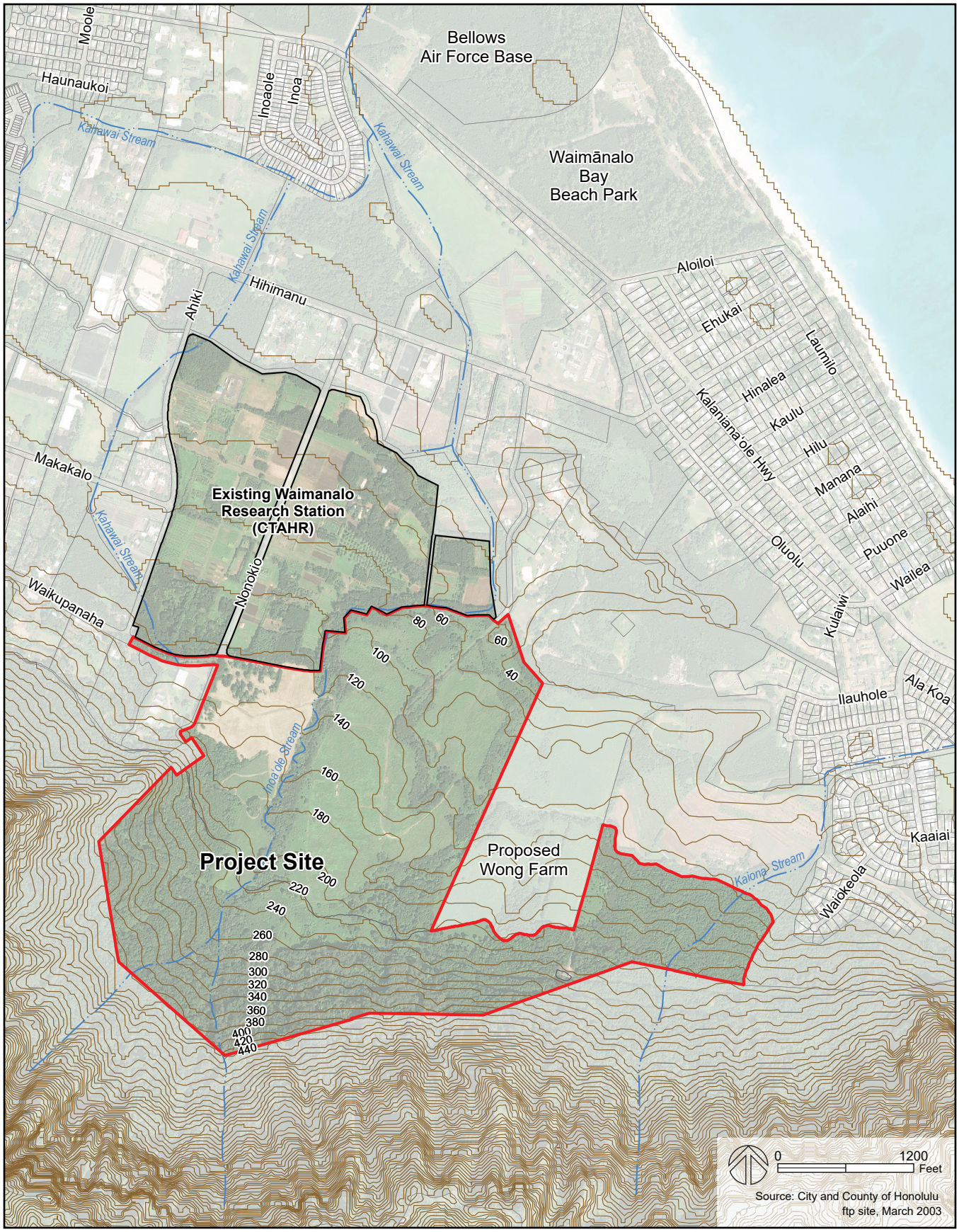
3.2.2.1 Existing Conditions

USDA NRCS Soil Survey

The U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) (formerly Soil Conservation Service, SCS) 1972 Soil Survey has identified the following soils within the Project Area: Aeloa silty Clay (ALF), Haleiwa Silty Clay (HeB), Kaena Clay (KaC), Kaena Stony Clay (KaeD), Kaena Very Stony Clay (KaeE), Kawaihapai Stony clay Loam (KlaB), Pohakupu Silty Clay Loam (PkB, PkC), and Waialua Clay (WnB). The Project Area soil types are shown in Figure 3-2 and are described in Table 3-1.

Land Study Bureau Detailed Land Classification

The University of Hawaiʻi Land Study Bureau (LSB) Master Productivity Rating System rates soil productivity on a scale from "A" (very good) to "E" (not suitable for agricultural use). The majority of the subject property is rated C, D and E. A small portion of the site is rated B.



Elevation and Topography

Figure 3-1

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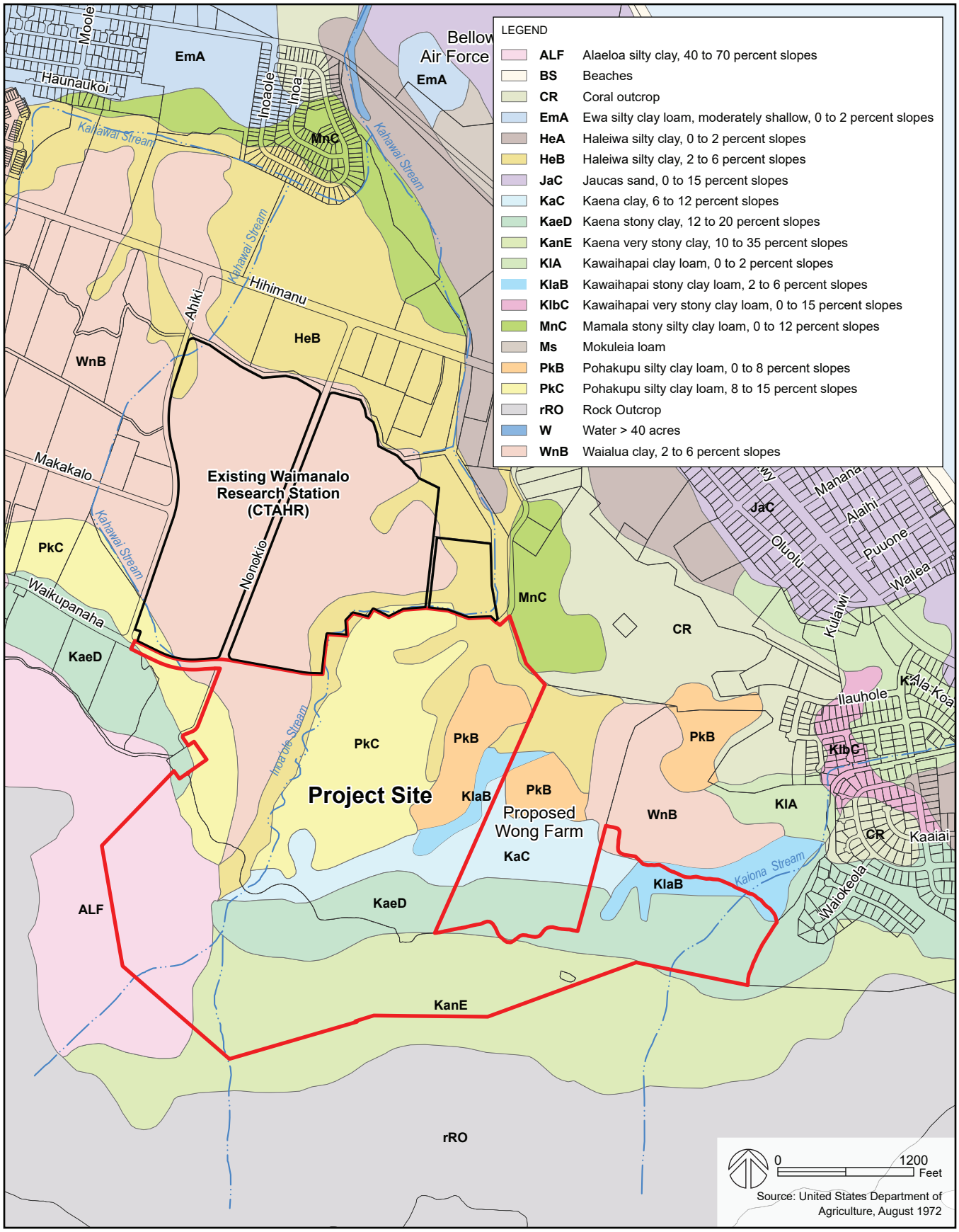

NRCS Soils Classification

Figure 3-2

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Table 3-1: Soil Types

Abbreviation	Soil Type	Description
ALF	Aeloa silty clay, 40%-70% slopes	Soils of the Alaeloa series consist of "well-drained soils on uplands…developed in material weathered from basic igneous rock".
HeB	Haleiwa silty clay, 2-6% slopes	Soils of the Haleiwa Series consist of "well-drained soils on fans and in drainageways along the coastal plains…developed in alluvium derived from basic igneous material.
PkB	Pohakupu silty clay loam, 0-8% slopes	Soils of the Pohakupu Series consists of "well-drained soils on terraces and alluvial fans…formed in old alluvium derived from basic igneous material."
PkC	Pohakupu silty clay loam, 8-15% slopes	
WnB	Waialua clay, 2-6% slopes	Soils of the Waialua Series consists of "Moderately well-drained soils on alluvial fans…developed in alluvium weathered from basic igneous rock." (Foote et al. 1972:26)
Kae	Kaena stony clay	Soils of the Kaena Series consists of "very deep, poorly drained soils on alluvial fans and talus slopes… developed in alluvium and colluvium from basic igneous material.
KanE	Kaena very stony clay, 10-35% slopes	
KlaB	Kawaihapai stony clay loam, 0-2% slopes	Soils of the Kawaihapai Series consist of "well-drained soils in drainageways and on alluvial fans on the coastal plans…formed in the alluvium derived from basic igneous rock in humid uplands".

Agricultural Lands of Importance to the State of Hawai‘i

The Agricultural Lands of Importance to the State of Hawai‘i (ALISH) was part of a national effort in 1977-1978 by the U.S. Department of Agriculture, Soil Conservation Service (SCS) and CTAHR to inventory important agricultural lands nationwide. The classification system for identification of agriculturally important lands in the State of Hawai‘i provides for the:

1. Establishment of classes of agricultural lands primarily, but not exclusively, on the basis of soil characteristics;
2. Establishment of criteria for classification of lands; and
3. Identification of lands which meet the criteria for the respective classes.

Three classes of agriculturally important lands were established for the State of Hawai‘i with the intent of facilitating the SCS effort to inventory prime farmlands nationally and adapting the classification to the types of agricultural activity in Hawai‘i. These classes and their corresponding SCS (national) equivalents are:

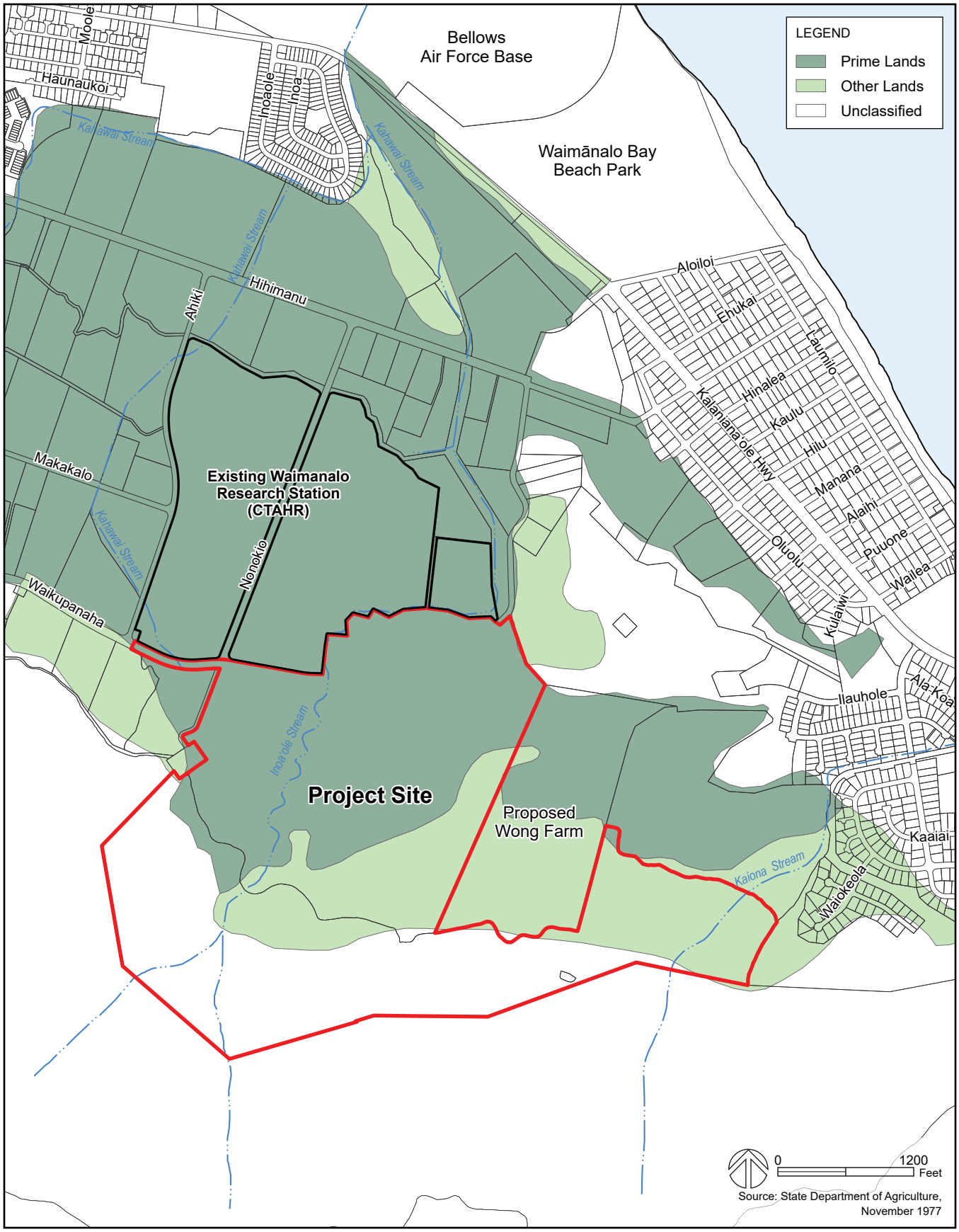
Hawai‘i Classification System	SCS Classification System
Prime Agricultural Land	Prime Farmland
Unique Agricultural Land	Unique Farmland
Other Important Agricultural Land	Additional Farmland of Statewide and Local Importance

The lower elevation, makai portions of the Waimānalo Research Station property are considered Prime Agricultural Land, which is land best suited for food, feed, forage, and fiber crops (Figure 3-3). The land has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

Unique agricultural land is land other than Prime Agricultural land and is used for the production of specific high-value food crops. As shown in Figure 3-3, the Project Area does not include this designation.

The mid-elevation sections of the site are considered Other Important Land, which has state-wide or local importance for the production of food, feed, forage, and fiber crops. The lands in this classification are important to agriculture in Hawai‘i yet they exhibit properties (e.g., seasonable wetness, erodability, limited rooting zone, slope, flooding, or droughtiness) that exclude them from the Prime or Unique agricultural land classifications. These lands can be farmed satisfactorily by applying greater inputs of fertilizer and other soil amendments, drainage improvement, erosion control practices, flood protection and produce fair to good crop yields when managed properly.

The steeper, mauka-most regions of the Project Area are unclassified by ALSIH.



Agricultural Lands of Importance to the State of Hawai'i (ALISH) **Figure 3-3**

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Important Agricultural Lands

As a result of the State Legislature's passage of Act 183, Session Laws of Hawaiʻi (SLH) 2005 ("Act 183") and Act 233, SLH 2008 ("Act 233"), Chapter 205, HRS was amended to define the framework for the identification and designation of Important Agricultural Lands (IAL). Passed nearly 30 years after Hawaiʻi's voters ratified the 1978 constitutional amendments, Act 183 and Act 233 are hailed as landmark legislation that led to the establishment of additional incentives and regulations to support the agricultural industry and protect Hawaiʻi's agricultural lands for agricultural uses.

The focus of these amendments to Chapter 205, HRS were privately owned agricultural lands. At the present time, final recommendations made by the City and County of Honolulu to designate privately owned Important Agricultural Lands on Oʻahu are before the State Land Use Commission for adoption. Agricultural land owned by the State of Hawaiʻi was intended to follow a separate process of review, which has yet to be initiated. The Waimānalo Research Station project site is included in lands owned by the State, and therefore has no adopted or recommended status with regard to the IAL legislation.

3.2.2.2 Potential Impacts and Mitigation

The uses proposed in the Waimānalo Research Station conceptual plan are consistent with these soil classifications, which indicate that the property is suitable and appropriate for agricultural activity. There will be no adverse impacts to soils as a result of the proposed uses. There will be no indirect or cumulative impact on erosion or erosion potential.

Department of Planning and Permitting (DPP) Rules Relating to Water Quality (July 2017) provides guidance on various applications of erosion and sediment controls, for both during and post construction conditions. The Water Quality Rules (WQR) control measures that prevent or reduce the addition of pollutants to the environment will be implemented through application of pollution control practices, technologies, processes, siting criteria, operating methods, and other alternatives. These include Low-Impact Development (LID) measures that use or mimic natural processes to protect water quality.

Construction Period Erosion and Sediment Control

During construction of any structures or other improvements, erosion and sediment controls will consist of the following:

- Sediment barriers (filter socks) will intercept sediment-laden runoff, slow runoff velocities, and allow suspended solids to settle out of the storm water. Refer to section 20-3-38 of the DPP WQR (July 2017) for additional information.
- Stabilized construction entrance and exists will provide an effective buffer for the deposit of mid and sediment from the project site prior to vehicles entering a paved or public road. Refer to section 20-3-44 of the DPP WQR (July 2017) for additional information.
- Slope management and protection demands that land disturbing activities on slopes with a grade of 15 percent or greater be minimized to the maximum extent possible. Refer to section 20-3-29 of the DPP WQR (July 2017) for additional information.

- Diversion BMPs must provide runoff diversion upstream of disturbed areas on slopes of 15 percent or greater. Refer to section 20-3-32 of the DPP WQR (July 2017) for additional information.
- Sediment traps or basins will provide excavated or depressed areas that are used to collect and detain sediment from areas of the site that were cleared or graded during construction. These areas can be used to allow suspended solids to settle out of storm water before it is discharged to off-site areas. Refer to section 20-3-41 and 20-3-42 of the DPP WQR (July 2017) for additional information.

Post-Construction Erosion and Sediment Control

As part of the post-construction condition and the LID strategy, there will be various techniques implemented to mitigate erosion. Section 20-3-61 of the DPP WQR (July 2017) provides additional information.

- Vegetated swales, sometimes referred to as a grass swale or biofiltration swale are broad shallow earthen channels vegetated with erosion resistant grasses. Swales can be used to help infiltrate and control the direction of the runoff.
- Vegetated buffer strips are grassy slopes vegetated with turf grass that are designed to accommodate sheet flow. They remove pollutants by vegetative filtration.
- Harvest/reuse is the collection and temporary storage of roof runoff in rain barrels or cisterns for subsequent non-potable use (landscape irrigation, vehicle washing, and other uses as allowed by the Building Code).
- Bioretention basin is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation.
- Areas disturbed during construction will be permanently stabilized with buildings, pavements, and vegetation.

3.3 Natural Hazards

3.3.1 Flooding

3.3.1.1 Existing Conditions

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the majority of the project site is in Zone D, unstudied areas (Figure 3-4). The northern most area of the project site is within Zone X, an area determined to be outside of the 0.2% annual chance floodplain. No base flood elevation or depths are shown in this zone. The WRS is located over one mile from the coast and is not vulnerable to coastal flooding.

3.3.1.2 Potential Impacts and Mitigation

The Proposed Action will not increase the risk of human health or property damage due to natural hazards. The uses shown in the concept plan are compatible with the current flood designations, as they include research-oriented agricultural and farming uses and practices. Areas immediately adjacent to Inoaʻole Stream will be used as a riparian management zone, intended to implement environmentally sustainable practices, flood and erosion control. This area will provide a buffer in the event of stream related flooding.

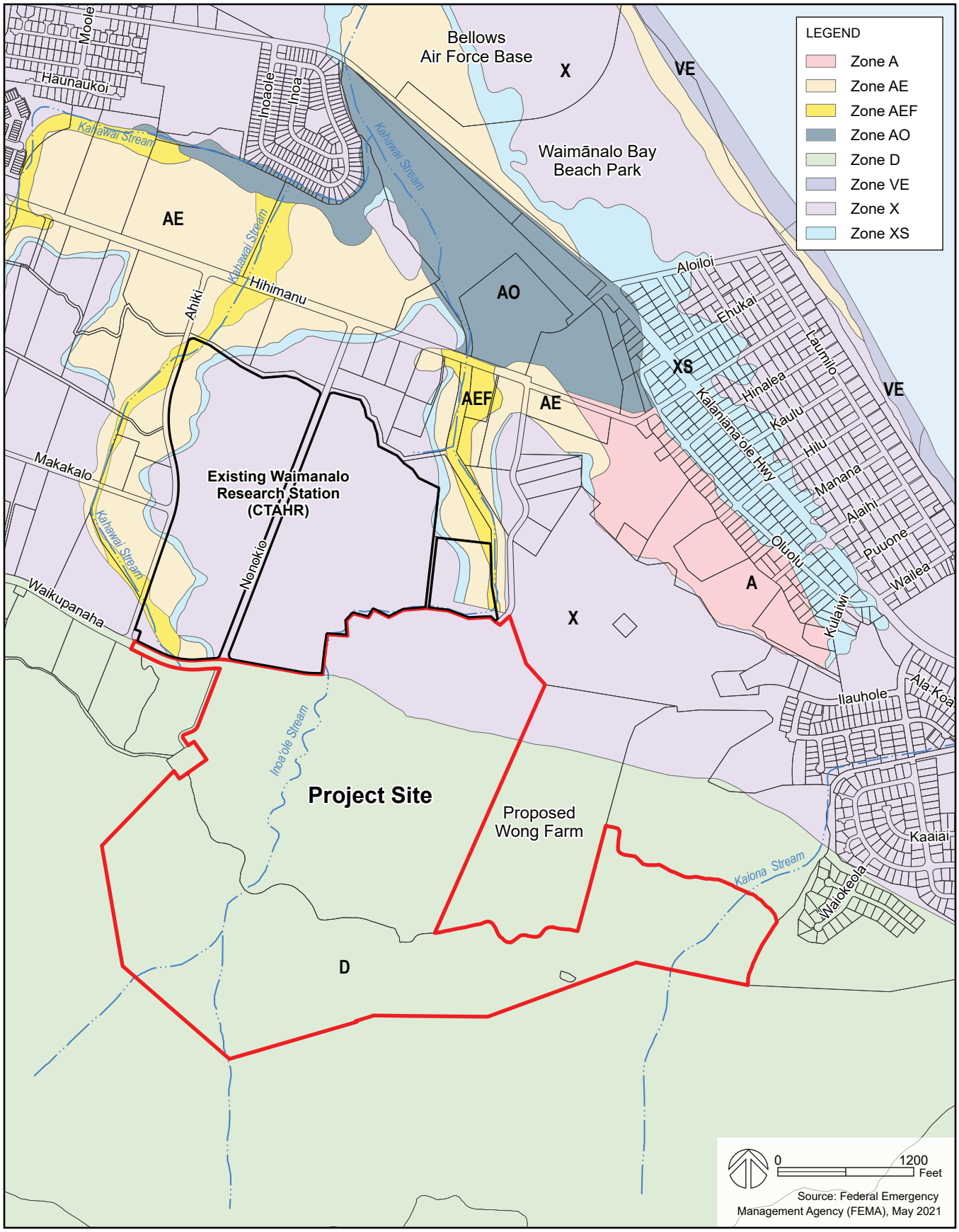
3.3.2 Tsunami, Hurricane, and Earthquakes

3.3.2.1 Existing Conditions

The WRS area is not vulnerable to tsunami inundation. Tsunami are sea waves that result from large-scale seafloor displacements, commonly caused by an earthquake (magnitude 7.0 or greater) adjacent to or under the ocean. If the earthquake involves a large segment of land that displaces a large volume of water, the water will travel outwards in a series of waves, each of which extends from the ocean surface to the sea floor where the earthquake originated.

Although they may be only a foot or so high at sea, tsunami waves can have wave lengths of hundreds of miles and travel at 500 miles per hour. When they approach shore, they begin to interact with the seafloor and slow down, but not into a surf-shaped wave. Instead, the water increases greatly in height and pushes inland at considerable speed. The water then recedes at considerable speed and the recession often causes as much damage as the original wave front itself.

The City and County of Honolulu has mapped the Tsunami Evacuation Zone (TEZ) and Extreme Tsunami Evacuation Zone (XTEZ). According to the Oʻahu Tsunami Evacuation map, the WRS is located over one mile from the shoreline, is not within the TEZ or XTEZ, and is in the Safe Zone.



Flood Map **Figure 3-4**

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Hurricanes are part of a family of storms known as "tropical cyclones" that are very large and produce three life-threatening effects: high winds, storm surge, and heavy rains. Each of these by itself could pose a serious threat to life and property. Taken together, they can cause widespread destruction, especially to older homes and residences that could be impacted by coastal storm surge (an abnormal rise of water generated by a storm).

3.3.2.2 Potential Impacts and Mitigation

To mitigate potential damage due to hurricanes and earthquakes, new structures within the WRS Project Area will be constructed in compliance with the Uniform Building Code and other State and County standards. All structures are expected to be low scale, one-story buildings. Only the caretaker's residence is expected to be permanently occupied. The Project Area is not within the coastal area or vulnerable to tsunami or storm surge.

3.3.3 Climate Change and Sea Level Rise

3.3.3.1 Existing Conditions

Climate change is a long-term global shift in patterns of temperature, precipitation, humidity, wind and seasons. Scientific data show that earth's climate has been warming, mostly attributable to rising levels of carbon dioxide and other "greenhouse gases" generated by human activity. These changes are already impacting Hawaiʻi and the Pacific Islands through rising sea levels, increasing ocean acidity, changing rainfall patterns, decreasing stream flows, and changing wind and wave patterns. Sea level has risen over the last century on each island at rates varying from 0.5 to 1.3 inches per decade. (UH Sea Grant, 2014) For the foreseeable future, the planet's warming atmosphere will cause increased melting of ice sheets and snow, in addition to thermal expansion of ocean water, resulting in sea level rise.

The Hawaiʻi Sea Level Rise Vulnerability and Adaptation Report provides a statewide overview of vulnerability to sea level rise and the potential impacts from chronic flooding based on modeling coastal flooding with sea level rise due to passive flooding, annual high wave flooding, and coastal erosion in the Sea Level Rise Exposure Area (SLR-XA) with up to 3.2 feet of sea level rise, and depicts flood hazards that may occur in the mid- to latter-half of this century. According to the report, this "timeframe is within the expected lifespan of most new construction and much of our existing development. It should be noted that sea level rise projections greater than 3.2 feet are "physically plausible" by the end of the century, based on the latest climate science…" (Hawaiʻi Climate Change Mitigation and Adaptation Commission, 2017).

In addition to sea level rise, human-driven climate change will result in warmer air temperatures, a decrease in prevailing northeasterly trade winds, a decline in rainfall and resulting decline in water resources and aquatic ecosystems, warming and acidifying seawater, and stress to human health. (UH Sea Grant, 2014)

3.3.3.2 Potential Impacts and Mitigation

The Proposed Action will not adversely impact climate, or climate change related issues. However, CTAHR's research, extension, and education activities have the potential to address and mitigate the effects of climate change on the physical and human environment.

For example, one of CTAHR's research interest areas that will be pursued at the research station is silvopasture, the integration of trees, plants, and livestock as an integrated, managed system. This practice can enhance the climate resilience of plants and animals, as shade can both improve crop growth and provide shelter from heat for grazing animals. Silvopasture systems can sequester carbon, are more productive, and have increased resilience against climate change. Forested areas incorporated through silvopasture can also create wildlife habitat supporting biodiversity.

In addition to silvopasture, other research activities that may be conducted in the Project Area focus on improving methods of agricultural productivity, pest and invasive species management, composting, bioenergy crops, soil health management, land stewardship, and carbon sequestration. Forestry research may include native forest restoration, wildlife ecology and management, watershed management, and wildfire management. The majority of the site, including most of the steeper mauka areas, will remain in a vegetated state, and no mass removal of vegetation is proposed.

Proposed farmer training and extension activities will nurture the next generation of local farmers, improving Hawaiʻi's food security to mitigate the impact of climate change. Proposed cultural activities can incorporate traditional Hawaiian knowledge and practices and strengthen partnerships between the university and the community. All of these activities will have a positive impact on increasing Hawaiʻi's resilience to climate change.

3.4 Drainage

Drainage conditions were addressed in a Preliminary Engineering Report (PER) prepared by Coffman Engineers. The following discussion provides the findings; more detailed calculations are included in the report in Appendix A.

3.4.1 Existing Conditions

The site consists of forested areas and meadow areas with water discharged into the Inoaʻole and Kaiono Streams, and existing culverts. Both streams are classified as Inland Class 2 by the Hawaiʻi Department of Health Clean Water Branch Quality Standards Classifications and collect into various existing culverts located under the Waikupanaha access road.

Drainage calculations were prepared by Coffman Engineers by applying the City and County Storm Drainage Standards (August 2017) and using the Soil Conservation Service (SCS) Technical Release 55 (TR-55) method. A recurrence interval of 100-years was used for drainage areas over 100- acres. The total drainage area is 712 acres, including the project site of 283 acres and a 429-acre area outside of the project boundaries which drain towards the project site.

There are three primary drainage basins, as shown in Figure 3-5. The western-most section of the project site is Drainage Area 1, consisting of 334 acres. Drainage Area 1 runoff is estimated at 1,083 cubic feet per second (cfs) and discharges into the Inoaʻole Stream basin.

Drainage Area 2, located east of the Inoaʻole Stream basin, is 208 acres and discharges into existing culverts. Runoff from Drainage Area 2 is estimated at 696 cfs.

Drainage Area 3 is located at the eastern most portion of the project site and surrounds the southern portion of the Wong Farm area. Drainage Area 3 is 170 acres with an estimated runoff flow of 632 cfs, managed though both infiltration and discharge into the Kaiono stream.

As shown previously in Figure 3-4, the site is located within two flood zone designations, Zone X and Zone D. Zone X determines the areas that are outside the 0.2% annual chance of floodplain, and Zone D indicates that the area has been unstudied for flood hazards, but flooding may be possible.

3.4.2 Potential Impacts and Mitigation

3.4.2.1 Drainage Patterns

Storm water runoff will be conveyed toward existing drainage ways (swales, channels, streams, etc.). Detention basins will be utilized to reduce the increase in runoff from the site to predeveloped levels. Roads will be unpaved agricultural roads. New impervious surfaces on the property will be limited to the educational center area and include the roof tops and sidewalks immediately surrounding the buildings. Future development of buildings and other impervious surfaces, in addition to the educational center and associated facilities, are under design development and will not be incorporated into the runoff and water quality calculations.

With no significant change to the existing drainage patterns, the drainage areas will remain the same as existing, as shown in Figure 3-5. The figure shows the existing and future drainage flow (see PER in Appendix A for drainage calculations).

Drainage Area 1 (334 acres) future runoff is estimated at 1,124 cubic feet per second (cfs) and will drain through vegetated buffers, detention basins, and discharge into the Inoaʻole Stream basin.

Drainage Area 2 (208 acres) will drain through vegetated buffers, detention basins and discharge into the Ino'aole stream. Runoff from Area 2 is estimated at 725 cfs.

Drainage Area 3 (170 acres) drains though vegetated buffers, detention basins and discharges into the Kaiono Stream. Future runoff from Area 3 is estimated at 624 cfs.

Proposed improvements within the Project Area, such as the construction of the education center and other structures will create new impervious areas. Other modifications will change the land cover characteristics in various areas of the site.

Drainage Areas

Figure 3-5

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The Soil Conservation Service (SCS) Technical Release 55 (TR-55) method was used to calculate an increased runoff of 62 cfs from the new modified and impervious areas (see Appendix A, Table 3.3.1 Drainage Area Values—100 Year Storm). An estimated storage requirement of 627,744 cubic feet will be stored using the bioretention basin LID techniques mentioned in Section 3.2.2.2 above (e.g., vegetated swales, vegetated buffer strips, harvest/reuse of roof runoff, bioretention basins). These will be implemented at the lowest elevation of the project site. Due to the minor increase in runoff compared to the overall runoff and the use of LID strategies, the proposed development will not cause adverse effects to the existing drainage patterns.

3.4.2.2 Water Quality Impacts

Stormwater design shall implement LID techniques to achieve the post-construction storm, as directed by the DPP Rules Relating to Water Quality (July 2017). It is preferable to use nonstructural techniques (e.g., vegetated swales, buffer strips, water harvesting/reuse, and bioretention basins) which will most closely replicate the natural hydrology of the area.

The proposed site is required to treat a water quality volume (WQV) of 65,313 cubic feet (see PER Appendix A, Exhibit 5). The WQV will be treated using the techniques listed above.

Prior to entering the drainage ways, stormwater runoff should be directed over vegetated buffer zones to separate the sediments from the runoff and be allowed to infiltrate into the ground. Vegetated buffers are the preferred method to mitigate water quality impacts and conform to the existing natural hydrology of the area. Vegetated buffer strips should be designed to treat sheet flow from adjacent surfaces by slowing runoff velocities and allowing sediment and other pollutants to settle and partially infiltrate into the underlying soil. A minimum of 50-foot undisturbed natural buffer and sediment control must be maintained between the stream and any land disturbing activities.

3.5 Water Resources

Inoaʻole Stream runs through the subject property. This perennial stream originates in the Koʻolau mountains, crosses the subject site in the north-south direction, and continues makai, reaching the ocean at the Waimānalo Bay State Recreation Area. Its tributaries include the Maunawili Ditch and Kailua Ditch which run in an east-west direction through the property. There is an existing ford crossing over Inoaʻole Stream within the Project Area.

Stream water quality measurements and an evaluation of potential project impacts was conducted by Element Environmental LLC (E2). The study is included as Appendix B. The purpose of the study was to conduct water quality monitoring of Inoa'ole Stream, perform a walking survey of the section of the stream that runs through the 283-acre Waimānalo Research Station Project Area, and discuss potential Best Management Practices that may be implemented to reduce potential impacts associated with future use of the property.

3.5.1 Existing Conditions

3.5.1.1 Background

Inoaʻole Stream is an ephemeral stream that originates in the Koʻolau mountains, crosses the Project Area in a generally north-south direction, and continues makai, ultimately reaching the ocean at the Waimānalo Bay State Recreation Area. The stream mouth is typically blocked by beach sand and the width of the beach at the discharge point ranges from 50 to 150 feet. The drainage basin contributing runoff to Inoaʻole Stream is 1.28 square miles at the former U.S. Geological Survey (USGS) crest gaging station located on Hihimanu Street. The terrain slope within the drainage basin ranges from approximately 40-95 percent near the Pali and gradually flattens to 3 to 5 percent at the lower end of the watershed near Hihimanu Street. Most of the land, especially in the upper slopes and within the Project Area, is undeveloped. There are some developed and agricultural areas, located between the northern boundary of the Project Area and Hihimanu Street.

Inoaʻole Stream in this area only flows during periods of heavy, intense rainfall (i.e., >1.0 inch/hour) corresponding to periods of time when waterfalls can be seen on the upland Pali. This typically occurs a few times per year. During the roughly two-year monitoring period associated with this project, the stream flowed twice on 3/15/20 and 3/11/21 during which time E2 collected runoff samples. The mean and median annual maximum streamflow measured at the USGS crest gauging station over a 38-year period between 1958 and 1996 were 485 and 380 cfs, respectively.

Inoaʻole Stream is not considered an impaired stream according to the State of Hawaiʻi Department of Health's 2004 List of Impaired Waters of Hawaiʻi. This list of impaired streams was created to comply with Section 303(d) of the Clean Water Act which required identification of Water Quality Limited Segments (WQLS) around the State of Hawaiʻi. WQLS are defined as water bodies which without additional action to control non- point sources of pollution, cannot reasonably be expected to attain or maintain State Water Quality Standards. Since Inoaʻole Stream discharges terminally into the Pacific Ocean, a navigable water, improvements involving work in close proximity to Inoaʻole Stream are subject to regulation pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

Waimānalo Stream, located outside the Project Area to the northwest of the WRS is considered an impaired waterbody. Pollutants of concern for Waimānalo Stream include nutrients, turbidity, and suspended solids.

3.5.1.2 Results from April 17, 2020 Walking Survey

A walking survey of Inoa'ole Stream was conducted on April 17, 2020, by two botanists and a hydrogeologist from E2. The walking survey began at the intersection of Inoaʻole stream and Waikupahana St. The team walked the stream north to the property boundary, then returned to the intersection and walked south to the stream confluence near the southern property boundary.

Vegetation observations

There were no dramatic changes in the plant community within the boundaries of this survey. The stream had a vegetative buffer of between an estimated 60 to 160 feet separating it from surrounding pastures.

Overstory

Canopy cover along the surveyed section of Inoa'ole Stream was between 90 and 100%. Dominant overstory species were koa haole, kukui, eucalyptus and castor. Other, less commonly observed trees included noni, mock orange, African tulip, guava, parasol leaf tree, and ironwood. A small stand of ironwood exists along the northern reach of the stream on the berm of the north bank. A large African tulip with many progeny exists on the southern reach of the stream on the west bank.

Understory

Guinea grass was the most common and persistent understory species observed growing along the full length of the surveyed stream, and often growing in the middle of the stream channel itself. Guinea grass was only absent under the canopy of ironwoods, or where stream cutbanks were too steep or recently eroded. Other common understory species observed were Ape taro, papaya, coffee, and saplings of the aforementioned common trees. Less commonly observed understory species were passionfruit, ferns, and various weedy vines.

Stream Characteristics and Morphology

The surveyed reach of Inoa'ole Stream on the existing and proposed WRS properties consisted of highly entrenched, single-thread channel. In these confined sections the average flood prone width was approximately 10' and the channel was incised between 1' and 4'. Less than 10% of the reach consisted of relatively unconfined, multi-thread channel with flood prone widths between 30 and 50'. The primary substrate throughout most of the reach was gravel, though substrate size generally increased upstream and was more boulder-dominated towards the mauka end of the property. Despite consistent vegetative cover, unstable banks were observed over 10-15% of the reach, especially in sections where cut banks exceeded 10' in height and fine, loose sediment was being delivered directly to the channel. In one area of the stream approximately halfway between the road crossing and the northern edge of the property, an active head cut over 5' deep and 6' across was observed. Several small rheocrene spring features (<50' in length) with in-channel pools were also documented on the southern end of the reach within 500' of the drainage split. It is unknown whether these stream course springs persist year-round.

Existing Land Use Impacts

Above and below the Waikupanaha Street stream crossing there are signs of storm runoff entering the stream course in both directions, though this flow is likely buffered by dense vegetation along the edges of the road. Within 300' of the makai edge of the property, a constructed berm over 5' tall was noted 15' above the channel bottom on the north side of the stream. This feature runs for at least 100' along the edge of the stream, confining the channel and limiting runoff from that direction. A berm may also exist on the southern side of the stream in this lower section, though it was obscured by thick vegetation. Evidence of storm water flow was observed near the makai edge of the property on Waikupanaha

Street, though where this discharge enters the stream was not determined and may occur just off the CTHAR property. Throughout the reach various types of debris including irrigation hoses, pipes, and smaller trash items could be found in and around the channel. Wild pig activity was noted at the mauka end of the reach along both banks and is likely contributing to erosional activity and nutrient and microbial input to this section of the stream.

3.5.1.3 Inoaʻole Stream Sampling

Two sets of runoff samples were collected from Inoa'ole Stream on 3/15/2020 and 3/11/2021 during heavy rainfall events in Waimānalo. The two sampled runoff events were the only time that runoff occurred in Inoa'ole Stream between December 2019 and September 2021. Figure 3-6 shows the three stream sampling locations. Sampling results can be found in the E2 report in Appendix B.

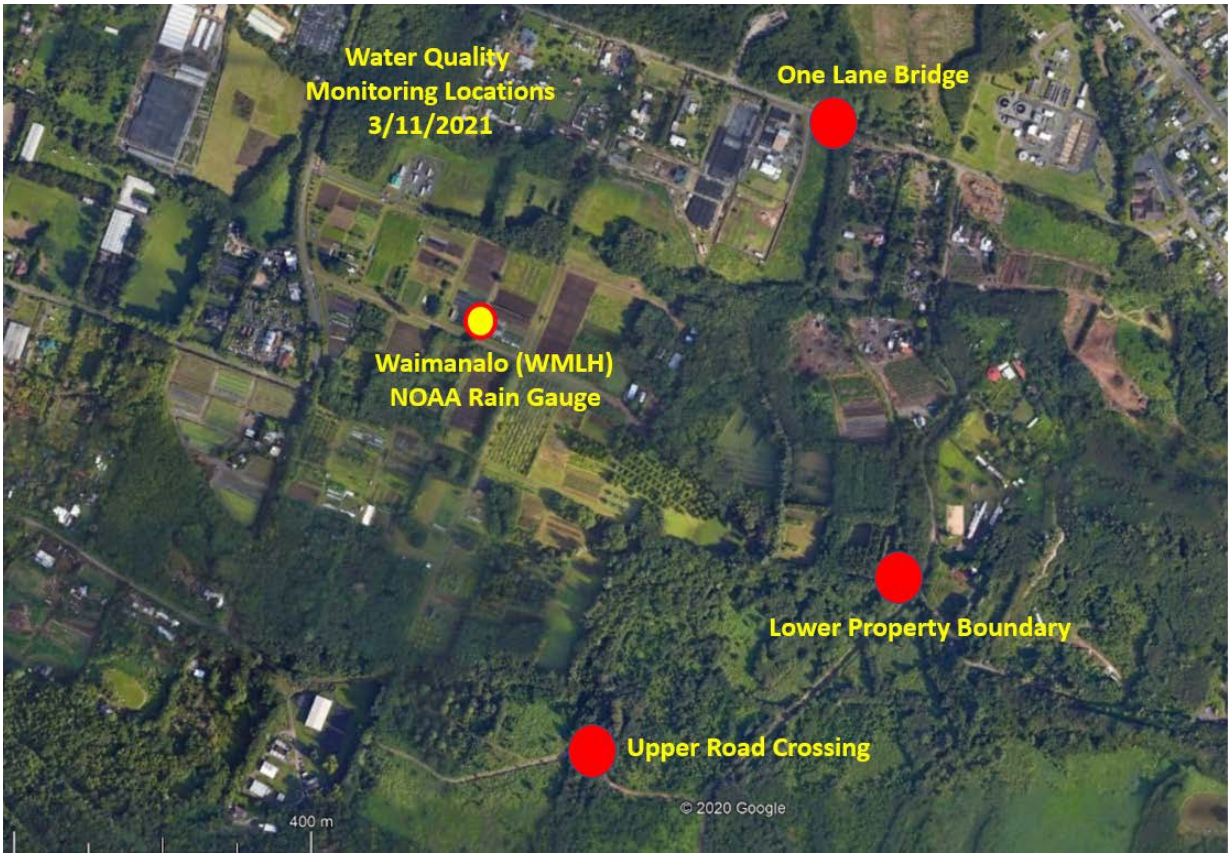


Figure 3-6: Inoaʻole Stream Sampling Locations

The One Lane Bridge sampling site is at the one lane bridge that crosses Hihimanu Street and is located downstream of the current Project Area. The Lower Property Boundary is the mid-stream sampling site, near the gate at the end of Waikupanaha Street. The upstream sample site, Upper Road Crossing, is located where the internal access road within the WRS property crosses Inoa'ole Stream. A hydrograph

for the two days samples were collected and the measured water quality parameters are included in Appendix B.

During the 3/15/2020 sampling event, samples were collected between 13:35 and 14:00. The rainfall measured at the Waimānalo rainfall station (WMLH) related to this runoff event was 1.75 inches, which fell over a time period of around 1.5 hours, starting shortly before noon. The streamflow at the Upper Road Crossing at 14:00 was visually estimated to be around 30 cfs.

During the 3/11/2021 sampling event, samples were collected between 8:20 and 9:20. The rainfall measured at the WMLH gauge related to this runoff event was 3.36 inches, which predominately fell over a time period of around 2.5 hours between 6:00 and 8:30 AM. The rainfall in the very back of the contributory watershed may have been somewhat higher. The streamflow at the Upper Road Crossing at 8:50 was visually estimated to be around 300 cfs. The stream flow at the one lane bridge had subsided to around 0.5 cfs by 16:45 that afternoon. A backhoe operator working to remove wooden debris that had partially blocked the culvert under the one lane bride on Hihimanu Street reported that the stream reached a height of around one foot above the street at around 9:00. A hydrograph for the two days samples were collected and the measured water quality parameters is included in Appendix B.

Table 1 of Appendix B summarizes the water quality parameters measured in the field and at the laboratory on the three stream samples collected on 3/15/2020 and 3/11/2021. The water quality parameters measured included total nitrogen, total phosphorous and total suspended solids (TSS) concentrations.

The most recent samples on 3/11/2021 were also analyzed for nitrate/nitrite and total Kjeldahl nitrogen which determined that organic nitrogen constitutes 88%, 55% and 74% of the total nitrogen present in the runoff samples collected at the Upper Road Crossing, Lower Road Crossing and One Lane Bridge, respectively.

Table 2 of Appendix B compares the Inoaʻole Stream water quality data to levels of total nitrogen, total phosphorous, and TSS in Waimānalo and Kahawai Streams in the year 2000 (Laws and Ferentinos, 2003). The year 2000 data includes during-rain, post-rain, and baseflow conditions for Kahawai and Waimānalo Streams.

The E2 report emphasized that Waimānalo and Kahawai Streams are anomalous with respect to their transport of suspended sediment and total phosphorous due to the extensive engineering modifications and channelization work that have been made to these streams. This channelization greatly reduces the flow weighted concentration of TSS measured in these streams compared to typical TSS and TP concentrations measured in streams elsewhere on the island of Oʻahu. The somewhat elevated concentrations of total nitrogen, phosphorous and total suspended solids measured in Inoa'ole Stream is likely related to the ephemeral nature of the stream runoff, causing their concentrations to build up between rain events.

3.5.2 Potential Impacts and Mitigation

Based on the water quality data collected during the E2 study, the implementation of the Waimānalo Research Station master plan will have a *de minimis* impact to the environment. The Inoaʻole Stream water quality data was collected during two runoff events that occurred over a two-year period. The data indicates that the stream is picking up much of its sediment and nitrogen load from agricultural areas to the north of the Project Area before reaching the down-stream monitoring location at the One Lane Bridge.

Moreover, the concept plan proposes creation of a Riparian Management Zone in the section of the stream that runs through the Project Area, that would be used to conduct natural resource conservation studies involving water quality monitoring and stormwater management.

The Waimānalo Stream TMDL Implementation Plan (USEPA and Hawaiʻi Department of Health, 2001) proposed measures to reduce pollutants in the nearby Waimānalo Stream in an effort to improve its water quality. The proposed Riparian Management Zone would include control measures that would contribute to the restoration of the stream and incremental reduction of nutrient loads similar to those suggested by the USEPA and HDOH. Coupled with the resources and expertise of CTAHR research and extension staff, the Riparian Management Zone will provide an ideal venue to test various pollution-reduction and watershed management strategies. The results can be applied to nearby streams including Waimānalo Stream.

3.5.2.1 Recommendations

Most of the HDOH and USEPA recommendations for Waimānalo and nearby Kahawai Streams are relevant for Inoa'ole Stream and are listed below:

1) Establish vegetated buffer strips along the stream to filter pollutants and debris in runoff before it enters the stream channel.

2) Improve the stream's ability to move water, filter pollutants, and support aquatic life. This can be achieved by removing alien vegetation, reducing steepness of channel walls, stabilizing stream banks with native or noninvasive plants, establishing shade trees, increasing instream flows

3) Develop methods for stabilizing the stream channel that maintain the stream's ability to filter pollutants and support aquatic life, i.e., toe protection, vegetative cover, drop structures, armoring stream banks with materials that combine structure with vegetation, restore floodplain.

4) Assure good agricultural management practices that minimize potential for fertilizer runoff and groundwater contamination.

5) Assure good animal waste management practices that minimize potential for runoff and groundwater contamination.

6) Increase capacity of community to protect and enhance stream ecosystem. For example, implement a water quality monitoring program with schools or community partners.

The appropriate remedial solutions for different segments of Inoa'ole Stream on the future Waimānalo Research Station are site-specific and will be based on the specific land use and geography present within various sections of the stream. Implementation of the uses proposed for the Project Area will likely have a slight beneficial impact on future water quality in Inoa'ole Stream (E2, 2021).

3.5.2.2 Construction Period

In a pre-assessment consultation letter dated September 20, 2021 (see Chapter 8), the State Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR) recommended best management practices for mitigation of erosion and Land Based Sources of Pollution (LBSP) be followed. DAR noted the need to consider the close proximity to the ocean and other natural waterways.

During construction, these measures would include any type of barrier (e.g., sediment barriers/bags, petroleum absorption diapers, etc.) that limits the amount of sediment or LBSP (e.g., petroleum products, chemicals, debris, etc.) to the maximum extent practicable. DAR recommends that all construction materials be composed of environmentally inert materials to the extent practicable. The Contractor shall consider the weather while performing construction. Some work may be performed during low rain conditions, but all construction would be halted during storm conditions or when storm conditions threaten the watershed. There should be sufficient measures in place to prevent runoff from the construction site even under storm conditions.

3.5.2.3 Regulatory Issues

The perennial Inoaʻole Stream discharges terminally into the Pacific Ocean, a navigable water. As such, tributaries to the Inoaʻole Stream, i.e., the Maunawili Ditch, the Kailua Ditch, and any adjacent wetlands, are also waters of the U.S. subject to regulation pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Should any improvements involve work in close proximity to Inoaʻole Stream or its tributaries, the U.S. Army Corps of Engineers should be contacted to determine if there will be a “discharge of fill.”

For example, if stream side improvements involve the temporary or permanent discharge of fill material below the ordinary high-water mark (OHWM), a Department of the Army (DA) permit will be required. If the fill results in either temporary or permanent loss of waters of the U.S. and/or associated function, compensatory mitigation may be required for any unavoidable impacts to the aquatic environment.

3.6 Biological Resources

Botanical, avian and mammalian surveys were conducted on the property by AECOS in August 2021 (Guinther & David, 2021, see Appendix C). The primary purpose of the surveys was to determine if there are any botanical, avian, or mammalian species currently listed, or proposed for listing under either federal or State of Hawaiʻi endangered species statutes within or adjacent to the study area. If present, impacts on listed species will be determined.

The 2021 biological surveys were an update of previous surveys of the Waimānalo Research Station Project Area conducted by David & Guinther in 2012. Portions of the Project Area were also surveyed in 2014 as part of a proposed irrigation line.

3.6.1 Botanical Resources

The current botanical survey was conducted on August 10-11, 2021. Plant species were identified as they were encountered during wandering transects that covered a majority of the property, with the exception that only a limited survey was undertaken within the mauka, forested lands. The forested areas are not projected to be developed as part of the current concept plan. However, the scrub forest on the far eastern end of the site and a portion of the forest land between this scrub forest and the central pasture were included in the August 2021 survey.

3.6.1.1 Existing Conditions

Vegetation

"Vegetation" refers to the type of plants that dominate an area. The field study found two basic vegetation types: pasture and forest. These are divisible into subtypes as discussed here. A map of the basic vegetation types is provided in Figure 3-7 (after David & Guinther, 2012).

On this site, pasturelands (**Ps**) vary somewhat, based presumably on grazing history. Some limited areas of mowed grassland are present, but most of the pastureland is now tall Guinea grass (*Megathyrsus maximus*), reaching a couple of meters (6 or more ft) in height and is nearly impenetrable. This dense growth of Guinea grass presents a monospecific vegetation: only Guinea grass is present, this large grass out-competing all other plant species. Shrub growth is present around the margins of these former pastures. In other areas of tall Guinea grass, larger shrubs are present (such as sourbush and Indian fleabane), possibly indicating a different grazing history. The area of uncontrolled growth of Guinea grass is mostly the northern part of the property near the north Waikupanaha entrance gate (former dairy area) and a few areas along the forest/pasture boundary, or where fences tended to limit grazing access to otherwise open (lacking trees) areas.

A majority of the pasture areas were of moderately cropped grasses. Within the vegetation zone labeled "Ps" are included some areas of grassland with scattered shrubs and trees, as well as linear forested areas along drainage gulches and former agricultural *auwai* that are in trees (riparian forests) or shrubs partly because these areas were fenced off from grazing cattle. Several gullies cross the property and these support mixed secondary forest. and narrow, winding areas of forest/scrub follow the old irrigation ditch.

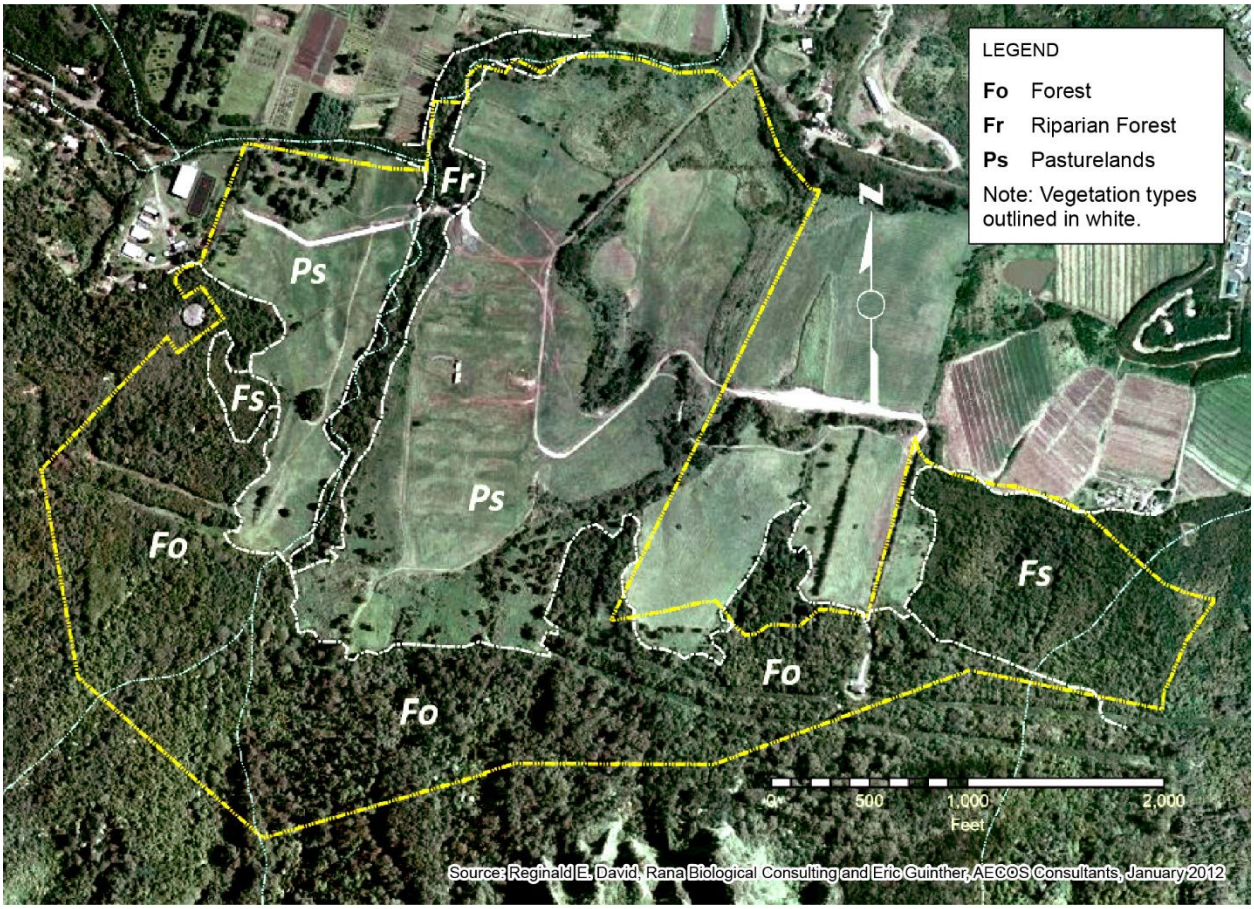


Figure 3-7: Vegetation Types

The Forest Vegetation type (**Fo**) is the most complex on the property, consisting of trees forming a closed or nearly closed canopy that extends the length of the *mauka* (upland) side of the Project Area and upslope beyond the project property to the base of the cliffs of the Koʻolau. This forest constitutes roughly one-third of the Project Area. Because there are no plans to alter this area, it was not entirely surveyed by David and Guinther in 2021. The description here is from the 2011 survey (David & Guinther, 2012). The forest differs considerably in composition from place to place and it is difficult to state what is typical. On the west, some steep slopes support a nearly monotypic stand of Formosan koa (*Acacia confusa*). Elsewhere on this side of the property a mixed forest of satin leaf (*Chrysophyllum oliviforme*), Java plum (*Syzygium cumini*), silk oak (*Grevillea robusta*), gunpowder tree (*Trema orientalis*), African tulip (*Spathodea campanulata*), and small numbers of Christmas berry (*Schinus terebinthifolius*) cover the slopes. This forest varies in canopy cover, supporting a relatively diverse understory.

In the middle part of the forest vegetation type, a forest dominated by two species of eucalyptus trees (*Eucalyptus crebra* and *E. saligna*) and a dense understory of *laua'e* ferns (*Phymatosorus grossus*) and *ki* or ti (*Cordyline fruticose*) is present. This area is also characterized by numerous downed eucalyptus logs, which make the area very difficult to traverse. There is evidence that a fire swept through the area in the distant past, and the downed trees may be those that did not survive and were subsequently felled by strong winds at some time later.

Two other forest types are mapped in Figure 3-7: a scrub forest (**Fs**) of low stature trees—mostly *koa haole* (*Leucaena leucocephala*) and fiddlewood (*Citharexylum spinosum*)—and a riparian forest (Fr) that runs north-south along the course of normally dry Inoa'ole Stream (called Puha Stream in some sources). In the latter, Java plum and Christmas berry are most prominent. The scrub forest is characterized by an open canopy, with areas of Guinea grass (*Panicum maximum*), coral berry (*Rivina humilis*), and Chinese violet (*Asystasia gangetica).*

In the scrub forest on the east occur numerous mock orange shrubs *(Murraya paniculata).* The scrub forest represents an area of reduced amounts of rainfall received in comparison with the main forested slopes. In this area, the gradient of increasing precipitation is both inland from the Waimānalo shore and east to west. Rainfall in the scrub forest areas is on the order of 45 inches (1140 mm) annually; that of the denser forested slopes closer to 55 inches (1400 mm) annually. Rainfall at Pu'u-o-Kona is estimated at around 60 inches annually (Giambelluca et al. 2011).

Flora

Table 1 in Appendix C provides a list of plants recorded during the August 2021 survey, as well as listed plants observed in a survey of the Project Area by David and Guinther in November 2011, and by notes, surveys in more limited parts of the property in May 2014 and August 2020 (AECOS, 2014, 2020). Altogether, a total of 130 species of plants are listed in Tables 1a and 1b as having been recorded on the Project Area property. Of these, 9 are "native," mostly early Polynesian introductions (7 species). Three indigenous native species have been observed in the past on the Project site: (*Scaevola taccada, Heliotropium currassavicum,* and *Thespesia populnea*). All three are rare in abundance on the site (but not island-wide), and none were observed during the 2021 survey.

3.6.1.2 Potential Impacts and Mitigation

The percentage of native and early Polynesian plants (around 7 percent) in the Project Area is low for lowlands on O'ahu where surveys tend to yield between 10 and 12 percent (David & Guinther 2006, 2010). The 2021 Natural Resources Assessment noted that the proposed land uses are compatible with the resources present and hold promise for improvements in native plant representation and environmentally sound agricultural use on this land. No adverse impacts on botanical resources are anticipated.

3.6.2 Avifauna

A bird survey was conducted on the mornings of August 10 and 11, 2021. Birds were identified by species by visual observation aided by Leica 8 X 42 binoculars and by listening for vocalizations. Avian species abundance was estimated at 11 count-stations distributed more or less evenly across the survey

area. A single eight-minute avian point-count was made at each of the count stations. Weather conditions were ideal, with unlimited visibility, no precipitation, and winds between 1 and 10 kilometers per hour. The avian phylogenetic order and nomenclature used in this report follows the AOU Check-List of North and Middle American Birds 2020 and the Sixty second Supplement to the Check-list of North American Birds (Chesser et al., 2021).

3.6.2.1 Existing Conditions

A total of 769 individual birds of 23 species, representing 17 separate families, were recorded during the previous 2011 survey (David & Guinther, 2012). During the most recent (2021) survey, 286 individual birds of 17 species, representing 14 separate families were recorded. One of the species detected during the previous survey—Pacific-Golden Plover (*Pluvialis fulva*)—is an indigenous migratory shorebird species. The remaining 22 species recorded during the first survey, and all 17 species recorded during the latest survey are considered to be alien to the Hawaiian Islands.

Avian diversity and densities were in keeping with the highly disturbed nature of the environment present at the site and the site's location in Waimānalo. Two species—Red-vented Bulbul (*Pycnonotus cafer*) and Japanese White-eye (*Zosterops japonicus*)—accounted for 41 percent of all birds recorded during station counts in the 2011 survey and 38 percent of the birds recorded the 2021 survey. The most commonly recorded species was Red-vented Bulbul, which accounted for slightly less than 28 and 38 percent of the total number of individual birds recorded during the two surveys.

3.6.2.2 Potential Impacts and Mitigation

The recommendations below were included in the Natural Resources Assessment (Appendix C), and are partly based on U.S. Fish and Wildlife Service, Animal Avoidance and Minimization Measures (USFWS-PIFWO, nd). Implementation of the recommendations by the Project contractor during construction will minimize impacts to listed species to the maximum extent practicable.

Seabirds

On Oʻahu, protected night-flying seabirds including Hawaiian Petrel (*Pterodroma sandwichensis*), Newell's Shearwater (*Puffinus newelli*), Band-rumped Storm-petrel (*Oceanodroma castro*), and Wedge-tailed Shearwater (*Ardenna pacifica*), may overfly the project site during the nesting season. The first three of these species are listed under both federal and state endangered species statutes, and the Wedge-tailed Shearwater is protected under the federal Migratory Bird Treaty Act (MBTA). Hawaiian Petrel and Newell's Shearwater nest in upland mountainous habitat and have been detected on the Island of Oʻahu (Young et al. 2019).

In the summer and fall, nocturnally flying seabirds (especially fledglings) transiting to the sea from inland locations can become disoriented by exterior lighting. When disoriented, seabirds can collide with man-made structures or the ground. If not killed outright, dazed or injured birds are easy targets of opportunity for feral mammals (Podolsky et al., 1998; Ainley et al., 2001; Day et al., 2003). The primary cause of mortality nesting seabirds in Hawaiʻi is predation by alien mammalian species at the nesting colonies (USFWS, 1983; Ainley et al., 2001). Collision with man-made structures is considered the second

most significant cause of mortality of these seabirds in Hawaiʻi. No suitable nesting habitat for seabird species occurs in the Project Area.

Recommendations: Deleterious impacts to transiting seabirds can be avoided if Project construction occurs during daylight hours and any outdoor lighting used/installed is fully "dark sky compliant" (HDLNR-DOFAW, 2016).

White Tern (*Gygis alba*), or *manu o Kū*, is an indigenous seabird listed as threatened under State of Hawaiʻi endangered species statute, HRS 195D (HDLNR, 2015). In the main Hawaiian Islands, the majority of the White Tern population is restricted to central urban and suburban Honolulu, with a known breeding range extending from Niu Valley to Aloha Tower. Isolated pairs have been observed as far west as Hickam Air Force Base at Pearl Harbor (VanderWerf and Downs, 2018). The Waimānalo Research Station is on the windward side of the island, ergo no nesting White Terns are likely on this property.

Owls

The Hawaiian endemic sub-species of Short-eared Owl or *pueo* (*Asio flammeus sandwichensis*) is state-listed as endangered on Oʻahu only. Short-eared Owl nest on the ground and thus susceptible to mammalian predation. The species is increasingly scarce on Oʻahu but is known to utilize agricultural crop and pastureland for hunting and nesting. No evidence of Short-eared Owl was found during the Guinther and David survey.

Recommendation: Currently there is no habitat on the site suitable for nesting Short-eared Owls. However, if the rank grass is cut before whatever modifications are made to the site, thus creating suitable nesting habitat for this owl species, it may be appropriate to conduct a nesting survey in the specific construction area(s) prior to any major construction activity.

Recommendation: If an owl nest is discovered, Hawaiʻi Department of Land and Natural Resources (DLNR) must be notified before proceeding with any activity that could disturb the nest.

Waterbirds

The Project Area lacks habitat suitable for waterbirds. No mitigation is necessary.

3.6.3 Mammals

A list was made of mammals encountered during the survey. Indicators of mammalian presence, such as tracks, scat, and other sign were noted. Mammalian phylogenetic order and nomenclature follow *Mammal Species of the World* (Wilson and Reeder, 2005). Hawaiian names are given for native species.

3.6.3.1 Existing Conditions

Three terrestrial mammalian species were recorded in the WRS Project Area during an earlier survey (David & Guinther, 2012). Tracks, scat and sign of dog *(Canis lupus familiaris)* were encountered at several locations within the study site, and dogs were heard barking from locations outside of the site during almost every avian point count. Five small Asian mongoose *(Herpestes a. auropunctatus)* were

seen within the site as was one cat *(Felis catus).* During the recent 2021 survey, the same three alien mammalian species were recorded in the Project Area.

3.6.3.2 Potential Impacts and Mitigation

The findings of the mammalian survey are consistent with the location of the Project Area and the environments present. Although no rodents were recorded on either the 2014 or 2021 surveys, it is likely that some of the four established alien Murida*e* found on Oʻahu—roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus musculus domesticus*)—use various resources found within the general project area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems. No wild pigs *(Sus scrofa)* were observed, although they generally would be expected in the area, and have a negative effect on native ecosystems.

Hawaiian hoary bat

The study noted that possibly, Hawaiian hoary bat or ʻŌpeʻapeʻa (*Lasiurus cinereus semotus*) overfly the Project Area on a seasonal basis (Bonaccorso et al., 2015). The principal impact that the development may pose to bats is during clearing and grubbing when vegetation is removed. The removal of vegetation within the Project Area may temporarily displace individual bats using the vegetation for roosting. Because bats typically use multiple roosts within their home territories, the potential disturbance from the removal of some of the vegetation is likely to be minimal. However, during the pupping season, females carrying their pups may be less able to rapidly vacate a roost site or an adult female may leave a pup in the roost tree when away foraging. Very small pups would be unable to flee a roost tree that is being felled.

Recommendation: Potential adverse impacts from disturbance to Hawaiian hoary bat can be avoided or minimized by not clearing woody vegetation taller than 4.6 m (15 ft) between June 1 and September 15, the period in which bats may have pups.

3.6.4 Protected Species and Critical Habitat

3.6.4.1 Existing Conditions

Guinther and David (2021) reported that during their survey, no plant or animal species currently listed as endangered, threatened, or proposed for listing under either the federal or the State of Hawaiʻi endangered species programs (DLNR, 1998, 2015; USFWS, nd-a, nd-b) were recorded. No exceptional trees occur on the property surveyed (C&C, 2012).

No federally declared critical habitat occurs in the Waimānalo Research Station Project Area. There is no equivalent statute or rule under State of Hawaiʻi laws or regulations.

3.6.5 Streams and Wetlands

Wetlands shown on U.S. Fish and Wildlife (USFWS), National Wetlands Inventory (NWI) maps (USFWS, nd-c) are seven man-made ponds associated with the former Meadow Gold Dairy that once occupied a portion of the Project Area. These ponds have since been removed and the land graded to normal

contours that do not result in a localized accumulation of runoff. Guinther and David (2021) reported that the former presence of these ponds could not be recognized in the field by the vegetation, with the exception of an area of elephant grass (*Pennisetum purpureum*) and Indian pluchea (*Pluchea indica*) in an overgrown (ungrazed pasture) in the northern part of the site. This former pond and another depressed area to the east overgrown with Guinea grass and *koa haole* are man-made features that appear to no longer store water.

In addition, at least two former water supply ditches once crossed the site. These are no longer functional or have been replaced by underground pipes (AECOS, 2014). Several streams that cross the property are intermittent flowing. Consequently, at present there are no aquatic habitats present anywhere within the Project Area.

Jurisdictional Waters

The seven ponds located in the area of the former Meadow Gold Dairy were at one time related to the property's use as a dairy and received runoff from dairy operations. These areas are classified in the NWI as "PUBHx": excavated (man-made), permanently flooded palustrine wetland (freshwater marsh) with an unconsolidated (mud) bottom. Features indicated on NWI maps are not necessarily jurisdictional (that is, do not necessarily come under U.S. Army Corps of Engineers authority) and, indeed, do not necessarily exist. Today, no evidence of these wetlands or aquatic features or berms surrounding them exists on the ground in the area (AECOS, 2014).

Wetland surveys (sampling points or SPs) were undertaken in apparent low spots of two of these NWI "wetlands" following guidelines issued by the U.S. Army Corps of Engineers (USACE, 1987, 2012). Neither of these points, or two others close by, exhibited characteristics of hydric soils or wetland hydrology and the authors concluded that the former pond areas were not wetlands (*AECOS*, 2014). No other locations on the property have any appearance of being wetlands.

It is possible that one or more of the gullies crossing the site is a jurisdictional stream.

3.6.6 Coordination with State and Federal Resource Agencies

During the EA early consultation period, a comment letter was received from the State of Hawaiʻi Department of Land and Natural Resources (DLNR), dated September 20, 2021, with input from the Division of Forestry and Wildlife (DOFAW). A letter dated October 1, 2021, was also received from the U.S. Department of the Interior, Fish and Wildlife Service (USFWS).

The comments and recommendations paralleled the findings and recommendations from the 2021 Guinther and David Natural Resources Assessment. The agency comments are summarized below, and the letters are included in Chapter 8, Agencies and Organizations Consulted.

3.6.6.1 Comments from DLNR Division of Forestry and Wildlife (September 20, 2021)

- State listed Hawaiian Hoary Bat could potentially occur in the vicinity of the project area and may roost in nearby trees.

- Recommend that site clearing be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15), and that woody plants greater than 15 feet tall not be disturbed, removed, or trimmed.
- DOFAW prefers that new construction avoid the use of barbed wire.
- Artificial lighting can have adverse effect on seabirds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts.
- Nighttime work requiring outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15.

3.6.6.2 Comments from USFWS (October 1, 2021)

- USFWS is supportive of the proposed research station activities, including plant pest management, soil health, native forest restoration, wildlife ecology management, invasive species management, and wildfire management.

Based on the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended (ESA), USFWS offered the following comments:

- There is no federally designated critical habitat within the immediate vicinity of the proposed project.
- The following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*), endangered Hawaiian gallinule *(Gallinula galeata sandvicensis)*, and endangered Hawaiian coot *(Fulica alai);* the endangered Hawaiian hoary bat *(Lasiurus cinereus semotus);* the endangered Hawaiian petrel (*Pterodroma sandwichensis*), endangered Hawai‘i distinct population segment (DPS) of band-rumped storm-petrel (*Oceanodroma castro*), and threatened Newell’s shearwater (*Puffinus auricularis newelli*).

4 Human Environment

This chapter focuses on the human-made environment, which includes land uses, air quality, noise, archaeological and cultural resources, infrastructure such as roads and utilities, and public services.

The analysis describes existing conditions, potential project impacts and proposed mitigation. The discussion of environmental impacts includes both direct and indirect impacts. Direct impacts are those caused by the Proposed Action and occur at the same place and time. Indirect effects may occur later in time or farther in distance but are still reasonably foreseeable. The analysis in this chapter also identifies possible cumulative environmental impacts. Cumulative impacts are defined as the results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.1 Project Site History

In pre-contact days, the project area supported upland taro loʻi and a wide variety of traditional Hawaiian crops. The introduction of cattle and horse ranching in Waimānalo in the 1800s had a negative impact on the natural environment as well as on traditional Hawaiian life. Taro loʻi were destroyed by animal trampling and grazing areas were stripped of native vegetation.

With the establishment of the Waimānalo Sugar Company in the late 1800's, former ranch lands were converted to cane fields, and by the 1920's, sugar cane fields stretched across the floor of Waimānalo Valley to the base of the Koʻolau Range.

Much of the project area, with the exception of the most mauka lands and gulch areas, was cultivated in cane. The rapid development of Waimānalo sugar cane lands required intense irrigation and led to the construction of a vast system of flumes, ditches, and tunnels collectively called the Waimānalo Ditch System. There were three sources of water for this system, including neighboring Maunawili Valley, Kawainui Marsh in Kailua, and a swampy area near the mouth of Waimānalo Stream called Waimānalo Lagoon. Until the cessation of the Waimānalo Sugar Company in 1947, water from these sources flowed to reservoirs through the Kailua Ditch, the Maunawili Ditch, and the Pump Ditch. The Maunawili Ditch crossed through the mauka portion of the current project area. The Kailua Ditch crossed through the makai portion of the current project area, and remnants remaining today include an

earthen channel with stone and mortar-lined sections, a wooden sluice gate, and modern cement culverts.

The intense cultivation of sugar in Waimānalo led to diverse forms of agriculture that continue today. In 1947, the Waimānalo Sugar Company sold its fee simple land holdings and remaining years of its government leased lands to the Waimānalo Agricultural Development Company, which in turn sublet farm lots to individual farmers. In the 1950's, the Territorial Government began selling agricultural parcels in the area known as the Waimānalo Farm Lots.

In 1950, the University of Hawaiʻi established an approximately 30-acre agricultural research farm, known as the Waimānalo Agricultural Experiment Station, in the area immediately makai of the current project area. Research conducted at the experiment station provided local farmers with scientific knowledge about crops and agricultural practices to improve agricultural production in Hawaiʻi. The Waimānalo Agricultural Experiment Station was later expanded to approximately 130 acres.

In 1967, the L.W. Campos Ranch relocated from Kailua to Waimānalo, establishing an approximately 200-acre dairy farm within the current project area, on land leased from the State of Hawaiʻi (General Lease No. S-4101). In 1969, Campos Ranch was purchased by Foremost Dairies which acquired the General Lease. Foremost expanded its holdings by acquiring an additional 140 acres for pasture. During this period, dairy employee housing was erected in the northwest corner of the current project area.

In 1984, Foremost Dairies subleased an approximately 21-acre area, to Universal Synergenics (Unisyn) consisting of the makai parcel of the current project area. The General Lease was assigned to Waimānalo Dairy in 1986. Unisyn was a company established to research and develop a commercial anaerobic digestion technology for converting manure and organic waste into usable agricultural and farm products. Initially, only animal wastes were handled under a pilot project, but over the years, a full-scale facility was developed to convert 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, and ethanol. As Unisyn expanded its facilities in the mid 1990's, so did complaints from Waimānalo residents about severe odors.

In 1997, the General Lease from the State was acquired by Meadow Gold Dairies (MGD), and in 1999, sub-lessee Unisyn ceased operation, largely due to numerous lawsuits about its operations and its inability to meet government standards. Unisyn was unable to complete cleanup of its operations. By this time, Meadow Gold had also downsized its dairy and by 2001, had decided to terminate its Waimānalo dairy operations. However, prior to its closure, Meadow Gold conducted remediation of the site to clean up biowaste and other remaining contaminants. Most of the structures on the property were torn down and removed and the land replanted in grass.

Meadow Gold submitted a Final Closure Report to the State of Hawaiʻi Department of Health (DOH), and on December 2, 2002, the DOH issued a letter concurring that no further action was required with respect to the remedial actions at the subject site.

4.2 Existing and Surrounding Land Uses

4.2.1 Existing Conditions

Project Site

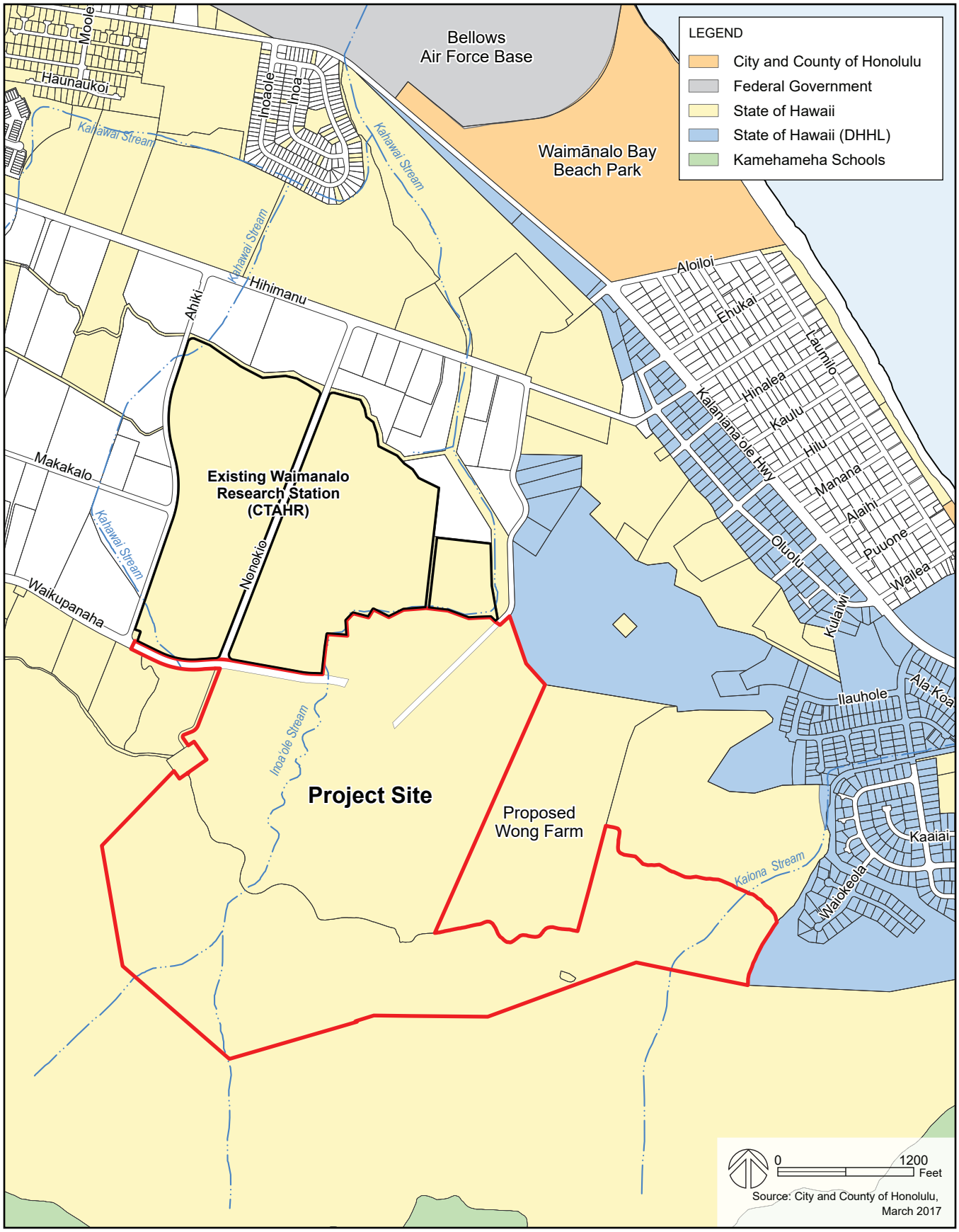
The level, makai most areas of the Project Area have been extensively disturbed over decades of historic and modern agriculture. Currently, the area is dominated by fallow fields which are overgrown and crossed by access roads (dirt and asphalt). A water tank (located along the western project area boundary) and the historic era Kailua and Maunawili Ditches run through the project area in an east-west direction.

In the makai northwestern corner of the project area there is currently an area of fruit trees, hedges and other ornamental trees. This portion of the project area once contained a variety of buildings related to dairy operations; however, the majority of the project area is now overgrown with vegetation. A group of dairy employee houses were once located north of the water tank along the project area's northern boundary. These houses, most likely constructed in the late 1960's were the residences of the former dairy employees and were removed sometime between 2001 and 2004. Their former location is noted in Figure 20 of the Archaeological Literature Review and Field Inspection (LRFI) (Appendix D).

The hilly, mauka portion of the Project Area is relatively undeveloped. Power lines and associated access corridors run through the project area in an east-west direction, and roughly delineate the undeveloped mauka portion of the project are from the agricultural fields and associated infrastructure located within the makai portion of the project area. Of note is the presence of a Board of Water Supply well in the southeastern portion of the property. The well is located on a separate TMK parcel and is not part of the Project Area.

Adjacent Land Uses

Figure 4-1 shows major landowners in the project vicinity. Lands immediately surrounding the project area are owned by the State of Hawai'i, Department of Land and Natural Resources (DLNR) and the Department of Hawaiian Home Lands (DHHL). The existing Waimānalo Agricultural Research Station is located along the northwest border of the project site. The existing research station encompasses 127 acres and is used for the raising of truck crops and tropical fruit trees, entomology research, cover crops, breeding of various vegetables and fruits, and research on taro, and organic and sustainable agriculture. A small cluster of buildings on the existing research station includes an office/laboratory, general storage building, tractor/chemical storage building, cottage, open storage shed, and a condemned building. Day-to-day operations are overseen by a station manager and five full time employees. It is intended that the future development envisioned by the proposed project be an extension of the existing Waimānalo Research Station.



Land Ownership **Figure 4-1**

Waimānalo Research Station Master Plan

Draft Environmental Assessment
University of Hawai'i, College of Tropical Agriculture
and Human Resources (CTAHR)

On the western boundary of the project site along Waikupanaha Street, State-owned farm lands are being leased to six individual farmers. Approximately 52 acres of the eastern portion of the former Meadow Gold Dairies property will be leased by the State to the Wong Farm. The Wong Farm is relocating from its present site in order to accommodate a 200-unit, DHHL subdivision. The DHHL is a major landowner in the Waimānalo ahupuaʻa, with control over approximately 1,900 acres of land (DHHL, 2008).

The relocation of the Wong Farm to a portion of the former MGD property will leave the mauka-most areas of the future Waimānalo Research Station land locked, on the opposite side of the Wong Farm. An access easement running along the eastern boundary of the proposed Wong Farm site will provide CTAHR with vehicular access to these mauka areas, which the concept plan designates as Forestry.

A site on the existing research station has been identified as a potential expansion site for Mālama Honua Public Charter School (PCS), which is currently located in Waimānalo. Site acquisition is being pursued by the school, and CTAHR is not involved in the negotiations or plans for the new campus. This potential school site is not included in the proposed project.

4.2.2 Potential Impacts and Mitigation

The master plan is limited to the 283-acre, former Meadow Gold Dairies site, but the intent is to integrate the functions and activities at the proposed Waimānalo Research Station with the existing research station, allowing it to function as one entity.

Many of the proposed types of activities are already occurring at the existing research station. The proposed research station will allow many of these ongoing projects to continue and expand to maximize their potential benefit. For example, the expansion of the farmer training areas currently used by GoFarm Hawaiʻi will provide additional land for cultivation and allow more community members to participate in farmer training programs.

The expanded station will also provide an opportunity for closer collaboration between CTAHR's research and extension staffs. This may result in research topics that are more applicable and practical and provide CTAHR extension agents and farmers with an opportunity to interact and exchange ideas with researchers. The expanded acreage will also provide the flexibility for more efficient use of both properties. The integration of both research properties may also open up new opportunities such as marketing of farm products to establish an agribusiness program for CTAHR students.

Although CTAHR is not involved with the development of the new Mālama Honua PCS campus, the proposed location of the school near the Waikupanaha Street entry is a compatible land use. This general area is also identified in the concept plan for a possible education center. The proximity of the school, research station, and education center would facilitate collaboration in programs and curricula, allowing students to participate in hands on learning at the research station.

No adverse impacts on the DHHL's existing or proposed residential subdivisions, or other residential neighbors are anticipated. The uses within the Project Area will not include large scale farming operations that would emit odors, dust, high noise levels, or heavy vehicle traffic.

4.3 Air Quality

4.3.1 Existing Conditions

According to the State Department of Health, the project area is not situated within an air quality maintenance or non-attainment area. Vehicular traffic and agricultural operations are the major source of air pollutants. However, the impact of these sources is not considered to be significant given the rural character of the area and relatively low level of these activities. Prevailing northeast trade winds also help to keep the pollution levels low.

4.3.2 Potential Impacts and Mitigation

The project will not have a long-term adverse effect on air quality. The project is within an agricultural area and dust or emissions from farm related machinery will not be significant. Farming and livestock activities will be on a small scale using sustainable farming practices, and hedges and vegetative barriers will be used at the property boundaries.

In the past, use of the property for large scale, confined animal feeding operations (dairy) and waste processing operations by Unisyn resulted in objectionable odors that generated complaints by the community. Because of this site history, there may be increased sensitivity and concern among some members of the community about future activities on the site. There are no plans for large animal populations or use of confined feeding operations. Environmentally sustainable methods of waste treatment and disposal will be implemented, such as composting, and dry litter systems.

There are no plans for waste treatment methods such as swine lagoons which could generate odors. The livestock activities will be research-focused rather than a large-scale commercial operation. Use of chemicals and pesticides will be minimized with the station's emphasis on organic farming and biological methods of pest control.

4.3.2.1 Construction Period

Construction on the site will be limited, and primarily associated with development of the small research and test facilities, animal barns and shelters, fenced paddocks, and equipment sheds. These structures are ancillary to the primary research activities on the site. An education center may also be constructed in the future.

Development of these facilities will occur over time, as funds are obtained, and there will not be extensive construction occurring at any one time. Site work and minor grading will be needed, and will generate some dust in the immediate area, similar to typical agricultural operations.

Activities will occur primarily on the level, makai areas of the property, and no major construction will occur in the mauka regions. Air quality impacts during construction will be minimal, and consistent with what would typically be expected in an agricultural area.

Standard dust control measures will be used during construction, in compliance with provisions of the State DOH Rules and Regulations (Chapter 43, Section 10) and Hawaiʻi Administrative Rules (HAR) Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33 on Fugitive Dust.

4.4 Noise

4.4.1 Existing Conditions

Noise levels in the vicinity of the project site are relatively low, consistent with the character of a rural, agricultural area. The primary source of noise at the project site is associated with wind, and traffic on Waikupanaha Street and trucks and cars within the property. Maintenance equipment used on the property is another source of noise.

Noise is regulated by the DOH under Hawaiʻi Administrative Rules (HAR) Title 11, Chapter 46, "Community Noise Control." Agriculturally zoned land such as the project area is considered a "Class C" zoning district by the DOH. This includes lands zoned agriculture, country, industrial, or similar type. The maximum permissible sound level for Class C zoning districts is 70 dBA daytime and 70 dBA nighttime.

Zoning	Daytime (7:00 AM to 10:00 PM)	Nighttime (10:00 PM to 7:00 AM)
Class C (agriculture, country, industrial or similar type)	70 dBA	70 dBA

4.4.2 Potential Impacts and Mitigation

The Waimānalo Research Station concept plan uses are not expected to have an adverse noise impact on surrounding areas, as activities on the property will be typical of those allowed within an agricultural district, and similar to what occurs in the surrounding areas. Surrounding lands are all zoned agriculture with similar activities.

Primary sources of noise will be vehicle traffic and farm-related machinery. Because the station will be a research facility not a commercial farm, vehicle volumes will be relatively low. The research station will have a full-time manager and ten-person crew, and regular visitors will include CTAHR investigators and graduate students. Occasional university class visitations may involve up to 50 students, though most will arrive via carpool and/or bus. The Education Center will have daily visitors and weekly classes may be held.

The only time large volumes of traffic are expected will be during community field days, open houses, or similar community-wide events. These events will be held on a weekend and no more than 2 or 3 times a year. Agricultural and farming operations will not involve regular or large-scale hauling of animals to and from the property. Farming activities will generate noise typically associated with agriculture, including noise from trucks, tractors, chain saws, mechanical ventilation fans, mechanical farm equipment, pumps, etc.

Short-Term Construction Impacts

Construction of the Education Center, and other research structures will involve temporary construction noise, but this will not adversely impact surrounding uses which are all agriculture related. There are no noise-sensitive land uses in the surrounding area.

All construction activities will comply with the DOH Administrative Rules Chapter 11-46 on Community Noise Control. Noise is not expected to exceed the DOH's "maximum permissible" noise levels at the property line.

4.5 Historic and Archaeological Resources

An archaeological literature review and field inspection (LRFI) of the project area was conducted by Cultural Surveys Hawaiʻi (CSH) (December 2021) and is included as Appendix D. The investigation was designed—through detailed historical, cultural, and archaeological background research and a field inspection of the study area—to determine the likelihood that historic properties may be affected by the proposed project and based on results, consider cultural resource management recommendations.

4.5.1 Background

The LRFI includes an extensive section on Waimānalo's traditional and historic background, from the early historic period to the contemporary period. It also includes a summary of previous archaeological research conducted throughout the Waimānalo ahupuaʻa.

Traditional accounts of Waimānalo generally indicate that it had a scarcity of water, an abundance of crops along Waimānalo Stream, and abundant marine resources in the coastal areas. As the area was easily accessible by sea, Waimānalo was a frequent point of arrival and departure on Oʻahu in late pre-Contact and early post-Contact times. Approximately 113 kuleana land claims were awarded in Waimānalo, most of which were located along the Waimānalo Stream or its upper tributaries. Land Commission Awards (LCAs) in Waimānalo largely consisted of cultivated land (wetland taro and sweet potato), and house lots.

In the mid-nineteenth century, much of Waimānalo shifted to become ranch lands. By the late nineteenth century, these lands began to be utilized for rice cultivation, and agricultural undertakings in the area later diversified to include sugar. Cultivation under the Waimānalo Sugar Company dominated the landscape of Waimānalo from the early 1900s through the 1940s. Within the current Project Area, a dairy farm utilized approximately 200 acres beginning in the 1960s, and their operations continued through the early twenty-first century. The University of Hawaiʻi established the Waimānalo Agricultural Experiment Station ca. 1950, which later expanded to encompass approximately 130 acres.

A variety of archaeological studies have previously been conducted throughout the Waimānalo ahupuaʻa. This previous archaeological research has documented both pre- and post-Contact surface features, as well as subsurface cultural deposits. Identified historic properties in the vicinity of the Project Area include human burials, ditch systems, subsurface cultural layers, and stone platforms.

Previous investigation within the current Project Area identified a variety of pre-Contact and historic surface features, including platforms, terraces, enclosures, mounds, and heiau. A LRFI was conducted

within the current Project Area in 2010 (Tulchin and McDermott 2010). The 2010 field inspection documented 12 historic properties encompassing 82 features within the Project Area. The 2010 report recommended consultation with the SHPD in the case of any future development plans.

The most recent CSH survey of the Project Area was conducted in April 2020 and included a pedestrian inspection. Because the current Project Area is the same as the 2010 pedestrian inspection, the current effort was designed to verify the field conditions and supplement the Tulchin and McDermott (2010) survey.

4.5.2 Existing Conditions

4.5.2.1 Historic Properties

During the current (2020) field inspection of the Project Area, three previously identified historic properties were re-located: State Inventory of Historic Places (SIHP) #s 50-80-15-1031 (Pueo Heiau), -4042 (Waimānalo Ditch System), and -5876 (basalt platforms).

Additionally, nine potential historic identified during the 2010 field inspection were again located and documented, and additional features of these potential historic properties were newly identified. These potential historic properties, listed in Table 4-1, consist of various pre-Contact and post-Contact features associated with agriculture, habitation, and/or religious/ceremonial functions. The features consist of terraces, platforms, walls, mounds, and an enclosure. These 9 historic properties do not have SIHP #'s assigned and have been grouped into temporary designations by feature type, function, and age. A total of 82 features have been identified during the two pedestrian inspections.

Most of the historic properties are within the mauka portions of the Project Area, except for the Waimānalo Ditch System (CSH 10)—which extends through the central project area—a retaining wall (CSH 11), and a reservoir (CSH 12). The makai (seaward) project area has been heavily disturbed by previous agricultural and dairy-related activities in the twentieth century. Their locations are shown in Figure 4-2. More detailed descriptions of the individual properties can be found in the LRLFI in Appendix D.

Table 4-1: Historic Properties Identified Within the Project Area

SIHP #50-80-15	Description	Function	Probable Age
-1031	Pueo Heiau	Religious/ceremonial	Pre-Contact
-4042	Waimānalo Ditch System	Water control, agriculture	Post-Contact
-5876	Stacked basalt platforms	Agriculture, habitation	Post-Contact
CSH 1	Terrace complex	Agriculture	Undetermined
CSH 2	Platform and wall	Agriculture	Undetermined
CSH 3	Platform and mounds	Habitation or ceremonial (heiau)	Pre-Contact
CSH 4	Two terraces	Agriculture, possibly human interment	Pre-Contact
CSH 5	Enclosure	Water control	Post-Contact
CSH 6	Complex of 50 platforms and/or mounds	Unknown	Undetermined
CSH 7	Complex of seven mounds	Agriculture	Post-Contact
CSH 8	Five basalt walls	Water control	Undetermined
CSH 9	Four terraces	Agriculture	Undetermined
CSH 10	Ditch	Water control	
CSH 11	Retaining wall/terrace	Agriculture	
CSH 12	Reservoir	Water control	

Source: Cultural Surveys Hawai'i, 2021

4.5.2.2 Project Area Zones

The 2010 LRFI conducted by Tulchin and McDermott classified the Project Area into two zones of varying archaeological sensitivity: a mauka portion and a makai portion. The mauka portion of the project area, which largely consists of undisturbed upland forest, contains a multitude of archaeological surface features of both pre-Contact and post-Contact origin. The mauka project area also contains remnants of the Maunawili Ditch, associated with the Waimānalo Ditch System (SIHP # -4042). The makai portion project area is disturbed due to the former dairy, and was devoid of sites, though it may contain obscured subsurface remnants associated with the dairy. Additionally, a portion of the Kailua Ditch, which is associated with the Waimānalo Ditch System (SIHP # -4042), extends through the makai portion of the project area.

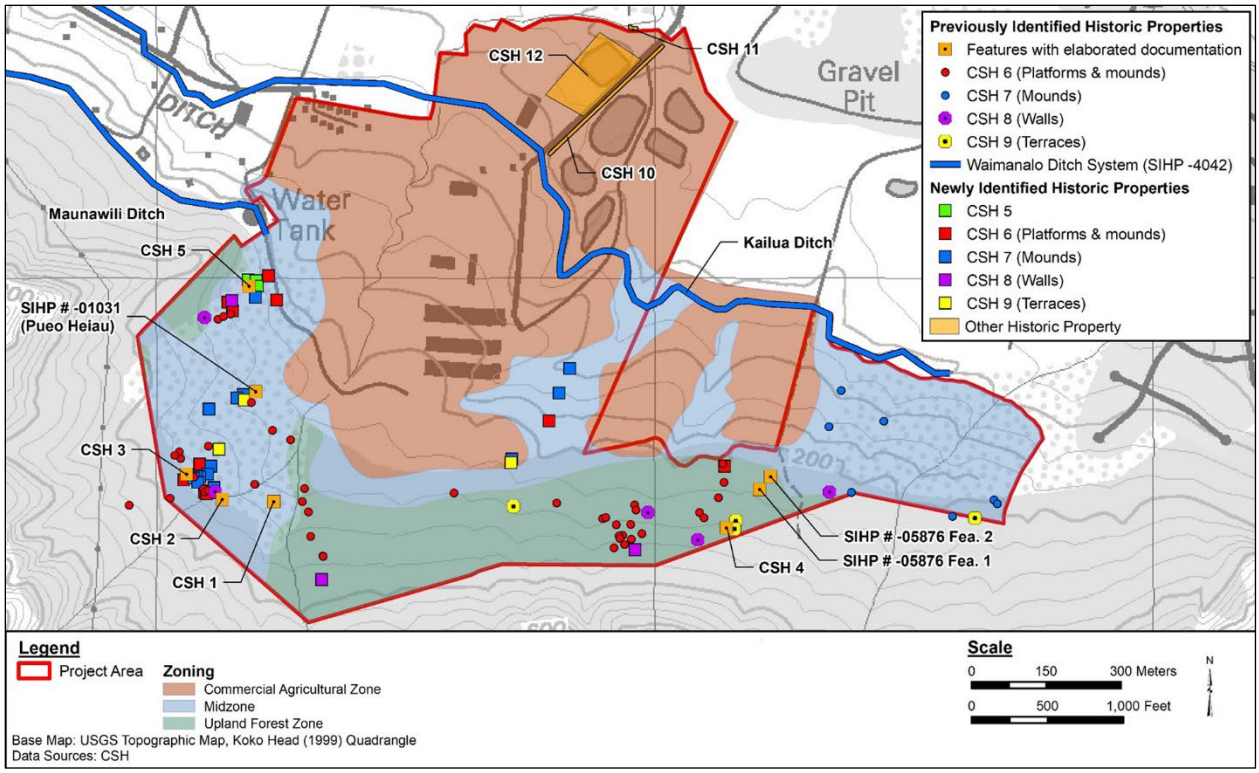


Figure 4-2: Archaeological and Cultural Sites

During the current (2020) field inspection, the Project Area was reclassified into three zones, as shown in Figure 4-2:

1) "Commercial agricultural zone" consisting of areas heavily modified and disturbed for plantation era and subsequent commercial agricultural activities in the makai portion of the project area;

2) "Upland forest zone" consisting of previously undisturbed forested land in the mauka portion of the project area; and

3) "Mid-zone" consisting of now-forested areas that were historically cleared of trees and vegetation, but not modified substantially for historical or modern commercial agricultural activities.

Both the mid-zone and the upland forest zone have similar types and densities of traditional Hawaiian features, however, there is a higher likelihood for historical features (such as agricultural clearing piles) or historical modification to features within the mid-zone.

Commercial Agricultural Zone

The commercial agricultural zone is largely covered by maintained grassy fields or by overgrown vegetation, such as dense California grass (*Brachiaria mutica*). Modern rubbish, including abandoned vehicles, was noted throughout the commercial agricultural zone. Dirt access roads related to former plantation use still cross portions of the existing Waimānalo Research Station (WRS) Project Area, and one paved access road also crosses through the commercial agricultural zone. Concrete lined ditches (CSH 10) were observed on the side of the paved access road and were likely installed to divert water away from the road. Culverts and sluice gate components were also noted extending underneath the paved access road.

Other objects noted by the archaeologists include a large, mortared basalt object, possibly a former wall portion or pillar in the dry gulch along the makai boundary of the Project Area; and a small retaining wall or terrace (CSH 11) on the mauka edge of the stream on the north boundary of the Project Area.

Three reservoirs were observed in the commercial agricultural zone. One of these reservoirs (CSH 12) is likely associated with Kailua Ditch (SIHP # -4042). Two additional, smaller reservoirs were observed to the east of the larger reservoir. Additional information is required to determine whether the two reservoirs are associated with the Waimānalo Ditch System or dairy operations.

Upland Forest Zone

The upland forest zone is more heavily wooded, covered with various trees, ferns, grasses, and other plants. This zone appears to have been spared from the mass grading and clearing of the plantation era, hence the separate classification. An area of cleared/fallen trees and brush were noted in the east portion of this zone, apparently related to vegetation maintenance for transmission lines that extend through the area.

Numerous dry-stacked basalt features were observed in the upland forest zone, many of which appear to have been previously identified by the prior LRFI study (Tulchin and McDermott 2010). The purposes of the previous and current field inspection were to provide insight on the likelihood of historic properties being present and did not survey the upland forest zone completely. An attempt was made to cross through some of the areas not previously surveyed during the previous study, the results of which confirm that many additional sites other than those identified during the two surveys are likely to be present in this area. The features included walls (CSH 8), terraces (CSH 9), platforms and mounds (CSH 6), and a possible pre-Contact burial mound (CSH 4).

It was noted that while features are distributed throughout the area, there were several dense clusters. Two of these clusters, consisting primarily of platforms and mounds (CSH 6 and 8), are to the west of CSH 4, one of which is along the east ridge of the eastern tributary of Inoaʻole Stream. Two previously identified features, SIHP # -5876 Features 1 and 2, are present within the upland zone area near a HECO substation. The features were fenced and are the subject of a previously approved preservation plan.

Mid-Zone

In the mid-zone, four main clusters of features were identified, although CSH stated it is likely that many additional features would be identified in a 100% pedestrian inspection. One cluster is along the west

edge of the project area above the Waimānalo Ditch System. This cluster includes several likely pre-Contact platforms and mounds (CSH 6), likely post-Contact mounds (CSH 7), walls (CSH 8), and a large enclosure (CSH 5).

Near Pueo Heiau (SIHP # -1031), there are several platforms and mounds (CSH 6), and terraces (CSH 9). A deep ravine is eroding the mauka area near Pueo Heiau and is threatening the feature. Just makai of the heiau is the transmission line corridor with cleared/fallen trees and brush.

To the southwest and mauka of the heiau is a dense cluster of features including a platform and wall (CSH 2), a platform and mound (CSH 3), numerous pre-Contact platforms and mounds (CSH 6), likely post-Contact mounds (CSH 7), walls (CSH 8), and a terrace (CSH 9).

The last main cluster of features observed in the mid-zone is an area to the east of the former main dairy complex. These features were on the east side of a dry streambed. It is unclear if the mounds observed (CSH 6 and CSH 7) were agricultural clearing mounds, but one of the mounds (labeled CSH 6) appeared to have a section of intentionally placed stones. At the transmission line just mauka of this area, an alignment of stones (possibly a terrace; CSH 9) was observed; however, it appears likely that this may have been a result of the construction of the lines or clearing/dozing of the area.

Additional piles of basalt appear in several areas throughout the mid-zone and commercial agricultural zone. There is no apparent organization to the piles, and they are likely the result of prior clearing of the area or were disturbed/altered during past land use.

In summary, a majority of the observed historic properties are situated within a relatively undeveloped strip of land fronting the Koʻolau Mountain range (i.e., the upland forest zone and mid-zone of the Project area) (see Figure 4-2). The relative absence of historic properties within the commercial agricultural zone of the project area is attributed to extensive historic and modern land modifications (i.e., grading and crop cultivation) associated with sugar cultivation and dairy farming.

4.5.3 Potential Impacts and Mitigation

The results of the field inspection indicates that numerous pre- and post-Contact historic properties are present within the master plan area. A high concentration of these historic properties have been identified within the upland forest and mid-zone portions of the Project Area. Though the commercial agricultural zone portion of the project area has been heavily disturbed by prior land use, it is possible that historic properties associated with plantation era or subsequent dairy operations are still present in this zone. No archaeological inventory survey (AIS) level study has been conducted for the project to date.

In general, for any projects associated with the Waimanalo Research Station Master Plan that may potentially impact historic properties within the study area, consultation with the State Historic Preservation Division (SHPD) should be conducted regarding historic property identification and mitigation measures, as appropriate. This may include the need for an AIS to identify and/or further document significant historic properties that may be present.

To assist with CTAHR's planning of future projects within the Project Area, an AIS of the core area of CTAHR's future operations (determined to be the area within the Project Area below 200 ft AMSL) is recommended to be conducted in consultation with SHPD. This area is approximately 138 acres in size.

For the areas above 200 ft AMSL (encompassing much of the upland forest and mid-zone areas), consultation with SHPD should be conducted prior to any projects that may potentially impact historic properties. It is recommended that AISs are conducted for these future projects in consultation with SHPD.

4.5.3.1 Proposed Archaeological/Cultural Preserve

The proposed concept plan for the Project Area identifies a general area around Pueo Heiau and other cultural sites as an Archaeological/Cultural Preserve. The boundaries of this preserve should be identified in consultation with Ke Kula Nui o Waimānalo (KKNOW) and the SHPD. KKNOW is a grassroots community-based 501(c)(3) non-profit organization with a mission to advance sustainability of the Waimānalo community through native cultural activities. A Memorandum of Understanding (MOU) for Cooperation and Exchange was executed in March 2021 between the University of Hawaiʻi, for the benefit of CTAHR, and KKNOW. The parties of the MOU agree to cooperate on activities concerning native cultural and educational activities associated with the Archaeological/Cultural Preserve at the Waimānalo Research Station.

The preserve is envisioned to be accessible to community groups for restoration, cultural and educational activities. No permanent structures are envisioned in this area, although a hale structure may be erected to provide shelter for program participants.

A Preservation Plan should also be developed for the preserve, which should include Pueo Heiau (SIHP # -1031). The Preservation Plan would be reviewed and approved by SHPD in accordance with HRS Chapter 6E. The proposed Archaeological/Cultural preserve is expected to have a long-term positive impact on archaeological and cultural resources.

4.5.3.2 HRS Chapter 6E Consultation

A meeting with State Historic Preservation Division staff was held on March 2, 2022 to discuss the Waimānalo Research Station Master Plan and CTAHR's proposed approach to future SHPD consultation and AIS. The LRFI and supporting documentation have been submitted via the Hawaiʻi Cultural Resource Information System (HICRIS) portal, requesting SHPD review and written comment in accordance with HRS §6E historic preservation requirements. CTAHR is also requesting SHPD concurrence with its proposed approach to future consultation and AIS.

4.6 Cultural Resources

A Cultural Impact Assessment (CIA) was prepared by Honua Consulting (January 2022) for the proposed project to comply with the State of Hawaiʻi's environmental review process under HRS Chapter 343 and HAR §11-200.1. The CIA is included as Appendix E.

The cultural impact assessment looks to assess the Proposed Action's potential impacts on historic and cultural resources and, at a minimum, describe: a) any valued cultural, historic, or natural resources in the area in questions, including the extent to which traditional and customary native Hawaiian rights are exercised in the area; b) the extent to which those resources—including traditional and customary native Hawaiians rights—will be affected or impaired by the Proposed Action; and c) the feasible action, if any, to be taken to reasonably protect native Hawaiian rights if they are found to exist.

4.6.1 Background

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to protect and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups. To assist decision makers in the protection of cultural resources, Chapter 343, HRS and Hawaiʻi Administrative Rules (HAR) § 11-200 rules for the environmental impact assessment process require project proponents to assess proposed actions for their potential impacts to cultural properties, practices, and beliefs.

This process was clarified by the Act 50, Session Laws of Hawaiʻi (SLH) 2000, which recognized the importance of protecting Native Hawaiian cultural resources and required some environmental review documents include the disclosure of the effects of a proposed action on the cultural practices of the community and state, and Native Hawaiians in particular. Specifically, the Environmental Council suggested the CIAs should include information relating to practices and beliefs of a particular cultural or ethnic group or groups. Such information may be obtained through public scoping, community meetings, ethnographic interviews, and oral histories.

The State and its agencies have an affirmative obligation to preserve and protect Native Hawaiians' customarily and traditionally exercised rights to the extent feasible. State law further recognizes that the cultural landscapes provide living and valuable cultural resources where Native Hawaiians have and continue to exercise traditional and customary practices, including hunting, fishing, gathering, and religious practices. In *Ka Paʻakai O Ka ʻĀina v. Land Use Commission ("Ka Paʻakai")* the Hawaiʻi Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. A *Ka Paʻakai* analysis has been completed for the proposed action and is included in the CIA and discussed below.

4.6.2 Existing Conditions

The CIA provides information concerning the ahupuaʻa of Waimānalo, focusing on areas near or adjacent to the project area. It provides an historic background of the area, characterizing the Hawaiian cultural landscape in the traditional period, and general land use patterns and change in the historic period, i.e., following the disintegration of the traditional kapu system (circa 1820). More recent

information is also provided specifically on the project area, including its use for sugar production and ranching, and most recently, its use by Meadow Gold Dairies until operations ceased circa 2002.

The overview of cultural and historic resources in the project area was obtained using thorough literature review, community and cultural practitioner consultation, and high-level, project-specific surveys.

As discussed in Section 4.5 of this Draft EA, Historic and Archaeological Resources, historic properties identified in the current project area include:

1. Pueo Heiau, a traditional (pre-Contact) Hawaiian ceremonial site formally described as an enclosure (SIHP # -1031);
2. A pair of field-clearing mounds built by plantation workers in the historic period (SIHP # -5876); and
3. Portions of the Kailua and Maunawili ditches (components of SIHP # -4042, the Waimanalo Irrigation System) built about a century ago.

The CIA notes that of these sites, Pueo Heiau is the most significant to Hawaiians, cultural practitioners, and other members of the community who take an interest in wahi pana (legendary places) and other material remains of "old Hawaiʻi." Recognizing the elevated significance of this heiau, a cultural and archaeological preserve is proposed to protect it in perpetuity.

Information from lineal and cultural descendants is instrumental in procuring information about the project area's transformation through time and changing uses. A notice was placed in the *Ka Wai Ola*, published by the Office of Hawaiian Affairs (October 2021 edition) seeking consultation with cultural practitioners, Native Hawaiian Organizations, stakeholders, and other individuals regarding historic or cultural resources or traditional practices that may be impacted by the project. Additionally, letters were sent to area organizations inviting their participation. Interviews were conducted with five recognized cultural experts, and additional moʻolelo from a sixth individual was included in the CIA.

The data obtained from these interviews helped to identify additional resources and practices in the area and to confirm the research conducted for the CIA. Summaries of all interviews are included in the CIA.

4.6.2.1 Ka Paʻakai Analysis

The 1995 Hawaiʻi Supreme Court decision, Public Access Shoreline Hawaii v. Hawaii County Planning Commission ("PASH"), established that the State of Hawaiʻi has an "obligation to protect the reasonable exercise of customary and traditionally exercised rights of Hawaiians to the extent feasible." In 2000, in the Ka Paʻakai decision, the Court established a framework "to help ensure the enforcement of traditional and customary Native Hawaiian rights while reasonably accommodating competition private development interests."

Based on the guidelines set forth in *Ka Paʻakai*, the Hawaiʻi Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and

customary Native Hawaiian rights, while reasonably accommodating competing private development or other interests. The Court has stated: "that in order to fulfill its duty to preserve and protect customary and traditional Native Hawaiian rights to the extent feasible, as required by Article XII, Section 7 of the Hawaiʻi Constitution, an administrative agency must, at minimum, make specific findings of fact and conclusions of law as to the following:

1. The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.
2. The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and
3. The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist."

Identification of Valued Cultural, Historical or Natural Resources

The first test - "The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area"—actually consists of two separate elements: a) the simple identification and existence of valued cultural, historical, or natural resources; and b) access to the resource, both physical access and cultural protocols.

The CIA shows there are potentially resources within the project area, the primary of which is access to other cultural sites. The interviews conducted for the CIA indicate there are otherwise no current traditional cultural resources in the area used for traditional or customary practices, but based on the ethnographic data, practitioners may access mauka lands and the resources located there through the Study Area.

Extent of Effect or Impairment by Proposed Action

The CIA notes that the second test—"The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action"—considers direct impacts on the resource, as well as indirect and cumulative effects that could harm resources or access to resources.

The CIA mentions concerns expressed by informants that the project would adversely impact native flora and fauna. The project should incorporate the recommendations from the biological assessment to minimize any potential impacts to biological resources in the area, including any biological resources with cultural use.

Feasible Action to Protect Native Hawaiian Rights

The third part of the *Ka Paʻakai* framework aims to identify "[t]he feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist." Determining whether or not action

has been suitably "feasible" is a matter for the State. These feasible actions could include continued access to the Project Area as needed to conduct cultural practices. As noted, there is a trail access through the subject property. Additionally, multiple practitioners noted that plants are gathered in the project area or near the project area. As long as access was maintained, any potential effect to traditional or customary practices would be minimized.

Further, many interviewees noted that previous prior ownership of the property actually prevented cultural activities. It notes that acquisition of the property by CTAHR and the ensuing community partnerships may result in a beneficial impact on traditional or customary rights. Nonetheless, archaeological monitoring and cultural monitoring in culturally sensitive areas should be utilized, and area practitioners should be engaged in these activities to the extent practicable.

4.6.3 Potential Impacts and Mitigation

Based on information gathered from the cultural and historical background and approved community consultations, the project has the following potential impacts and recommended mitigation:

- There are no current traditional cultural resources in the area used for traditional or customary practices, but based on the ethnographic data, practitioners may access mauka lands and the resources located there through the Study Area.
- The primary potential cultural resource within the Project Area is access to other cultural sites, including Pueo Heiau.
- Recommendations from the biological assessment should be followed to minimize any potential impacts to biological resources in the area, including any biological resources with cultural use.
- The proposed project has the potential to have a significant beneficial impact to cultural resources and traditional or customary practices in the area. This would be primarily achieved through continued partnership with local nonprofits like Ke Kula o Waimānalo.
- The most beneficial partnership would be for the stewardship of cultural resources within the Project Area.
    - Ke Kula o Waimānalo has demonstrated expertise and success in establishing cultural workdays and cultural accesses.
    - A similar program established in the Project Area in partnership with CTAHR would not only enhance access but would potentially increase the number of practitioners conducting traditional or customary practices in the area.

4.7 Socio-Economic

4.7.1 Existing Conditions

Waimānalo is located within the City and County of Honolulu's Koʻolau Poko region, one of eight geographic planning areas on Oʻahu, stretching from Waimānalo northward to Kailua, Kāneʻohe, and

Kahalu‘u. Waimānalo is a rural and agricultural community that has experienced successive years of farming and ranching use, starting with the creation of the Waimānalo Sugar Company in the late nineteenth century. The Project Area has a history of ranching and dairy use for most of the 20th century. Agriculture is the major industry in the greater Waimānalo area, and the surrounding lands include a variety of operations such as dairies, nurseries, ornamental crops, tropical food orchards, truck crops, and agricultural research. Residential homes, community businesses, parks and recreational facilities, a school and library, and Bellows Air Force Station are also located in the surrounding area of Waimānalo.

The 2020 U.S. Census reports that the Waimānalo Census Data Place (CDP) has a total population of 6,057, an 11.1% increase from 2010 (5,451 persons). The racial composition of the Waimānalo census data place (CDP) is shown in Table 4-2 below. Waimānalo has a larger percentage of individuals identifying as being of two or more races (43.3%), compared to Honolulu County (22.8%). Of the individual identifying as one race, Waimānalo had a lower percentage of whites and Asians than Honolulu County, and a higher percentage of native Hawaiian and Pacific Islanders.

In 2010, the median household income in Waimānalo was $102,656 (2019 dollars), compared to the median income in the City and County of Honolulu of $85,857. The higher household income is largely due to the larger average household size in Waimānalo, 4.62 persons compared to 3.03 persons for the County as a whole. When per capita income is compared, Waimānalo has a lower per capital income of $29,868 compared to $36,816 for Honolulu. Waimānalo also had 12.7 percent of its population in poverty, compared to 7.9 percent for Honolulu City and County.

Waimānalo has a higher percentage of owner-occupied housing units at 72.0%, compared to 56.2% County wide. Median gross rent is $1,292, slightly below the County median of $1,745.

Table 4-2: 2020 Census: Racial Characteristics of Waimānalo CDP

	Waimānalo CDP	City & County of Honolulu
White alone	9.6%	21.6%
Black, African American	0.0%	2.8%
American Indian, Alaskan native	0.0%	2.8%
Asian alone	21.1%	42.9%
Native Hawaiian & Other Pacific Islander	25.8%	9.6%
Two or more races	43.3%	22.8%
Hispanic or Latino	12.9%	10.0%
White alone, not Hispanic or Latino	9.2%	17.9%

Source: U.S. Census Bureau, Quick Facts, 2021

4.7.2 Potential Impacts and Mitigation

The proposed expansion of the CTAHR Waimānalo Research Station is expected to have a positive socio-economic impact on the Waimānalo community, the greater Koʻolau Poko region, and the State-wide agricultural industry. The proposed activities involve state of the art research and demonstration projects intended to promote economic diversity, sustainability, and a healthy environment.

The expanded research station will return the land to active agricultural use, after nearly 20 years lying fallow. The research activities proposed on the site will not entail large scale commercial farming, but smaller scale projects, intended to promote and demonstrate sustainable agriculture and farming practices.

This will support the community's desire to cultivate more locally grown food. The property includes a varied terrain, from lower elevation, easily cultivable lands to steeper forested areas, ahupuaʻa concept for land use and natural resource management.

The technical assistance provided by CTAHR's Cooperative Extension Service and CTAHR staff will directly benefit the Waimānalo farming community, and research findings will have practical applications both locally and state-wide. Public education and technical assistance are a major part of CTAHR's mission, and community involvement will be an important component at the proposed research station. The Education Center will provide a venue for workshops, classes, and the expansion of programs such as the Agricultural Diagnostic Service Center and community gardens.

The proposed archaeological preserve will protect important historic features on the property that are largely unknown to the public. In coordination with an established community group, limited visitation to these resources will be allowed. This will open up an area that is currently inaccessible, and provide new opportunities for community-initiated restoration, visitation, and educational activities.

The best management practices area around the stream provides places where water quality, erosion control and wetland, and watershed restoration projects can be implemented. Proposed demonstration areas for soil and water conservation, home wastewater treatment, rainwater catchment, ecological restoration and watershed management will have positive benefits Statewide. Community concerns about invasive plants and the need to cultivate more native species are also directly addressed through concept plan areas identified for entomology research, and reforestation in the mauka areas.

Adverse impacts to the surrounding community will be minimal. Unlike previous tenants of the property, there will not be large numbers of animals on site or confined animal feeding operations. Plant and animal wastes will be composted on site and "dry litter" systems will be used to provide environmentally sound waste management. There will be no potentially obnoxious waste treatment methods such as sewage lagoons or injection wells. Noise and odors will be similar to that from other farming and agricultural properties in the area.

The proposed expansion of the Waimānalo Research Station will have a positive socio-economic impact to Waimānalo community, the university, and the agricultural and farming industry throughout the State.

4.8 Infrastructure and Utilities

A Preliminary Engineering Report (PER) was prepared by Coffman Engineers (Appendix A). The PER provides a civil and electrical assessment of the Project Area and focuses on establishing sewer, domestic water, and irrigation demands; meeting Low-Impact Development (LID) measure requirements; and compliance with the established City and County of Honolulu Rules Relating to Water Quality.

The following sections on potable and non-potable water, wastewater, and electrical and telecommunication facilities are from the PER. More detail and calculations can be found in Appendix A.

4.8.1 Potable Water

4.8.1.1 Existing Conditions

Potable water service to the project site is provided by a 2-inch water meter from the Board of Water Supply (BWS)'s Waimānalo 230 Reservoir. The meter is connected to a 4-inch water line about half-way between the reservoir and Waikupanaha Street. The maximum flow from the meter is 160 gallons per minute (gpm).

The Project Area does not include BWS source well, Waimānalo Well III, which is located near the southeastern boundary in the area designated for Forestry. The well is on a separate TMK parcel 4-1-008:098.

4.8.1.2 Potential Impacts and Mitigation

Potable water service will be required to serve the proposed site structures such as the farm manager's residence, educational center and associated offices and classrooms. Water demand calculations in the PER are based on the Board of Water Supply, City and County of Honolulu, State of Hawai'i Water System Standards (2002) and assume a consumption usage demand of 60gals/student for Schools Zone Designations. The estimated potable water service demand for the education center building is calculated to be peak hour demand of 11 gpm and maximum daily demand of 2,700 gpd (See Appendix A, Exhibit 9, Water Demand Calculations).

A new 2-inch line lateral connection can be tied to the existing 4-inch water line, located at the half-way point between the reservoir and Waikupanaha Street, to provide service to the proposed education center, and animal shelters and support facilities. The existing 4-inch water line is connected to the existing 2-inch water meter from BWS, which will need to be reactivated. Usage restoration will need to be approved by BWS prior to reactivation. Water pressures will need to be verified for minimum requirements prior to reactivation of water service. Another potential source of potable water could be to capture and process rainwater and merits further investigation.

Potable water will also be required for the livestock raised on site. Water needs for livestock will vary significantly depending on the animal species. The estimated number of animals on the property is 20 sheep and/or goats (combination of the two); 150 pigs; and 30 chickens. CTAHR currently does not plan to include cows on site. The maximum number of animals envisioned on site is 60 to 70 sheep and/or goats; 300 pigs; and 50 chicken. Although not currently anticipated, it is possible that future research

needs and the status of CTAHR's other animal research stations require that cows be included. At most, there would be 100 head of cattle at the site.

Table 4-3 presents the potable water demand for livestock requirements; assuming the high-end (maximum) livestock population for the water demand of 100 cows, 300 pigs, and 70 sheep, it would require approximately 4,710 gallons of potable water daily or 15 gpm.

Table 4-3: Livestock Potable Water Requirements

Livestock	Gallons Per Day Required (gpd)
Dairy Cow	30
Beef Cattle	7 - 5
Swine	5
Grazing Sheep	2 - 3

BWS Waimānalo III Well

In an early consultation letter dated September 13, 2021 (see Chapter 8, Agencies and Organizations Consulted), the BWS noted the presence of its Waimānalo III well adjacent to? the Project Area, and had the following comment:

Any proposed developments shall verify with the State Department of Health regarding wastewater disposal systems that are allowable within the "No Pass Zone." Ground disposal of wastewater could detrimentally impact the underlying freshwater aquifer; therefore, no wastewater system shall be within 1,000 feet of BWS potable water sources.

The well is on a separate TMK parcel and will not be impacted by the Proposed Action. The Project Area lands surrounding the well are designated for Forestry Use, and no wastewater facilities are proposed within 1,000 feet of the well. The project will have no direct, indirect or cumulative impact on this well or the underlying aquifer.

4.8.2 Non-Potable Water

4.8.2.1 Existing Conditions

Agricultural water was formerly provided to the Waimānalo area by the Maunawili and Kailua Ditches, two of three irrigation ditches established in the early 1900s by the Waimānalo Sugar Company. Ownership of the ditches was taken over by the Territory of Hawaiʻi in 1947 when Waimānalo Sugar Company ceased its sugar operations. In more recent years, the ditches were maintained by the State of Hawaiʻi Department of Agriculture and provided irrigation water to a number of farmers in Waimānalo, but since have been abandoned.

The CTAHR property is currently served by the Waimānalo Irrigation System (WIS) via a 2-inch lateral PVC pipe extending from an 8-inch PVC lateral which ends near the CTAHR property by Waikupanaha

Street. The WIS collects water from the Maunawili Stream, Ainoni Stream, and Makawao Stream. It supplies approximately 0.4 million gallons of water per day to approximately 1,174 acres of farmland in Waimānalo.

In a September 14, 2021 letter sent during the EA early consultation period (see Chapter 8), the State of Hawaiʻi Department of Agriculture, Agricultural Resources Management Division (ARMD) provided the following comment:

The Waimānalo Irrigation System (WIS) has 8-inch PVC irrigation lines and associated air relief valves within your project area. Please consult with the HDOA ARMD in the development of design plans to avoid disturbance to the existing irrigation system.

4.8.2.2 Potential Impacts and Mitigation

Board of Water Supply (BWS) Rules and Regulations Section 1-112 requires non-potable water for the irrigation of large, landscaped areas (see Chapter 8, letter from BWS dated September 13, 2021).

Non-potable, agricultural water for irrigation will be provided via the existing 2-inch lateral from the State's system. The proposed irrigation system should be designed to avoid disturbance to the existing irrigation systems. Currently, it is unknown whether additional agricultural water will be required for the proposed land uses. If additional water is required, the State Department of Agriculture will be contacted, and a description of the proposed uses provided. There are no plans to develop additional sources of ground water.

Estimated water demand will depend on the types and acreage of crops on the property. As a rough estimate, the BWS lists a rate of 4,000 gallons of water per acre for agricultural areas (various crop types). It is not CTHAR's intent to establish a commercial farm, but to provide crops for research and education.

4.8.3 Wastewater

4.8.3.1 Existing Conditions

The sewer system on the property consists of four cesspools to dispose of domestic wastewater effluent. No other existing wastewater structures exist on site. The size and quantity of treatment for the cesspools are unknown. Cesspool locations are shown in the Preliminary Engineering Report (Appendix A, Exhibit 6, Utility Map).

4.8.3.2 Potential Impacts and Mitigation

According to the PER, sewer systems shall be designed based on an average wastewater flow of 30 gallons per capita per day (gpcd). Development on the site would create an additional wastewater flow of 36-gpm, based on the demand generated by the education center. Sewer demand calculations are included in the Preliminary Engineering Report (Appendix A, Exhibit 7).

It is assumed that the current wastewater treatment and disposal method would not be able to accommodate the additional flow and does not meet current State of Hawaiʻi standards for wastewater treatment.

As stated by the State of Hawaiʻi Department of Health (DOH) Administrative Rules Chapter 62 Wastewater Systems, section 11-62-06—General Requirements, "All buildings and places of assembly generating wastewater or with toilets, sinks, drains, or other plumbing fixtures capable of conveying wastewater and located within or near an available public sewer system as determined by the director, shall connect to the public sewer.".

To meet the requirements of the DOH Administrative Rules, the first option to manage the project site wastewater flow is to connect into the existing City and County of Honolulu sanitary sewer main located at the Nonokio St. and Hihimanu St. intersection. A new main, approximately 3,700 linear feet, from the project site to the Hihimanu St. main sewer connection would be required. A sewer connection application was submitted to Department of Planning and Permitting (DPP) to confirm service connection to the sewer main, however the response from DPP was that the location of the new sewer connection could not be confirmed. The status of the sewer connection application is indicated as "approved with conditions", such conditions entail that construction plans would need to be submitted for review and approval.

An Industrial Wastewater Discharge Permit (IWDP) may be required when applying for the sewer connection at the time of development.

A second option, if determined that a connection to an available public system is not viable, are up to two 1,000-gallon capacity septic tanks to be provided on site; one each for the farm manager's home and education center. This will also accommodate the occasional peak demand from visitors and special events. Each of the septic tanks shall employ a leaching field of sufficient area to absorb the effluent from the septic tank.

A third option explores installing composting toilets for the property. Future development of buildings and facilities, in addition to the educational center and associated facilities, are only conceptual at this time, and are not incorporated into the sewer calculations of this report.

4.8.4 Electrical and Telecommunication Facilities

4.8.4.1 Existing Conditions

Electrical and telephone services are provided to the site by Hawaiian Electric Company (HECO) and Hawaiian Telcom (HT) via overhead lines from Waikupanaha Street.

4.8.4.2 Potential Impacts and Mitigation

There are existing overhead utilities running along Waikupanaha Street consisting of HECO 12.47KV, three phase primary, HT, and Spectrum CATV facilities. Therefore, the project area can be served by extending HECO three phase primary power lines, HT telephone lines, and Spectrum CATV lines from Waikupanaha Street near Nonokio Street intersection into the site.

Service will be required for the farm manager's residence, educational center, and research facilities. Electrical, telephone, and CATV services will be required for proposed buildings and structures and security lighting throughout the property. A section of the existing overhead utilities appears to run

through the proposed project site and may need to be relocated or re-routed if in conflict with the proposed development plans. During project design, project plans will be submitted to HECO, HT, and Spectrum to request new service and for review and comments to ensure adequate service and to mitigate any impacts to utility facilities or service and to conform to each utilities respective design standard.

4.9 Solid and Hazardous Waste

4.9.1 Solid Waste

4.9.1.1 Existing Conditions

The Waimānalo convenience center is a drop-off area for residential waste material only located on Hihimanu Street. Commercial solid wastes are hauled to the H-POWER, the city's waste-to-energy plant, or to the Waimānalo Gulch Landfill in Leeward Oʻahu.

A covered composting facility will be established on the new research station for green waste as well as swine and poultry waste and slaughter waste. Compost can be used for crops within the research station. There are no plans for other waste treatment methods such as swine lagoon or injection wells.

4.9.1.2 Potential Impacts and Mitigation

No adverse impacts associated with livestock waste management are anticipated. Items that cannot be composted or recycled will be disposed at the HPOWER plant. Construction period debris and waste will be removed from the Project Area. The construction contractor will dispose of all debris at DOH-approved City and County disposal or recycling facilities, and in accordance with applicable City, State, and Federal requirements.

4.9.2 Hazardous Waste

A Phase I Environmental Site Assessment (ESA) for the property was 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. The Phase I ESA is included as Appendix F.

The purpose and goal of the 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."

The scope of work for the ESA included an evaluation of user-provided information; evaluation of information in environmental data bases; visual reconnaissance of the property and adjacent properties; interviews with owners, site managers, local government officials and individuals with knowledge of

past and prior use; and a Tier 1Vapor Encroachment Screening (VES) for the property in conformance with ASTM Practice E2600-15.

4.9.2.1 Existing Conditions

Visual Observation

Visual observation for the use and/or storage of hazardous materials and hazardous waste was performed by ETC on August 24, 2020. Visual inspection of the Subject Property (i.e., Project Area) indicated that the groundcover generally consists of dense vegetation and bare soil with limited areas of asphalt and concrete pavement. An abandoned steel and CMU structure which sat on a concrete pad was observed in the location of the former Meadow Gold Dairy on the central portion of the Subject Property. Next to the structure was an approximate 15,000-gallon above ground storage tank, which was reportedly formerly used to store water. The tank was rusted but appeared to be intact with no evidence of leaks or staining on the ground. No significant findings to indicate any additional suspect recognized environmental conditions (RECs), historical RECs, controlled RECs, or *de minimis* conditions were identified during ETC's site reconnaissance of the subject property.

User-Provided Information

Historical information on the Project Area was provided to ETC by the CTAHR WRS farm manager, whose knowledge of the property and surrounding area dates back approximately 30 years.

It was confirmed that Unisyn operated on the Subject Property from 1984 to 1999 (discussed previously in in Chapter 2, Section 2.2). The closure of Unisyn's facility was conducted under the State Department of Health (DOH) oversight and direction. Because Unisyn was unable to complete clean-up of its operations, Meadow Gold Dairies completed the closure of the site to clean up the residual biowaste and other remaining. File review indicated that Meadow Gold submitted a Final Closure Report to the DOH and on August 26, 2003, the DOH issued a letter indicated that no further action was required regarding the cleanup of waste materials accepted by Unisyn.

Based on these findings, ETC concluded that the former Unisyn facility is not considered a REC for the Subject Property. No other significant findings indicate suspect RECs, historical RECs, or *de minimi*s conditions.

Environmental Data Base Information

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 radius search report focused on the Subject Property and adjacent properties within a specified radius, that may impact the Subject Property.

The Subject Property was listed as a leaking underground storage tank (LUST); underground storage tank (UST); and a SPILLS and FINDS-NPDES site by the contracted database. File review of the *Meadow Gold Dairies (Facility ID No. 9-202526)* LUST/UST facility file indicated that a release was reported in April 1993 during the removal of two 2,000-gallon capacity USTs (containing diesel and gasoline). Release

response activities were conducted including over-excavation of contaminated soils and groundwater sampling. 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. Final release response documentation indicated that residual petroleum contaminants were not detected in the soil, stockpiled soil or groundwater. As a result, on June 25, 2004, the facility was issued a letter indicating that 'no further action' was required in response to the UST release. Based on these findings, ETC believes this finding is not a REC. File review indicated that the SPILLS and FINDS listings were not considered RECs.

In addition to the Subject Property findings, the contracted database search identified one CERCLIS-NFRAP site, five SHWS sites, three LUST sites, one UST site, and three Orphan sites within the specified radii around the property. Based on ETC's database and file review of these facilities, none of the database-identified facilities are considered a significant concern for the Project Area.

4.9.2.2 Potential Impacts and Mitigation

The Phase I ESA by ETC revealed no evidence of recognized environmental conditions in connection with the Waimānalo Research Station Project Area. Previously identified concerns with a leaking underground storage tank have been adequately remediated to the satisfaction of the State DOH. There are no existing hazardous material concerns on or around the property that will have an adverse impact on future uses of the property.

Future activities on the property may include the use and storage of fuels, solvents, fertilizers, pesticides, herbicides, and veterinary chemicals. Best practices will be implemented, and all applicable State and federal guidelines and regulations will be followed in the storage, use, and disposal of these substances.

4.10 Transportation and Roadways

A Traffic Impact Analysis Report (TIAR) for the proposed project was prepared by Austin, Tsutsumi & Associates and is included as Appendix G. The TIAR addresses the following:

- Assess existing traffic operating conditions during the weekday AM and PM peak hours of traffic within the study area.
- Traffic Projections for Base Year 2045 (without the Project).
- Estimate the vehicular trips that will be generated by the Project.
- Traffic projections for the Project for Future Year 2045 (with Project).
- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the Project

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), 6th Edition, includes methods for calculating volume-to-capacity (v/c) ratios, delays, and corresponding LOS that were used in this study.

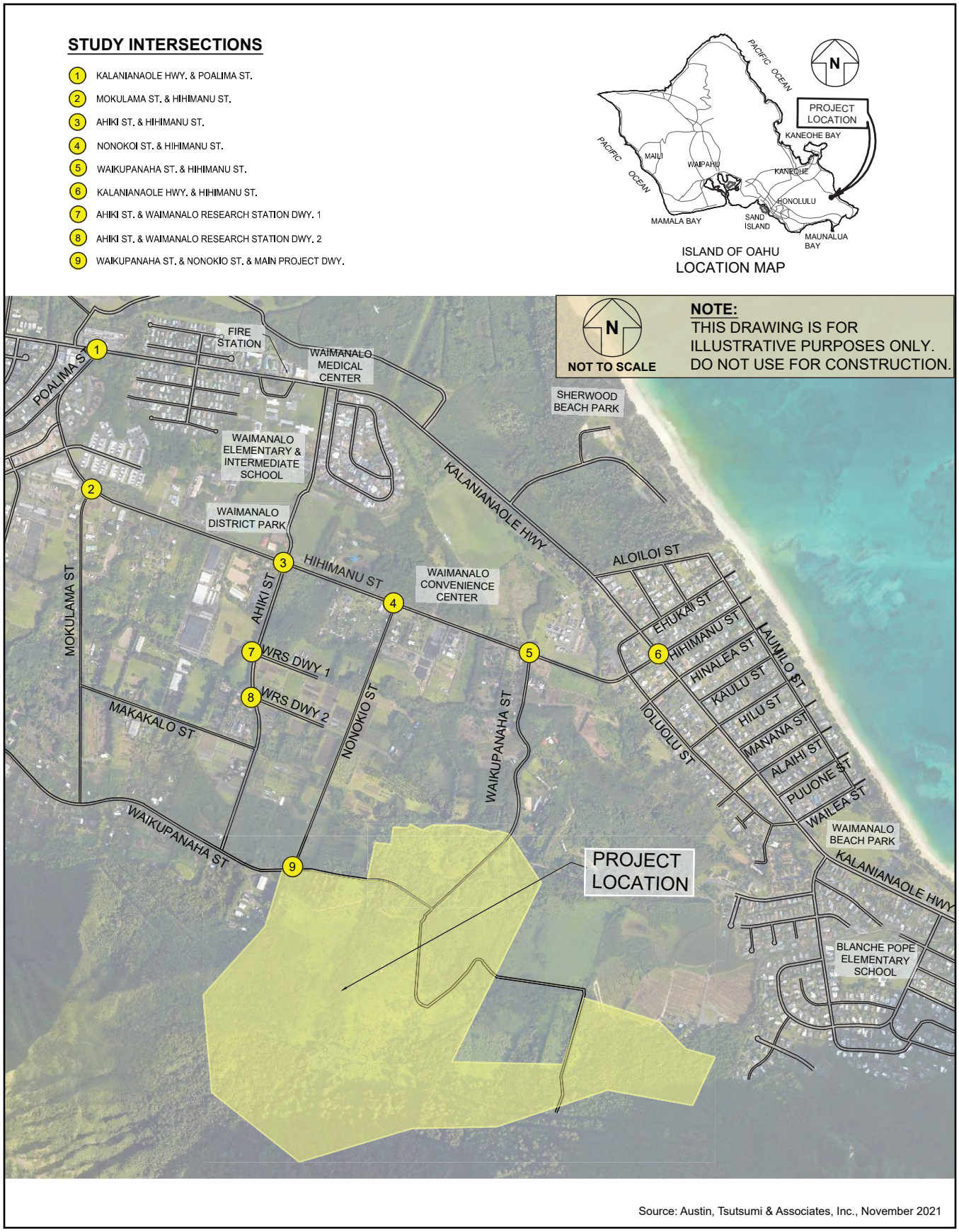
The TIAR study area, shown in Figure 4-3, included nine intersections in the vicinity of the WRS Project Area, including several intersections along Kalaniana‘ole Highway. Based on the vehicular delay at each intersection, a LOS is assigned to each approach and intersection movement as a qualitative measure of performance. These results, as confirmed or refined by field observations, constitute the technical analysis that will form the basis of the recommendations outlined in the TIAR.

4.10.1 Existing Conditions

Current access to the project site is through an existing driveway on the east side of Ahiki Street, approximately 2,000 feet south (mauka) of its intersection with Hihimanu Street.

4.10.1.1 Pedestrian Facilities

Sidewalks and/or a pedestrian walkway are provided along the south side of Kalaniana‘ole Highway throughout the traffic study area. Sidewalks are also provided along the north side of Hihimanu Street between Kakaina Street and Ahiki Street. There are no existing dedicated pedestrian facilities on the remaining roadways within the study area. Pedestrian facilities in the study area are shown in the TIAR, Appendix G, Figure 2.1.



Source: Austin, Tsutsumi & Associates, Inc., November 2021

Traffic Impact Analysis Report Study Intersections **Figure 4-3**

Waimānalo Research Station Master Plan

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4.10.1.2 Bicycle Facilities

According to the *Oahu Bike Plan* (December 2019), Kalaniana‘ole Highway is currently a shared roadway between Kumuhau Street and Oluolu Street. There are currently no existing dedicated bicycle facilities on the remaining roadways within the study area. However, the *Oahu Bike Plan* has proposed Hihimanu Street, Waikupunaha Street, and Ahiki Street as signed shared roadways (i.e., signing as preferred bike routes). In addition, a shoulder bikeway is planned along Kalaniana‘ole Highway throughout the study area. Bicycle facilities are shown in the TIAR, Appendix G, Figure 2.1.

4.10.1.3 Bus Transit

O‘ahu Transit Services (OTS) operates TheBus with a fleet of 542 fixed-route buses and services most populated areas of the island. The following bus routes run through the study area along Kalaniana‘ole Highway**:**

- Route 67—Honolulu/Kailua/Waimānalo/Sea Life Park
- Route 69—Kaneohe/Waimānalo/Sea Life Park
- Route 89—Waimānalo/Kailua Express

Route 67 provides daily service and generally runs from 5:00 AM to 12:00 AM during weekdays with service approximately every 30 minutes. Route 69 provides daily service and generally runs from 6:00 AM to 10:30 PM during weekdays with service approximately every 60 minutes. Route 89 provides weekday commuter service with two (2) AM trips and two (2) PM trips. Transit facilities in the study area are shown in the TIAR, Appendix G, Figure 2.1.

4.10.1.4 Roadway System

The following are brief descriptions of the existing roadways studied within the vicinity of the proposed Waimānalo Research Station:

Kalaniana‘ole Highway is generally a two-lane, two-way, east-west, State roadway with a posted speed limit of 25-35 miles per hour (mph). Kalaniana‘ole Highway provides regional connectivity between Kailua, Waimānalo, and Kahala. This roadway provides direct access to commercial, residential, and recreational areas within the study area.

Poalima Street is generally a two-lane, two-way, north-south County roadway. This roadway provides access to commercial and residential land uses. Poalima Street begins to the north at its signalized intersection with Kalaniana‘ole Highway and terminates to the south as a cul-de-sac. There is no posted speed limit.

Hihimanu Street is generally a two-lane, two-way, east-west County roadway that provides access to commercial, residential, and recreational areas within the study area. Hihimanu Street begins to the west at Poalima Street and terminates to the northeast at Laumilo Street. The posted speed limit is 25 mph.

Waikupanaha Street is generally a two-way, north-south, unmarked County roadway that provides access to residential and agricultural land uses. This roadway is narrow and unimproved with no posted speed limit. Waikupanaha Street has two segments. The first segment begins to the north at Hihimanu Street and terminates to the south as a dead end. The second segment begins near Ahiki Street and travels west till it's terminus near Mahiku Place.

Nonokio Street is generally a two-way, north-south, unmarked County roadway that provides access to residential uses. This roadway is narrow and unimproved with no posted speed limit. Nonokio Street begins to the north at Hihimanu Street and terminates to the south as a dead end.

Ahiki Street is generally a two-way, north-south, unmarked County roadway that provides access to residential and agricultural uses. Ahiki Street begins to the north at Hihimanu Street and terminates to the south at Waikupanaha Street. This roadway is narrow and unimproved with no posted speed limit.

Mokulama Street is generally a two-way, north-south, unmarked County roadway that provides access to residential and agricultural uses. Mokulama Street begins to the north at Hihimanu Street and terminates to the south at Waikupanaha Street. This roadway is narrow and unimproved with no posted speed limit

4.10.1.5 Existing Traffic Volumes

Turning movement traffic counts and field observations were conducted on Thursday, September 2, 2021, at the following traffic study intersections, shown in Figure 4-3:

1. Kalaniana'ole Highway/Poalima Street (signalized)
2. Mokulama Street/Hihimanu Street (unsignalized)
3. Ahiki Street/Hihimanu Street (unsignalized)
4. Nonokio Street/Hihimanu Street (unsignalized)
5. Waikupanaha Street/Hihimanu Street (unsignalized)
6. Kalaniana'ole Highway/Hihimanu Street (unsignalized)
7. Ahiki Street/Waimānalo Research Station Driveway 1 (unsignalized)
8. Ahiki Street/Waimānalo Research Station Driveway 2 (unsignalized)

To account for the potential disruptions to traffic in the Waimānalo area as a result of the impacts of COVID-19, previously collected traffic volume data from the Hawai'i Department of Transportation (HDOT) as well as previous traffic studies were used to estimate the appropriate adjustments to the traffic volumes along Kalaniana'ole Highway and Hihimanu Road.

Based on information provided by CTAHR, average visitors per day have been lower due to COVID-19. Thus, adjustments at the existing Project driveways were made to account for pre- COVID-19 visitor traffic.

Finally, an annual ambient growth rate of 0.80%, which is based on the Oahu Regional Transportation Plan 2040 (ORTP) Travel Demand Forecasting Model was applied to the through movements along Kalaniana‘ole Highway to represent traffic growth between year 2019 and 2021. Traffic volume data is provided in Appendix B of the TIAR.

4.10.1.6 Existing Conditions, Observations, and Intersection Analysis

General Observations:

- Drivers along Kalaniana‘ole Highway were observed to occasionally yield to minor street traffic (including Hihimanu Street) to allow those vehicles to turn onto Kalaniana‘ole Highway.
- Two-stage left-turn lanes or median storage lanes were recently installed along Kalaniana‘ole Highway west of Poalima Street. Drivers along Kalaniana‘ole Highway were also observed to yield to vehicle waiting in the median storage lanes.
- Congestion along Kalaniana‘ole Highway seems to exist as a result of the “small-town” feel and flow disruptions caused by driveways to commercial areas, Waimānalo Elementary and Intermediate School, and drivers stopping for those turning onto or from minor streets.

AM Peak Hour:

- Vehicle queues observed along Kalaniana‘ole Highway stem from the Kalaniana‘ole Highway/Poalima Street intersection and Waimānalo Elementary and Intermediate School. However, vehicle queues along Kalaniana‘ole Highway were generally observed to travel at a steady, but slow speed.
- School traffic around Waimānalo Elementary and Intermediate School was observed to peak at approximately 7:45 AM, leading to an increase of westbound and eastbound vehicle queues at the Kalaniana‘ole Highway/Poalima Street intersection.
- Apart from Kalaniana‘ole Highway, relatively low traffic volumes were observed at the remaining Study Intersections during the AM peak hour.

PM Peak Hour:

- During the PM peak hour, eastbound queues from the Kalaniana‘ole Highway/Poalima Street intersection were observed to occasionally extend beyond Olomana Golf Course.
- Eastbound vehicles along Kalaniana‘ole Highway were observed to slow down prior to the Kalaniana‘ole Highway/Poalima Street intersection to allow pedestrians and vehicles to access the nearby commercial areas, causing the eastbound/westbound green time to occasionally gap out.

- Youth sports practices were observed at the Waimānalo District Park with approximately 25 cars parked at roughly 4:00 PM.
- Apart from Kalaniana‘ole Highway, relatively low traffic volumes were observed at the remaining Study Intersections during the PM peak hour.

Intersection Analysis

To account for the slower speeds and flow disruptions that occur through Waimānalo, the analyzed roadway capacity along Kalaniana‘ole Highway was reduced by approximately 30%. Additionally, to account for the driver yielding behavior observed at the Kalaniana‘ole Highway/Hihimanu Street intersection, the northbound minor street critical headway was reduced by roughly 15% during the PM peak hour.

All movements at the Study Intersections currently operate at LOS D or better during the AM and PM peak hours of traffic.

Kalaniana‘ole Highway/Poalima Street

The westbound and eastbound through movements were observed to operate near capacity during the AM and PM peak hours of traffic, respectively, with some vehicle queuing observed. As mentioned above, vehicles along Kalaniana‘ole Highway were observed to yield to minor street movements and commercial area traffic, resulting in the eastbound/westbound green time occasionally gapping out, especially during the PM peak hour.

The TIAR, Table 2.1 (Appendix G) shows a summary of the existing delay, v/c ratio, and LOS. TIAR Figure 2.2 shows the existing traffic volumes and lane configuration at the Study Intersections.

4.10.2 Potential Impacts and Mitigation

The existing Waimānalo Research Station is located east of Ahiki Street between Hihimanu Street and Waikupanaha Street. The proposed Project expansion is mostly located south of Waikupanaha Street. Access to the Project is proposed via future roadway extensions at the Waikupanaha Street/Nonokio Street/Main Project Driveway intersection.

The implementation of the master plan at the WRS will occur over a 10 to 20-year period, as funding and other resources become available, with full buildout anticipated by 2045. Parking for future uses, including the education center, will be provided on the site. The Future Year 2045 scenario represents the traffic conditions within the TIAR study area with the full build-out of the Project.

4.10.2.1 Trip Generation

A description of proposed land uses and estimated number of people and vehicles at the proposed WRS was provided in Chapter 2 of this EA. That information was used by the traffic engineers to estimate the increase in the number of vehicular trips generated by the Proposed Action.

Daily trips are expected by CTAHR principal investigators (PI), graduate students, staff, volunteers, and visitors. As shown in Table 4-4 below, the Project is estimated to generate 157 daily trips.

Occasional trips are expected to/from the proposed WRS. Occasional trips include class field trips, community events, and workshops with 20-100 attendees per trip/event. Occasional trips were assumed to be infrequent and represent atypical traffic patterns, and thus, were not included in the daily Project trips.

Table 4-4: Daily Project Trips

Department/Land Use	Number of Daily Trips
Full-Time Staff	22
Animal Department	10
Plants Department	12
GoFarm Hawai‘i	80
Forestry Department	8
Cultural Activities	25
Total	157

Based on the concept plan described in Chapter 2, work hours are between 7:00 AM and 3:30 PM, however some PIs and graduate students come in earlier and leave later extending the work hours between 6:00 AM and 6:00 PM. The daily project trips are expected to occur throughout the day. The portion of trips expected to occur during the AM and PM peak hours were determine based on existing staff, average visitors per day, and existing peak hour traffic patterns at the two (2) existing WRS accesses on Ahiki Street.

As shown in Table 4-5, the Project is projected to generate 52(30) new trips during the AM(PM) peak hours of traffic. Trips generated by the proposed land uses within the Project Area were assigned throughout the study area generally based upon existing traffic patterns and the proposed site plan. They are shown below in vehicles per hour (vph).

Table 4-5: Project Trip Generation

	AM Peak Hour			PM Peak Hour		
Land Use	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Proposed Expansion	37	15	52	0	30	30

4.10.2.2 Future Year 2045 Analysis

Under Future Year 2045 conditions, all traffic movements are expected to continue operating similar to Base Year 2045 conditions during both the AM and PM peak hours with the exception of the following intersection movements:

Kalaniana‘ole Highway/Poalima Street

The westbound left-turn movement is expected to operate at LOS E, with an increase in vehicle delay of roughly 6 seconds.

The intersection movements operating at LOS E/F and/or overcapacity under Base Year 2045 conditions will continue to operate similarly under Future Year 2045 conditions. The reduction of traffic operations (LOS and capacity) can mostly be attributed to the volume increases due to the projected background growth. For example, the Project-generated trips only account for roughly 1.2% and 0.70% of the Future Year 2045 volumes at the Kalaniana‘ole Highway/Poalima Street intersection during the AM and PM peak hours, respectively. Similarly, the Project-generated trips only account for roughly 1.6% and 0.80% of the Future Year volumes at the Kalaniana‘ole Highway/Hihimanu Street intersection during the AM and PM peak hours, respectively. Additionally, drivers along Kalaniana‘ole Highway were observed to occasionally yield to minor street traffic to allow those vehicles to turn onto Kalaniana‘ole Highway.

Details on future year delay, v/c ratio and LOS are provided in the TIAR, Appendix G, Table 4.3. Information about traffic volumes and lane configuration at the study intersections are also provided in the TIAR.

4.10.2.3 Recommendations

The TIAR notes that congestion along Kalaniana‘ole Highway exists as a result of the “small-town” feel and flow disruptions caused by driveways to commercial areas, Waimānalo Elementary and Intermediate School, and drivers stopping for those turning onto or from minor streets. However, no regional improvements are currently planned, and it is possible that widening Kalaniana‘ole Highway could alter its “small town” rural feel. Congestion along Kalaniana‘ole Highway is expected to increase by 2045 as a result of anticipated general increases in overall traffic not necessarily related to the Proposed Project, leading to overcapacity conditions at the Kalaniana‘ole Highway/Poalima Street intersection. Consequently, improvements to improve conditions at this intersection were explored.

According to a sensitivity analysis conducted for both the AM and PM peak hours at the Kalaniana‘ole Highway/Poalima Street intersection, the addition of a northbound left-turn lane improves the northbound through/right-turn movement ratio by approximately 75%. This is also reflected in a decrease in delay for this movement. All other movements are anticipated to operate similarly to Future Year 2045. While the northbound traffic would improve, this particular improvement does not address the prevailing congestion along Kalaniana‘ole Highway.

The addition of an eastbound right-turn lane was determined to improve eastbound through, eastbound right-turn, and westbound left-turn movements during both the AM and PM peak hours. In this scenario, the existing eastbound through/right-turn lane was separated into an eastbound through lane and an eastbound right-turn lane, resulting in the v/c ratio improving by approximately 14% and 85% for the through and right-turn lanes, respectively. The westbound left-turn v/c ratio improves by approximately 53%. All other movements are anticipated to operate similarly to Future Year 2045.

While additional laneage could help, it would appear that the improvements might not be able to fit within the existing right-of-way (ROW). Additionally, the benefits of the improvements may be limited,

based upon the prevailing congestion along Kalaniana‘ole Highway, which is not entirely caused by the Kalaniana‘ole Highway/Poalima Street intersection.

Given the locations of the existing utility poles, underground conduits, and traffic signal poles, the improvements are estimated to cost roughly $4.1 million, which does not include right-of-way (ROW) acquisition costs. This would be disproportionate to the Project impacts. As previously stated, Project-generated traffic accounts for roughly 1% of the total Future Year 2045 traffic projections at the Kalaniana‘ole Highway/Poalima Street intersection during the AM and PM peak hours of traffic.

Due to the relatively low increase in Project traffic at the traffic study intersections and observed yielding behavior of existing drivers, no improvements are recommended.

4.11 Public Services

4.11.1 Police, Fire and Emergency Services

4.11.1.1 Existing Conditions

Police, fire and emergency services in Waimānalo are provided through the City and County of Honolulu. Fire protection is provided by the Waimānalo Fire Station Number 27, located at 41-1301 Kalaniana‘ole Highway, about two miles from the project site. The primary pieces of equipment are Boat 27 and Engine 27, and the station is serviced by a standard complement of five firefighters for each shift. An emergency medical response team is also based at the fire station.

The project is located within the Honolulu Police Department’s District 4, Kāne‘ohe/Kailua/Kahuku. District 4 is HPD’s largest patrol area, and extends from Makapu‘u Point to Kawela Bay on the windward side of O‘ahu.

4.11.1.2 Potential Impacts and Mitigation

The project will not increase the demand for fire, police or emergency services or operations. The number of new structures on the property will be minimal. Fire access roads will be provided within the property as well as adequate water supply capable of supplying required fire flow for fire protection. Drawings will be submitted to HFD for review and approval as various master plan components are developed.

There will not be adverse impacts to pedestrians or vehicles on Waikupanaha during construction of the educational center or other improvements. Construction vehicles and equipment will be staged on site and will be moved to and from the property during non-peak traffic hours.

4.11.2 Schools and Parks

4.11.2.1 Existing Conditions

Schools

The community of Waimānalo is located within the State of Hawai‘i Department of Education’s Kailua-Kalāheo Complex. The public schools located in Waimānalo include Waimānalo Elementary, Mālama

Honua Public Charter School, and Blanche Pope Elementary School. Kamehameha Schools Preschool Waimānalo is an independent school. The closest high school serving the community is Kailua High School, located roughly five miles from the Waimānalo Research Station.

The research station is affiliated with the College of Tropical Agriculture and Human Resources (CTAHR) at the University of Hawaiʻi at Mānoa, where the majority of CTAHR faculty are based. The Mānoa campus is located about 16.5 miles, or a 30-minute drive from the research station.

CTAHR's Waimānalo Learning Center (WLC) works closely with community partners and welcomes thousands of community members to the station each year to improve awareness of the station's research activities and support ʻaina based education. Current research and other activities include breeding and selecting food crops for sustainable local production, apiculture (Bee Program), bioenergy crops, certified organic agriculture, aquaponics, and beginner farmer training.

Mālama Honua Public Charter School (MHPCS) is a State Department of Education public school established in 2014 in Waimānalo. The grounding principle guiding the school is the Hawaiian concept of "Mālama honua," which means to care for our Island Earth, and is the message that the iconic double-hulled canoe, Hōkūleʻa carried throughout her three-year voyage around the globe. The school's stated mission is to "provide an education that cultivates the caring, compassionate and astute 'mind of the navigator' in students and teachers alike by appropriate application of indigenous Hawaiian values, inclusive of 21st century skills." Currently, the MHPCS operates out of multiple sites in Waimānalo, all of which are aging and less than ideal. Over the past five years, MHPCS has searched for a semi- to permanent home with 3+ acres to accommodate its Pre-K to 8th grade enrollment, as well as possible expansion to high school as part of its long-term vision.

In recent years, MHPCS has been in discussion with CTAHR to lease a site at the southern edge of the existing research station for a new school campus. The school's desired site is across Waikupanaha Road from the entry to the Project Area. However, the proposed campus is not part of the WRS Project Area or current CTAHR plans for the expanded research station. Should an agreement be reached to use the site for the school, a separate Environmental Assessment would need to be prepared in support of that project.

Parks and Recreational Areas

Waimānalo includes a variety of county owned and operated parks, including the Waimānalo District Park, Kaiona Beach Park, Kaupō Beach Park, Waimānalo Beach Park, Waimānalo Bay Beach Park, and Makapuʻu Beach Park. Kaiona Beach Park provides a popular picnic area. Kaupō Beach Park is primarily used by fishers and surfers, and Makapuʻu is a popular spot for body surfing.

Bellows Field Beach Park, while owned by the military, is accessible to the public on weekends and holidays and provides camp sites. Other recreational facilities include the 18-hole Olomana Golf Links, a popular course among local golfers.

4.11.2.2 Potential Impacts and Mitigation

The project will not impact area schools or public parks, nor will it affect streets or storm water drainage structures serving these areas. The proposed project will expand the academic, research and extension activities of the University of Hawaiʻi in the Waimānalo community, as well as associated educational programs and projects sponsored or supported by the Waimānalo Learning Center.

The site that Mālama Honua PCS desires for its future campus is located on State-owned property on Waikupanaha Road, across from the future entry to the Project Area. Should the school be successful in funding and developing its new campus, the proximity to the existing and expanded WRS will increase opportunities for collaboration and partnerships between the school and CTAHR. That said, development in the Project Area and the new MHPCS campus are completely independent efforts. CTAHR intends to continue its educational collaboration with community partners, including local students and their families, through the Waimānalo Learning Center and CTAHR extension programs. The land uses and activities envisioned in the concept plan are not dependent on or affected by whether a new MHPCS campus is built.

Overall, CTAHR activities envisioned at the Project Area are agricultural and educational in nature, of low intensity, and involve a limited number of personnel on site. The proposed use is consistent with the rural character of the surrounding community, as well as with CTAHR's mission.

5 Relationship to Land Use Plans, Policies and Controls

This chapter discusses the proposed project's conformance with relevant state and county land use plans, policies, and controls. State plans and policies include the State Land Use District, Hawaiʻi State Plan (HRS Chapter 266) and the State Coastal Zone Management program. County-level plans and policies include the Honolulu General Plan, the Koʻolau Poko Sustainable Communities' Plan, Special Management Area (HRS Chapter 205A) and zoning.

5.1 State of Hawaiʻi

5.1.1 State Land Use

The State Land Use Commission, pursuant to Chapter 205 and 205A, Hawaiʻi Revised Statutes (HRS) and Chapter 15-15, Hawaiʻi Administrative rules (HAR), is empowered to classify all lands in the State into one of four land use districts: urban, rural, agricultural and conservation. The entire Project Area is within the State Agricultural District (Figure 5-1). HRS §205-2(d) specifies that Agricultural Districts shall include:

(1) Activities or uses as characterized by the cultivation of crops, crops for bioenergy, orchards, forage, and forestry;

(2) Farming activities or uses related to animal husbandry and game and fish propagation;

(3) Aquaculture, which means the production of aquatic plant and animal life within ponds and other bodies of water;

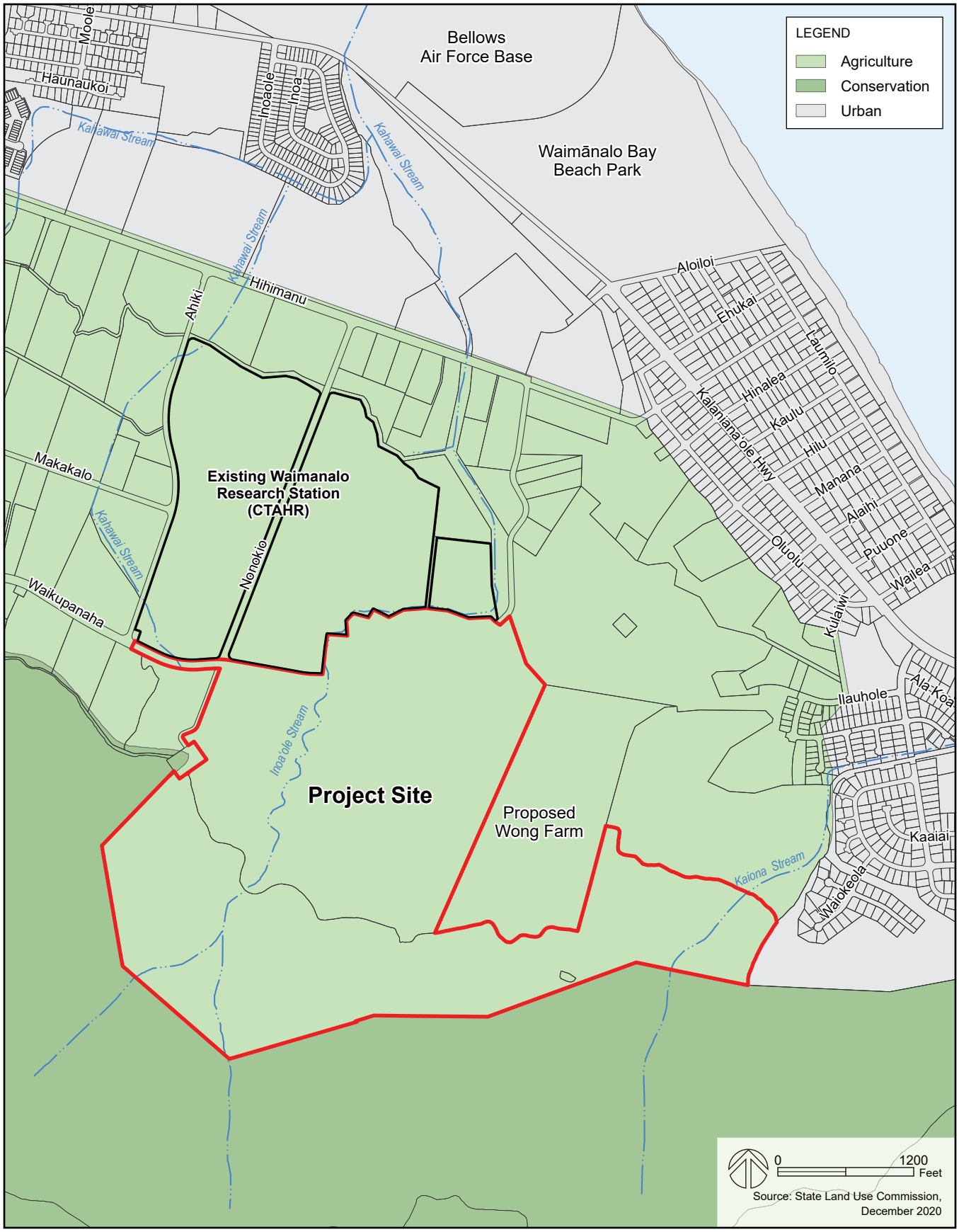
(4) Wind generated energy production for public, private, and commercial use; (5) Biofuel production for public, private, and commercial use;

(6) Solar energy facilities (with LSB land classification productivity rating class D or E);

(7) Bona fide agricultural services and uses that support the agricultural activities of the owner of the property;

(8) Wind machines and wind farms;

(9) Small-scale meteorological, air quality, noise, and other scientific and environmental data collection and monitoring facilities occupying less than one-half acre of land;



State Land Use Districts **Figure 5-1**

Waimānalo Research Station Master Plan

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(10) Agricultural parks;

(11) Agricultural tourism conducted on a working farm, or a farming operation…for the enjoyment, education, or involvement of visitors;

(12) Agricultural tourism activities, including overnight accommodations of twenty-one days or less…;

(13) Open area recreational facilities;

(14) Geothermal resources exploration and geothermal resources development…

(15) Agriculture-based commercial operations registered in Hawaiʻi including:

(A) A roadside stand that is not an enclosed structure owned and operated by a producer for the display and sale of agricultural products grown in Hawaii and value-added products that were produced using agricultural products grown in Hawaiʻi;

(B) Retail activities in an enclosed structure owned and operated by a producer for the display and sale of agricultural products grown in Hawaiʻi, logo items related to the producer's agricultural operations, and other food items;

(C) A retail food establishment owned and operated by a producer permitted under chapter 11-50, Hawaiʻi administrative rules, that prepares and serves food at retail using products grown in Hawaiʻi and value-added products that were produced using agricultural products grown in Hawaiʻi;

(D) A food hub, which is a facility that may contain a commercial kitchen and provides for the storage, processing, distribution, and sale of agricultural products grown in Hawaiʻi and value-added products that were produced using agricultural products grown in Hawaiʻi.

(16) Hydroelectric facilities as described in section 205-4.5(a)(23).

Discussion: All of the uses identified in the conceptual plan and described in this Environmental Assessment are allowed within the Agricultural District.

The Proposed Action will not require a State Special Use Permit (SUP), which is required for “certain unusual and reasonable uses...other than those for which the district is classified.”

5.1.2 Hawaiʻi State Plan, HRS Chapter 226

The Hawaiʻi State Planning Act, Hawaiʻi Revised Statutes (HRS) Chapter 226 was enacted in 1978 to “improve the planning process in this state, to increase the effectiveness of government and private actions, to improve coordination among different agencies and levels of government, to provide for wise use of Hawaii’s resources and to guide the future development of the state.” The Act sets forth the Hawaiʻi state plan, which is a long-range comprehensive plan that includes an overall theme, goals, objectives, policies, priority guidelines, and implementation mechanisms.

The state plan is divided into three parts:

- *Part I, Overall Theme, Goals, Objectives, and Policies*. Part I lists the state plan's overall theme and goals. Objectives and policies focus on general topic areas including population, economy, physical environment, facility systems, and socio-cultural advancement.
- *Part II, Planning Coordination and Implementation*. Part II establishes a statewide planning system to coordinate and guide all major state and county activities and to implement the overall theme, goals, objectives, policies, and priority guidelines. These are implemented through State functional plans and county general plans.

Functional plans set forth the policies, statewide guidelines, and priorities within a specific field of activity. There are thirteen functional plans focusing on Agriculture, Conservation Lands, Education, Employment, Energy, Health, Higher Education, Historic Preservation, Housing, Human Services, Recreation, Tourism, and Transportation.

- *Part III, Priority Guidelines*. The purpose of this part of the State Plan is to establish overall priority guidelines to address areas of statewide concern. This part lays out the overall direction for the state, as follows:

"The state shall strive to improve the quality of life for Hawaii's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education" (HRS §226-102).

5.1.2.1 Agriculture Functional Plan (1991)

The Agriculture Functional Plan (1991) sets forth the policies, programs, and projects for implementing the State Plans' agricultural related objectives, policies and priority guidelines. For agriculture, one of the fundamental objectives to be achieved is the continued growth and development of diversified agriculture throughout the State.

The mission of the State Agricultural Functional Plan is ultimately "to increase the overall level of agricultural development in Hawaiʻi, in accordance with…fundamental Hawaiʻi State Plan objectives…." The State Plan objectives include the "continued growth and development of diversified agriculture throughout the State."

Discussion: The ongoing and proposed research and extension activities at the Waimānalo Research Station (WRS) support the mission to increase agricultural development in the State, and the goal of growth in diversified crops and products.

The Agricultural Plan identifies four issue areas, each with objectives and policies. Issue area objectives and policies that will be supported by the Proposed Action, as well as ongoing CTAHR efforts, include:

Issue Area: Industry Research and Development

Objective A: Achievement of increased agricultural production and growth through cultural and management practices.

Policy A(1): Stimulate agricultural commodity industries to expand their production and growth by supporting problem-specific research and other direct assistance.

Objective B: Achievement of an orderly agricultural marketing system through product promotion and industry organization.

Policy B(1): Promote effective marketing of Hawaiʻi's agricultural commodities.

Policy B(2): Encourage the development of Hawaiʻi's agricultural industries.

Objective D: Achievement of optimal contribution by agriculture to the State's economy.

Policy D(1): Encourage the conduct of basic and applied research on agricultural systems, technologies, practices, organisms, crops, and products, and encourage the transfer of research information to agricultural users.

Policy D(2): Develop capabilities to convert Hawaiʻi-grown crops into potential new value-added products for the local, visitor industry, and export markets.

Policy D(3): Recover economically and environmentally beneficial products from agricultural waste.

Issue Area: Agricultural Pests and the Environment

Objective F: Achievement of increased agricultural production and growth through pest and disease controls.

Policy F(1): Manage present populations, and prevent further introductions, of destructive and harmful insects, plants, animals, plant and animal diseases, and other pests in the State.

Policy F(2): Eliminate fruit flies as a barrier to the uninhibited export of host commodities from Hawaiʻi in accordance with Federal quarantine requirements.

Objective G: Achievement of effective protection and improved quality of Hawaiʻi's land, water and air.

Policy G(1): Ensure the effective, efficient, and safe use of pesticides, and minimize their possible adverse impacts on the public and the environment.

Policy G(2): Minimize the adverse impacts of agricultural practices on Hawaiʻi's ground water, surface water, air quality, and endangered species.

The proposed activities within the proposed Waimānalo Research Station are consistent with and support the objectives and policies in these two issue areas. The Proposed Action sets aside areas for agricultural and environmental research and development, farmer training, and community education. The proposed cultural preserve supports cultural management efforts led by the community.

5.1.2.2 Hawaiʻi State Plan Update Phase 1

In the decades since the Hawaiʻi State Plan and functional plans were adopted by the State Legislature, there have been significant changes in Hawaii's economic, physical, and social conditions, technology,

and the global marketplace, as well as in the constraints and opportunities the State faces as it plans for the future.

The Hawaiʻi Office of Planning (OP) has completed Phase 1 of the comprehensive review of HRS Chapter 226, the State Planning Act—with respect to how it aligns with current and emerging conditions and issues and its effectiveness in addressing the needs of Hawaii's people and providing for Hawaii's future. Phase 1 of the update involves inventorying and reviewing all state department plans, strategic plans, functional plans, and capital improvement plans; identifying common themes and policy directions; developing findings as to the overall status of the plans and preparing findings and recommendations for next steps in the update of the State Planning Act. Its findings and recommendations are included in a March 2018 report entitled *Hawaiʻi State Plan Update: Phase 1*. Phase II will include the Hawaiʻi State Plan update subject to the findings and recommendations from Phase I.

The Phase 1 Final Report recommended revisiting the State Plan's priority guidelines, which may no longer be the priority areas of today. It notes new priority directives should be added to the Hawaiʻi State Planning Act, including Sustainability and Climate Change. The Phase 1 report recommends a thorough update of state plan issues, noting that new cross-cutting issues have emerged. These new issues include homelessness, affordable housing, green practices, climate change, conservation and environmental stewardship, self-reliance/resiliency/security, local food production, and alternate finance mechanism including public-private partnerships.

The Phase 1 Final Report noted that functional plans are outdated. It noted as an example, this statement pertaining to agriculture, "*The previous Functional Plan emphasis was on large acre crops such as sugar and pineapple. That has all changed."*

The Priority guidelines portion of the state plan should also be revisited through a planning process that involves agencies, counties, and the public. New priority directives include sustainability and climate change, which should be addressed in a "cross-cutting fashion."

The Phase 1 Final Report also noted the importance of having a shared vision and noted the 2017 effort by a small group of long-time local leaders as part of the Hawaiʻi Asia Pacific Association's "I Am Hawaiʻi" visioning. The overall Vision is aloha. To achieve this the group identified nine sectors and visions, with associated key issues, core values, strategic goals and implementation. The sectors include: malama aina; food security and sustainability; economic growth; energy; education; workforce development and innovation; community health; and government and infrastructure.

Discussion: The proposed land uses and activities at the Waimānalo Research Station are consistent with and support the general direction of the ongoing state plan update. The emphasis on sustainability and climate change, food security and self-sufficiency, environmental stewardship and conservation will be directly supported by research and extension activities at the site. The expanded WRS provides a venue to pursue applied research and community activities in these priority issue areas, and to support the agriculture functional plan.

5.1.3 Hawaiʻi Coastal Zone Management Program

Coastal Zone Management ("CZM") objectives and policies (Section 205A-2, HRS) and the Special Management Area ("SMA") guidelines (Section 25-3.2 ROH) have been developed to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaiʻi. All lands in the State of Hawaiʻi and the area extending seaward from the shoreline are classified as valuable coastal resources within the State's CZM area.

Part II of Chapter 205A, HRS contains the general objectives and policies upon which all counties have established Special Management Areas (SMA). The Project Area is outside the City and County of Honolulu's SMA, and is not subject to the City's SMA requirements, Chapter 25, ROH. The project site is located inland or mauka of the coastal zone, and the proposed uses will not impact coastal recreation or coastal access, coastal ecosystems, or coastal hazards.

The proposed uses of the site are consistent with many of the SMA objectives and are indirectly supportive of sound coastal management practices.

For example, the SMA objectives include the identification, retention, and preservation of significant archaeological and historic resources. The concept plan includes plans to protect and restore the Pueo Heiau, located in the mauka portion of the property, through establishment of an archaeology preserve, with opportunities for community-initiated restoration efforts. The proposed Waimānalo Research Station's agricultural uses will also preserve open space resources, support sound environmental management of upland areas, and control non-point source pollution. These activities will have a positive impact on coastal water quality and coastal ecosystems.

5.1.4 Department of Hawaiian Home Lands Waimānalo Regional Plan

The Department of Hawaiian Home Lands (DHHL) Waimānalo Regional Plan (November 2011) was prepared to facilitate DHHL's partnerships with other government agencies, private sector entrepreneurs and non-profit organizations as it develops its lands in Waimānalo. It is one of twenty (20) regional plans that DHHL has developed statewide, and is intended to:

- Identify data—people, lands, and infrastructure of homestead communities and the surrounding region;
- Identify what DHHL and other landowners are planning to do;
- Provide the primary mechanism for beneficiary input in the development of their homestead communities;
- Identify issues and potential projects; and
- Identify priority projects determined by the Department and homestead community.

According to the Waimānalo Regional Plan, DHHL owns nearly 2,000 acres of land in the Waimānalo area. These lands include urban residential, unimproved residential, agricultural, and conservation lands. In the Project Area vicinity, the DHHL is in the process of acquiring some 52 acres occupied by the

Wong Farm for a 200-unit residential homestead subdivision. The displaced Wong Farm will be relocated to 50 acres of the former Meadow Gold Dairies site, immediately adjacent to (east of) the Project Area. The DHHL intends to maintain an open space buffer between the relocated Wong Farm and its development, to ensure compatibility between residential and agricultural uses.

The Waimānalo Regional Plan identifies the Wong Farm Acquisition and Relocation as a "priority project" for DHHL, and one that involves a partnership between DHHL, the Department of Land and Natural Resources (DLNR), the Wong Farm and the University of Hawai'i.

Discussion: The proposed uses in the Project Area are consistent with DHHL plans for a new residential subdivision, and with the Wong Farm relocation. As shown previously in Figure 2-3, an easement has been established providing access to the Wong Farm relocation site.

5.2 City and County of Honolulu

The City's planning process is comprised of three distinct tiers. At the first tier, the General Plan establishes policy guidance for O'ahu as a whole, with all subsequent plans and implementing regulations of the City and County of Honolulu required to be consistent with the General Plan.

The second tier consists of the eight regional Development Plans (DPs) and Sustainable Communities Plans (SCPs). These plans relate to specific regions of the island and 1) conceptually describe the pattern of land use desired for the region; 3) provide guidance for functional infrastructure planning; and 3) identify areas within the DP/SCP boundary that might benefit from more detailed planning.

The third tier is comprised of the specific mechanisms to implement the two higher levels of the planning hierarchy. These include the implementing ordinances and regulations (i.e., the Land Use Ordinance, Honolulu's zoning code), the Subdivision Rules and Regulations, and the City's Capital Improvement Program), public facilities and infrastructure functional plans, and special area plans that give specific guidance for specific portions of the DP or SCP area.

5.2.1 County General Plan

On December 1, 2021, the Honolulu City Council adopted Resolution 21-023, CD1, adopting the revised O'ahu General Plan, December 2017. This revised plan was developed through a multi-year planning and review process that began in 2011. In April 2018, a resolution to adopt the revised General Plan was transmitted from the Planning Commission to the City Council. In November 2021, the Proposed Revised General Plan was reported out of the City Council's Committee on Zoning and Planning (Resolution 21-023), and on December 1, 2021, was adopted by a vote of 9-0, signed and certified.

The General Plan for the City and County of Honolulu was first adopted in 1977 and has been subsequently amended (until this year, the most recent amendment was in 2002). The General Plan is a comprehensive statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of O'ahu, including broad policy statements that facilitate the attainment of the Plan's objectives.

The General Plan is organized into 11 areas of concern: population; the economy; the natural environment and resource stewardship; housing and communities; transportation and utilities; energy; physical development and urban design; public safety and community resilience; health and education; culture and recreation; and government operations and fiscal management.

The growth policy presented in the General Plan calls for full development of the Primary Urban Center (including lands between Kahala and Pearl City), development of the secondary urban center at Kapolei and the ʻEwa and Central Oʻahu urban-fringe areas, and management of the physical growth and development in the remaining urban-fringe and rural areas to maintain their low densities.

Discussion: The Proposed Action is consistent with the following policies and guidelines of the Revised General Plan (2017) pertaining to the Economy, Health and Education, and Culture and Recreation:

Chapter II. The Economy

Objective C: To ensure the long-term viability and continued productivity of agriculture on Oʻahu.

Policy 1: Foster a positive business climate for agricultural enterprises of all sizes, as well as innovative approaches to farming as a business, to ensure the continuation of agriculture as an important component of Oʻahu's economy.

Policy 2: Support agricultural diversification to help strengthen the agricultural industry and to make more locally grown food available for local consumption.

Policy 3: Foster market opportunities and increased consumer demand for safe, locally grown, fresh and processed agricultural products.

Policy 6: Promote small-scale farming activities and other operations, such as truck farming, flower growing, aquaculture, livestock production, taro growing, and subsistence farms.

Policy 10: Support and encourage technologies and agricultural practices that conserve and protect water, soil, air quality, and drainage areas, and that promote public health and safety.

Policy 11: Support and encourage the availability and use of non-potable water for irrigation, where feasible.

Policy 12: Provide plans, incentives, and strategies to ensure the affordability of agricultural land for farmers.

Policy 13: Encourage both public and private investments to improve and expand agricultural infrastructure, such as irrigation systems, agricultural processing centers, and distribution networks.

Policy 14: Promote farming as a desirable and fulfilling occupation by encouraging agricultural education and training programs and by raising public awareness and appreciation for agriculture.

Policy 16: Seek ways to discourage agricultural theft and vandalism.

Policy 17: Recognize the scenic value of agricultural lands as an open-space resource and amenity.

Chapter IX Health and Education

Objective A: To protect the health and well-being of residents and visitors.

Policy 5: Encourage healthy lifestyles by supporting opportunities that increase access to and promote consumption of fresh, locally grown foods.

Objective B: To provide a wide range of educational opportunities for the people of Oʻahu.

Policy 6: Encourage outdoor learning opportunities and venues that reflect our unique natural environment and Native Hawaiian culture.

Foster a positive business climate for agricultural enterprises of all sizes, as well as innovative approaches to farming as a business, to ensure the continuation of agriculture as an important component of Oʻahu's economy.

Chapter X Culture and Recreation

Objective B: To protect, preserve and enhance Oʻahu's cultural, historic, architectural, and archaeological resources.

Policy 1: Promote the restoration and preservation of early Hawaiian structures, artifacts, and landmarks.

Policy 4: Promote the interpretive and educational use of cultural, historic, architectural, and archaeological sites, buildings, and artifacts.

Policy 5: Seek public and private funds, and encourage public participation and support, to protect, preserve and enhance social, cultural, historic, architectural, and archaeological resources.

Policy 7: Encourage the protection of areas that are historically important to Native Hawaiian cultural practices and to the cultural practices of other ethnicities, in order to further preserve and continue these practices for future generations.

5.2.2 Koʻolau Poko Sustainable Communities Plan

The City and County of Honolulu's Development Plan (DP) program provides a relatively detailed framework for implementing General Plan objectives and policies for the growth and development of Oʻahu at a regional level. Eight geographical DP and Sustainable Communities Plan (SCP) have been established on Oʻahu. The WRS Project Area is within the planning area covered by the Koʻolau Poko SCP.

The Koʻolau Poko SCP was first adopted by Ordinance 97-49 in 1997, and most recently revised in 2017with the adoption of Ordinance No. 17-42. The Koʻolau Poko SCP area encompasses Oʻahu's windward (northeastern) coastal and valley areas, extending from Makapuʻu Point at its eastern end to Kualoa at its western end. In carrying out the purposes of the General Plan, Koʻolau Poko is expected to experience essentially no growth over the 25-year planning horizon. Policies in support of this goal limit the potential for expansion of the region's housing stock, commercial centers, and economic activity, and are focused on maintaining the patterns of development characteristics of its urban fringe and rural

areas. The SCP's vision statement and implementing policies are shaped around two principal concepts, the first which calls for protection of the communities' natural, scenic, cultural, historic, and agricultural resources, and the second which addresses the need to improve and replace, as necessary, the region's aging infrastructure systems. The Open Space Map, Urban Land Use Map, and Public Facilities Map appended to the Koʻolau Poko SCP graphically demonstrate the desired long-range pattern for land use, open space, and public facilities.

Discussion: The land use map is shown in Figure 5-2 and shows the Project Area designated as an Agricultural Area. The Proposed Action is consistent with the SCP. It supports the principal concept of protection of scenic, cultural, historic, and agricultural resources by returning the site to active and productive agricultural use after more than ten years of lying fallow. The proposed research and extension activities focus on improving agricultural productivity, promoting locally grown food and food security, and sustainable environmental practices that are broadly applicable within the agriculture industry. The expanded research station will have an active public education component and continue established partnerships with the Waimānalo community. Programs such as GoFarm Hawaiʻi will be able to expand and serve more people. Extension programs provide education and technical assistance to farmers. The proposed land uses will also preserve the rural and open space character of the site, consistent with the community's long-term vision. The proposed archaeological preserve will protect important cultural and historic features on the property and provide the opportunity for future restoration and educational activities.

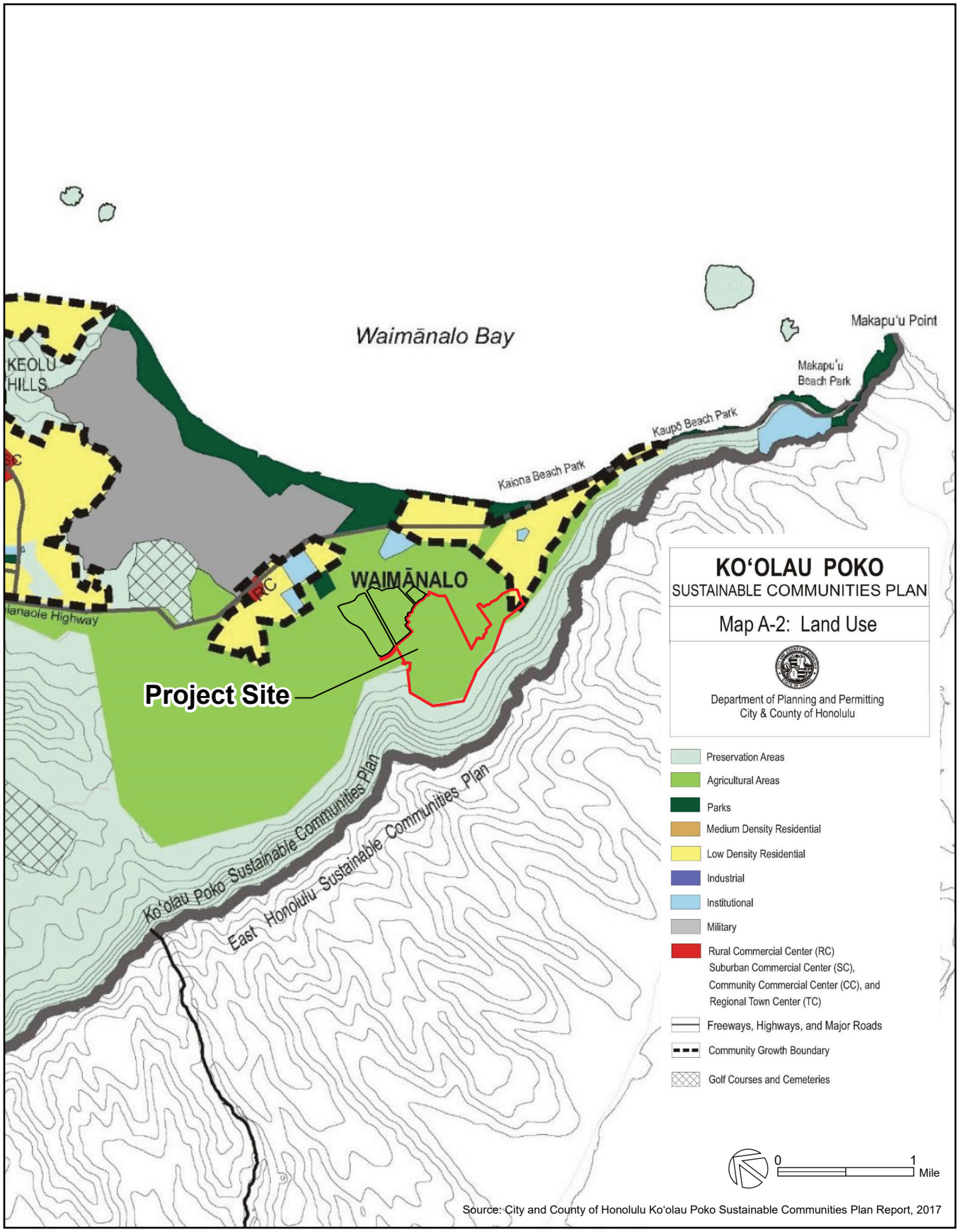
The Proposed Action complies with the following policies of the Koʻolau Poko SCP:

Section 3.3.1 Historic and Cultural Resources (Policies)

- Preserve significant historic feature from earlier periods
- Implement in situ preservation and appropriate protection measures for sites that have high preservation value because of their good condition or unique features
- Establish the degree of public access and interpretation that would best promote the preservation of the historic, cultural, and educational value of the site

Section 3.4.1, Agricultural Use (Policies)

- Provide support infrastructure, services, and facilities to foster and sustain agricultural operations
- Encourage organic and sustainable agriculture
- Encourage self-contained land-based aquaculture in appropriate locations
- Limit non-agricultural uses to those that provide support services for agricultural operations or operations related to public renewable energy sourcing, provided it does not remove high quality agricultural land
- Promote and provide opportunities for small family farms



Ko'olau Poko Community Plan Land Use **Figure 5-2**

Waimānalo Research Station Master Plan

Draf Environmental Assessment
University of Hawai'i, College of Tropical Agriculture
and Human Resources (CTAHR)

5.2.3 City and County of Honolulu Zoning

The City and County of Honolulu's Land Use Ordinance (LUO) (Section 21, ROH) is its zoning ordinance, which regulates land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the General Plan and Development Plans.

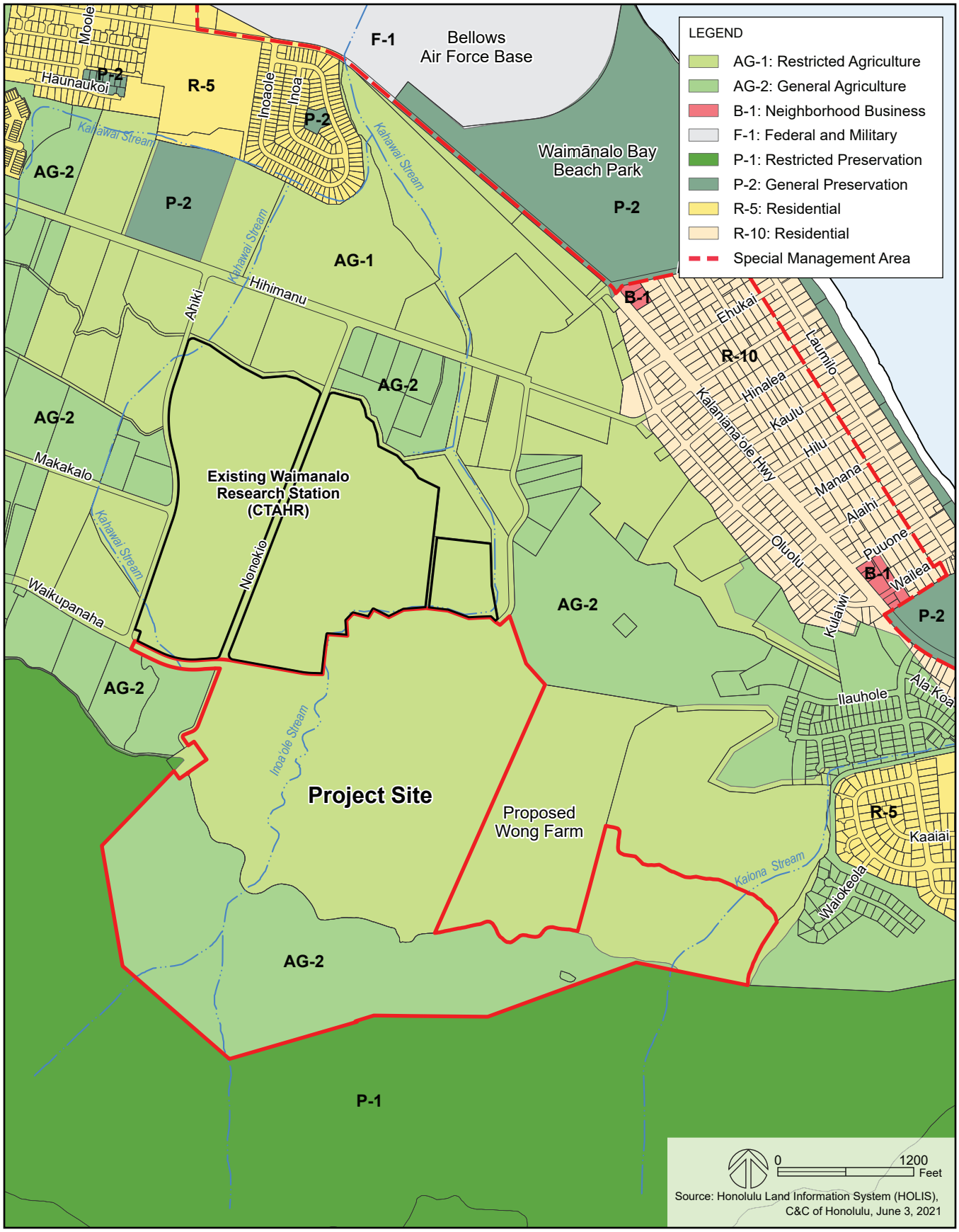
Discussion: As shown in Figure 5-3, the majority of the Project Area is zoned AG-2 (General Agricultural District), with the steeper mauka areas zoned AG-1 (Restricted Agricultural District, 5 acres minimum). The purpose of agriculture districts is to maintain a strong agricultural economic base, to prevent unnecessary conflicts among incompatible uses, to minimize the cost of providing public improvements and services and to manage the rate and location of physical development consistent with the city's adopted land use policies.

The proposed land uses and activities are all compatible with the purpose of the agriculture districts and will support continued and expanded agricultural activity in the area. Under the LUO, Section 21-3.50 and Table 21-3.1, proposed uses such as crop production, forestry, livestock grazing and minor production, composting, and farm dwellings are permitted within the AG-1 and AG-2 zoning districts.

5.2.4 Special Management Area

Coastal Zone Management objectives and policies (Section 205A-2, HRS) and the Special Management Area (SMA) guidelines (Section 25-3.2 ROH) have been developed to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaiʻi.

Discussion: As noted previously, the project site is outside the City and County of Honolulu's SMA and is not subject to the City's SMA requirements. The land uses proposed within the Project Area are consistent with many of the SMA objectives and are indirectly supportive of sound coastal management practices.



City and County of Honolulu Zoning Districts & Special Management Area **Figure 5-3**

Waimānalo Research Station Master Plan

Draft Environmental Assessment
University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR)

5.2.5 Oahu Resilience Strategy

The O‘ahu Resilience Strategy, developed by the City’s Office of Climate Change, Sustainability and Resiliency, was formally adopted by the City Council in September 2019 (Resolution 19-233). The Strategy serves as a guiding policy document to improve O‘ahu’s resilience to social, economic and environmental stresses, with an emphasis on preparing for climate change impacts. To inform climate resilient planning while balancing economic and environmental goals for sustainability, the Strategy identifies 44 actions across four focal areas or resilience “pillars:” Pillar I: long-term affordability (local economy); Pillar II: disaster preparedness; Pillar III: climate security; and Pillar IV: community cohesion (Adaptation Clearinghouse, 2020).

Discussion: The Proposed Action is consistent with the following goals and action items of the O‘ahu Resilience Strategy (2019).

PILLAR I. REMAINING ROOTED, Ensuring an Affordable Future for our Island

Goal 3: Improving Economic Opportunity

Action 10: Promote New Agricultural Models for Economic and Food Security

PILLAR II. BOUNCING FORWARD, Fostering Resilience in the Face of Natural Disasters

Goal 2: Effective Disaster Response

Action 15. Develop a Network of Community Resilience Hubs

PILLAR III. CLIMATE SECURITY, Tackling Climate Change by Reducing Emissions and Adapting to Impacts

Goal 3: Climate Resilient Future

Action 28. Chart a Climate Resilient Future by Creating and Implementing a Climate Adaptation Strategy

Action 33. Keep O ‘ahu Cool by Maintaining and Enhancing the Community Forest

PILLAR IV. COMMUNITY COHESION, Leveraging the Strength and Leadership of Local Communities

Goal 1: Empower Grassroots Resilience Champions

Action 35. Increase Coordination with Neighborhood Emergency Preparedness Groups

Action 36. Increase City-Community Relationships through Volunteerism

Action 37. Weave a Tighter Community with Neighborhood Gatherings

Action 40. Lift Up Positive Examples of Island Values in Action

Action 42. Foster Shared Understanding of Climate Change Island-Wide Through an Outreach Campaign

Action 43. Ensure City Partnership in O ‘ahu’s Collective Impact Resilience Efforts

The research, education and extension activities proposed within the Project Area are intended to promote new agricultural models for economic and food security, supporting Pillar I of the Resilience Plan. Agricultural extension and outreach programs with the community, including programs that support community farmers, are consistent with Action 15 of Pillar II, to develop a network of community resilience hubs available to provide support during natural disasters. Much of the research activity at the station will be focused on climate adaptation and mitigation. Increased opportunities for collaboration between CTAHR and the community strengthen community cohesion and resilience.

5.3 Other

5.3.1 Keeping Waimānalo, Waimānalo: Community Values & Priorities for the Future

The Exploratory Document entitled *Keeping Waimānalo, Waimānalo: Community Values & Priorities for the Future* (December 2017), was prepared by and for the community of Waimānalo, supported by State funds and a facilitated process, to put the community's words and values down on paper. The document is seen as a vehicle to communicate community vision, values, and priorities to people and entities within and outside the community. It is a "living document" that can evolve and be built upon with further community input.

The goals of the Waimānalo Community Values and Priorities Exploratory Document are to:

- Explore and restore the resources within Waimānalo's ahupuaʻa;
- Help maintain the community's character over time;
- Express the community's kuleana to Waimānalo and each other;
- Mobilize local and outside resources to get projects done and address community priorities;
- Provide guidance for Neighborhood Board and community organization decision-making;
- Communicate local priorities to city and state decision-makers; and,
- Communicate to newcomers and visitors an understanding of the fundamental values of Waimānalo**.**

Chapter 3.1 of the Exploratory Document conveys the vision for Waimānalo, representing how the community aspires to be, and the community values, which capture the qualities, attitudes and beliefs that make Waimānalo special and should be perpetuated. The community's vision for Waimānalo is embodied in seven vision statements, summarized as:

- Keep Waimānalo, Waimānalo
- Value the wisdom of the people of Waimānalo
- Keep agriculture land-agricultural

- ‘Ohana grow and thrive in Waimānalo
- Cultivate the values of caring for one another and community health and safety
- Support and sustain local businesses and organizations that contribute to a thriving community
- Manage our resource to preserve the Waimānalo *ahupua‘a*

Discussion: The agricultural research, educational, and extension activities that will occur at the proposed Waimānalo Research Station are consistent with and support each of these community vision statements. The Proposed Action supports the vision to keep agriculture land agricultural, transforming a long-unused State property to a productive, non-commercial use. This will prevent encroachment onto agricultural lands by other non-agricultural uses. Proposed activities in the mauka forested areas including native forest restoration, watershed management, and invasive species control are all consistent with the vision to retain Waimānalo’s unique spaces and environment.

Extension and educational activities directly support building skills and knowledge of the next generation, and collaborative activities with local schools and non-profit organizations will bring the community together, another stated value. Local youth will be encouraged to learn about agriculture and environmental stewardship through educational programs, and aspiring farmers will be supported through programs on-site. These activities support the values of enhancing education, building leadership in the younger generation, and strengthening the agricultural community network through shared knowledge. Programs such as GoFarm will also support farm entrepreneurs and promote economic activity benefiting the community.

The archaeological preserve will protect valuable historic resources, preserve the unique and sacred spaces and culture, and be a venue for community-led cultural activities. This will support the value of perpetuating cultural values and traditions.

5.4 Permits and Approvals

A list of the anticipated and potential permits and approvals for the Proposed Action is presented below.

Table 5-1: Potential Permits and Approvals

Responsible Agency	Permit/Approval
University of Hawai‘i	HRS Chapter 343 Hawai‘i Environmental Policy Act compliance
Board of Land and Natural Resources	Project Area lease approval
State Department of Health-Disability and Communication Access Board	Review
State Department of Health-Wastewater Branch	Review
State Department of Health-Clean Water Branch	National Pollutant Discharge Elimination System (NPDES) (if required during construction)
DLNR Commission on Water Resource Management	Stream Channel Alteration Permit (SCAP) (if required for work in stream channel)
Dept. of Land and Natural Resources-State Historic Preservation Division	Chapter 6E, HRS compliance
City & County of Honolulu-Department of Planning and Permitting	Building, engineering, and construction permits

6 Anticipated Determination

To determine whether a proposed action may have a significant impact on the environment, the approving agency needs to consider all phases of the action, the expected impacts and the proposed mitigation measures. The agency's review and evaluation of the action would result in a determination that either: 1) the action may have a significant effect on the environment, and issuance of an Environmental Impact Statement Preparation Notice is required; or 2) the action is not likely to have a significant effect and notice of a FONSI should be issued.

Based on the findings presented in this Draft Environmental Assessment, the Proposed Action is not expected to result in a significant impact on the environment, and a Finding of No Significant Impact (FONSI) is anticipated.

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

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

The Proposed Action is a 20+ year master plan for use of 283 acres adjacent to CTAHR's existing Waimānalo Research Station (WRS). The Project Area will be an extension of the existing research station and will be a venue for CTAHR's research and extension activities. There are no sensitive natural resources, species, or habitats within the site. Much of the Project Area, particularly the flatter makai portions, have been heavily disturbed by agriculture and dairy use. A number of historic properties have been identified, mostly within the mauka upland forest and mid-zone portions of the site. Historic properties are from both pre- and post-Contact period.

The recently completed archaeological literature review and field inspection (LRFI) (see Chapter 4, Section 4.5, and Appendix D) recommended archaeological inventory surveys (AIS) for areas above 200 ft AMSL (encompassing much of the upland forest and mid-zone areas). For areas below 200 ft AMSL, consultation with the State Historic Preservation Division (SHPD) is recommended prior to any projects that may potentially impact historic properties.

The concept plan proposes an archeological/cultural preserve in the general area around Pueo Heiau and other cultural sites to protect these resources. The boundaries of this preserve will be identified in consultation with Ke Kula Nui o Waimānalo and the SHPD, in accordance with a Memorandum of Understanding (MOU) executed in March 2021.

2. Curtail the range of beneficial uses of the environment

The uses proposed in the Project Area are consistent with the Agricultural designation for the site, and compatible with ongoing activities at the adjacent Waimānalo Research Station. Structures will be low scale and support the proposed research and extension activities. Construction of buildings and

improvements will conform with applicable State and County regulations to minimize impact to the natural environment. The Proposed Action will not curtail the beneficial uses of the environment.

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

The Proposed Action does not conflict with the long-term environmental policies, goals and guidelines specified in HRS Chapter 344. The analysis of the individual resource areas presented in this EA demonstrates consistency with the State's policy to conserve natural resources and enhance residents' quality of life.

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

The Proposed Action will not have an adverse effect on the economic welfare, social welfare, or cultural practices. The activities and land uses proposed will have a positive effect on the State's agricultural industry, support community self-sufficiency and education, protect cultural resources, and support cultural practices.

5. Have a substantial adverse effect on public health.

The Proposed Action will not have an adverse effect on public health. It will have a positive impact on public health, as CTAHR's research and extension activities are intended to support the local agriculture industry, support local farmers, improve Hawai'i's food security, and promote energy self-sufficiency.

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

The Proposed Action will not result in adverse secondary impacts such as population changes or effects on public facilities. Other than the farm manager who will reside on the site and about 10 full-time staff who are assumed to already reside on O`ahu, there will be no population changes. Traffic impact is expected to be minimal.

7. Involve a substantial degradation of environmental quality.

The proposed uses at the future research station will be conducted in accordance with all applicable environmental rules and regulations. Research activities related to natural resource management, managing agricultural and forestry systems, watershed management, and sustainable food production will have a long-term positive impact on environmental quality—not only of the site but Statewide.

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

There will be no cumulative adverse effect or commitment for larger action.

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

There are no rare, threatened, or endangered species or habitats on or near the Project Area. There will be no impact on any of these species or habitats.

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

There will not be a substantial adverse effect on air or water quality or ambient noise levels. Uses are low intensity and will follow all applicable environmental rules and regulations. During construction, best management practices will be used to minimize erosion and protect water quality. Low Impact Development (LID) measures will be incorporated into any development to mitigate impacts of runoff, including the incorporation of vegetated swales and vegetated buffer strips, harvest or reuse of runoff, and bioretention basins.

11. Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, sea level rise exposure are3a, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The Project Area is not in an environmentally sensitive area such as floodplain, tsunami zone, sea level rise exposure area, geologically hazardous area, or near coastal waters.

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

Proposed land uses will be of low scale and intensity and will have no effect on scenic vistas or view plane.

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

The proposed activities in the Project Area will not require substantial energy consumption or emit substantial greenhouse gases.

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8 Agencies and Organizations Consulted

8.1 Master Planning Process

8.1.1 Consultation with CTAHR Representatives

The Waimānalo Research Station master planning process commenced in mid-2020 with a series of meetings between the planning team and CTAHR administration, faculty, and staff. The purpose of the meetings was to better understand each program's mission; ongoing activities; and the types of land uses that might be appropriate at the expanded research station. Meetings were held with CTAHR administration, and representatives of the following programs and departments:

- Cooperative Extension Services (CES)
- Human Nutrition, Food and Animal Sciences (HNFAS)
- Natural Resources and Environmental Management (NREM)
- Plant and Environmental Protection Sciences (PEPS)
- Tropical Plant and Soil Sciences (TPSS)

The information provided guided the development of the conceptual land use plan, as described in Chapter 2.

8.1.2 Community Outreach Effort

In late 2020, as the meetings with CTAHR representatives were wrapping up, the consultation process broadened to include members of the public, targeting the Waimānalo community. An online community survey was developed and distributed on Oʻahu via email, social media, and announced at the Waimānalo Neighborhood Board meeting in February 2021. The survey was also distributed via email to numerous non-profit organizations, community groups, and education groups located in Waimānalo or associated with CTAHR.

Using a Likert scale, nine (9) questions were created to determine response to CTAHR programs, specifically, how "valuable" the respondents found different programs at the Waimānalo Research Station. Two open ended questions sought to identify gaps in programming or any specific concerns with the CTAHR program areas. The CTAHR program areas mentioned were:

- Early career farming training and business incubation
- Integrated animals and livestock food production
- Forestry
- Entomology

- Archaeological preserve and cultural stewardship
- Community-led education center or charter school
- Best Management Practices test area
- Research and development of renewable and biobased energy resources

Four questions tested respondent's familiarity with CTAHR programs, again using a Likert scale. Demographic questions were included to assess variability of responses.

A total of 260 respondents completed the survey; 109 were self-identified Waimānalo residents. As the respondents were not randomly sampled, the results are not statistically significant, but rather provide a sample of public response to the proposed project and programs. In general, the survey indicated a generally positive opinion of CTAHR program areas. The program areas receiving the highest positive responses were forestry (89.19% positive) and early farmer training and business incubation (87.16%). No program area received below 60% positive responses. Responses trended similarly between Waimānalo residents and non-residents. A copy of the survey, the community distribution list, and survey results are included in Appendix H.

The results indicated that survey respondents were largely in favor of the identified CTAHR programs and supported CTAHR proceeding to preliminary planning in the next step of the master planning process. The following were the key takeaways of the survey:

- Responses to CTAHR program areas were largely positive.
- Responses trended similarly between Waimānalo residents and non-residents.
- Support for community-led efforts and community engagement.
- Opportunity to educate community about CTAHR programs.
- Respondents are largely interested in trying or potentially trying programs at the Waimānalo Research Station.

8.2 Environmental Assessment Process

8.2.1 Pre-Assessment Consultation

Pre-Assessment consultation, as required under HRS Chapter 343, was conducted prior to the initiation of the Environmental Assessment. A pre-assessment consultation letter was sent on August 17, 2021, via email to government agencies and private and non-profit community organizations. The letter included a map of the project area, the concept plan, and a brief description of the proposed uses. Comments were requested by September 17, 2021.

8.2.2 Agencies and Organizations Consulted

Agencies and organizations that were consulted during preparation of the Draft EA are listed in Table 9-1. The parties that provided formal response during the 30-day pre-assessment consultation period are identified with a check mark (✓). Written comments are summarized in Table 9-2 and reproduced at the end of this chapter.

Table 9-1: Agencies and Organizations Consulted

Agency/Organization	Response
Federal	
U.S. Army Corps of Engineers, Honolulu District	
Oahu Natural Resource Conservation Service	
U.S. Fish and Wildlife Service, Pacific Islands Office	✓
State of Hawai'i	
Department of Agriculture	✓
Department of Accounting and General Services	✓
Department of Health (Clean Air Branch, Clean Water, Safe Drinking Water, Solid & Hazardous Waste, Wastewater Branches)	✓
Disability and Communication Access Board	✓
Office of Planning and Sustainable Development	
Department of Business, Economic Development & Tourism	
Department of Defense	
Department of Education	
Department of Hawaiian Home Lands	✓
Department of Land & Natural Resources, State Historic Preservation Division	
Department of Land & Natural Resources, Land Division	✓
Department of Transportation	✓
University of Hawai'i, Water Resources Research Center	
Office of Hawaiian Affairs	
City and County of Honolulu	
Department of Design and Construction	✓
Office of Climate Change, Sustainability and Resiliency	
Department of Community Services	
Department of Environmental Services	
Department of Facility Maintenance	✓
Honolulu Fire Department	
Department of Land Management	

Agency/Organization	Response
City and County of Honolulu (cont.)	
Office of Housing	
Department of Planning and Permitting	✓
Honolulu Police Department	
Department of Transportation Services	
Utilities/Other	
Honolulu Board of Water Supply	✓
Hawaiian Electric Company	✓
Charter Communications	
Historic Hawaiʻi Foundation	
News Media	
Honolulu Star Advertiser	
Honolulu Civil Beat	
Elected Officials	
Honorable Mazie K. Hirono, U.S. Senate	
Honorable Brian Schatz, U.S. Senate	
Honorable Ed Case, U.S. House of Representatives	
Honorable Kai Kahele, U.S. House of Representatives	
State Senator Chris Lee, District 25	
State Senator Lisa Marten, District 51	
Honorable Mayor Rick Blangiardi	
City Councilmember Esther Kiaʻaina	
Community Organizations/Other	
Waimānalo Neighborhood Board	
Waimānalo Limu Hui	
Ke Kula Nui o Waimānalo	
Mālama Honua Public Charter School	
Hawaiian Civic Club of Waimānalo	
Waimānalo Co-Op	
Waimānalo Hawaiian Homes Association	
Kamehameha Schools	
Friends of Waimānalo	
Waimānalo Canoe Club	
Hui Mālama o ke Kai	
Waimānalo Health Center	
Manawaleʻa Riding Center	
Kinaʻi Eha	

Agency/Organization	Response
Community Organizations/Other (cont.)	
Shriners	
Puʻa Foundation	
Hui Mahiʻai	
Waimānalo Pono Research Hui	
Waimānalo Village Resident Corporation	
Save Our Sherwoods	
Queen Liliʻuokalani Trust	
Kua aina o Waimānalo	
Hawaiʻi Farmers Union United	
Hawaiʻi Farm Bureau	
Waimānalo Ag Association	
Waimānalo Learning Center	
Sustain Hawaiʻi	

8.2.3 Summary of Comments Received

Agency/Organization	Contact	Date	Comments	Response
FEDERAL				
U.S. Department of the Interior, Fish and Wildlife Service	Narissa Brown, F&W Biologist, (808) 792-9400, Narissa_Brown@fws.gov	Ltr dated 10/1/2021	No federally designated critical habitat within the immediate vicinity. Data indicates following federally listed species may occur or transit through vicinity: endangered Hawaiian stilt (*Himantopus mexicanus knudseni)*, endangered Hawaiian gallinule (*Gallinula galeata sandvicensis*), and endangered Hawaiian coot (*Fulica alai*); the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); the endangered Hawaiian petrel (*Pterodroma sandwichensis*), endangered Hawaii distinct population segment (DPS) of band-rumped storm-petrel (*Oceanodroma castro*), and threatened Newell's shearwater (*Puffinus auricularis newelli*).	Acknowledged. Information incorporated in EA.
STATE OF HAWAII				
Department of Agriculture, Agricultural Resource Management Division (ARMD)	Janice Fujimoto, ARMD, (808) 973-9473	Ltr dated 9/14/2021	Waimanalo Irrigation System (WIS) has 8-inch PVC irrigation lines and associated air relief valves within your project area. Please consult with the HDOA ARMD in the development of design plans to avoid disturbance to the existing irrigation system. Please address whether facility will request use of agricultural water from the WIS. If yes, provide an estimate of the amount of agricultural water that will be requested and description of its use. Include us on your list for review of the DEA.	Acknowledged. Future request for agricultural water is unknown and will depend on specific land uses. Currently, no request is proposed.
Department of Accounting and General Services	Dennis Chen, Planning Branch, (808) 586-0491, dennis.yk.chen@hawaii.gov	Ltr dated 9/23/2021	Project does not impact DAGS-projects or existing facilities. No comments to offer at this time.	Acknowledged.

Agency/Organization	Contact	Date	Comments	Response
Department of Health, Hawaii Safe Drinking Water Branch	Michael Miyahira, P.E., Engineering Section Supervisor, (808) 586-4258 Joan Corrigan	Email dated 9/8/2021	We have just one question: will this entire facility be serviced by the Honolulu Board of Water Supply's system? If so, we have no further questions or comments. If CTAHR intends to drill wells for human consumptive use, they will need to contact us.	Potable water will utilize BWS system. No new wells are anticipated.
Disability Communication Access Board (DCAB)	Duane Buote, Facility Access Coordinator, (808) 586-8121	Ltr dated 8/19/2021	Project on State land and covered by §103-50, HRS, and Dept of Justice 2010 ADA Standards for Accessible Design. Construction documents must be submitted to DCAB for formal doc review.	Acknowledged.
Department of Hawaiian Home Lands	Julie-Ann Cachola, (808) 620-9483, julie-ann.cachola@hawaii.gov; or Pearlyn Fukuba, (808) 620-9279, pearlyn.l.fukuba@hawaii.gov	Ltr dated 9/15/2021	DHHL has approx. 1,914 ac in Waimanalo and subject project is adjacent to our homestead communities and land holdings. EA should include project's potential impacts on Hawaiian Home Lands in the region and evaluate consistency with DHHL's General Plan, Oahu Island Plan and the Waimanalo Regional Plan. Important that DHHL beneficiaries be informed of potential impacts, mitigations, and alternatives. DHHL and homestead associations and native Hawaiian orgs should be included in future consultation.	See EA Section 4.2 discussion of adjacent land uses. The proposed uses will not emit noise, odors, or dust or cause traffic that would impact the DHHL subdivision. See EA Chapter 5 for discussion of consistency with plans, including DHHL plans. DHHL will continue to be included in EA process.
Department of Land and Natural Resources, Land Division	Barbara Lee Barbara.j.lee@hawaii.gov DAR-Kimberly Fuller Engineering-Carty S. Chang DOFAW-David G. Smith	Ltr dated 9/20/2021, sent via email	Division of Aquatic Resources Erosion and Land Based Sources of Pollution (LBSP) Mitigation: DAR recommends BMP for mitigation and LBSP be followed. Consider close proximity to ocean and natural waterways. During construction, measures include barrier that limits sediment or LBSP to max extent practicable. Landscape design and leveling should minimize long-term erosion and LBSP. DAR encourages water quality studies that could show best practices efficacy. If	DAR Comments acknowledged. BMPs will be incorporated. See EA Appendix B, Inoaʻole Stream Monitoring Report Engineering Division See EA Chapter 4 for projected water demand. DOFAW

Agency/Organization	Contact	Date	Comments	Response
			negative aquatic effects are observed, DAR requests to be notified. DAR would like to request notification and photo-documentation of any occurrences where above-average amounts of sediment or pollution have entered the water in order to assess impact, if any. <u>Engineering Division</u> Applicant should include water demands and infrastructure required to meet project needs. Applicant required to provide water demands and calculations to the Engineering Division so it can be included in State Water Projects Plan update projections. <u>Division of Forestry and Wildlife</u> Hawaiian Hoary Bat could occur in vicinity. Site clearing should avoid bat birthing and pup rearing season (June 1 through Sept. 15). Woody plants greater than 15 ft should not be disturbed, removed, or trimmed. Avoid use of barbed wire. Nighttime lighting should be fully shielded to minimize impacts on seabirds. Nighttime work with outdoor lighting should be avoided during fledging season Sept 15 through Dec 15. Hawaiian short-eared owl or Pueo could potentially occur in project vicinity. Recommend twilight pre-construction surveys by qualified biologist prior to clearing vegetation. If Pueo nests are present, buffer zone should be established and DOFAW staff notified. Minimize movement of plant and soil materials between worksites to minimize invasive fungal pathogens, vertebrate and invertebrate pests or	Acknowledged and incorporated. See EA Chapter 3 for discussion and Appendix C, Natural Resources Assessment. <u>CWRM</u> See EA Chapter 4 for discussion of water use and sources and Appendix A, PER. Regarding reference to Puha Stream, per stream consultant Element Environmental, stream through Project Area is Inoaʻole Stream. CWRM will be consulted re possible SCAP if work in bed or banks proposed. <u>Land Division</u> See EA Chapter 2 for discussion of reservoir and acknowledgement that it has been set aside under Executive Order 1598.

Agency/Organization	Contact	Date	Comments	Response
			invasive plant parts. Recommend consulting Oahu Invasive Species Committee in planning, design and construction of project. Clean equipment, materials and personnel of excess soil and debris to minimize invasive species spread. Recommend appropriate native plant species for landscaping; do not plant invasive species. Consult Hawaii-Pacific Weed Risk Assessment website. <u>Commission on Water Resource Management</u> Coordinate with County to incorporate project into Water Use Development Plan. Recommend water efficient fixtures and practices. Recommend BMP for stormwater management. Recommend alternative water sources when practical. Adopt landscape irrigation conservation BMP. Stream Channel Alteration Permit required before any alteration to bed and/or banks of stream channel. Subject parcels contain Puha Steam, intermittent stream classified by DAR as a perennial stream. Work on bed and/or banks may require SCAP. Identify proposed water sources and projected demand, both potable and non-potable, provide calculations used to estimate demand. Discussion of potential impacts on water resources and other public trust uses of water should be included. Discuss water conservation and efficiency measures. Commission supports use of alternative resources whenever practicable. It is policy of Water Commission to promote viable and appropriate reuse of reclaimed water.	

Agency/Organization	Contact	Date	Comments	Response
			Land Division We note approved Subdivision File No. 2016/SUB-199 for this area excluded Reservoir site of 1.984 acres at TMK:(1) 4-1-026:003 under Executive Order 1598, but the Master Plan integrates the area	
Department of Transportation, Highways Division	Jeyan Thirugnanam, Systems Planning Engineer, Highways Division Planning Branch, (808) 587-6336, jeyan.thirugnanam@hawaii.gov	Ltr dated 9/27/2021	1. The following discussions should be provided in DEA and Traffic Assessment or TIAR should be included and prepared by traffic engineer. a. Full eval required o whether proposed work, daily operation or educational uses will have any local impacts to nearby Kalaniana‘ole Hwy b. Discussion of expansion plans and future timelines phasing should also be included in the study 2. DEA should assess impacts to highway traffic and/or highway drainage of any new expansion of farm operations or new farm facilities such as irrigation systems and wells.	See EA Chapter 4 for Traffic discussion and Appendix G for TIAR.
CITY AND COUNTY OF HONOLULU				
Board of Water Supply	Robert Chun, Project Review Branch, Water Resources Division, (808) 748-5443	Ltr dated 9/13/2021	1. MP should include estimated water demands, proposed water facilities & hydraulic calculations showing that proposed facilities can provide adequate fire protection & peak hour pressure 2. Service limit for this area set at 130-ft elevation 3. BWS requires non-potable water for irrigation of large, landscaped areas. 4. BWS source well Waimanalo Well III located at southeaster boundary of area designated for forestry. Any proposed development shall verify	See EA Chapter 4 for discussion of water demands and Appendix A, PER for calculations.

Agency/Organization	Contact	Date	Comments	Response
			with DOH re wastewater disposal systems allowable within "No Pass Zone." No wastewater system within 1,000 ft of BWS potable water sources. BWS defers comments on water availability until more info is provided.	
Department of Design and Construction	Alex Kozlov, P.E., Director	Ltr dated 9/1/2021	No comments at this time.	Acknowledged.
Department of Facility Maintenance	Kyle Oyasato, Division of Road Maintenance, (808) 768-3697	Ltr dated 9/10/2021	We do not have any facilities or easements on the subject property. However, a portion of Nonokio Street and Waikupanaha Street is City maintained. Upon project completion, any damages/deficiencies along these portions shall be repaired to City standards.	Acknowledged.
Department of Planning and Permitting	Franz Kraintz, fkraintz@honolulu.gov, (808) 768-8046	Ltr dated 9/15/2021	1. DEA should list and address relevant policies and guidelines including State and County plans, SLUC boundary classifications, sea level rise exposure, and proposed IAL designations. 2. DEA should provide some indication of the proposed size and location of research station facilities, namely station management buildings, research and testing labs, education center, shelters and support facilities (including parking, roads, utilities) and publicly accessible areas 3. DEA should provide hours of operations, number of employees on site, and number, frequency, and size of events 4. Include discussion of consistency with applicable development standards for zoning district (AG-1 Restricted and AG-2 General Ag) under LUO 5. Our records indicate Kahawai Stream runs along middle portion of the lots and the stream and	1. See EA Chapter 5 for discussion of relevant plans and policies. 2. Size and location of facilities to be determined. EA Chapter 2 provides estimated and maximum number of people and animals and type of structures anticipated. 3. See EA Chapter 2 4. See EA Chapter 5 5. Re reference to "Kahawai Stream," per stream consultant, Kahawai Stream is located to the west of the project site and does not cross the project site. The stream through the Project Area is Inoaʻole Stream. The

Agency/Organization	Contact	Date	Comments	Response
			surrounding area are considered "Freshwater Forested/Shrub Wetlands." DEA should discuss potential impacts to stream waters or wetland that may occur. Estimate of the vegetated and forested areas should be included. 6. DEA should include discussion of land use permits anticipated 7. Should connection to municipal sewer system be proposed, Sewer Connection Application will be required. 8. Further comments may be provided based on review of DEA.	section of Inoaʻole Stream just mauka and makai of Kalanianaʻole Highway, roughly northwest of the project site, are likely classified as wetland areas. Inoaʻole Stream only flows once or twice a year across the project site. 6. See EA Chapter 5 7. Acknowledged. See utility discussion in EA Chapter 4 and PER in Appendix A. 8. Acknowledged.
UTILITIES				
Hawaiian Electric Co.	Rouen Liu, Permit Engineer, HECO, 543-7245	Email dated 8/25/2021	HECO has no objection to the project. Should HECO have existing easements and facilities on the properties, will need continued access and proper clearances for maintenance of facilities. Please continue to keep us informed.	Acknowledged. HECO will continue to be consulted during the EA process.

Pre-Assessment Consultation Correspondence

United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2021-TA-0479

October 1, 2021

Mr. Scott Ezer
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Subject: Technical Assistance for Waimanalo Research Station Master Plan Pre-EA, Oahu

Dear Mr. Ezer:

Thank you for your letter dated August 17, 2021, requesting a species list in preparation of an Environmental Assessment (EA) for the Waimanalo Research Station master plan. The University of Hawaii, College of Tropical Agriculture and Human Resources is preparing an EA for the use of 283 acres of land in Waimanalo, Oahu, adjacent to the existing Waimanalo Research Station master plan. The U.S. Fish and Wildlife Service is supportive of the proposed research station activities, including plant pest management, soil health, native forest restoration, wildlife ecology mangement, invasive species management, and wildfire management.

This letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.), as amended (ESA). Based on this authority, we offer the following comments for your consideration. We have reviewed the information you provided and pertinent information in our files, as it pertains to listed species and designated critical habitat in accordance with section 7 of the ESA. There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian stilt (*Himantopus mexicanus knudseni)*, endangered Hawaiian gallinule (*Gallinula galeata sandvicensis*), and endangered Hawaiian coot (*Fulica alai*); the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); the endangered Hawaiian petrel (*Pterodroma sandwichensis*), endangered Hawaii distinct population segment (DPS) of band-rumped storm-petrel (*Oceanodroma castro*), and threatened Newell's shearwater (*Puffinus auricularis newelli*).

If you have questions regarding this letter, please contact Narrissa Brown, Fish and Wildlife Biologist (phone: 808-792-9400, email: Narrissa_Brown@fws.gov). When referring to this project, please include this reference number: 01EPIF00-2021-TA-0479.

Sincerely,

Island Team Manager
Oahu, Kauai, Northwestern Hawaiian
Islands and American Samoa

cc: Ms. Leslie Kurisaki

DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor

PHYLLIS SHIMABUKURO-GEISER
Chairperson, Board of Agriculture

MORRIS M. ATTA
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

September 14, 2021

Mr. Leslie Kurisaki, Project Planner
HHF Planners
Attn: Waimanalo Research Station Master Plan
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Dear Ms. Kurisaki:

RE: Waimanalo Research Station Master Plan
Draft Environmental Assessment Pre-Assessment Consultation
Waimanalo, Oahu, Hawaii
TMK No. 4-1-008:103 and 4-1-008:005

The State of Hawaii, Department of Agriculture (HDOA), Agricultural Resource Management Division (ARMD) reviewed the Draft Environmental Assessment Pre-Assessment Consultation for the *Waimanalo Research Station Master Plan* dated August 17, 2021. The HDOA ARMD has reviewed your request and provides the following comment.

The Waimanalo Irrigation System (WIS) has 8-inch PVC irrigation lines and associated air relief valves within your project area. Please consult with the HDOA ARMD in the development of design plans to avoid disturbance to the existing irrigation system.

The pre-assessment consultation letter indicates that the vision for the facility includes areas for animals/livestock and plants. Please address whether the facility will request the use of agricultural water from the WIS. If yes, provide an estimate of the amount of agricultural water that will be requested and a description of its use.

Please include us on your list for review of the draft Environmental Assessment and let us know if there are any changes to the scope. Should you have any questions, please contact Ms. Janice Fujimoto of the ARMD at (808) 973-9473.

Sincerely,

BRIAN KAU, P.E.
Administrator and Chief Engineer
Agricultural Resource Management Division

Island Fresh

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) 21.151

AUG 23 2021

Ms. Leslie Kurisaki
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: Waimanalo Research Station Master Plan
Draft Environmental Assessment Pre-Assessment Consultation
Waimanalo, Oahu, Hawaii
TMK: 4-1-008:103 and 4-1-008:005

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

If you have any questions, your staff may contact Mr. Dennis Chen of the Planning Branch at (808) 586-0491 or via e-mail at dennis.yk.chen@hawaii.gov.

Sincerely,

CHRISTINE L. KINIMAKA
Public Works Administrator

DE:mo

From: Miyahira, Michael M
To: Leslie Kurisaki
Cc: Corrigan, Joan
Subject: Waimanalo Research Station master Plan Draft EA Pre-Assessment Consultation
Date: Wednesday, September 08, 2021 4:29:31 PM
Attachments: 20210817_WaimanaloResearchStnEarl_ConsultLtr.pdf

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[This message was sent from an outside source.]
Aloha Leslie,

We are in receipt of the subject document and have just one question: will this entire facility be serviced by the Honolulu Board of Water Supply's system? If so, we have no further questions or comments.

If CTAHR intends to drill wells for human consumptive use, i.e. drinking, bathing, showering, cooking, dishwashing and maintaining oral hygiene, then they will need to contact us.

Michael Miyahira, P.E.
Engineering Section Supervisor
Hawaii Safe Drinking Water Branch
Uluakupu Building 4
2385 Waimano Home Road, Suite 110
Pearl City, HI 96782-1400
Ph: 586-4258

RECEIVED
By Safe Drinking Water Branch at 12:16 pm, Aug 17, 2021

HHF PLANNERS
places for people

8/31/2021
M3__

August 17, 2021

Waimanalo Research Station Master Plan
Draft Environmental Assessment Pre-Assessment Consultation
Waimānalo, O'ahu, Hawai'i
TMK 4-1-008:103 and 4-1-008:005

Dear Participant:

The University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR) is preparing an Environmental Assessment (EA) for the use of 283 acres in Waimānalo, adjacent to the existing 127-acre Waimanalo Research Station (WRS) (Figure 1). The subject property is the site of the former Meadow Gold Dairies (MGD), and is envisioned as an extension of the existing WRS. The Waimanalo Research Station Master Plan represents CTAHR's 20+ year vision for the property.

The EA is being prepared in accordance with the State of Hawai'i Chapter 343 HRS environmental guidelines and requirements. We are conducting early consultation to solicit input from you or your agency.

Master Plan
The approximately 283-acre site will be leased from the State of Hawaii, Department of Land and Natural Resources (DLNR). The proposed Waimanalo Research Station will be part of an existing network of agricultural experimental stations and Cooperative Extension office throughout Hawaii. The stations provide a venue for CTAHR staff, faculty and students to study, learn, and conduct research in areas such a sustainable agriculture and food production, ecosystem restoration, and natural resource management. The stations also support Cooperative Extension activities which provide applied science-based education to the state's farmers, stakeholders, and consumers.

The master plan (Figure 2) illustrates general types of uses that are envisioned at the site. Three primary land uses are proposed:

1) Animals/Livestock
   These areas will allow CTAHR to continue and expand its domestic animal research, teaching, and extension activities on multiple species (sheep, goats, swine, poultry). The areas will include space for grazing, pasture, shelters, and support facilities. There are no immediate plans to raise cattle at Waimanalo.

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawaii 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

2) Plants
   These areas may be used to grow fruit, vegetable crops, and ornamentals. Small scale research may include testing and breeding crop varieties, integrated pest management, soil health management, integrated food production research, and others. An area will be included for GoFarm Hawaii, the successful farmer development program.

3) Forestry
   The steeper, mauka areas of the site are designated for forestry. Research activities may include native forest restoration, wildlife ecology and management, timber management, watershed management, invasive species management, and wildfire management.

The area near the Waikupanaha Street extension on the western side of the property is designated for an Educational Center. This general area will also include functions such as station management, access control, and public interface. Areas alongside Inoaʻole Stream are a Riparian Management Zone which may be used for Best Management Practices, water quality monitoring, stormwater management, or biodiversity studies. The plan shows an archaeological/cultural preserve surrounding the Pueo Heiau and other cultural sites. The preserve will include a publicly-accessible area to allow for community-driven and sponsored projects.

The location and size of these land use components is intended to be conceptual and the boundaries shown are intended to be flexible and responsive to user needs and changing conditions.

Pre-Assessment Consultation

This pre-assessment consultation is intended to ensure that interested parties are notified of the forthcoming Draft EA and are given the opportunity to identify relevant issues and concerns to be addressed in the EA.

Please send any written comments to Leslie Kurisaki, project planner, via email to lkurisaki@hhf.com, or by U.S. mail to:

HHF Planners
ATTN: Waimānalo Research Station Master Plan
733 Bishop Street, Suite 2590
Honolulu, Hawaiʻi 96813

Please send comments by September 17, 2021. If you have any questions or would like to be removed from the list of parties to receive the Draft EA, please contact Leslie Kurisaki at the email address above or at (808) 457-3182.

Sincerely,

HHF Planners
Scott Ezer, Principal

Site Location Map

Waimanalo Research Station Master Plan

Figure 1

Figure 2

Conceptual Land Uses

Waimanalo Research Station Master Plan

May 2021

DISABILITY AND COMMUNICATION ACCESS BOARD

1010 Richards Street, Room 118 • Honolulu, Hawaii 96813
Ph. (808) 586-8121 • Fax (808) 586-8129

August 19, 2021

Mr. Scott Ezer
Principal
ATTN: Waimanalo Research Station Master Plan
HHF Planners
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Regarding: Draft Environmental Assessment for the Waimanalo Research Station Master Plan

Dear Mr. Ezer:

The Disability and Communication Access Board (DCAB) would like to thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Waimanalo Research Station Master Plan. The purpose of this review is to ensure that the master plan will take into account accessibility design requirements for persons with disabilities.

The area identified in the master plan is located on State land and is covered by §103-50, Hawaii Revised Statutes (HRS). The Waimanalo Research Station Master Plan is required to comply with the Department of Justice's (DOJ) 2010 ADA Standards for Accessible Design (2010 Standards) http://www.ada.gov/2010ADAstandards_index.htm. To be consistent with the DOJ's standard, DCAB adopted the 2004 Americans with Disabilities Act Accessibility Guidelines (ADAAG) as of January 1, 2011 and passed interpretive opinions consistent with the 2010 ADA Standards. All new Interpretive Opinions can be viewed or downloaded at http://health.hawaii.gov/dcab/facility-access/interpretive-opinions/.

If any project is receiving federal funds, it will also have to comply with the requirements under Section 504 of the Rehabilitation Act, but this is not included in the DCAB review process. If you have any questions regarding your obligations under Section 504 of the Rehabilitation Act, you should contact the federal agency that is providing federal funds for your project.

Projects with construction documents that are covered by §103-50, HRS, are required to be submitted to DCAB for a formal document review.

Beyond DCAB's review process, program access obligations must be met under the ADA Title II provisions. This obligation may require additional means to provide access, especially where full compliance with the 2010 Standards cannot be achieved.

The above reflects DCAB's staff review and comments concerning the Draft Environmental Assessment for the Waimanalo Research Station Master Plan.

Should you have any further questions, please feel free to contact Duane Buote, Facility Access Coordinator at (808) 586-8121.

Sincerely,

KIRBY L. SHAW
Executive Director

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

September 15, 2021

In reply refer to:
PO-21-248

Sent by electronic mail: lkurisaki@hhf.com

Mr. Scott Ezer, Principal
HHF Planners
ATTN: Waimānalo Research Station Master Plan
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Subject: Chapter 343, Hawaii Revised Statutes Environmental Assessment,
Early Consultation Comments
Waimānalo Research Station Master Plan
TMK 4-1-008:103 and 4-1-008:005
Waimānalo, O'ahu, Hawai'i

Dear Mr. Ezer,

The Department of Hawaiian Home Lands (DHHL) acknowledges receiving the request for early consultation comments on the above-cited project. The DHHL has approximately 1,914 acres of land in Waimānalo and the subject project is located adjacent to our homestead communities and land holdings. The subject project was previously identified in the department's Waimānalo Regional Plan (November 2011) and we anticipate that the project may impact both our lands and beneficiaries.

Therefore, we ask that the Environmental Assessment include the subject project's potential impacts on Hawaiian Home Lands in the region as well as evaluate the project's consistency with DHHL's General Plan, O'ahu Island Plan and the Waimānalo Regional Plan.

It is also important that DHHL's beneficiaries are informed of potential impacts, proposed mitigations, and evaluation of alternatives to the location and scope proposed. DHHL and homestead associations located in the Waimānalo Region should be included in future consultation conducted for this project. In addition, DHHL encourages the University of Hawaii, College of Tropical Agriculture and Human Resources and its agents to consult with native Hawaiian organizations when preparing environmental assessments in order to better assess potential impacts to cultural and natural resources, access and other rights of Native Hawaiians.

Mahalo for the opportunity to provide comments. If you have any questions, please call Julie-Ann Cachola at phone (808) 620-9483/email: julie-ann.cachola@hawaii.gov or Pearlyn Fukuba, at phone (808) 620-9279/email pearlyn.l.fukuba@hawaii.gov.

Aloha,

William J. Ailā, Jr., Chairman
Hawaiian Homes Commission

c: DHHL Land Development Division
DHHL Land Management Division

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

September 20, 2021

LD 0925e

HHF Planners
ATTN: Waimanalo Research Station Master Plan
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Via email: lkurisaki@hhf.com

To Whom It May Concern:

SUBJECT: **Waimanalo Research Station Master Plan**
Draft Environmental Assessment Pre-Assessment Consultation
Waimanalo, Island of O'ahu, Hawai'i; TMK: (1) 4-1-008:103 & 005

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to various DLNR divisions, as indicated on the attached, for their review and comment.

Attached are comments received from our (a) Division of Aquatic Resources, (b) Engineering Division, (c) Division of Forestry and Wildlife, (d) Commission on Water Resource Management, and (e) Land Division, Oahu District. Should you have any questions, please feel free to contact Barbara Lee via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 17, 2021

LD 0925e

MEMORANDUM

TO: **DLNR Agencies:**
_X_ Div. of Aquatic Resources *(via email: Kendall.L.Tucker@hawaii.gov)*
__ Div. of Boating & Ocean Recreation
_X_ Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_ Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__ Div. of State Parks
_X_ Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__ Office of Conservation & Coastal Lands *(via email: Sharleen.K.Kuba@hawaii.gov)*
_X_ Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Environmental Assessment Pre-Assessment Consultation**
Waimanalo Research Station Master Plan
LOCATION: Waimanalo, Island of Oahu, Hawaii
TMK: (1) 4-1-008:103 and 4-1-008:005
APPLICANT: **HHF Planners on behalf of University of Hawaii, College of Tropical Agriculture and Human Resources**

Transmitted for your review and comment is information on the above-referenced project. Please review the attached information and submit any comments by the internal deadline of **September 15, 2021** to the Land Division at DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by the above due date, we will assume your agency has no comments at this time. If you have any questions, please contact Barbara Lee at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: _____
Print Name: Brian J. Neilson- Administrator
Division: Aquatic Resources
Date: Sep 15, 2021

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

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

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

Date: 9/13/2021
DAR # AR0099

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Kimberly Fuller, Aquatic Biologist

SUBJECT: Waimānalo Research Station Master Plan
Draft Environmental Assessment Pre-Assessment Consultation

Request Submitted by: HHF Planners on behalf of UH, College of Tropical Ag and HR

Location of Project: Waimānalo, O'ahu, Hawai'i
TMK 4-1-008:103 and 4-1-008:005

Brief Description of Project:

This is a pre-consultation for the use of 283 acres in Waimānalo by the University of Hawai'i, College of Tropical Agriculture and Human Resources (CTAHR) for use as an agricultural experimental station and Cooperative Extension office. This property previously was used by Meadow Gold Dairies and is adjacent to the existing 127 acre Waimānalo Research Station (WRS). The three primary land uses are for 1)Animals/ Livestock, 2)Plants, and 3) Forestry.

1) Animal use: Sheep, goats swine and poultry will be used for research, teaching and extension activities. There will be space for grazing, pasture, shelters and support facilities. There are no immediate plans to raise cattle.

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: Sep 15, 2021

Brian J. Neilson
DAR Administrator

DAR# AR0099

Brief Description of Project

2) Plants: These areas may be used to grow fruit, vegetable crops, and ornamentals. Small scale research may include testing and breeding crop varieties, integrated pest management, soil health
management, integrated food production research, and others. An area will be included for
GoFarm Hawaii, the successful farmer development program.

3) Forestry: The steeper, mauka areas of the site are designated for forestry. Research activities may include native forest restoration, wildlife ecology and management, timber management, watershed management, invasive species management, and wildfire management.

They will build an Educational Center that will be used for station management, access control and public interface new the Waikupanaha Street extension. Areas alongside Inoa'ole stream are a Riparian Management Zone and may be used for Best Maangement Practices, water quality monitoring, stormwater management, or biodiversity studies. There will be an archaeological/ cultural preserve surrounding the Pueo Heiau and other cultural sites that can be used by the public for appropriate events. Provided land designation included below.

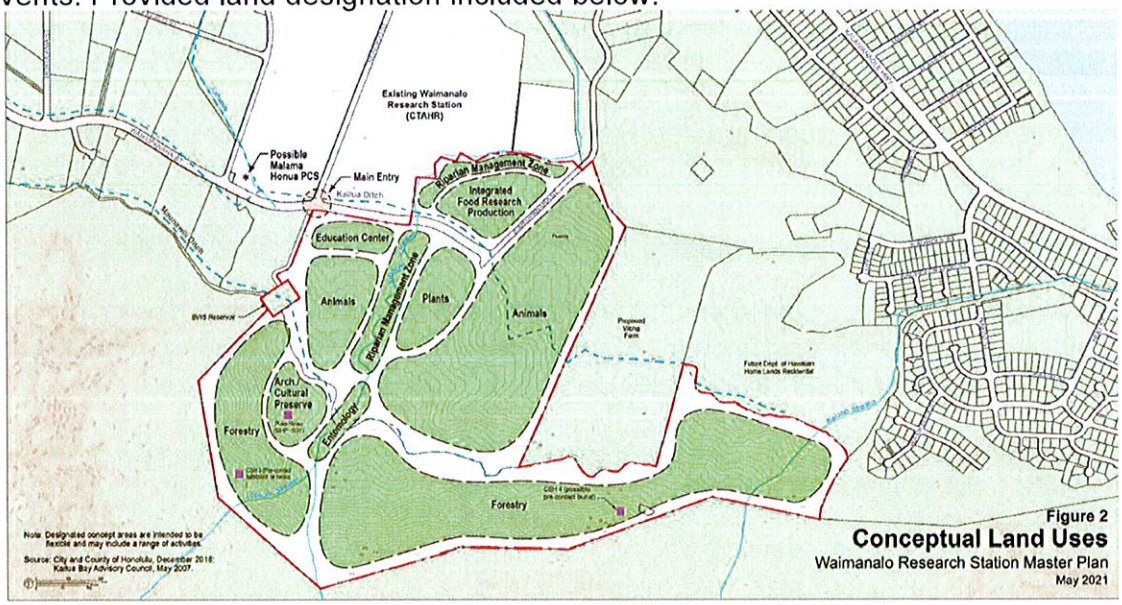

Figure 2
Conceptual Land Uses
Waimanalo Research Station Master Plan
May 2021

DAR# AR0099

Comments

This is a pre-assessment request for comments, thus DAR needs more information to provide adequate comments once the environmental assessment is completed.

Things to address in the Environmental Assessment:

Erosion and Land Based Source of Pollution (LBSP) Mitigation:

DAR recommends that best management practices for mitigation of erosion and LBSP be followed. The close proximity to the ocean and other natural waterways should be considered.

During construction these measures would include any type of barrier (e.g. sediment barriers/bags, petroleum absorption diapers, etc.) that limits the amount of sediment or LBSP (e.g. petroleum products, chemicals, debris, etc.) to the maximum extent practicable. DAR recommends that all construction materials be composed of environmentally inert materials to the extent practicable. The Contractor shall consider the weather while performing construction. Some work may be performed during low rain conditions, but all construction would be halted during storm conditions or when storm conditions threaten the watershed. There should be sufficient measures in place to prevent runoff from the construction site even under storm conditions.

Landscape design and leveling should be such that long term erosion and LBSP are minimized. Particularly with agricultural use, methods should minimize or negate any increase of nutrients and other LBSP going into the several canals and streams running through the property that connect with the nearby marine environment. As mentioned in the proposal, water quality studies may occur in these areas, and DAR encourages studies that could show best practice efficacy. If negative aquatic effects from use are observed, DAR requests to be notified, and the land users should practice adaptive management to mitigate the degradation.

DAR would like to request notification and photo-documentation of any occurrence where above-average amounts of sediment or pollution have entered the water, in order to assess impact, if any.

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

August 17, 2021

LD 0925e

MEMORANDUM

FROM:

~~TO:~~ **DLNR Agencies:**
_X_ Div. of Aquatic Resources *(via email: Kendall.L.Tucker@hawaii.gov)*
__ Div. of Boating & Ocean Recreation
_X_ Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_ Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__ Div. of State Parks
_X_ Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__ Office of Conservation & Coastal Lands *(via email: Sharleen.K.Kuba@hawaii.gov)*
_X_ Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*

TO:

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

SUBJECT: **Environmental Assessment Pre-Assessment Consultation**
Waimanalo Research Station Master Plan

LOCATION: Waimanalo, Island of Oahu, Hawaii
TMK: (1) 4-1-008:103 and 4-1-008:005

APPLICANT: **HHF Planners on behalf of University of Hawaii, College of Tropical Agriculture and Human Resources**

Transmitted for your review and comment is information on the above-referenced project. Please review the attached information and submit any comments by the internal deadline of **September 15, 2021** to the Land Division at DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by the above due date, we will assume your agency has no comments at this time. If you have any questions, please contact Barbara Lee at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: *[signature]*
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Sep 8, 2021

Attachments
Cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji

Ref: Environmental Assessment Pre-Assessment Consultation
Waimanalo Research Station Master Plan
Location: Waimanalo, Island of Oahu, Hawaii
TMK(s): (1) 4-1-008:103 and 4-1-008:005
Applicant: HHF Planners on behalf of University of Hawaii, College of Tropical Agriculture and Human Resources

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, Chapter 1, Subchapter B, part 60 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). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT) could also be used to research flood hazard information.

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) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4896.

The applicant should include water demands and infrastructure required to meet project needs. Please note that all State projects 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: Sep 8, 2021

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

August 17, 2021

LD 0925e

MEMORANDUM

TO: **DLNR Agencies:**
_X_ Div. of Aquatic Resources *(via email: Kendall.L.Tucker@hawaii.gov)*
__ Div. of Boating & Ocean Recreation
_X_ Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_ Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__ Div. of State Parks
_X_ Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__ Office of Conservation & Coastal Lands *(via email: Sharleen.K.Kuba@hawaii.gov)*
_X_ Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: **Environmental Assessment Pre-Assessment Consultation**
Waimanalo Research Station Master Plan

LOCATION: Waimanalo, Island of Oahu, Hawaii
TMK: (1) 4-1-008:103 and 4-1-008:005

APPLICANT: **HHF Planners on behalf of University of Hawaii, College of Tropical Agriculture and Human Resources**

Transmitted for your review and comment is information on the above-referenced project. Please review the attached information and submit any comments by the internal deadline of **September 15, 2021** to the Land Division at DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by the above due date, we will assume your agency has no comments at this time. If you have any questions, please contact Barbara Lee at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: _____
Print Name: DAVID G. SMITH, Administrator
Division: Division of Forestry and Wildlife
Date: Sep 14, 2021

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

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

September 14, 2021

MEMORANDUM *Log no. 3292*

TO: RUSSELL Y. TSUJI, Administrator
Land Division

FROM: DAVID G. SMITH, Administrator
Division of Forestry and Wildlife

SUBJECT: Division of Forestry and Wildlife Comments on the Environmental Assessment Pre-assessment Consultation for the University of Hawai'i Waimānalo Research Station Master Plan

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding the environmental assessment pre-assessment consultation for the master plan for the University of Hawai'i, College of Tropical Agriculture and Human Resources' (CTAHR) proposed use of 283 acres in Waimanālo on O'ahu, Hawai'i; TMKs: (1) 4-1-008:103 and 4-1-008:005. The land will be used to a) raise sheep, goats, swine and poultry, b) grow fruit and vegetable crops and ornamentals, and to c) conduct forestry, wildlife ecology, and lands management related operations. An area near the Waikupanaha Street extension on the western side of the property will be designated for an Educational Center, an archaeological/cultural preserve will surround the Pueo Heiau and other cultural sites, and the preserve will include a publicly accessible area to allow for community driven and sponsored projects.

The State listed Hawaiian Hoary Bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*) could potentially occur in the vicinity of the project area and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). During this period, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed. DOFAW additionally prefers that new construction avoid the use of barbed wire.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade structures or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

The State endangered Hawaiian Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) could potentially occur in the project site vicinity. Pueo are a crepuscular species, most active during dawn and dusk twilights. DOFAW recommends twilight pre-construction surveys by a qualified biologist prior to clearing vegetation. If Pueo nests are present, a buffer zone should be established in which no clearing occurs until nesting ceases, and DOFAW staff should be notified.

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens, vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the O'ahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Gear that may contain soil, such as work boots and vehicles, should be thoroughly cleaned with water and sprayed with 70% alcohol solution to prevent the spread of Rapid 'Ōhi'a Death and other harmful fungal pathogens.

DOFAW recommends using native plant species for landscaping that are appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Please do not plant invasive species. DOFAW recommends consulting the Hawai'i-Pacific Weed Risk Assessment website to determine the potential invasiveness of plants proposed for use in the project (https://sites.google.com/site/weedriskassessment/home). We recommend that you refer to www.plantpono.org for guidance on selection and evaluation for landscaping plants.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Paul Radley, Protected Species Habitat Conservation Planning Coordinator at (808) 587-0010 or paul.m.radley@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

MICHAEL G. BUCK
ELIZABETH A. CHAR, M.D.
NEIL J. HANNAHS
AURORA KAGAWA-VIVIANI, PH.D.
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

September 13, 2021

REF: RFD.5768.3

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: M. Kaleo Manuel, Deputy Director
Commission on Water Resource Management

SUBJECT: Environmental Assessmemt Pre-Assessment Consultation Waimanalo Research Station Master Plan

FILE NO.: RFD.5768.3
TMK NO.: (1) 4-1-008:005, (1) 4-1-008:103

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.

[X] 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.

[X] 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.

[X] 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/

[X] 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.

[X] 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.

[X] 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.

[X] 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.

[X] OTHER: The subject parcels contain Puha Stream which is defined by the National Hydrography Dataset as an intermittent stream and classified by the State Division of Aquatic Resources as a perennial stream. Any proposed work on the bed and/or banks of the stream channel may require a Stream Channel Alteration Permit from the Commission.

Planning - The proposed water source(s) and projected water demands for the project, both potable and non-potable, should be identified and the calculations used to estimate demands should be provided. A discussion of the potential impacts on water resources and other public trust uses of water should be included, and any proposed mitigation measures described. Water conservation and efficiency measures to be implemented should also be discussed.

The Commission supports the use of alternative resources wherever practicable to conserve natural supplies. It is the policy of the Water Commission to promote the viable and appropriate reuse of reclaimed water insofar as it does not compromise beneficial uses of existing water resources.

If you have any questions, please contact Neal Fujii of the Planning Branch at 587-0216, Ryan Imata of the Regulation Branch at 587-0225 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

August 17, 2021

LD 0925e

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources *(via email: Kendall.L.Tucker@hawaii.gov)*
__Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__Div. of State Parks
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__Office of Conservation & Coastal Lands *(via email: Sharleen.K.Kuba@hawaii.gov)*
X Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Environmental Assessment Pre-Assessment Consultation**
Waimanalo Research Station Master Plan
LOCATION: Waimanalo, Island of Oahu, Hawaii
TMK: (1) 4-1-008:103 and 4-1-008:005
APPLICANT: **HHF Planners on behalf of University of Hawaii, College of Tropical Agriculture and Human Resources**

Transmitted for your review and comment is information on the above-referenced project. Please review the attached information and submit any comments by the internal deadline of **September 15, 2021** to the Land Division at DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by the above due date, we will assume your agency has no comments at this time. If you have any questions, please contact Barbara Lee at barbara.j.lee@hawaii.gov. Thank you.

We note approved Subdivision File No. 2016/SUB-199 for this area excluded Reservoir site of 1.984 acres at TMK:(1) 4-1-026:003 under Executive Order 1598, but the Master Plan integrates the area.

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(X) Comments are ~~attached~~ to the left

Signed: Darlene Bryant-Takamatsu BC
Print Name: Darlene Bryant-Takamatsu
Division: Land Division
Date: 8/23/21

Attachments
Cc: Central Files

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
DIR 0807
HWY-PS 2.6357

September 27, 2021

VIA EMAIL: lkurisaki@hhf.com

Ms. Leslie Kurisaki
Planner
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: Request for Comments for Pre-Assessment Consultation
Waimanalo Research Station Masterplan
Waimanalo, Oahu, Hawaii
Tax Map Key Nos.: (1) 4-1-008: 005 and 103

Thank you for your letter dated August 17, 2021, requesting for our comments relating to an upcoming preparation of a Draft Environmental Assessment (DEA) required by Chapter 343, Hawaii Revised Statutes due to the use of State lands and funds. The University of Hawaii College of Tropical Agriculture and Human Resource is proposing to lease a 283-acre site adjacent to the existing research station as a 20-year masterplan expansion. The adjoining research station comprises of 127 acres of land is south of the proposed site.

The proposed land use will include raising livestock with grazing and shelter areas, agricultural uses, forestry management, and the construction of an Educational Center. Based on the provided exhibits, the proposed site is accessible by the State Kalanianaole Highway (Route 72) with access points, which appears to be on Waikupanaha Street and Nonokio Street, off Hihimanu Street; all are County roadways.

The Hawaii Department of Transportation has the following comments:

1. The following discussions should be provided in the DEA and a Traffic Assessment or a Traffic Impact Analysis Report should be included and prepared by a traffic engineer licensed in the State of Hawaii.

    a. A full evaluation is required on whether the proposed work, daily operation, or educational uses will have any local impacts to the nearby State Kalanianaole Highway.

b. A discussion of expansion plans and future timelines/phasing should also be included in the study.

2. The DEA should assess impacts to highway traffic and/or highway drainage of any new expansion of farm operations or new farm facilities such as irrigation systems and wells.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PS 2021-144.

Sincerely,

JADE T. BUTAY
Director of Transportation

BOARD OF WATER SUPPLY

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

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Manager and Chief Engineer

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

September 13, 2021

Ms. Leslie Kurisaki
HHF Planners
ATTN: Waimanalo Research Station Master Plan
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: Letter Dated August 17, 2021 Requesting Pre-Assessment Consultation Comments on the Draft Environmental Assessment of the Waimanalo Research Station Master Plan, Waikupanaha Street – Tax Map Key: 4-1-008: 003 and 005

Thank you for the opportunity to comment on the proposed Waimanalo Research Station Master Plan (WRSMP).

The Board of Water Supply (BWS) has the following comments:

1. The WRSMP shall be submitted for BWS review and approval. The WRSMP should include the estimated water demands, proposed water facilities, and hydraulic calculations showing that the proposed facilities can provide adequate off-site fire protection and peak hour pressures.

2. The service limit for this area is set at the 130-foot elevation.

3. BWS Rules and Regulations Section 1-112 requires non-potable water for the irrigation of large, landscaped areas. The developer should investigate the feasibility of using nonpotable water for irrigation of the proposed research facilities. If nonpotable 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.

4. BWS source well, Waimanalo Well III, is located at the southeastern boundary of the area designated for forestry, on parcel with Tax Map Key: 4-1-008: 005. Any proposed developments shall verify with the State Department of Health regarding wastewater disposal systems that are allowable within the "No Pass Zone". Ground disposal of wastewater could detrimentally impact the underlying freshwater aquifer; therefore, no wastewater system shall be within 1,000 feet of BWS potable water sources.

The BWS defers comments on water availability until more information on the proposed developments are provided for our review.

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

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

RICK BLANGIARDI
MAYOR

ALEX KOZLOV, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

September 1, 2021

Ms. Leslie Kurisaki
Project Planner
HHF Planners
ATTN: Waimanalo Research Station Master Plan
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Kurisaki:

Subject: Waimanalo Research Station Master Plan
Draft Environmental Assessment Pre-Assessment Consultation
Waimanalo, Oahu, Hawaii
TMK: 4-1-008:103 and 4-1-008:005

Thank you for the opportunity to review and comment. The Department of Design and Construction has no comments to offer at this time.

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

Sincerely,

PR Alex Kozlov, P.E.
Director

AK:krn (860188)

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

RICK BLANGIARDI
MAYOR

ROGER BABCOCK, JR., Ph.D., P.E.
DIRECTOR AND CHIEF ENGINEER

DAWN B. SZEWCZYK, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
21-536

September 10, 2021

HHF Planners
ATTN: Waimanalo Research Station Master Plan
733 Bishop Street, Suite 2590
Honolulu, Hawai'I 96813
Attention: Leslie Kurisaki, Project Planner

Dear Leslie Kurisaki:

Subject: **WAIMANALO RESEARCH STATION MASTER PLAN DRAFT ENVIRONMENTAL ASSESSMENT PRE-ASSESSMENT CONSULTATION WAIMANALO, O'AHU, HAWAI'I TMK: 4-1-008:103 & 4-1-008:005**

Thank you for the opportunity to review and to give our input regarding the subject Waimanalo Research Station Master Plan.

- We do not have any facilities or easements on the subject property. However, a portion of Nonokio Street and Waikupanaha Street is City maintained. Upon completion of the project, should there be any damages/deficiencies along the City portions of Nonokio Street and Waikupanaha Street all damages/deficiencies shall be repaired to City standards and accepted by the City at no cost to the City & County of Honolulu.

Should you have any questions, please contact Kyle Oyasato of the Division of Road Maintenance, at 768-3697.

Sincerely,

for Roger Babcock, Jr., Ph.D., P.E.
Director and Chief Engineer

Enclosures: Map

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

RICK BLANGIARDI
MAYOR

DEAN UCHIDA
DIRECTOR

DAWN TAKEUCHI APUNA
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

September 15, 2021

2021/ELOG-1630(FK)
2086428

Mr. Scott Ezer
Principal
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Ezer:

SUBJECT: Waimanalo Research Station Master Plan
Draft Environmental Assessment (DEA)
Pre-Assessment Consultation
Waimanalo, Oahu, Hawaii
Tax Map Keys 4-1-008: Parcels 005 and 103

Thank you for the opportunity to comment on the subject Waimanalo Research Station Master Plan DEA, Pre-Assessment Consultation. The Department of Planning and Permitting (DPP) provides the following comments:

1. The DEA should list and address all relevant policies and guidelines of applicable laws and public policies including consistency with State and County plans and policies, State Land Use Commission boundary classifications, sea level rise exposure, and proposed Important Agricultural Land designations.

2. The DPP understands that the location and size of the land use components are intended to be conceptual at this stage for flexibility in meeting user needs. However, in order to assess potential impacts and mitigative measures, the DEA should provide some indication of the proposed size and location of the research station facilities, namely, the station management buildings, the research and testing laboratories, the education center, the shelters and support facilities (including parking, public or private roads, utilities), and publicly-accessible areas or staging areas for community tours and projects.

3. Following up on the items requested in Comment No. 2, the DEA should provide hours of operation, number of employees on-site, number, frequency, and size of events expected to be held at the research station.

4. The subject properties are within the AG-1 Restricted and AG-2 General Agricultural Districts. Please include a discussion of the Project's consistency with the applicable development standards for the zoning district under the Land Use Ordinance, Chapter 21, Revised Ordinances of Honolulu.

5. Our records indicate that Kahawai Stream runs along the middle portion of the lots, and the stream and its surrounding riparian area are considered "Freshwater Forested/Shrub Wetlands." Therefore, the DEA should discuss any potential impacts to stream waters or wetlands that may occur as a result of the proposed action and any associated activities to this area. An estimate of the vegetated and forested areas should also be included.

6. The DEA should include a discussion of any land use permits anticipated to be required prior to Project implementation.

7. Should a connection to the municipal sewer system be proposed, a Sewer Connection Application will be required.

8. Further comments may be provided based on our review of the DEA.

Should you have any questions, please contact Franz Kraintz, of our staff, at fkraintz@honolulu.gov or at (808) 768-8046.

Very truly yours,

Dean Uchida
Director

DU:ah

From: Leslie Kurisaki
To: Liu, Rouen
Cc: Kuwaye, Kristen
Subject: RE: Waimanalo Research Station Master Plan--Environmental Assessment (EA) consultation
Date: Thursday, August 26, 2021 9:44:00 AM

Dear Mr. Liu and Ms Kuwaye,

Thank you for your comments. A copy of your email will be included in the Draft EIS.

Mahalo,
Leslie

Leslie Kurisaki
Associate
HHF Planners
40 years in Hawai'i

d 808.457.3182
733 Bishop St. Ste. 2590 | Honolulu, HI 96813
www.hhf.com

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Wednesday, August 25, 2021 11:19 PM
To: Leslie Kurisaki <lkurisaki@hhf.com>
Cc: Kuwaye, Kristen <kristen.kuwaye@hawaiianelectric.com>
Subject: RE: Waimanalo Research Station Master Plan--Environmental Assessment (EA) consultation

[This message was sent from an outside source.]
Dear Ms. Kurisaki,

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 Waimanalo Research Station Master Plan project comes to fruition, please continue to keep us informed.

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

Thank you,
Rouen Liu
Permit Engineer

From: Leslie Kurisaki <lkurisaki@hhf.com>
Sent: Tuesday, August 17, 2021 10:21 AM
To: Leslie Kurisaki <lkurisaki@hhf.com>

Subject: Waimanalo Research Station Master Plan--Environmental Assessment (EA) consultation

[This email is coming from an EXTERNAL source. Please use caution when opening attachments or links in suspicious email.]

Aloha,

The University of Hawaiʻi College of Tropical Agriculture and Human Resources (CTAHR) is preparing an Environmental Assessment (EA) for the Waimanalo Research Station Master Plan. Attached is a Pre-Assessment Consultation letter to your agency with information about the project and instructions on how to provide comment.

Thank you,
Leslie

Leslie Kurisaki
Associate
HHF Planners
40 years in Hawaiʻi

d 808.457.3182
733 Bishop St. Ste. 2590 | Honolulu, HI 96813
www.hhf.com

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