Bonnie D. Irwin
Chancellor

UNIVERSITY of HAWAIʻI®
HILO
Ke Kulanui o Hawaiʻi ma Hilo

March 6, 2026

Mary Alice Evans, Director
Office of Planning and Sustainable Development
Environmental Review Program (ERP)
235 South Beretania Street, Suite 702
Honolulu, Hawaiʻi 96813

SUBJECT: Chapter 343, HRS Final Environmental Assessment – Finding of No Significant Impact Publication; University of Hawaiʻi at Hilo - Upgrading Halepōhaku Fuel Storage System, Tax Map Key (TMK): (3) 4-4-015:012, District of Hāmākua, Island of Hawaiʻi, State of Hawaiʻi

Dear Director Evans,

With this letter, the University of Hawaiʻi at Hilo hereby submits a Final Environmental Assessment with a Finding of No Significant Impact (FEA-FONSI) for the proposed Upgrading Halepōhaku Fuel Storage System project, located at TMK (3) 4-4-015:012 in the Hāmākua District on the Island of Hawaiʻi for publication in the next available edition of *The Environmental Notice*.

Based on the effects analysis presented in the FEA and the significance criteria outlined in HAR 11-200-12, the University of Hawaiʻi at Hilo issues a Finding of No Significant Impact (FONSI).

We have uploaded an electronic copy of this letter and a searchable PDF of the FEA-FONSI to the online submittal site.

If there are any questions, please contact our consultant, Kristin Duin of Sustainable Resources Group Intn'l, Inc. by email at kduin@srgii.com or by phone at (808) 778-7364.

Sincerely,

Bonnie D. Irwin
Chancellor

cc: Kristin Duin, Sustainable Resources Group Intn'l, Inc., kduin@srgii.com
Rodrigo Romo, Maunakea Shared Services, rromo@hawaii.edu
Gregory Chun, Center for Maunakea Stewardship, gchun711@hawaii.edu

200 W. Kāwili St.
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An Equal Opportunity Institution

From: dbedt.opsd.erp@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Tuesday, March 31, 2026 10:06:54 AM

Action Name

Upgrading Halepōhaku Fuel Storage System Final Environmental Assessment/FONSI

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (2) Propose any use within any land classified as a conservation district

Judicial district

Hāmākua, Hawai‘i

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

(3) 4-4-015:012

Action type

Agency

Other required permits and approvals

Office of Conservation and Coastal Lands: Site Plan Approval; County of Hawai‘i Department of Public Works: Grading, Grubbing, and Stockpiling Permits; County of Hawai‘i Department of Public Works, Building Division: Approval of all plans for electrical work; County of Hawai‘i Fire Department, Fire Prevention Branch: Tank Permit required for installation and removal of all tanks containing flammable or combustible liquids in excess of 60 gallons; Hawai‘i State Department of Health: Notification of permanent closure or a change-in-service of underground storage tanks; Hawai‘i State Department of Health: Community Noise Permit; Hawai‘i State Historic Preservation Division (SHPD): Concurrence that either no historical properties would be affected, or if present, SHPD approved protections or mitigation measures will be taken to protect historic property or burial sites.

Proposing/determining agency

University of Hawai‘i at Hilo

Agency jurisdiction

State of Hawai‘i

Agency contact name

Gregory Chun

Agency contact email (for info about the action)

cmshilo@hawaii.edu

Email address for receiving comments

comments@srgii.com

Agency contact phone

(808) 933-0734

Agency address

200 W. Kāwili St.
Hilo, HI 96720-4091
United States
Map It

Is there a consultant for this action?

Yes

Consultant

Sustainable Resources Group Intn'l Inc.

Consultant contact name

Kristin Duin

Consultant contact email

comments@srgii.com

Consultant contact phone

(808) 356-0552

Consultant address

111 Hekili St, Suite A373
Kailua, HI 96734
United States
Map It

Action summary

The University of Hawai‘i at Hilo (UH Hilo) Center for Maunakea Stewardship (CMS) proposes to upgrade the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea. The proposed upgrade involves decommissioning three existing single-wall underground storage tanks (USTs) and associated infrastructure and installing two aboveground storage tanks (ASTs).

The USTs would be removed in accordance with Hawai‘i Administrative Rules (HAR) Chapter 11-280.1-21, Upgrading UST Systems, which requires that by July 15, 2028, tanks with piping installed before August 9, 2013 be upgraded with secondary containment meeting HAR Section 11-280.1-24.

This infrastructure improvement is proposed to continue fulfilling the Operating and Site Development Agreements between UH Hilo/Maunakea Shared Services (MKSS) and the individual observatories, which require UH Hilo to provide essential services and utilities, including fuel. Onsite fuel storage is also necessary to support CMS and MKSS operational activities such as ranger patrols, road maintenance, and snow removal.

Reasons supporting determination

UH Hilo determined that the Proposed Action would not result in significant environmental impacts. Based on the Effects Analysis and the Significance Criteria detailed in the EA, the anticipated impacts were found to be minimal; consequently a Finding of No Significant Impact (FONSI) was issued.

Attached documents (signed agency letter & EA/EIS)

- Final-EA_UpgradingHalepohakuFuelStorageSystem_0331261.pdf
- ERP-Coverletter-EA-FONSI-UpgradingHalepohaku_0331261.pdf

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- ProjectSite4.zip

Compliance certification (HRS §368-1.5):

The authorized individual listed below certifies that documents submitted are unlocked, searchable, and compliant with the Hawaii Electronic Information Technology Disability Access Standards (including, but not limited to transcripts, captions, and other descriptions accompanying audio/video files). The individual acknowledges that the submitter retains the responsibility for compliance after documents have been published and any compliance queries will be directed back to the agency and/or applicant.

Authorized individual

Michelle Roberts

Authorized individual email

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Authorization

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

Final Environmental Assessment: Upgrading Halepōhaku Fuel Storage System

TMK (3) 4-4-015:012
District of Hāmākua, Island of Hawai‘i,
State of Hawai‘i

APPLICANT:

Center for Maunakea Stewardship
University of Hawai‘i at Hilo
200 W. Kāwili St.
Hilo, HI 96720-4091

CONSULTANT:

Sustainable Resources Group Intn’l, Inc.
111 Hekili Street, Suite A373
Kailua, HI 96734

March 2026

Final Environmental Assessment: Upgrading Halepōhaku Fuel Storage System

TMK (3) 4-4-015:012
District of Hāmākua, Island of Hawai‘i, State of Hawai‘i

March 2026

CLASS OF ACTION:

Use of Land in the Conservation District
Use of State Funds

University of Hawai‘i at Hilo
CENTER FOR MAUNAKEA STEWARDSHIP

SUSTAINABLE RESOURCES GROUP INTN'L INC.

APPLICANT:

Center for Maunakea Stewardship
University of Hawai‘i at Hilo
200 W. Kāwili St.
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CONSULTANT:

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APPROVING AGENCY:

University of Hawai‘i at Hilo
200 W. Kāwili St.
Hilo, HI 96720-4091

This document is prepared pursuant to:
Hawai‘i Environmental Policy Act,
Chapter 343, Hawai‘i Revised Statutes, and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules.

Project Summary

Project Name: Upgrading Halepōhaku Fuel Storage System

Location: Halepōhaku, Island of Hawai‘i

District: Hāmākua

Project Site Tax Map Key: TMK (3) 4-4-015:012

Proposed Action: The University of Hawai‘i (UH) at Hilo Center for Maunakea Stewardship (CMS) proposes to decommission three single-wall fiberglass underground fuel storage tanks (UST) and associated infrastructure within the Maintenance Facility Area at Halepōhaku on Maunakea and replace them with two aboveground storage tanks (AST). The USTs would be removed in accordance with the 2028 regulatory deadline pursuant to Hawai‘i Administrative Rules (HAR) Chapter 11-280.1-21 (*Upgrading UST Systems*). The rule stipulates that "Not later than July 15, 2028, tanks with piping installed before August 9, 2013 must be provided with secondary containment that meets the requirements of HAR Section 11-280.1-24." Per HAR 11-280.1-40(c) and Hawai‘i Department of Health guidelines, tanks not upgraded by the deadline will be required to permanently close. CMS proposed this infrastructure improvement in continued fulfillment of Operating and Site Development Agreements between UH/Maunakea Shared Services (MKSS) and individual observatories, which require UH to provide services and utilities, including fuel, to observatory facilities. Onsite diesel and gasoline are also needed for CMS and MKSS staff to fulfill duties including ranger patrol for public safety and resource protection, and road maintenance work and snow removal. It is more economically and environmentally friendly to replace the USTs with ASTs that provide multiple layers of containment in the event of a release, than to replace them with new regulatory compliant USTs, and/or build secondary containment around the existing structures.

Anticipated Impacts: The Proposed Action would have short-term and temporary impacts to flora, habitat, air quality, noise, vehicular and pedestrian traffic, and utilities. The Proposed Action could potentially impact soils, water resources, fauna, cultural practitioners, and increase fire risk. Required mitigation measures are expected to successfully moderate or alleviate all impacts (Appendix A).

Proposing Agency: University of Hawai‘i at Hilo, Center for Maunakea Stewardship

Determination: Finding of No Significant Impact (FONSI)

Permits, Approvals, and Compliance: See Section 4.2

EA Preparer: Sustainable Resources Group Intn'l Inc. 111 Hekili Street, Suite A373, Kailua, HI 96734

Consultations: See Section 1.4 and Appendix B

Contents

Tables

Figures

Acronyms

AMP	Archaeological Monitoring Plan
AST	Aboveground Storage Tank
BLNR	Board of Land and Natural Resources
BOR	Board of Regents
BMP	Best Management Practices
CDUP	Conservation District Use Permit
CMP	Comprehensive Management Plan
CMS	Center for Maunakea Stewardship
CRMP	Cultural Resources Management Plan
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
EA	Environmental Assessment
FONSI	Finding of No Significant Impact
HAR	Hawai‘i Administrative Rules
HRS	Hawai‘i Revised Statutes
ISMP	Invasive Species Management Plan
MKMB	Maunakea Management Board
MKSS	Maunakea Shared Services
MKSOA	Maunakea Stewardship and Oversight Authority
NPDES	National Pollutant Discharge Elimination System
NRMP	Natural Resources Management Plan
OAR	Outcome Analysis Report
OCCL	Office of Conservation and Coastal Lands
OMKM	Office of Maunakea Management
OMMP	Operations, Monitoring, and Maintenance Plan
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Places
UH	University of Hawai‘i
UH Hilo	University of Hawai‘i at Hilo
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VIS	Visitor Information Station

1 INTRODUCTION

1.1 Background

This Environmental Assessment (EA) is for proposed upgrades to the fuel storage system within the Maintenance Facility Area at Halepōhaku on Maunakea. The current fuel storage system, three underground storage tanks (UST) and associated infrastructure (fuel transfer pumps, dispensing pumps, buried fuel lines, and electrical lines), were originally approved under Conservation District Use Permit (CDUP) 1430, "Subdivision and Construction of the Hale Pōhaku Mid-Level Facilities" at the Board of Land and Natural Resources (BLNR) meeting on April 23, 1982. The Proposed Action is to remove the three existing USTs and associated infrastructure and replace them with two aboveground storage tanks (AST) to serve the fuel needs of the University of Hawai'i (UH) Managed Lands on Maunakea ("Maunakea Lands").

Setting

The 19.3-acre Halepōhaku parcel (TMK (3) 4-4-015:012) is situated at an elevation of about 9,200 ft on the south slope of Maunakea on the island of Hawai'i. The parcel, located in the State Land Use Conservation District, is leased to UH through 2041 by BLNR under General Lease No. S-5529. The facilities at the Onizuka Center for International Astronomy at Halepōhaku include the Visitor Information Station (VIS); the Astronomy Mid-Level Support Facilities, providing food and lodging operations for those working on Maunakea; and a Maintenance Facility Area.

The UH Board of Regents (BOR) delegated responsibility to UH Hilo for the governance and management of UH Managed Lands on Maunakea. A part of UH Hilo, the Center for Maunakea Stewardship (CMS) is responsible for day-to-day management of the Maunakea Lands. Under the direction of CMS, Maunakea Shared Services (MKSS) maintains Mauna Kea Access Road and the facilities at Halepōhaku and provides support for all organizations working on Maunakea. MKSS operates the Maintenance Facility Area, which houses the supplies and equipment needed to carry out these responsibilities, including the USTs and associated infrastructure that are proposed for replacement (Figure 1).

Project Area: Refers to entire Halepōhaku parcel, the adjacent Mauna Kea Access Road, and the land immediately surrounding the Halepōhaku parcel (Figure 1).

Project Site: Refers to the portions of the Halepōhaku Maintenance Facility Area that will be affected by project activities including removal of USTs and associated infrastructure, and installation of ASTs including underground utility lines (Figure 2).

Existing Fuel Storage System

Three single-wall fiberglass USTs (a 12,000-gallon diesel tank, a 4,000-gallon gasoline tank, and a 2,000-gallon gasoline tank) and associated infrastructure were installed within the Maintenance Facility Area at Halepōhaku on Maunakea between 1982 and 1983.[1] In 1998, a Veeder-Root TLS-350

[1] The UST Permit administered by DOH lists the facility name as "Mauna Kea Observatories Support Services". This EA refers to the facility as the Halepōhaku Fuel Storage System as it is more descriptive for the general public's understanding. They are the same system. Mauna Kea Observatories Support Services was renamed Maunakea Shared Services in 2020 when it merged with the Office of Maunakea Management (OMKM) to become CMS.

Leak Detection System was installed on the USTs to provide continuous monitoring for unwanted releases by tracking fuel levels in the tanks. The leak detection system undergoes annual inspections and certifications, and no leaks have been detected since its installation. Further, no fuel spills have ever been reported.

1.2 Purpose and Need for Action

Regulations for USTs in Hawai‘i are set forth in Hawai‘i Administrative Rules (HAR) §11-280.1, (*Underground Storage Tanks*).[2] Within the regulations, HAR §11-280.1-21 (*Upgrading of UST Systems*) instructs that UST systems must comply with either the performance standards listed in HAR §11-280.1-20 (b) to (d) (*Performance Standards for UST Systems*), or the closure requirements (HAR §11-280.1, Subchapter 7). The rule stipulates that “Not later than July 15, 2028, tanks with piping installed before August 9, 2013 must be provided with secondary containment that meets the requirements of [HAR] section 11-280.1-24”. The Hawai‘i Department of Health (DOH) states that no extensions will be granted for this deadline.

Rather than install secondary containment around the existing USTs, CMS proposes to decommission the existing fuel storage system and replace it with two ASTs. The USTs would be removed by the 2028 regulatory deadline. It is more economically and environmentally friendly to replace the USTs with ASTs that provide multiple layers of containment in the event of a fuel release, than to replace them with new regulatory compliant USTs, and/or build secondary containment around the existing structures.

The two new ASTs would have a capacity of approximately 3,000 gallons each. While this represents a 12,000-gallon reduction in the overall fuel storage capacity, MKSS determined that based on current fuel use and minimum fuel delivery requirements, two 3,000-gallon ASTs would be sufficient. Diesel is used to fuel heavy equipment used for road maintenance and snow removal, as well as one of the two boilers that provides heating for buildings at Halepōhaku. Diesel use averages 250 to 500 gallons per month and is highest during months with heavy snow or during propane shortages. The diesel boiler will be replaced with a propane boiler as the supply lines that provide fuel for the diesel boiler will be removed. Diesel will still be required for heavy equipment. The minimum delivery load for diesel is 2,500 gallons. Gasoline is less critical than diesel, however the tanks provide fueling capability for on-mountain fleets for CMS, MKSS, and Maunakea Observatories including ranger vehicles, some snow removal equipment, and observatory vehicles. Gasoline use averages 2,000 to 2,500 gallons per month. The minimum delivery load for gasoline is 2,500 gallons.

CMS proposed this infrastructure improvement in continued fulfillment of Operating and Site Development Agreements between UH/MKSS and individual observatories, which require UH to provide services and utilities, including fuel, to observatory facilities. Onsite diesel and gasoline are also needed for CMS and MKSS staff to fulfill duties including ranger patrol for public safety and resource protection, and road maintenance work and snow removal.

[2] https://health.hawaii.gov/opppd/files/2025/03/Chapter-11-280.1-HAR-effective-March-21-2025.pdfn_.pdf

Figure 1. Proposed Action: Location at Halepōhaku

1.3 Environmental Assessment Process

This EA process was conducted pursuant to the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes (HRS), and its implementing regulations HAR §11-200 (*Environmental Impact Statement Rules*). According to HRS Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Development of an EA was triggered under HRS Chapter 343 due to "use of land in the Conservation District". Further, Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) advised CMS to conduct an EA based on the ground disturbance that will be required for the Proposed Action. Additionally, the Proposed Action lies within the Maunakea Lands, which is an environmentally and culturally sensitive area.

Section 5 presents the determination that implementation of the Proposed Action is not expected to result in significant environmental impacts. This section evaluates each significance criterion set forth in HRS Chapter 343 and documents the corresponding findings made by UH Hilo, acting as both the proposing and approving agency. Under the EA process, if, after considering public and agency comments on the Draft EA, the approving agency determines that no significant impacts are likely to occur, a Finding of No Significant Impact (FONSI) is issued, allowing the action to proceed subject to applicable approvals and permits. Conversely, if significant impacts are anticipated, preparation of an Environmental Impact Statement would be required. Following review of the Draft EA UH Hilo determined that issuance of a FONSI was appropriate for the Proposed Action.

The Proposed Action is not being taken by a federal agency, nor does it involve federal lands or federal funding, therefore procedural requirements under the National Environmental Policy Act do not apply.

1.4 Consultation

The following entities were consulted in the development of the EA (Appendix A). During early scoping, they were provided with an in-depth project description and a project location map and asked to provide any input or concerns regarding the Proposed Action. Consultation occurred throughout the EA review process, including solicitation of public and agency comments on the Draft EA during the public comment period from December 8, 2025 through January 7, 2026.

U.S. Fish and Wildlife Service

U.S. Fish and Wildlife Service (USFWS) is responsible for the conservation and recovery of endangered and threatened species, including designating critical habitat and developing protective measures. The project area may be visited by endangered and threatened and is located within federally designated critical habitat for the endangered palila. While formal consultation under Section 7 of the Endangered Species Act is not required since the project is not authorized, funded, or being carried out by a federal agency, informal consultation with USFWS is being conducted to determine protections for endangered and threatened species.

U.S. Geological Survey Pacific Islands Ecosystems Research Center

Wildlife biologist Paul Banko at the U.S. Geological Survey (USGS) Pacific Islands Ecosystems Research Center, a palila expert, has been studying the bird, its habitat, and population and distribution changes for over 35 years.

Office of Hawaiian Affairs
The Office of Hawaiian Affairs (OHA) advocates for Native Hawaiians. OHA's advocacy is reflected in its efforts to help ensure that laws are complied with at the local, state, and federal levels.

Hawai'i Department of Health
DOH Environmental Management Division, Solid and Hazardous Waste Branch administers the UST program under HAR §11-280.1.

Hawai'i Department of Land and Natural Resources, Office of Conservation and Coastal Lands
Applications for land use permits within the Conservation District are submitted for OCCL for review. During early scoping, guidance was sought from OCCL on all land use permitting requirements and the requirements for UH Hilo to complete an EA.

Hawai'i Department of Land and Natural Resources, Land Division
DLNR Land Division is responsible for managing state-owned lands in ways that will promote the social, environmental, and economic well-being of Hawai'i's people and for ensuring that these lands are used in accordance with the goals, policies, and plans of the state.

Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife
The Mauna Kea Forest Reserve surrounds the Halepōhaku parcel. DLNR Division of Forestry and Wildlife (DOFAW) manages parcels within the Forest Reserve system. DOFAW advises on preferred protections for endangered and threatened species.

Hawai'i Department of Land and Natural Resources, State Historic Preservation Division
Halepōhaku is known to contain historic properties. Formal consultation under the National Historic Preservation Act is not required since the project is not authorized, funded, or being carried out by a federal agency. However, HRS Chapter 6E requires consultation with the State Historic Preservation Division (SHPD) and concurrence on measures to protect any historic properties present, as well as procedures for the inadvertent discovery of burials (Section 4.2).

Department of Hawaiian Home Lands
DHHL is a state entity that manages an extensive land trust to serve its beneficiaries, namely Native Hawaiians. DHHL actively manages their lands on Maunakea to protect natural and cultural resources.

County of Hawai'i Planning Department
The County of Hawai'i Planning Department is charged with long-range planning for the County and review and revision of the *County of Hawai'i General Plan*.

County of Hawai'i Fire Administration
The County of Hawai'i Fire Administration is responsible for fire protection, inspection, and education, throughout the county, along with responding to the need for emergency medical services and search and rescue operations. The agency enforces fuel storage regulations to ensure compliance with the Hawai'i State Fire Code codes, which includes permitting storage of flammable or combustible liquids.

Maunakea Stewardship and Oversight Authority
The Maunakea Stewardship and Oversight Authority (MKSOA), created by Act 255 in 2022, is a state entity managing Maunakea lands. Its role involves balancing cultural, environmental, and scientific

interests through collaborative oversight honoring Native Hawaiian values.[3] Full management authority, including leases, will transfer from UH to MKSOA by July 1, 2028.

Maunakea Management Board and the Environment Committee

The Maunakea Management Board (MKMB) provides the community with a sustained direct voice for the management of Maunakea. The public is invited to attend MKMB meetings and agendas are posted on the State of Hawai'i, Office of Information Practices website prior to scheduled meetings.[4] A link to that website as well as the meeting minutes are posted on the CMS website.[5]

The Environment Committee advises and provides expertise on environmental issues for the CMS and the MKMB, with the goal of protecting natural resources.

Kahu Kū Mauna

Kahu Kū Mauna is a volunteer, community-based council whose members are from the native Hawaiian community. Kahu Kū Mauna advises CMS, MKMB, and the UH Hilo Chancellor on all matters impacting the cultural integrity of Maunakea. It reviews Proposed Actions and provides input to MKMB. Kahu Kū Mauna has been consulted on this proposed project throughout the planning stages, including being given the opportunity to provide alternatives to the overall project design. Kahu Kū Mauna members were invited to express opinions on the Proposed Action at MKMB meetings where the topic was discussed.

Maunakea Shared Services

Maunakea Shared Services (MKSS) is a logistical services organization that operates under the direction and funding of the MKSS Oversight Committee. MKSS provides support for all organizations working on Maunakea, maintains the Mauna Kea Access Road from the start of the gravel/cinder section to the summit, and operates and maintains the mid-level facilities at Halepōhaku, including the area where the Proposed Action is taking place. MKSS is overseeing the technical work being carried out as part of the Proposed Action.

Public Involvement

During early scoping, outreach was conducted with community members who may use the area or possess knowledge of cultural practices in and around Halepōhaku. The public was also provided opportunities to comment on the Proposed Action at all MKMB meetings at which the Proposed Action was listed on the meeting agenda. These meetings were accessible both in person and virtually. In addition, the Draft EA was published in the Hawai'i Office of Planning and Sustainable Development Environmental Review Program's *The Environmental Notice* on December 8, 2025, initiating a 30-day public comment period. No public comments were received during this comment period.

[3] Information on MKSOA, including public meetings, is available at https://dlnr.hawaii.gov/maunakea-authority/

[4] Agendas are available at https://calendar.ehawaii.gov/calendar/

[5] Meeting minutes are available at https://hilo.hawaii.edu/maunakea/management/board/meetings

2 ALTERNATIVES

This section describes the Proposed Action (Alternative 1, Section 2.1), the No Action Alternative (Alternative 2, Section 2.2), and all alternatives considered and eliminated (Section 2.3).

2.1 Alternative 1 (Proposed Action)

Under the Proposed Action the three USTs and associated infrastructure within the Maintenance Facility Area at Halepōhaku would be removed and replaced with two ASTs to meet the fuel needs of the Maunakea Lands.

Figure 2. Proposed Action: Project Site

2.1.1 Project Description

UST System Removal

The decommissioning involves removal of all three USTs, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines. The USTs are located on either side of the road leading into the Maintenance Facility Area, close to Mauna Kea Access Road (Figure 2). All fuel in the USTs, fuel pipes, and pumps will be emptied prior to removal. Removal of the USTs requires digging out areas approximately 385 sq ft (35’ x 11’) for the diesel tank and 600 sq ft (30’ x 20’) for the two gasoline tanks combined. Buried lines for the diesel tank run from the USTs to the dispensing pump, to the

old generator room, and to the boiler room in the common building at Halepōhaku. Buried lines for the two gasoline tanks run from the USTs to the two gasoline dispensing pumps. Removal of the buried lines requires trenching (width of two ft) of approximately 240 linear feet of asphalt concrete and approximately 225 linear feet of previously disturbed soil. Lines will be disconnected and capped at building terminations. Removal of the dispensing pumps concrete pad requires disturbing 65 sq ft (13' x 5'). All elements required by HAR §11-280.1, Subchapter 7 (*Out-of-Service UST Systems and Closure*), will be met.

Grading and excavation depths vary across the project site from several inches to several feet. Excavated material will be temporarily stockpiled. Before excavation and removal of the USTs and pipelines, each feature will be sampled to check for the presence of hydrocarbons. This will be done using a hydrocarbon probe, or "sniffer," which detects vapor levels through small diameter holes placed around the features. If no hydrocarbons vapors are detected, no further sampling or mitigation will be required. If hydrocarbons are detected, additional sampling will be conducted after the tanks and pipelines are removed. This will involve collecting soil samples at each feature to confirm the presence and concentration of hydrocarbons. If concentrations meet or exceed actionable thresholds, mitigation actions will be carried out in accordance with an approved remediation protocol and HAR §11-280.1, Subchapter 6 (*Release Response Action*).

Voids created by infrastructure removal will be backfilled in layers, utilizing on-site excavated material, drain rock from both on-site and off-site sources, and cinder from on-site or pre-existing Maunakea stockpiles. Voids will initially be filled with 2½" minus drain rock to within three feet of the ground surface. A layer of geotextile fabric will be placed on top of the drain rock and then 1½" minus base course rock placed on top to within one foot of ground surface. The remaining one foot will be filled with cinder. Drain rock will come from USTs fill material excavated from the project site as well as a local off-mountain source. Cinder topping would come from excavated material at the project site and MKSS stockpiles of local cinder that are stored for road maintenance and other projects.

AST Installation

Two Transtank Pro P12[6] (or similar) ASTs, each with a safe fill capacity of 3,068 gallons, will be installed to meet fuel needs for the Maunakea Lands. One tank will store diesel fuel and the other gasoline. The selected tank size reflects the minimum fuel delivery quantities and historical fuel usage patterns. These ASTs are double walled, providing secondary containment in the event of any leaks. They have an access manway that allows for inspection and maintenance of the inner tank. The ASTs measure 9.8' x 8' x 9.5' and have fully integrated dispensing pumps. To help protect the surrounding environment from spills, the tanks have an overfill detection sensor with automatic shut off, leak detection sensors, a clearly marked emergency electrical shut off button, and will sit on a single concrete slab with approximate dimensions of 14' x 23' (322 sq ft) and a 6-inch-high spill containment berm. The proposed location for the new ASTs is on previously disturbed ground that is free of vegetation and is already graded and compacted (Figure 2). The proposed location is not visible from Mauna Kea Access Road and has existing electricity nearby.

[6] https://western-global.com/us/products/transtank-pro/; Brim fill capacity: 3,223 gallons, Safe fill capacity: 3,068 gallons.

Sequencing

The preferred (optimal) sequence of events for the project is as follows:

1. Install project BMPs;
2. Install and commission the ASTs;
3. Empty the USTs and drain associated lines;
4. Excavate and remove the USTs, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines;
5. Backfill excavated locations; and
6. Conduct restoration activities.

Following this sequence will ensure an uninterrupted fuel supply at the Halepōhaku mid-level facilities. If this sequence cannot be followed and the USTs are removed prior to AST installation, a temporary portable fuel tank will be required to supply diesel for heavy equipment. Fleet vehicles requiring gasoline would need to travel to Hilo or Waimea for refueling.

2.1.2 Project Schedule and Cost

Construction is expected to start early in 2027. This would provide for a construction period of approximately 18 months until the compliance deadline of July 15, 2028. The actual construction period is expected to take 12 months or less if there are no breaks in construction and weather permitting. The construction schedule will be updated if necessary as the project progresses through the permit process. Funding of the estimated construction cost for the infrastructure improvements of $1.2 million has been approved by the observatories that fund MKSS.[7]

2.2 Alternative 2 (No Action)

Under the No Action Alternative, no changes would be made to the current fuel storage system at Halepōhaku and fueling needs would continue to be met using the existing USTs and associated infrastructure. While this option is not viable as UH would not be in compliance with DOH regulations requiring decommissioning (HAR §11-280.1-21), a "no action" alternative (i.e. no changes to current conditions) is required in an EA to provide a baseline for comparison of impacts from the Proposed Action.

2.3 Alternatives Considered but Eliminated from Further Analysis

2.3.1 *Decommission USTs and Associated Infrastructure and Leave in Place (Empty)*

The three USTs, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines would be decommissioned and left in place. New fuel storage and dispensing units would not be installed. The existing UST system would be required to permanently close, as it would no longer be compliant with HAR §11-280.1. HAR §11-280.1 requires that for in-place decommissioning, USTs must be emptied and thoroughly cleaned to reduce the environmental hazard. In some cases, cleaning necessitates entry into the tank to remove any sludge or scale that cannot be pumped out—an activity that is hazardous and would still require excavation of the surrounding area. Additionally, DOH allows for in-place decommissioning only in limited circumstances, such as when a tank is

[7] Construction costs are based on current quotes. Due to potential fluctuations in material and labor markets, actual costs may vary.

located beneath or close to a building, and its removal could compromise the structural integrity of the building. Under this alternative, removal of the UST may still have been required.

On-going fuel needs would be met through a combination of off-site and on-site strategies. Fleet vehicles could refuel in Hilo or Waimea, although this would lead to much higher fuel use, raising both costs and environmental impact. MKSS would still need to transport diesel and gasoline to Halepōhaku for motorized equipment to support operations. Fuel would be transported in smaller, portable dispensing tanks, increasing the risk of unwanted releases compared to using permanent, stationary tanks designed for storage and dispensing.

2.3.2 *Decommission USTs and Associated Infrastructure and Leave in Place (Empty) and Install ASTs*

In-place decommissioning involves rendering the USTs and associated infrastructure permanently out of service without physically removing it from the ground. Under this alternative, USTs would be decommissioned in-place as described in Section 2.3.1, and ASTs would be installed to meet the fuel needs for the Maunakea Lands. As outlined in Section 2.3.1, DOH allows for in-place decommissioning only in limited circumstances. The location of the USTs would not appear to meet these criteria. Given the potential safety hazard, the environmental implications, the cultural significance of the area, and the unlikeliness of DOH approving in-place decommissioning, this alternative was eliminated from further analysis.

2.3.3 *Replace Existing USTs with Regulatory Compliant USTs*

Replacement of the USTs with upgraded USTs that meet the requirements of HAR §11-280.1 was considered. Similar to the Proposed Action, this would involve excavating and removing the existing USTs and most of the associated infrastructure. The USTs would be replaced with USTs that have secondary containment. Most of the associated infrastructure would be replaced to be compatible with the new USTs and compliant with HAR §11-280.1. Upgrading to new USTs may require more extensive excavation and still involves the associated issues with storing petroleum products underground (e.g. inspecting and servicing equipment, remediation in the event of unwanted release). Given that ASTs are easier to inspect and service than USTs, and the need to minimize impacts to environmental and cultural resources of Maunakea, this alternative was eliminated from further analysis.

2.3.4 *Remove USTs and Install ASTs at Alternate Location within the Maintenance Facilities Area*

Three alternative locations for the ASTs were evaluated and ruled out due to more challenging ground conditions that would require more earthwork, as well as increased visibility from Mauna Kea Access Road (Figure 3). Additionally, these sites were situated directly above the existing USTs, meaning that the ASTs could not be installed and made operational until the USTs were removed, resulting in a gap in fueling capabilities during that transition period. This alternative was eliminated from further analysis due to adverse impacts to scenic resources and logistical considerations.

Figure 3. Alternate Locations Considered for ASTs

3 SETTINGS, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the baseline conditions relevant to the potentially significant environmental consequences (impacts) of the Proposed Action. Information about the affected environment was gathered from scientific studies, previous environmental documents associated with the area, site surveys, and interviews and consultations (Section 1.4). While all relevant environmental factors were considered, those not expected to be impacted by the Proposed Action are not addressed in this EA. The potentially impacted resources are organized into general categories: Environmental Setting, Infrastructure, Cultural Practices, and Archaeological and Historic Resources.

After describing the existing condition of each resource, the potential environmental impacts associated with implementing each alternative are analyzed. For each identified impact, mitigation measures are proposed to reduce the effects to a level considered less than significant. Impacts are generally mitigated by adhering to county, state, and federal laws; conditions of any DLNR approvals in the form of site plan approvals, CDUPs, and an Archaeological Monitoring Plan (AMP); stipulations of the Comprehensive Management Plan (CMP); construction Best Management Practices (BMPs); and Kahu Kū Mauna, the CMS Environment Committee, and MKSOA recommendations. While most requirements and BMPs are outlined in this section, details are included in Appendix A.

3.1 Environmental Setting

3.1.1 Topography, Geology, Soils, and Geologic Hazards

The ground surface in the Maintenance Facility Area of Halepōhaku is covered with alluvial wash materials consisting of small cinder gravels, lava rock particles, and ash layers that are several centimeters thick in some locations. The soil is characterized by the Natural Resources Conservation Service as the Pohakulehu-Lanapohaku complex and is comprised of two soil series. The Pohakulehu series consists of deep or very deep, well drained soils that formed in volcanic ash and ʻaʻa lava. The Lanapohaku series consists of very deep, somewhat excessively drained soils that formed in volcanic ash and ʻaʻa lava. Soil erosion is moderate. The Halepōhaku parcel, situated on Maunakea's southern flank, spans elevations ranging from 9,100 to 9,400 ft. Although three cinder cones or puʻu are located near Halepōhaku, none are within the Halepōhaku parcel or the project area.

The entire island of Hawaiʻi is subject to geological hazards, especially lava flows and earthquakes. Located within Zone 7 of the USGS lava flow hazard map (Wright et al. 1992), Halepōhaku faces a low probability of lava flow coverage, aside from potential localized upwelling. Maunakea is considered dormant, not extinct, and there is currently no evidence supporting a near-future eruption. Maunakea falls within the USGS classified Seismic Hazard Zone D, meaning that in the event of an earthquake the area could experience very strong shaking.[8] The potential effects of very strong shaking are slight damage to earthquake-resistant structures; considerable damage to structures built to approved codes with no earth-quake resistant design features; and significant damage in poorly built structures.

[8] https://hvo.wr.usgs.gov/earthquakes/hazards/

Potential Impacts and Mitigation Measures

The Proposed Action will include excavation, grubbing, and grading, which will require removal of vegetation (mainly non-native plants). This may increase the potential for erosion caused by rainfall-runoff and wind. To mitigate potential impacts, the construction contractor will prepare an erosion and runoff control plan outlining the installation of BMPs. These may include sediment waddles, silt fences, biosocks, and gravel bag filters, all designed to prevent erosion and control runoff from leaving the containment area (Appendix A). All grubbing and grading work shall comply with Chapter 10 of the Hawai‘i County Code, which establishes Erosion and Sedimentation Control Standards and Guidelines. These standards are intended to reduce erosion and sedimentation, prevent property damage, and protect public health and welfare. All BMPs installed to control erosion shall be checked and repaired as needed, typically on a weekly basis during dry periods and within 24 hours after any rainfall of 0.5 inches or more within a 24-hour period. During periods of extended rain, daily inspections will be conducted. The contractor will be responsible for maintaining records of all inspections and repairs.

The Proposed Action involves the removal of one diesel and two gasoline USTs and associated fuel lines. Removal is regulated by the DOH UST Program pursuant to HAR §11-280.1. Prior to excavation and removal, the USTs and all associated piping shall be pumped empty. In-situ sampling will be conducted at each tank location and along the buried pipelines. A Licensed Engineer will prepare a sampling plan detailing the protocols for pre and post UST removal testing. No unwanted releases of fuel have been detected since installation of the existing USTs, and the presence of hydrocarbons in the surrounding soil is not anticipated.

In the event petroleum products are or have been released into the environment, the required Release Response Actions detailed in HAR §11-280.1, Subchapter 6 shall be followed. Immediate required actions include reporting the release to the DOH Hazard Evaluation and Emergency Response Office and the DOH UST Program, taking action to prevent any further release, identifying and mitigating any safety hazards (such as fire, explosion, and vapor hazards) posed by the release, and taking actions to minimize the spread of contamination. HAR §11-280.1 outlines the next steps, including a site assessment, abatement measures, petroleum removal, investigations for soil (and when necessary, groundwater) contamination, clean-up criteria, and notification and reporting regarding the release.

The two proposed ASTs are designed to reduce the risk of unwanted fuel releases during regular operations and in the event of an earthquake. Key safety features include double-walled construction for secondary containment, integrated leak detection sensors, and an emergency shut off valve for each tank. The ASTs will be installed on a 6-inch-thick concrete pad with a 6-inch raised curb on all sides, which provides another layer of containment. The steel tanks will be securely anchored to the concrete pad, which will be reinforced with rebar and anchored into the ground. All design elements and safety features of the ASTs will meet County of Hawai‘i Fire Department, Fire Prevention Branch requirements.

The Proposed Action will require fill to be placed in trenches and voids where USTs and associated infrastructure have been removed. The amount and types of backfill are described in Section 2.1.1, and include 2½” minus drain rock, and 1½” minus base course rock, with the top one foot being native cinder. MKSS has an on-site stockpile of local cinder for road maintenance and other projects

on the Maunakea Lands. Cinder from this stockpile, along with any cinder excavated as part of the Proposed Action, will be used as backfill in the top portion of the trenches and voids. These sources are expected to meet the cinder requirements for the project. If additional material is needed, it would be sourced from locations on Maunakea at a similar elevation to Halepōhaku. Upon project completion, areas where vegetation was removed, and other bare areas, will be planted with native plants from the Halepōhaku greenhouse to stabilize soils and mitigate erosion (Section 3.1.3).

The Proposed Action involves the use of motorized equipment. To prevent potential soil contamination from fuel or fluid leaks, project BMPs require the use of a drain pan beneath stationary equipment to capture any unwanted releases (Appendix A).

3.1.2 Water Resources

There are no perennial surface waterbodies and no history of flooding in the Halepōhaku area. Total annual mean rainfall at Halepōhaku is 29.25 inches.[9] Surface water runoff from undisturbed areas within the project occurs when the rainfall rate exceeds the infiltration rate. The frequency of runoff events off these surfaces is unknown. Runoff is generated more frequently off developed and altered land surfaces within the project site due to their impervious surfaces and compaction of soils, which reduces infiltration into the soil. Runoff from both undisturbed and developed surfaces is carried across the landscape in natural and manmade channels. Manmade storm water features such as swales and culverts have been constructed and located to capture runoff and move water away from the existing Halepōhaku buildings and parking areas. The project site does not discharge into a Municipal Storm Sewer System.

There is an earthen swale/ditch that begins at approximately 9,350 ft elevation and runs parallel to the east side of Mauna Kea Access Road. It is routed into a culvert that goes under the northernmost roadway entrance/exit to the project site that houses the fuel tanks and water storage tanks that service the project area. A portion of surface water runoff from the project site flows overland and is captured in this ditch, which continues to flow downslope passing under John A. Burns Way and the entrance/exit to the northernmost VIS Parking Area via culverts. South of the culverts, the swale angles southeast, directing flow away from Mauna Kea Access Road toward an open, undeveloped area south of the VIS Parking Areas.

Halepōhaku is located within the Onomea aquifer system of the East Mauna Kea aquifer sector. The highest known elevation of the regional aquifer on Maunakea is approximately 4,500 ft above sea level. This is for areas in the Maunaloa-Maunakea saddle region and there is no direct data for immediately under the project site, which may differ in depth to the regional aquifer. Localized perched or dike-impounded groundwater features may or may not be present in the project area. Groundwater levels are assumed to be at significant depths below the ground surface. There are no wells within the vicinity of the project area.

Potential Impacts and Mitigation Measures

An independent construction monitor shall be engaged during the Proposed Action to ensure regulatory and BMP compliance. This includes compliance with all applicable water quality and water pollution control standards contained in HAR §11-54 (*Water Quality Standards*); HAR §11-55

[9] Western Regional Climate Center, 1949-2025, https://wrcc.dri.edu/my/stations, HALEPOHAKU 111 (511065)

(*Water Pollution Control*); and Chapter 10 of the Hawai‘i County Code (*Erosion and Sedimentation Control*), as well as any additional conditions specified in the project's permits. Project BMPs shall be implemented to prevent increased runoff from the project site during construction activities and to meet these state and county requirements (Appendix A). These measures include diverting all stormwater away from construction areas using appropriate control measures. Any construction-related discharge will be contained and managed using sediment waddles, biosocks and gravel bag filters. A basin with an impermeable liner shall be installed and used when washing all equipment to contain sediment or pollutants that might be present in wastewater. All BMPs installed to control erosion shall be checked and repaired as needed, typically on a weekly basis during dry periods and within 24 hours after any rainfall of 0.5 inches or more within a 24-hour period. During periods of extended rain, daily inspections will be conducted. The contractor will be responsible for maintaining records of all inspections and repairs.

The Proposed Action includes the installation of native plants in areas where vegetation was removed during project implementation, as well as in other bare areas as part of ongoing habitat enhancement efforts at Halepōhaku. Increased plant cover will help reduce the rate of stormwater runoff by capturing water and allowing more time for it to filter into the soil.

The Proposed Action would add approximately 1,200 sq ft (0.03 ac) of paved surface within the Maintenance Facility Area, primarily in a location where infiltration is already poor due to compacted soil from vehicle parking. As a result, the net increase in stormwater runoff from the project site would be negligible. There are no other changes that would impact the surface water runoff regime.

3.1.3 Flora

Halepōhaku lies within the subalpine ecosystem on Maunakea. The vegetation is a mixture of māmane (*Sophora chrysophylla*) woodland and xerophytic scrub. Char (1999) describes māmane woodlands at Halepōhaku as clumps of māmane trees, 16 to 18 ft tall, interspersed with open areas of bare soil or rocky outcroppings.

Xerophytic scrub is comprised of low growing, drought tolerant shrubs. Understory plants tend to be denser under and around the clumps of māmane, with groundcover plants being primarily mixed bunch grasses. At Halepōhaku, the most abundant plant cover is non-native grasses, with needlegrass (*Nassella cernua*) and ripgut brome (*Bromus diandrus*) being the dominant species (Gerrish 2011). The most abundant native plant species include two grasses, Hawai‘i bentgrass (*Agrostis sandwicensis*) and pili uka (*Trisetum glomeratum*), and māmane trees. Native shrubs include pūkiawe (*Styphelia tameiameiae*), pāwale (*Rumex giganteus*), and ‘aweoweo (*Chenopodium oahuense*). Table 1 lists the native plant species that occur at Halepōhaku or in the areas immediately adjacent.

No federally or state-listed threatened or endangered plant species occur within the project site. The Maunakea silversword (*Argyroxiphium sandwicense ssp. sandwicense*) is federally and state-listed as endangered. Although this species has been out-planted within a DLNR-maintained enclosure adjacent to Halepōhaku, it does not occur within the project site. Māmane trees are not federally listed as threatened or endangered, but they are a preferred food source for three honeycreeper bird species that can potentially occur at Halepōhaku, including the endangered palila (*Loxioides bailleui*). Māmane trees are found throughout the project area, including within the project site.

Table 1. Native Plant Species Found in the Halepōhaku Area

Scientific Name	Hawaiian Name	Common Name	Origin
Trees and Shrubs			
Argyroxiphium sandwicense ssp. sandwicense	ʻāhinahina	Maunakea silversword	Endemic
Cosprosma montana	pilo	-	Endemic
Chenopodium oahuense	ʻāweoweo	goosefoot	Endemic
Dubatia aroborea	naʻenaʻe	Maunakea dubautia	Endemic
Dubautia ciliolata ciliolata	naʻenaʻe	lava dubautia	Endemic
Geranium cuneatum hololeucum	hinahina	silver geranium	Endemic
Leptecophylla tameiameiae	pūkiawe	-	Native
Osteomeles anthyllidifolia	ʻūlei	Hawaiian rose	Native
Rumex giganteus	pāwale	lava dock	Endemic
Sophora chrysophylla	māmane	-	Endemic
Asplenium trichomanes	olaliʻi	maidenhair spleenwort	Native
Herbaceous Species			
Agrostis avenacea	heʻupueo	Pacific bentgrass	Native
Agrostis sandwicensis	-	Hawaiʻi bentgrass	Endemic
Argemone glauca	pua kala	Hawaiian prickly poppy	Endemic
Bidens menziesii	koʻokoʻolau	Menzie's bur-marigold	Endemic
Carex macloviana	-	St. Malo's sedge	Native
Carex wahuensis	-	Oʻahu sedge	Endemic
Deschampsia nubigena	-	alpine hairgrass	Endemic
Pseudognaphalium sandwicensium	ʻenaʻena	-	Endemic
Stenogyne microphylla	-	littleleaf stenogyne	Endemic
Stenogyne rugosa	māʻohiʻohi	native mint, little leaf stenogyne	Endemic
Trisetum glomeratum	pili uka	mountain pili	Endemic

Non-native and invasive plant species are more common and diverse at Halepōhaku than they are at higher elevations. Efforts to control invasive weed species from being transported to and around Maunakea, and specifically from lower elevations to higher elevations, include mechanical removal of existing invasives, requiring vehicles driving up to or past Halepōhaku be free of mud that can harbor invasive plant species, and inspections of equipment and materials for propagules of invasive plants prior to them entering the Maunakea Lands (Appendix A). Removal of existing invasives around the project area, including the project site, includes weed whacking non-native species to prevent seed production, and pulling non-native broadleaf species from around parking areas, structures, and buildings. Non-native and invasive plant species are removed through volunteer weed pulling events and by rangers as part of their routine responsibilities. Species names of the removed plants are recorded in an Invasive Species Report and transported to the Hilo Transfer Station Greenwaste for disposal.

CMS supports the established nursery at Halepōhaku, which includes a greenhouse, to facilitate habitat restoration efforts. All the plants are grown from seeds collected locally within the ecotype. Out-planting of native plants is ongoing as part of habitat enhancement activities. Since 2019, the natural resources crew and volunteers have out-planted over 1,600 native plants both within the Halepōhaku parcel and the DLNR-maintained enclosure adjacent to Halepōhaku. Species planted include māmane, ʻāweoweo, pāwale, pua kala, pilo, ʻūlei, and koʻokoʻolau.

Potential Impacts and Mitigation Measures

Per recommendations from the Hawaiʻi Wildfire Management Organization, a ten-foot vegetation free buffer should be maintained around all flammable structures. One māmane tree within five to ten feet of the proposed AST location would be removed to comply with this guideline. Regrowth of vegetation within this ten-foot radius would be cleared regularly. Another large māmane tree located just outside the ten-foot buffer would remain in place. However, pruning may be necessary to maintain the fire-safe distance, as some branches could extend into the buffer. Pruning would occur every two years and be limited to branches hanging into the ten-foot buffer. No māmane trees are located within the trenching and excavation areas.

Table 2. Species Name and Numbers to be Out-Planted and Minimum Survival Rates

Scientific Name	Hawaiian Name	Common Name	Number of Plants to be Out-Planted	Minimum Acceptable Survival
Trees and Shrubs				
Chenopodium oahuense	ʻāweoweo	goosefoot	9	3
Dubautia ciliolata ciliolata	naʻenaʻe	lava dubautia	3	1
Geranium cuneatum hololeucum	hinahina	silver geranium	3	1
Leptecophylla tameiameiae	pūkiawe	-	3	1
Sophora chrysophylla	māmane	-	36	12
Ferns				
Asplenium trichomanes	olaliʻi	maidenhair spleenwort	3	1
Herbaceous Species				
Agrostis avenacea	heʻupueo	Pacific bentgrass	3	1
Agrostis sandwicensis	-	Hawaiʻi bentgrass	3	1
Argemone glauca	pua kala	Hawaiian prickly poppy	3	1
Carex macloviana	-	St. Malo's sedge	3	1
Carex wahuensis		Oʻahu sedge	3	1
Deschampsia nubigena	-	alpine hairgrass	6	2
Pseudognaphalium sandwicensium	ʻenaʻena	-	3	1
Stenogyne microphylla	-	littleleaf stenogyne	12	4
Stenogyne rugosa	māʻohiʻohi	native mint, little leaf stenogyne	6	2
Trisetum glomeratum	pili uka	mountain pili	6	2

Some vegetation removal, mainly non-native grasses and herbaceous species, would be necessary to implement the Proposed Action. To mitigate removal of native plants, including the one māmane tree, and to support ongoing habitat enhancement activities at Halepōhaku, CMS will develop a site restoration plan. This plan will outline strategies for revegetating areas disturbed by soil excavation and vegetation clearing associated with the Proposed Action. Natural Resources staff would identify any native grasses or herbaceous plants that may be disturbed and assess whether they can be salvaged prior to disturbance and temporarily stored in the Halepōhaku greenhouse for future out-planting.

Since native plants require considerable time to propagate and mature for out-planting, several species are currently being cultivated in the Halepōhaku greenhouse. The species selection and plant quantities (Table 2) were determined based on native plant frequency per square meter at Halepōhaku in general, the size of the project site, and the number of plants needed to achieve a minimum of 33% survival rate. While some species may exceed this rate, a 33% survival target aligns with the natural distribution of native plants in the area. Even with this conservative estimate, the resulting native plant presence within the project site would represent a substantial improvement over current conditions.

3.1.4 Fauna

Māmane woodlands on Maunakea, including those at Halepōhaku, are home to a variety of native invertebrates (insects, spiders), the native Hawaiian hoary bat, ʻōpeʻapeʻa (*Lasiurus cinereus semotus*), and a few species of native birds, including the endangered palila (Scott et al. 1986).

Mammals

Ten mammal species occur or potentially occur at Halepōhaku (Table 3). The Hawaiian hoary bat, the only indigenous land mammal in Hawaiʻi, inhabits māmane woodlands on Maunakea but has not been recorded at Halepōhaku. It is federally and state-listed as endangered. Hawaiian hoary bats roost in woody vegetation (i.e. trees and shrubs) and leave young unattended when the adults are foraging.

Table 3. Mammal Species of Halepōhaku

Scientific Name	Common Name	Origin	Occurrence
Capra hircus	feral goat	Non-native	Known
Felis catus	feral cat	Non-native	Known Intermittent
Herpestes auropunctatus	mongoose	Non-native	Known Intermittent
Lasiurus cinereus semotus	ʻōpeʻapeʻa (Hawaiian hoary bat)	Endemic	Potential
Mus domesticus	house mouse	Non-native	Known
Mus musculus	mouse	Non-native	Known
Ovis aries (also called Ovis ovis)	feral sheep	Non-native	Known
Ovis musimon	mouflon sheep	Non-native	Known
Rattus rattus	black rat	Non-native	Known
Sus scrofa	pig	Non-native	Known Intermittent

Potential Impacts and Mitigation Measures

To avoid adverse impacts to Hawaiian hoary bats the Avoidance and Minimization Measures provided by USFWS shall be followed (Appendix A). Woody plants greater than 15 ft tall will not be removed, disturbed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Outside of pup rearing season, any woody plants/trees scheduled for removal or pruning will be examined for the presence of Hawaiian hoary bats immediately prior to any disturbance. If a Hawaiian hoary bat is detected, the plants/tree will not be cut until the bat has left of its own accord. To protect Hawaiian hoary bats from the known threat of entanglement, the Proposed Action will not include the installation of any barbed wire fencing. While the Proposed Action would require removal of one māmane tree and trimming of another, the presence of numerous māmane trees in the project area ensures that this would not result in significant adverse impacts to native mammals, specifically the Hawaiian hoary bat.

Birds

Eight native bird species occur or may potentially occur at Halepōhaku, three of which are federally listed as endangered or threatened (Table 4). Hawaiian honeycreepers–including palila, Hawai'i 'amakihi (*Chlorodrepanis virens virens*), 'apapane (*Himatione sanquinea*), and 'i'iwi (*Vestiaria coccinea*), have been observed at Halepōhaku. Although two additional native bird species, the Hawaiian owl, pueo (*Asio flammeus sandwichensis*) and the Hawaiian hawk, 'io (*Buteo solitaries*), are not common visitors, they have been recently detected in the area. Hawaiian geese, nēnē (*Branta sandvicensis*) have not been recorded at Halepōhaku; however they occur at lower elevations on Maunakea and could potentially visit the project site.

Table 4. Native Bird Species of Halepōhaku

Scientific Name	Common Name	Origin	Occurrence	Legal Status
Asio flammeus sandwichensis	pueo (Hawaiian owl)	Endemic	Known intermittent	Federal Species of Concern
Branta sandvicensis	nēnē (Hawaiian goose)	Endemic	Potential	Federal / State Threatened
Buteo solitaries	'io (Hawaiian hawk)	Endemic	Known intermittent	None
Chasiempis sandwichensis	Hawai'i 'elepaio	Endemic	Potential	Federal Species of Concern
Chlorodrepanis virens	Hawai'i 'amakihi	Endemic	Known	Federal Species of Concern
Himatione sanquinea	'apapane	Endemic	Known intermittent	Federal Species of Concern
Loxioides bailleui	palila	Endemic	Known intermittent	Federal / State Endangered
Vestiaria coccinea	'i'iwi (scarlet honeycreeper)	Endemic	Known intermittent	Federal Threatened

The Hawai‘i ‘amakihi, the most common native bird species at Halepōhaku, forages on a variety of food sources, while the other three honeycreeper species—palila, ‘apapane, and ‘i‘iwi—are more specialized and are only known to be intermittent visitors. Palila forage on māmane seeds and insects that inhabit the trees. ‘Apapane and ‘i‘iwi feed on nectar from māmane and naio (*Myoporum sandwicense*) flowers and may traverse the upper slopes of Maunakea searching for flowering māmane. Hawai‘i ‘elepaio (*Chasiempis sandwichensis*), a flycatcher species, feeds on insects and are mainly found in koa-‘ōhi‘a (*Acacia koa-Metrosideros polymorpha*) forests. Palila, Hawai‘i ‘amakihi, and Hawai‘i ‘elepaio all nest in māmane trees.

Surveys to determine population abundance and range of palila have been conducted annually on Maunakea since 1998.[10] The surveys are focused within the ‘core area’ of higher palila use and population density on the southwestern slope. Supplemental transects adjacent to the core area are surveyed to investigate possible range expansion. One of the supplemental transects, #109, of a higher elevation than the current core range, is near Halepōhaku and provides insight on the use of the project area by palila. Surveys are conducted in January when māmane seedpods are most abundant at higher elevations, to coincide with when palila would be using the higher areas of their elevational range. Palila were consistently detected along transect #109 up until 1990, but since then have only been recorded on a few occasions, specifically in 1997 and 2006. While there have been a few incidental sightings at Halepōhaku, most recently in 2016 and 2017, biologists currently consider the species’ use of this area to be infrequent and tied to times when māmane pod availability is high and birds move freely around a larger range, or low within their core area and birds are expanding their foraging area to search for food. A discussion of designated critical habitat for palila, which includes Halepōhaku, is included in Section 3.1.5.

Although Halepōhaku contains habitat types utilized by the Hawaiian owl and the Hawaiian hawk, these species typically occur at lower elevations. During the winter of 2025-2026, however, both species were recorded at Halepōhaku on several occasions, likely while foraging. Given the high elevation of the project area, these wide-ranging species are unlikely to breed at the site.

There are three species of seabirds, Hawaiian petrels, ‘ua‘u (*Pterodroma sandwichensis*); band-rumped storm petrels, ‘akē‘akē (*Hydrobates castro*); and Newell’s shearwater, ‘a‘o (*Puffinus newelli*) that have been recorded utilizing the high elevation areas of Maunakea for nesting. Hawaiian petrels occur in subalpine and alpine habitats on Maunakea. Prior to 2018, Hawaiian petrels had not been detected on Maunakea since 1954. In 2018 scientists investigating whether Hawaiian petrels still nested on Maunakea detected the species’ calls using specialized bio-acoustic equipment. Since then, their presence has been confirmed both visually and acoustically (Planning Solutions, Inc. and Hoʻokuleana, LLC 2022a). While Hawaiian petrels have not been observed near Halepōhaku in recent years, and recent detections are located outside the Maunakea Lands, it is possible that they fly over the project area. Band-rumped storm petrels and Newell’s shearwaters may fly over the project area on their way to nesting sites at higher elevations but have never been recorded within the Halepōhaku parcel.

[10] Data is collected at different times by different entities including DOFAW, USFWS, USGS Pacific Island Ecosystems Research Center, and the American Bird Conservancy.

Eight non-native bird species have been recorded at Halepōhaku: chukar (*Alectoris chukar*), California quail (*Callipepla californica*), Erckel's Francolin (*Francolinus erckelii*), white eye (*Zosterops japonica*), red-billed leiothrix (*Leiothrix lutea*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). It is likely that some of the other eleven non-native bird species found in the nearby māmane and māmane-naio woodlands also visit the Halepōhaku area seasonally. These species are not protected by federal or state laws.

Potential Impacts and Mitigation Measures

To avoid adverse impacts to federally protected bird species, the Avoidance and Minimization Measures provided by USFWS shall be followed (Appendix A). To decrease the risk of seabird fledgling fallout, the construction activities will not involve any nighttime lighting.[11] If a nēnē appears within 100 ft (30.5 m) of ongoing work, all activity shall be temporarily suspended until the bird leaves the area of its own accord. Feeding of nēnē is prohibited.

The removal of one māmane tree and the pruning of another does not represent a significant adverse effect on the availability of food or habitat for the three honeycreeper bird species that may be present at Halepōhaku. Māmane trees are widely distributed across this elevational zone on Maunakea. Additionally, if these species utilize māmane trees in the Halepōhaku area, they are more likely to be found in trees located father from the built environment. Immediately prior to any removal or pruning, all trees will be examined for the presence of any native birds or active nests. If a native bird or active nest is found, the tree will not be cut until the bird has left of its own accord, or until chicks have fledged.

Invertebrates

Although it is widely accepted that there are hundreds if not thousands of species of invertebrates that have yet to be identified in Hawai'i, a few studies provide localized information on this group. For example, more than 200 species of invertebrates have been collected within the māmane forests on Maunakea (NASA 2005). Although available research cannot determine the total number of invertebrate species in the project area (including the project site), surveys to describe invertebrate biodiversity at Halepōhaku have been conducted regularly. These surveys, which include monitoring non-native invasive invertebrates, began in 2012.

Invertebrate surveys in the Halepōhaku area recorded 99 species on or around three native host plants ['āweoweo (*Chenopodium oahuense*), hinahina (*Geranium cuneatum*) and māmane] (Stever 2016).[12] Of these, approximately 30% are native species, with the majority of those being endemic. Others are either non-native, or their origin is unknown. While none of these species is listed as threatened or endangered at the federal or state level, several are considered *species of concern*.[13] Invertebrate species of concern that have been found at Halepōhaku include four flightless species with limited dispersal ability (three *Nesosydne* sp. and the flightless brown lacewing (*Micromus*

[11] 'Fallout' is the grounding of fledgling seabirds due to disorientation associated with being attracted to light.

[12] These species are the dominant native plants in Maunakea's subalpine region that are known to support high levels of invertebrate richness.

[13] Species of concern is an informal term not defined in the Endangered Species Act. The term commonly refers to species that federal and state agencies consider to be at-risk of declining and appear to need conservation efforts.

usingeri)); three yellow-faced bees (*Hylaeus difficilis*, *Hylaeus flavipes,* and *Hylaeus volcanicus*); and two newly discovered or rediscovered species (the black-veined agrotis noctuid moth (*Agrotis melanoneura*), previously thought to be extinct, and a *Phaeogramma* sp. not previously recorded).

Surveys for non-native invertebrates are conducted quarterly at Halepōhaku in the form of perimeter searches around buildings, parking lots, and all areas used for construction staging, using baiting stations and hand searches. The buildings and parking lots within the project site are currently included in these surveys. Of particular concern is early detection of the introduction of any aggressive competitors that could become established and adversely affect native insect populations in the high elevations on Maunakea, including Halepōhaku. For example, the invasive Argentine ant (*Linepithema humile*), which preys upon and displaces native insects, has become an established, difficult to control pest in the subalpine areas on Haleakalā (a similar environment on Maui) and is present in other areas on the Island of Hawai‘i. Although there has not been a confirmed observation of Argentine ants within the Maunakea Lands, multiple colonies and nests have been detected along the Mauna Kea Access Road at an elevation of 8,200 ft. Surveys conducted above that elevation along the Mauna Kea Access Road did not detect any colonies or nests, and only two ants were found in bait traps. The establishment of Argentine ants at Halepōhaku could significantly impact native invertebrate populations.

Potential Impacts and Mitigation Measures

To prevent the introduction of invasive invertebrates, procedures and prevention strategies outlined in the *Maunakea Invasive Species Management Plan* (ISMP) are actively implemented (Vanderwoude et al. 2015).[14] The ISMP includes standard operating procedures for cleaning vehicles and personal belongings, which apply to all drivers, passengers, personal items, and any vehicles or equipment operating within the UH Management Lands on Maunakea under a permit. All new construction activities must fully adhere to these requirements, including inspection of all imported fill material and follow on monitoring–conducted monthly during construction and quarterly thereafter–to ensure that no new invasive invertebrates are introduced. Monitoring covers both the staging area for materials and equipment as well as the locations where new fill is placed.

No adverse impacts to native invertebrates are anticipated. The project site is an active work area, and any native invertebrates present are unlikely to be affected by the Proposed Action, as it involves activities similar to those routinely carried out in the area. The introduction of non-native species is of greater concern as the Proposed Action will involve bringing in fill soil, construction equipment, and other materials. The required measures outlined in the CMP, the ISMP and the required BMPs will minimize this risk through mandatory inspections and prevention protocols (Appendix A). Monitoring during and after construction will further increase the likelihood of early detection. If invasive invertebrates are detected, ISMP protocols will be implemented immediately to ensure timely eradication and follow-up monitoring to confirm the effectiveness of these efforts.

3.1.5 Habitat

Habitat in the project area transitions from māmane woodland to scrub (Section 3.1.3). A long history of feral ungulate browsing around Halepōhaku and in the adjacent Mauna Kea Forest Reserve has resulted in habitat degradation, characterized by declining native plant populations–particularly

[14] https://hilo.hawaii.edu/maunakea/environment/invasive-species-management

māmane trees—and the spread of invasive weeds. Although culling of feral ungulates has contributed to some habitat recovery, the lasting effects of past browsing are still evident in the condition of the māmane trees and the continued dominance of non-native plant species.

The entire Halepōhaku parcel lies within federally designated palila critical habitat. Palila are the last surviving finch-billed honeycreeper species found in the main Hawaiian Islands; all other species of finch-billed honeycreepers have been extirpated. Palila are found exclusively on the island of Hawai‘i, with more than 95% of their population restricted to the southwest slope of Maunakea. They inhabit dry māmane and māmane-naio forest at elevations ranging from 6,500 to 9,250 ft, with the highest densities occurring around 7,550 ft (DLNR 2015). Palila have evolved a specialized diet and feed primarily on māmane seeds, flowers, and associated invertebrates. In 1977, USFWS designated just under 60,200 acres between 5,500 ft and 10,000 ft elevations encircling Maunakea as critical habitat for the endangered palila. While the elevation of the project site is at the high end of the current core range of this bird, during times of drought there is a greater tendency for birds to move around looking for food. Annual palila surveys at Halepōhaku indicate it is only an occasional visitor (Section 3.1.4) (Brinck et al 2022). The area near the Halepōhaku facilities is not considered preferred nesting habitat for palila or other native forest birds due to relatively constant human activity.

Habitat within the project site is considered degraded, though a few mature māmane trees may provide refuge and food for certain species. The project site is located within the Maintenance Facility Area at Halepōhaku, an area containing existing infrastructure, including roads, buildings, and paved parking areas, where human activity and noise from vehicles and equipment are common. Wildlife generally prefers less disturbed habitat away from people and are not expected in the project site.

Focused efforts to enhance habitat in the Halepōhaku parcel have been on-going in recent years. These efforts include removing non-native plant species, out-planting native plant species, maintaining out-planted natives (e.g. watering and weeding), and monitoring for and removing invasive invertebrates.

Potential Impacts and Mitigation Measures

Habitat changes caused by the introduction and spread of non-native and invasive species are a major concern across all Maunakea Lands, particularly when a project involves earthmoving or bringing in materials and equipment from outside of the area. CMS implements an *Invasive Species and Control Program* guided by the ISMP. To reduce the threat of non-native and invasive species being introduced, regular monitoring and inspections of incoming equipment and materials is conducted (Section 3.1.3 and 3.1.4).

The Proposed Action shall include habitat enhancement through the out-planting of native plants and the monitoring of invasive species. Native plants for out-planting efforts are propagated and cultivated in the Halepōhaku greenhouse, which greatly reduces the accidental introduction of pests and disease to the site. In accordance with the CMP, these enhancement efforts will be monitored monthly for at least three years to evaluate their effectiveness. The implementation of habitat enhancement and invasive species control is expected to improve existing habitat conditions within the project site and thus represents a beneficial effect rather than a significant adverse impact.

3.1.6 Scenic Resources

Scenic resources at Halepōhaku include on-ground resources, scenic vistas (including pu'u), and stargazing. The Halepōhaku area is highly scenic, with foreground views of māmane-naio forest and background views of Maunakea and Mauna Loa volcanoes. Halepōhaku's facilities were built with a deliberate focus on minimizing visual impact, effectively concealing them from view from other locations on the island.

Potential Impacts and Mitigation Measures

The proposed location for the new ASTs is within the Maintenance Facility Area, which is not accessible to visitors. The specific site was selected in part because the ASTs would not be visible from Mauna Kea Access Road. While some individuals may perceive the temporary presence of equipment and materials at the project site as an impact to scenic resources, this effect would be temporary. Overall, the Proposed Action would not result in any significant adverse impacts to scenic resources due to concealed placement of the ASTs and the temporary nature of construction related activities.

3.1.7 Air Quality

Maunakea is renowned worldwide for the exceptional air clarity at its high elevations. Persistent winds and its position above the tradewind inversion layer help sustain this air quality by dispersing volcano-induced vog and human-generated pollutants. At Halepōhaku, sources of air pollution include vehicle exhaust and airborne dust. Dust can be stirred up by vehicles traveling on unpaved surfaces, road grading, construction activities, or wind.

Potential Impacts and Mitigation Measures

The Proposed Action would not have a measurable effect on air quality within the region. Locally the effects would be minimal and limited mainly to the construction period.

During construction, there would be a short-term increase in exhaust emissions from heavy machinery, gas-powered tools, and additional worker commutes. However, this increase would be minor relative to the overall area, and trade winds would help disperse air pollutants quickly. Once construction is complete, emissions from these sources will end. Over the long-term, the Proposed Action would result in a slight increase in exhaust emissions due to an increase in gasoline deliveries to the site–from approximately five to ten times per year. This increase is not significant relative to the overall volume of vehicular traffic at Halepōhaku.

Construction activities most likely to create dust above normal levels include excavation for the removal of USTs and associated infrastructure, as well as backfilling and grading. Low levels of dust may also be produced by heavy equipment operating on unpaved surfaces. All work would comply with DOH air pollution control rules (HAR §11-60.1, *Fugitive Dust*) and the contractor would be responsible for minimizing dust impacts within the project site and surrounding areas. Dust control measures, such as spraying water on exposed surfaces, would be implemented as needed. If the existing MKSS water supply is insufficient, the contractor may bring an additional water truck to the site. Dust-generating activities, including trenching, backfilling, and grading, would be suspended during high winds that prevent compliance with the statute.

The temporary changes in air quality associated with the Proposed Action, in combination with the implementation of mitigation measures, does not represent a significant adverse impact.

3.1.8 Noise

Ambient noise levels at Halepōhaku areas are generally low, with vehicle traffic, wind, and short-term construction being the most pervasive contributors. HRS Chapter 342F states that the DOH Director shall prevent, control, and abate noise pollution in the state.

Potential Impacts and Mitigation Measures

Construction activities would create intermittent, temporary noise during daylight hours due to the use of heavy machinery and small power equipment needed to carry out the Proposed Action. This noise could disturb resident astronomy personnel, particularly any day sleepers, as the project site is adjacent to the Astronomy Mid-Level Support Facilities, which includes dormitories. To address this, the contractor would consult with MKSS to anticipate, identify, and mitigate potential noise impacts on dormitory residents. Day sleepers can be assigned rooms in the dorm building furthest from the construction site during the construction period. Visitors to Halepōhaku are unlikely to be affected, as the VIS and parking area are located approximately 825 ft from the project site.

The only known cultural practices within the area potentially affected by the increased, intermittent, and temporary noise are those occurring in the silversword enclosure located in the Maunakea Forest Reserve, east/northeast of the VIS. As with other projects on Maunakea Lands, quiet periods can be requested during construction to accommodate cultural practices. Concerned individuals can make inquiries at the VIS, speak with the construction monitor, or contact CMS directly.

Temporary noise from the construction activities associated with the Proposed Action is expected to exceed the maximum allowable daytime sound levels of 78 decibels, as specified in HAR §11-46 (*Community Noise Control*). Therefore, a Community Noise Permit would be obtained from DOH.

The temporary nature of noise associated with the Proposed Action, in combination with the implementation of mitigation measures, does not represent a significant adverse impact.

3.1.9 Fire

Although dry shrublands and grasslands present an inherent fire risk, the project site's sparse vegetation, large bare areas, and paved surfaces would significantly limit the potential spread of fire. While non-native grasses can act as fine fuels and increase fire risk, their patchy distribution and the presence of intervening bare area help reduce this potential.

Most native vegetation in the area is not fire tolerant and would likely die in the event of a fire. However, māmane trees are somewhat fire tolerant, and may resprout relatively quickly if not completely killed. No fires have occurred in the Halepōhaku facilities area since construction of the modern facilities (not including the historic stone buildings).

MKSS staff are trained in fire response, including the use of fire extinguishers and outdoor hoses, and would attempt to extinguish any small fire. In the event of a large fire or one involving hazardous materials, the protocol is to call 911. Under a mutual agreement with the County, initial emergency response is provided by Pōhakuloa Training Area Fire and Emergency Services, with the Hawai'i County Fire Department responding if they are unavailable.

Potential Impacts and Mitigation Measures

A fire caused by construction vehicles or personnel could potentially damage existing buildings and vegetation. To minimize this risk, all running vehicles and machinery shall remain on paved or gravel

surfaces whenever possible. Unattended machinery and vehicles may not be left running or idling. A water hose connected to a reliable water source would be available on site and accessible during all work hours. Fire extinguishers would also be kept in the vicinity of active construction areas.

In the unlikely event of a fire, protocols in place for the Maunakea Lands require all fires to be reported immediately by calling 911, notifying both the County and Pōhakuloa Training Area fire departments to ensure the fastest possible response.

If construction activities result in a fire that causes vegetation loss, the affected area would be promptly restored with native plants and seeds to minimize soil erosion and prevent the spread of invasive species.

3.1.10 Climate Change

In Hawai‘i, climate change is projected to result in rising sea levels, higher temperatures, and changes in rainfall patterns. While rainfall events may become less frequent, they are expected to be more intense when they do occur, leading to longer periods of drought punctuated by heavy downpours. Over time, these changes could significantly reshape microclimates and vegetation zones on Maunakea. Current projections indicate that both the frequency and severity of droughts will increase at higher elevations, making the already dry subalpine habitat even drier.

In Maunakea's subalpine habitat, Hawaiian honeycreepers such as palila, ‘apapane, and ‘i‘iwi, rely on māmane trees as a primary food source. Drought conditions can reduce flower and seed production in māmane and may lead to the death of mature trees, particularly those already stressed by other factors such as browsing by ungulates (Banko et al. 2013); pathogens (Gardner and Trujillo 2001); and competition from invasive grasses and weeds (Banko et al. 2009).

Avian malaria, caused by the parasite *Plasmodium relictum*, has contributed significantly to the decline and extinction of many native forest bird species in Hawai‘i. Due to climate change, rising temperatures at higher elevations in Hawai‘i are expected to increase the spread of mosquito-borne avian malaria by shortening the cool winter periods that currently suppress its spread. This disease poses a direct threat to the four honeycreeper species and one flycatcher species that inhabit Maunakea. Overall, climate change is likely to shift and reduce the amount of suitable habitat for these native forest birds.

Potential Impacts and Mitigation Measures

The timing and magnitude of potential impacts related to climate change remain uncertain. For this project, the most likely effects relate to changes in forest bird habitat and potential increases in erosion. Climate change is expected to alter forest bird habitat by shifting plant species distribution. Drier conditions and increased competition from invasive species may further stress māmane trees and other native plants, compounding the environmental challenges faced by palila and other honeycreeper bird species. Additionally, heavier rainfall intensifies the risk of soil erosion because it exerts greater force on surface soils.

Ongoing conservation efforts to protect palila and other honey creeper species focus on expanding suitable habitat by fencing to exclude feral ungulates that browse on māmane trees, controlling invasive species, and studying how māmane distribution may shift in response to climate change. Removal of one māmane tree and the selective trimming of another within the project site is not expected to be significant in terms of climate change. Moreover, if climate-driven habitat shifts lead

to increased use of the project area by palila, ongoing habitat enhancement, such as the planting of māmane trees, would help support this change.

Out-planting of native plants at Halepōhaku into bare soil and cinder areas, is also being conducted to help reduce erosion. Out-planting efforts as part of the Proposed Action will substantially increase the number of native plant species within the project site and revegetate bare areas created by vegetation removal, thereby reducing erosion and enhancing habitat quality.

The Proposed Action aims to reduce carbon emissions. Replacing the current diesel-fueled boiler with a propane-fueled system for heating the buildings would result in lower emissions associated with on-site energy use. In addition, storing fuel on-site would eliminate the need for fleet vehicles to travel to Hilo or Waimea for refueling, thereby avoiding additional transportation-related emissions.

3.2 Infrastructure

3.2.1 Vehicular and Pedestrian Traffic

There are two ingress/egress points off the Mauna Kea Access Road and three paved parking areas in the northern portion of the Halepōhaku parcel where the Maintenance Facility Area and Astronomy Mid-Level Support Facilities are located (Figure 2). The main ingress/egress for the northern portion of the Halepōhaku parcel connects the Mauna Kea Access Road to a short road named John A. Burns Way that is used mainly to access the Astronomy Mid-Level Support Facilities. North of the entrance to John Burns Way, there is another access road off the Mauna Kea Access Road. While MKSS fleet vehicles often park in this area, there are no paved, designated parking spaces at this location. Pedestrian traffic in the area is minimal and limited to MKSS employees, astronomy personnel using the Mid-Level Support Facilities, and contractors working at the Maintenance Facility Area.

The southern portion of the Halepōhaku parcel, where the VIS is located, contains two ingress/egress points off Mauna Kea Access Road and three parking areas. Visitor traffic does not pass through the project site or the Maintenance Facility Area, as visitor activity is contained to the southern part of the parcel. The project site is approximately 825 ft away from the VIS and visitor parking.

Potential Impacts and Mitigation Measures

The Proposed Action will not impact traffic along the Mauna Kea Access Road. The contractor will be required to maintain continuous vehicular and pedestrian access to existing facilities and schedule construction activities to avoid disruption of normal activities. Any anticipated interruptions must be communicated in advance and approved prior to implementation. If necessary, the contractor shall install traffic control devices to divert traffic and ensure safe pedestrian access around or through the construction site.

The Proposed Action will not eliminate any paved parking areas for vehicles or impede pedestrian traffic. The area designated for the ASTs is occasionally used to park two or three MKSS fleet vehicles, which can be parked elsewhere.

3.2.2 Potable Water and Wastewater

There are no wells near Halepōhaku. MKSS maintains two 40,000-gallon storage tanks filled with water trucked in from Hilo. This water is used at Halepōhaku and is available for purchase by the

construction contractor. The individual wastewater system (IWS) at Halepōhaku was designed and installed in compliance with DOH permit requirements for onsite wastewater treatment and disposal. Domestic wastewater is discharged into the system, and the treated effluent is released into disposal fields. Sludge and solids that accumulate in the septic tanks are regularly pumped out and transported off the mountain for proper disposal.

Potential Impacts and Mitigation Measures

The Proposed Action will not cause any permanent change to the amount of wastewater generated at Halepōhaku. Although the construction crew will produce wastewater, it will be within the typical daily range generated daily by visitors, staff, and astronomy personnel. Water discharge during construction will be controlled using sediment waddles, silt fences, biosocks, and gravel bag filters to control sediment and protect water quality. A basin with an impermeable liner shall be installed and used when washing all equipment to contain sediment or pollutants that might be present in wastewater.

3.2.3 Solid Waste

Solid waste at Halepōhaku is continuously generated by the VIS activities, food and lodging services for astronomy personnel, and operations at the Maintenance Facility Area. Typical waste includes food scraps, personal trash, cardboard, paper, and plastic packaging, as well as discarded equipment, construction debris, and other non-hazardous refuse associated with daily operations and maintenance. Elevated levels of solid waste are commonly associated with special events or construction projects.

The Debris Removal, Monitoring and Prevention Plan guides procedures for solid waste disposal from the Maunakea Lands in an effort to maintain "a clean and orderly condition for resource protection" (Planning Solutions, Inc. and Hoʻokuleana, LLC 2022a). All permanent and temporary trash containers at Halepōhaku are required to be covered and secured to prevent access by invasive fauna and to reduce the likelihood of windblown debris. MKSS collects waste from Halepōhaku facilities daily and transports it to an off-site sanitary landfill for disposal. The plan states that solid waste generated by construction projects must be removed from the site at regular intervals and disposed of off-site.

Potential Impacts and Mitigation Measures

The Proposed Action would generate two types of solid waste. One type would come from general construction activities, including materials used to transport and secure construction supplies (such as plastic wrap, cardboard, and strapping) and waste from project personnel (such as trash and food scraps). The second type would include the USTs and associated infrastructure.

To ensure the project site is kept clear of solid waste and prevent access by invasive fauna, contractors shall adhere to project BMPs (Appendix A). These include providing designated, covered trash receptacles at the project site and ensuring the covers remain secured when not in use. All personal trash, including perishable items including food, food wrappers, and containers, must be removed from the site daily. The contractor is responsible for retrieving any solid waste that escapes the project site and enters adjacent areas (e.g. due to wind or heavy rain). Rangers also routinely collect small amounts of trash and debris around Halepōhaku and along the Mauna Kea Access Road during daily patrols. All solid waste will be properly disposed of at the East Hawaiʻi Sanitary Station.

Before disconnection and removal from the project site, the USTs and associated infrastructure shall be pumped empty of all petroleum products. The contractor is responsible for the proper disposal of the USTs and all related infrastructure in compliance with applicable regulations from Hawai‘i County, DOH, and U.S. Environmental Protection Agency.

3.2.4 Petroleum Products

Halepōhaku currently has three fuel USTs: one 12,000-gallon tank for diesel, and two gasoline tanks with capacities of 2,000 and 4,000 gallons. The stored fuel supports MKSS operations including road maintenance, snow removal, and natural resource management (e.g. weed whacking), as well as fueling ranger patrol and observatory vehicles. While vehicles could refuel in Hilo or Waimea if necessary, some form of on-site fuel storage at Halepōhaku or the summit remains essential for operating large and small equipment.

The existing tanks, located in front of the maintenance utilities shop, are equipped with a leak detection system that continuously monitors for unwanted releases. No unwanted releases of fuel have been detected since the installation of the leak detection system in 1998. Additionally, there is no evidence of unwanted releases occurring during the period between the tanks' installation and the implementation of the monitoring system. MKSS routinely monitors fuel levels in the tanks. The existing fuel pumps were installed on top of asphalt, to facilitate easier clean-up in the event of an unwanted release.

Potential Impacts and Mitigation Measures

If the Proposed Action is completed, the fuel storage capacity at Halepōhaku will consist of two 3,000-gallon ASTs, one for diesel and one for gasoline. Although this decreases the overall fuel storage capacity by 66% from 18,000 gallons to 6,000 gallons, MKSS has determined that this capacity is adequate based on current fuel consumption and minimum fuel delivery requirements. The larger diesel tank was originally installed because diesel was needed to fuel the generators that powered Halepōhaku before the site was connected to utility lines. The amount of diesel fuel required for daily activities has been reduced significantly as the generators are no longer in service. The ASTs would be installed and filled before the USTs and associated infrastructure are removed to ensure continuous fuel availability.

Project BMPs will be implemented to prevent petroleum products from contaminating surrounding resources during construction activities. These measures include prohibiting the storage of fuel or hydraulic fluid onsite except within the ASTs or the USTs prior to removal. Fueling or field maintenance of equipment must take place in the vehicle storage area, which is protected by a gravel bag containment berm. Drip pans will be placed under vehicles when onsite but not in use to contain any unwanted releases of fuel or other fluid. In the event of an unwanted release, the contractor must immediately stop the flow of fluids by placing sandbags around the spill area. Any contaminated soil and sandbags shall be removed and disposed of properly once the spill is contained. In the event of ponding fuel, a hazardous materials vacuum truck shall remove the fuel.

Currently, fuel is pumped along supply lines from the USTs to three dispensing pumps and down to the boiler room in the common building. The new ASTs will be self-contained, with fully integrated dispensing pumps, eliminating the need for separate distribution lines. This represents a significant reduction in the footprint under which unwanted releases can potentially take place. The ASTs will be placed on a 6-inch-thick concrete pad with a 6-inch-high spill containment berm to prevent

petroleum products from entering the surrounding environment in the event of a spill during equipment or vehicle fueling. Safety features of the tanks to prevent unwanted releases of fuel from entering the environment are detailed in Section 3.1.1.

3.2.5 Utilities

The project site contains both above ground and below ground utilities. Utilities associated with the USTs include buried fuel lines and utility conduit lines.

Potential Impacts and Mitigation Measures

As part of the Proposed Action, all buried infrastructure associated with the USTs–including fuel lines and utilities such as electrical wiring and conduits–will be removed (Figure 2). Additionally, new underground electrical lines will be installed to power the ASTs. Because excavation, grading, and heavy equipment use are involved, there is a risk of damaging existing utility lines above and below ground. To minimize this risk, the following BMPs shall be implemented. MKSS will provide the contractor with available utility location drawings. The contractor will coordinate with appropriate utility companies to mark the location of all existing utilities, above and below ground, prior to construction, regardless of whether they appear in the drawings. The contractor shall take the necessary precautions to protect all utilities that are not being removed within the work area from damage during project activities. The contractor shall repair any utilities damaged during implementation of the Proposed Action.

3.3 Cultural Practices

Most cultural practices within the Maunakea Lands occur at higher elevations within the Astronomy Precinct. While none are known to take place with the Halepōhaku parcel itself, areas near the parcel are sometimes used by cultural practitioners.

There is a contemporary ahu located within the DLNR-managed silversword enclosure in the Maunakea Forest Reserve to the east/northeast of the VIS that is used by cultural practitioners (Figure 5). Even though the contemporary ahu is located on DLNR managed land, it is regularly maintained by CMS as part of their commitment to supporting cultural practices within and around the Maunakea Lands. Two shrines (State Inventory of Historic Places (SIHP) #50-10-23-10313 and SIHP #50-10-23-10315) are located just south of the Halepōhaku parcel within the Mauna Kea Forest Reserve near the Kahinahina dirt jeep road (Figure 4). The shrines are classified as part of the Pu‘u Kalepeamoa Complex (SIHP #50-10-23-16244) (Section 3.4).

Ko‘oko‘olau and māmane occur in the Halepōhaku parcel and may be collected by cultural practitioners as ethnobotanical resources, particularly ko‘oko‘olau for la‘au lapa‘au practices. However, there are no ko‘oko‘olau near the project site and plant collection by cultural practitioners rarely, if ever, occurs in the immediate vicinity of the Halepōhaku facilities. Subsistence hunting and gathering are not practiced within the Halepōhaku parcel. Most cultural activities within the Maunakea Lands take place during daylight hours, with a few occurring at night or in the early morning.

The CMP requires that access to culturally significant sites on Maunakea be maintained for cultural practitioners. It states that “Native Hawaiian traditional and customary practices shall not be restricted, except where safety, resource management, cultural appropriateness, and legal compliance considerations may require reasonable restrictions.” Cultural practices are permitted if

they do not cause damage to historic properties or result in physical impacts, such as the accumulation of offerings or debris. Public access to the majority of the Halepōhaku parcel is unrestricted, except the Astronomy Mid-Level Support Facilities, which is restricted to authorized personnel only.

In November 2023, all state public lands on Maunakea from the 6,500-foot elevation to and including the summit were approved for listing on the Hawai‘i Register of Historic Places. This area, named the Mauna a Wākea Traditional Cultural Property and District, is identified as SIHP #50-10-23-31382. In March 2025, the National Park Service listed the Mauna a Wākea Traditional Cultural Property and District on the National Register of Historic Places.

Ka Pa‘akai Analysis

An analytical framework for preserving and protecting customary and traditional Native Hawaiian practices was established through the court case *Ka Pa‘akai O Ka ‘Āina vs. Land Use Commission* (Ka Pa‘akai). This case resulted in the development of a three-part process used to assess potential impacts, which is now commonly applied to fulfill the requirements of HRS Chapter 343 and the *Guidelines for Assessing Cultural Impacts*.

1. Identify any valued cultural, historical, or natural resources are present and the extent to which any traditional and customary Native Hawaiian rights are exercised.
2. Identify the extent to which those resources – including traditional and customary Native Hawaiian rights – will be affected or impaired.
3. Specify any actions to be taken to reasonably protect identified cultural, historical, or natural resources and exercise of traditional and customary Native Hawaiian rights if they are found to exist.

Consultation Efforts. On July 17, 2025 an email was sent to community members identified as having knowledge of or interest in the Maunakea Lands, requesting information about any Native Hawaiian traditional or customary rights or practices that may take place within or near the project site (Appendix B). Recipients were encouraged to share the request with others in the community who might also have relevant knowledge. The email included a description of the Proposed Action along with figures showing the location and extent of the project site. Community members were asked to identify any potential impacts the Proposed Action could have on these rights or practices. A reminder email was sent to the same group on August 20, 2025. Both emails noted that a public comment period for the EA would follow. In total, five responses were received.

Findings. Cultural, historical, and natural resources in and around the project site are documented in the *Mauna Kea Cultural Resources Management Plan* (McCoy et al. 2009), the *Natural Resources Management Plan for the UH Management Areas on Mauna Kea* (SRGII 2009), and the CMP, and are further discussed in this EA. Community outreach did not identify any previously unknown cultural, historical, or natural resources, nor any previously unreported traditional or customary practices occurring within or near the project site. Table 5 summarizes the responses by topic area, with some individual responses addressing multiple topics. Copies of the responses are provided in Appendix B.

The Ka Pa‘akai Analysis acknowledges the profound cultural significance of Maunakea to Native Hawaiian people. The analysis did not identify any previously unreported traditional or customary

practices that would be affected by the Proposed Action. The most notable potential impact to cultural practices relates to noise generated during construction. As outlined in the mitigation measures for impacts related to noise (Section 3.1.8), quiet periods can be requested during construction to accommodate cultural practices. While the *Mauna Kea Cultural Resources Management Plan* represents a comprehensive effort to identify customary and traditional Native Hawaiian practices associated with Maunakea, including Halepōhaku, the public comment period for the Draft EA provided additional opportunities for input specific to the Proposed Action.

Table 5. Response Topics

Topic	Specifics of the Comment	Number of Comments
Traditional and customary rights or practices within the project site	None known to occur No comment due to lack of knowledge of that area	2 1
Sound	May cause sound disturbance during prayers or ceremonies	1
Visual	Out of sight of the general public Out of sight of the kuahu in the ʻāhinahina reserve	1 1
Ground disturbance	Acknowledge that the proposed project would occur on previously disturbed ground	1
Decommissioning of existing fuel tanks	In favor of decommissioning and removal	1
Installation of new above ground fuel tanks	Opposed to due to risk to water sources, impacts to the natural environment and the sacred landscape of Halepōhaku	1
General location of the proposed project (Halepōhaku/Maunakea)	Opposition to construction projects at Halepōhaku and on Maunakea	2

Potential Impacts and Mitigation Measures

It is not anticipated that the Proposed Action would have any significant adverse effects on cultural practices as most known cultural practices occur at other areas on Maunakea (mainly at the higher elevations on the mountain) and none are known from within the small footprint of the project site. Safety features of the tanks to prevent unwanted releases of fuel from entering the environment are detailed in Section 3.1.1. Mitigation measures to protect water resources are outlined in Section 3.1.2 and mitigation measures to provide for noise controls during cultural activities are outlined in Section 3.1.8. Additionally, the Proposed Action would not limit travel of cultural practitioners through or around the project site except for during the short period of active construction. Prior to and during the construction period, a cultural resources monitor will frequent the project site to advise on cultural protocols and assist with cultural practitioner access. In the event of an inadvertent discovery, the cultural monitor may assist the on-site archaeological monitor with ensuring all procedures outlined in HAR §13-280 “Rules Governing General Procedures for Inadvertent Discoveries of Historic Properties During a Project Covered by the Historic Preservation Review Process” are followed.

3.4 Archaeological and Historic Resources

Archaeological and historic resources within the Maunakea Lands include historic properties, areas and items of cultural significance, and burials and possible burials. Most of these resources are within or associated with the summit area. This section details those within or close to the Halepōhaku parcel.

Initial archaeological investigations in the project area were conducted in 1979 in preparation for development at Halepōhaku. No archaeological sites were identified during that reconnaissance. Since then, additional archaeological surveys have been carried out for various development projects, including a 1990 reconnaissance survey that covered the entire Halepōhaku parcel and the more recent *Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor* (McCoy et al. 2010). While the Maunakea Lands are known to contain over 200 historic properties, only four historic properties have been recorded at Halepōhaku, none of which are within the project site (McCoy et al. 2010, McCoy et al. 2009). Previous historic preservation studies and historic preservation efforts within or near the Mid-Level Facilities at Halepōhaku are provided in the AMP prepared for the Proposed Action (Appendix C).

Historic properties recorded at Halepōhaku include several lithic scatters and two shrines, collectively known as the Puʻu Kalepeamoa Complex (SIHP #50-10-23-16244), and the Halepōhaku Rest Camp and Comfort Station, which consists of three historic stone buildings.

The Puʻu Kalepeamoa Complex was recorded between 1984 and 1986 and includes features located within both the Halepōhaku parcel and the adjacent Mauna Kea Forest Reserve (Figure 4). The Puʻu Kalepeamoa Complex is comprised of several tool quarry/workshop sites. The complex is believed to have been multifunctional, consisting of several temporary camp sites where adzes and octopus lure sinkers were manufactured. Most of the sites that make up the complex are located outside of the Halepōhaku parcel.

The stone buildings at Halepōhaku are three uncut stone and mortar structures with constructed roofs that date between 1936 and 1950. Although SHPD classifies these stone buildings as historic properties, they have not been listed on the National Park Service's National Registry of Historic Places. They are located on the northern portion of the Halepōhaku parcel (Figure 5).

Since 2012, annual assessments of historic sites within the Maunakea Lands have been conducted. To date, no significant changes have been documented to historic sites within the Halepōhaku parcel, and no previously undocumented historic sites have been discovered during the assessments.

To date no burials have been discovered at Halepōhaku, nor are any referenced in recorded ancestral oral histories. All known and reported burials within the Maunakea Lands are located at higher elevations, typically near cinder cones. The *Burial Treatment Plan for the UH Management Areas on Maunakea*, finalized and approved by SHPD in 2014, states that the Halepōhaku parcel does not contain any burials (Collins and McCoy 2014). This is supported by extensive archaeological surveys of the parcel and a lack of burial markers or surface indicators of burials. Additionally, there are no known burials at the three puʻu closest to the project site.

Potential Impacts and Mitigation Measures

There are no previously recorded historic properties within the project site. The closest known historic property is a lithic scatter (SIHP #50-10-23-10314), part of the Puʻu Kalepeamoa Complex, located approximately 165 ft west of the project site (Appendix C, AMP: Figure 2). No project activities will take place near the Halepōhaku Rest Camp and Comfort Station.

Since the Proposed Action involves ground disturbance, the CMP requires preparation of an AMP (Appendix A, Appendix C). SHPD reviewed the AMP and, on December 1, 2025, informed CMS that the plan was accepted and that the project initiation process could proceed. Upon completion of the Proposed Action, an Archaeological Monitoring Report will be submitted to SHPD for review.

The AMP specifies that a qualified archaeologist (meeting the standards of HAR §13-281 and with at least two years of fieldwork experience in Hawaiʻi) will be present on-site throughout all ground disturbing activities. Before work begins, the archaeologist will conduct a pre-construction briefing for the construction crew. This briefing will outline the types of archaeological materials that could potentially be encountered, including the possibility of human burials, and the procedures to follow if archaeological materials are found. It will also review the AMP's provisions, including the archaeologist's authority to stop work immediately if archaeological resources are discovered. The archaeologist will note that it is the responsibility of the construction contractor to ensure no ground disturbing activity takes place without an archaeological monitor present. Hard copies of the SHPD-approved AMP will be kept on-site and accessible to both the construction contractor and the archaeologist throughout the project.

Although the discovery of historic materials is not anticipated—due to previous ground disturbance from UST installation and multiple prior archaeological surveys—monitoring will include identifying, evaluating, collecting, recording, and analyzing any archaeological materials that may be found. The data retrieved will be sufficient to characterize the nature of all major deposits and strata. Details on documenting and treatment of historic properties are outlined in the AMP (Appendix C). The archaeologist is responsible for following the procedures outlined in HAR §13-280, which governs inadvertent discoveries during permitted projects. To ensure the construction crew can readily identify the boundaries of the closest known historic property, lithic scatter (SIHP #50-10-23-10314), that site will be clearly demarcated by flagging along its western, southwestern, and southern boundaries.

If human remains are identified during the project, work will stop immediately within a 10-foot radius of the discovery. The area will be secured and the SHPD Archaeology Branch and Historic and Cultural Branch staff will be notified immediately. No further work including screening of back dirt, cleaning and/or excavation of the burial area, or exploratory work of any kind, will proceed unless explicitly requested by the SHPD. Any human skeletal remains identified shall be treated as an inadvertent discovery in accordance with HAR §13-300-40. SHPD, in consultation with UH Hilo and the Hawaiʻi Island Burial Council, will determine whether the remains should be preserved in place or relocated. If the SHPD makes a determination for removal of the human remains, the consulting archaeologist will remove and treat the human remains in accordance with HAR §13-300-40.

Although the likelihood of encountering archaeological resources, historical resources or human burials within the project site is low, by following all applicable legislation and requirements of the AMP, no significant adverse impacts to historical resources or human burials are anticipated.

Figure 4. Puʻu Kalepeamoa Complex at Halepōhaku (SIHP #50-10-23-16244)

From *Maunakea Cultural Resources Management Plan* (McCoy et al. 2009)

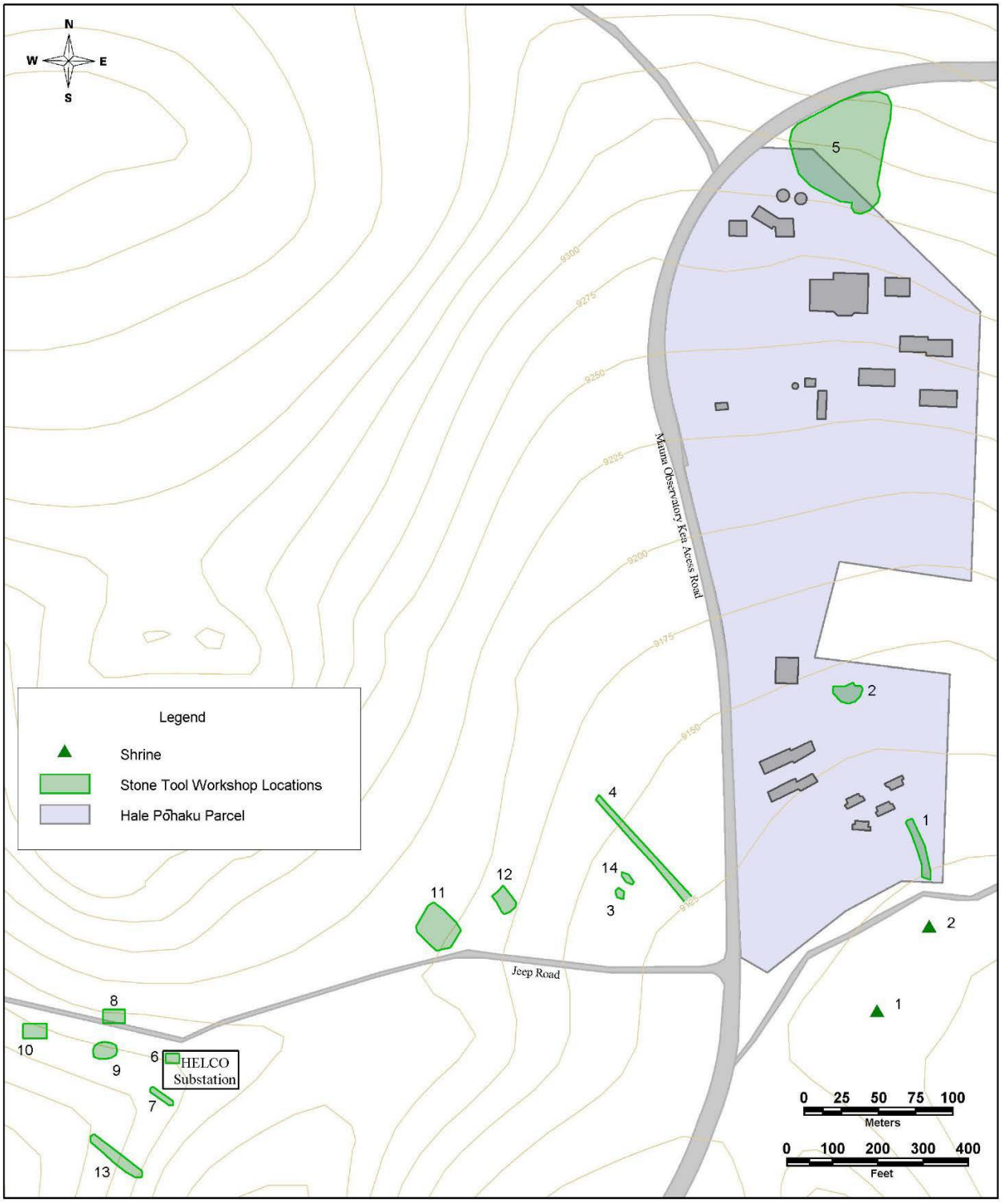

Figure 5. Key Features in the Halepōhaku Area

3.5 Secondary and Cumulative Impacts

Cumulative impacts result when multiple projects—whether past, current, or reasonably foreseeable—each have limited individual impacts but collectively result in more substantial impacts or conflict with mitigation efforts. Currently, no other projects are planned for the Halepōhaku parcel during the anticipated construction period for this project or in the near future. The Proposed Action would result in a temporary increase in workers and minor construction related traffic in the area. These short-term effects would be managed in accordance with stipulations in the CMP and the required project BMPs, as outlined in Appendix A. This increase would not result in any long-term cumulative adverse effects since there are no other projects scheduled at Halepōhaku or the summit area during the execution of the Proposed Action, or during the surrounding time periods.

Infrastructure changes at Halepōhaku associated with past, current, and future projects have the potential to contribute to cumulative adverse impacts through habitat disturbance. These potential changes include a range of planned projects, most of which involve minimal to no alternation of habitat or removal of māmane trees. Examples include digging post holes for a few interpretive signs; paving over an area of existing crushed gravel used for parking; and creating established trails that are already frequently used by pedestrians. A project to permanently install a small teaching telescope within a previously disturbed area at Halepōhaku was proposed but is not currently moving forward. If implemented, each of these actions would occur within the built environment and are expected to result in negligible individual and collective impacts. Planning efforts at Halepōhaku have successfully limited development to small, previously disturbed areas and are anticipated to continue doing so. The Proposed Action would occur within the existing, previously disturbed, built environment of the Maintenance Facility Area. Similarly, potential future projects are expected to take place within highly disturbed areas and maintain a minimal footprint.

The Proposed Action would result in cumulative beneficial effects. It includes the out-planting of native plant species in the Maintenance Facility Area, which is currently dominated by non-native herbaceous species. This effort continues on-going habitat enhancement initiatives at Halepōhaku associated with previous construction projects and general management objectives aimed at replacing non-native plant species with native vegetation. Collectively, these actions contribute to a beneficial cumulative effect on the local ecosystem.

Ongoing road maintenance, snow removal, ranger patrols, as well as any future construction, repair, and decommissioning efforts in the Astronomy Precinct, will require fuel, which could be supplied by the upgraded fuel storage system at Halepōhaku. If USTs are decommissioned and ASTs are not installed, fuel would not be readily available at Halepōhaku, making it time consuming and costly to obtain fuel from Hilo or Waimea to support these activities.

Implementation of the Proposed Action, in combination with other projects at or near Halepōhaku, is not expected to result in significant adverse cumulative effects to natural, historic, or cultural resources. These resources are protected under state and federal law as well as requirements outlined in the CMP. Additionally, the BMPs and required mitigation measures incorporated into the Proposed Action minimize or even negate adverse cumulative impacts. Therefore, no significant cumulative impacts are anticipated in connection with the Proposed Action, including those related to modifications to the existing facilities.

4 RELATIONSHIP TO LAND USE REGULATIONS, PLANS, AND POLICIES

4.1 Consistency with Government Plans and Policies

4.1.1 *2009 Maunakea Comprehensive Management Plan* and *2022 Supplement*

The CMP was approved in 2009 by the UH BOR and BLNR (Kuʻiwalu 2009).[15] It addresses the management of activities and resources for the Maunakea Lands. Since 2010, CMS has submitted annual reports to BLNR on the status of the implementation of the CMP as required as a BLNR condition of CMP approval.[16] The 2009 CMP called for periodic updates to ensure the management actions remain relevant and sufficient. In support of updating the 2009 CMP, UH prepared an *Outcome Analysis Report* (OAR) in 2021. The OAR describes the status of the resources, summarizes the work that has been conducted regarding each of the management actions in the CMP, and outlines progress made towards meeting the stated goals of the CMP. In 2022 UH released, and BLNR approved, the *CMP 2022 Supplement: Management Actions Update* (Planning Solutions, Inc. and Hoʻokuleana, LLC 2022a). The 2022 CMP Supplement incorporates insights from annual reports to the BLNR and findings from the OAR. The Proposed Action was designed in accordance with the management actions outlined in the CMP. Management actions in the CMP that are relevant to the Proposed Action are summarized in Appendix A of this EA.

4.1.2 *Master Plan for the University of Hawaiʻi Maunakea Lands, E Ō I Ka Leo (Listen to the Voice)*

The *Master Plan for the University of Hawaiʻi Maunakea Lands, E Ō I Ka Leo (Listen to the Voice)* (2022 Master Plan) was approved and adopted by UH (Planning Solutions, Inc. and Hoʻokuleana, LLC. 2022b).[17] It replaced the *Maunakea Science Reserve Master Plan* (Group 70 International, Inc. 2000). The 2022 Master Plan addresses the planning, siting, and design of new facilities and significant material changes to existing facilities. The chapter on Halepōhaku discusses potential changes that may occur within and adjacent to the parcel. The "upgrading of fuel storage by July 15, 2028 to comply with new regulations" is listed as one of the improvements to existing facilities that may be undertaken over the term of the new Master Plan. Other potential changes include, but are not limited to, repurposing a portion of the underutilized Astronomy Mid-Level Support Facilities for educational purposes; adding a teaching telescope for use by UH students and the public (this proposed project has since been determined currently unfeasible); erecting educational, safety, and interpretive signs; paving portions of the Maintenance Facility Area that are currently compacted gravel; and improving pedestrian connectivity with trails in the neighboring Forest Reserve. The changes that could potentially add to cumulative impacts are included in Section 3.5. The Master Plan also directs "UH continue its habitat restoration efforts within Halepōhaku … to contribute to the State's pledge to conserve, restore, or grow 100 million trees".

4.1.3 *Natural Resources Management Plan for the UH Management Areas on Mauna Kea*

The *Natural Resources Management Plan for the UH Management Areas on Mauna Kea* (NRMP) is a sub-plan of the CMP (SRGII 2009). The NRMP is a comprehensive review of scientific studies,

[15] https://hilo.hawaii.edu/maunakea/stewardship/management-plans-and-updates#cmp

[16] Previously as OMKM until the 2020 merger with MKSS (see https://hilo.hawaii.edu/maunakea/stewardship/).

[17] https://hilo.hawaii.edu/maunakea/stewardship/management-plans-and-updates#master

biological inventories, and historical documentation meant to identify the status of natural resources with the Maunakea Lands. The baseline information contained in the NRMP was used to provide management recommendations in both the NRMP and the CMP. The OAR contained in the CMP provides updates on the status of some of the natural resources outlined in the NRMP and the results of recommended management actions that have been completed or are in progress.

4.1.4 *Cultural Resources Management Plan for the UH Management Areas on Mauna Kea*

The *Cultural Resources Management Plan for the UH Management Areas on Mauna Kea* (CRMP) outlines the historical and cultural significance of Maunakea, sets forth management objectives and actions, and describes implementation of recommended policies and procedures (McCoy et al. 2009). As part of the plan's development, an intensive archaeological survey of Halepōhaku was conducted between 2005 and 2009, supplementing earlier surveys in the area. The CRMP also includes specific cultural background information related to the Halepōhaku area.

4.1.5 *Maunakea Invasive Species Management Plan*

The *Maunakea Invasive Species Management Plan* details measures to prevent the introduction and spread of invasive species (Vanderwoude et al. 2015). The plan outlines requirements for cleaning and inspection for vehicles, machinery, and materials entering Maunakea Lands; maintenance of the construction staging area; monitoring and control for invasive species; and trash removal. All construction contractors are required to comply with applicable actions detailed in the ISMP.

4.1.6 *Operations, Monitoring, and Maintenance Plan*

An *Operations, Monitoring, and Maintenance Plan* (OMMP) for Maunakea was developed by MKSS and approved by OMKM in February 2017 in fulfillment of CMP management action IM-1. The OMMP coordinates maintenance needs, activities, and schedules. It identifies monitoring requirements and reporting procedures to ensure compliance and document implementation. Within the OMMP, projects are categorized as either Minimal Impact, Routine Activities, or In-Depth Consultation Activities. Projects involving underground tanks and ground disturbance are listed as In-Depth Consultation Activities and require consultation with Kahu Kū Mauna prior to seeking project approval from MKMB (Section 1.4).

4.1.7 Act 255: A Bill for an Act Relating to Mauna Kea

Act 255 established the Mauna Kea Stewardship and Oversight Authority and a transition and governance structure for the management of Mauna Kea lands. This act outlines, in part, the commitment to astronomy as a policy of the state. Astronomy on Maunakea is dependent on the support services provided at Halepōhaku. The Proposed Action supports and is consistent with Act 255 by ensuring an on-going source of fuel for on-mountain activities including observatories and their supporting infrastructure.

4.1.8 Hawai'i State Plan

The *Hawai'i State Plan*, HRS Chapter 226, serves as a guide for the future long-range development of the state.[18] It identifies goals, objectives, policies, and priorities for the state with the intention of providing for wise use of Hawai'i's resources and guiding future development. The Proposed Action supports and is consistent with the *Hawai'i State Plan* objectives and policies for the physical

[18] http://planning.hawaii.gov/hawaii-state-planning-act/

environment (land-based, shoreline, and marine resources, Section 226-11; scenic, natural beauty, and historic resources, Section 226-12; and land, air, and water quality; Section 226-13).

The Proposed Action involves improvements to meet regulatory compliance in an already disturbed area. The Proposed Action is designed to minimize potential impacts to natural, historic, and cultural resources. No direct impacts to archaeological resources are anticipated as part of the construction activities. Scenic vistas in the vicinity of Halepōhaku would be preserved by containing improvements to the vicinity of existing infrastructure and siting new infrastructure to limit them from view from Mauna Kea Access Road.

4.1.9 State Land Use Law

HRS Chapter 205, the Hawai'i State Land Use Law, entitled *State Land Use Commission*, is meant to preserve and protect Hawai'i lands and encourage uses to which the lands are best suited.[19] It designates that all lands in the State of Hawai'i are classified into one of four land use designations: Urban, Rural, Agricultural and Conservation, and lists the permissible uses within each designation. The Proposed Action is in the Conservation District.

HAR §13-5 regulates land use in the Conservation District "for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare". The Administrative Rules establish five subzones and describe the objective of the level of protection, permitted uses, and procedures to obtain permission for those uses. Halepōhaku is in the Resource Subzone of the Conservation District.

All elements of the Proposed Action are identified permitted land uses in the Resource Subzone of the Conservation District, pursuant to HAR §13-5-22, HAR §13-5-23, and HAR §13-5-24. In correspondence dated May 20, 2025, OCCL stated that the proposed project is consistent with the following identified land uses in HAR §13-5-22 P-8: Structures and Land Uses, Existing (B-1) *Demolition, removal, or minor alteration of existing structure, facilities, land, and equipment. Any historic property shall be evaluated by the department for historical significance*; and HAR §13-5-22 P-9: Structures, Accessory (B-1) *Construction or placement of structures accessory to existing facilities*. OCCL states that this requires filing a Site Plan Approval Application (Appendix B). The Draft and Final EAs are components of the process used to determine the appropriate permitting pathway for the project. OCCL has reviewed the Draft EA and will be provided with a Site Plan Approval Application to confirm or revised the conclusions of that review.

4.1.10 County of Hawai'i General Plan

The *County of Hawai'i General Plan* establishes the long-range goals and policies that guide development and appropriate uses of land for the County of Hawai'i.[20] The plan was adopted by ordinance in 1989, revised in 2005, and revised again as of 2024 with a vision toward 2045. The General Plan recognizes the economic and employment contributions provided by the facilities managed by UH. A review of the *Final Recommended Draft General Plan 2045* indicates that the Proposed Action is consistent with the goals, policies, and standards set forth in the County's

[19] https://files.hawaii.gov/luc/docs/hrs_chapter205_web.pdf

[20] https://www.planning.hawaiicounty.gov/general-plan-community-planning/gp

General Plan in that it provides for conservation of natural resources and incorporates pollution controls within facilities development.

4.1.11 Hāmākua Community Development Plan

The *Hāmākua Community Development Plan* (CDP) is an official, long-range plan authorized by the County of Hawai'i General Plan that translates the broad goals and objectives of the General Plan to the unique needs and conditions of a region.[21] The plan was adopted by ordinance in 2018. The *Hāmākua CDP* outlines a set of Kōkua Actions[22] for the agencies and groups that currently manage resources at the summit and near-summit lands. All the CDP Kōkua Actions for Maunakea are based on previously developed policies that align with CDP Community Objectives. A review of the *Hāmākua CDP* indicates that the Proposed Action is consistent with the priorities, values, community objectives, and strategies set forth in the plan in that it provides for conservation of natural resources and strengthens infrastructure.

4.1.12 HRS Chapter 6E Historic Preservation

HRS Chapter 6E details the regulations for historic preservation for the State of Hawai'i. Before any state agency or its political subdivisions begin a project that may affect historic property, aviation artifact, or a burial site, the agency must advise SHPD and provide an opportunity for review of the effect of the Proposed Action (Section 1.4). SHPD is to provide concurrence or non-concurrence within ninety days after the filing of a request. The Proposed Action shall not begin until SHPD has given written concurrence. The state agency must report the finding of any historic property or burial and cooperate with SHPD in the investigation, recording, preservation, and/or salvage. Any human skeletal remains (and any associated burial goods) discovered that appear to be over fifty years old shall not be moved without the approval of SHPD.

4.2 Permits, Approvals, and Compliance Required or Potentially Required

Permits being sought for this project include:

Conservation District Use Land Use Approval. HAR §13-5 stipulates that all land use within the Conservation District requires review by OCCL, and in some cases a permit. Implementation of the Proposed Action will require UH to obtain a Site Plan Approval (Section 4.1.9). If an approval is secured, CMS will oversee compliance with all conditions and report known or suspected violations to DLNR.

Historic Preservation. Under HRS Chapter 6E-8, the Proposed Action requires UH to obtain concurrence from SHPD that either no historical properties would be affected, or if present, SHPD approved protections or mitigation measures will be taken to protect historic property or burial sites (Section 3.4). Since the Proposed Action involves ground disturbance, the CMP requires a SHPD approved AMP to guide archaeological monitoring efforts during construction.

SHPD uses the Hawai'i Cultural Resource Information System (HICRIS) online portal to conduct the HRS Chapter 6E-8 historic preservation review process. On July 17, 2025, details of the Proposed Action were entered into HICRIS for SHPD review. On September 26, 2025, SHPD issued a memo

[21] https://www.planning.hawaiicounty.gov/general-plan-community-planning/cdp/hamakua/doc

[22] Kōkua Actions are the responsibility of federal or state governmental agencies or nongovernmental organizations.

concurring that the Proposed Action would not affect historic properties, provided a SHPD-approved AMP is implemented during project activities. An AMP was submitted for SHPD review during the public review period of the Draft EA. On December 1, 2025 SHPD informed CMS that the AMP was accepted and the project initiation process could proceed. The Final AMP is included in Appendix C of this Final EA.

Construction Permits. The Proposed Action requires Grading, Grubbing, and Stockpiling Permits from the County of Hawai'i Department of Public Works. The permit applications require an *Erosion and Sediment Control Plan*. The permits require approval from SHPD, the County Public Works Engineering Division, and the County Planning Department. The County Public Works Building Division must approve all plans for electrical work. This project requires a Community Noise Permit from DOH. The construction contractor will be responsible for securing all construction permits.

HAR §11-55 Appendix C Requirement. HAR §11-55 (*Water Pollution Control*) regulates the National Pollutant Discharge Elimination System (NPDES) in Hawai'i. HAR §11-55 Appendix C is the NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activity. The NPDES General Permit details the required controls for construction activities with regard to storm water discharge. Specifics are included in Appendix A. The construction contractor will be responsible for implementing required controls and maintaining compliance.

Incidental Take Permit and Habitat Conservation Plan.[23] Incidental take permits may be sought when a non-federal entity believes their otherwise lawful activities may result in take of endangered or threatened animal species. The permit may include non-listed at-risk species. A Habitat Conservation Plan must accompany an application for an Incidental Take Permit. UH does not hold an Incidental Take Permit for the Maunakea Lands. Due to planned mitigation and the infrequent presence of protected species at the project site, incidental take is not anticipated, eliminating the need for an Incidental Take Permit and Habitat Conservation Plan.

DOH Notification. Per HAR §11-280.1.71 (*Permanent closure and changes-in-service*), owners and operators of a UST must notify DOH in writing at least 30 days before beginning either a permanent closure or a change-in-service. UH will be responsible for notifying DOH about the planned closure of the USTs and replacement with ASTs.

Tank Permit. A permit from the County of Hawai'i Fire Department, Fire Prevention Branch is required for installation and removal of all tanks containing flammable or combustible liquids in excess of 60 gallons. Permits would be required for removal of USTs and installation of ASTs. The construction contractor will be responsible for securing the permits.

[23] https://www.fws.gov/library/collections/permits-native-endangered-and-threatened-species

5 DETERMINATIONS, FINDINGS, AND REASONS

5.1 Determination

Based on the effects analysis (Section 3), UH Hilo determined that the Proposed Action would not result in significant environmental impacts. As the anticipated impacts are minimal and less than significant, a FONSI was issued.

5.2 Significance Criteria

HAR §11-200.1-13 (*Significance criteria*), which is part of HAR §11-200.1 (*Environmental Impact Statement Rules*) outlines factors agencies must consider when determining whether an action has significant environmental effects. An action shall be determined to have a significant impact on the environment if it meets any of the following criteria:

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

The site is appropriate for the Proposed Action given its disturbed condition and the surrounding built environment. Additionally, the final footprint of the Proposed Action is very small. Impacts to māmane habitat would be minimal and offset by planned out-planting of native plants, including māmane, into bare ground areas within the project site as well as ongoing habitat enhancement efforts at Halepōhaku. While threatened and endangered species may occasionally be present within the project area, the removal of one māmane tree and trimming of another does not represent a significant habitat modification and is unlikely to affect these species as they rarely utilize the area within and surrounding the project site. Due to required mitigation measures from USFWS and the infrequent visitation of listed species, no 'take' of threatened or endangered species is anticipated.[24] There are no identified cultural or historic resources within the project site. The *Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor* (McCoy et al. 2010) does not list any historic resources within the project site. This supports the anticipated SHPD determination that there are no historic properties within the project site that would be significantly impacted. While cultural practitioners are not known to pass through the project site to access other areas of the mountain, the Proposed Action would not impede access by cultural practitioners, except temporarily during active construction. As such, the Proposed Action would not irrevocably commit any natural, cultural, or historic resources.

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

The Proposed Action would occur in a previously disturbed area that contains existing facilities and paved surfaces–essentially modifying the built environment. Infrastructure improvements would result in only minor changes to the existing footprint of the Maintenance Facility Area. Additionally, replacing the USTs with ASTs would improve containment and simplify clean-up in the event of an unwanted release of fuel, which is a benefit to the environment. Impacts to māmane trees would be minimal and offset by ongoing habitat enhancement efforts in the immediate vicinity. As such, the Proposed Action would not curtail the range of beneficial uses of the environment.

[24] The Endangered Species Act defines 'take' as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect".

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

HRS Chapter 344 outlines the state's long-term environmental policies, which emphasize conserving natural resources and enhancing quality of life. The project is located within previously disturbed areas and has been designed to minimize environmental impacts. It aligns with the intent of these policies by supporting the protection of the natural environment. Specifically, upgrades to the fueling system at Halepōhaku will decrease the chance of any fuel entering the surrounding environment. As such, the Proposed Action is consistent with the state's long-term environmental policies and guidelines set forth in HRS Chapter 344 and does not present any significant conflicts.

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

The Proposed Action would not impact the economic and social welfare of the community. It is not anticipated that the Proposed Action would have any permanent adverse effects on cultural practices as most known cultural practices occur at other areas on Maunakea (mainly at the higher elevations on the mountain) and none are known from within the project site. Additionally, public access for cultural practices would remain unchanged. Impacts related to construction noise are not considered substantial as they would be temporary and include the mitigation measures outlined in Section 3.1.8. As such, the Proposed Action would not have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and state.

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

The Proposed Action involves only short-term, construction-related impacts to ambient air quality and noise levels. No long-term significant adverse impacts to public health and welfare are anticipated. Implementation of recommended mitigation measures and project BMPs during construction will help minimize these temporary impacts to the local area and reduce the likelihood of adverse effects. Over time, replacing aging infrastructure with ASTs equipped with secondary containment walls, leak detection systems, readily available emergency shut-off switches, fully integrated dispensing pumps, and housed within a spill containment berm significantly reduces the risk of fuel releases into the environment. By reducing the potential for environmental contamination, these upgrades could improve public health and safety by lowering the likelihood of exposure to hazardous materials. As such, the Proposed Action would have a beneficial effect on public health.

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

The Proposed Action would not result in any adverse effects or secondary impacts related to population changes or the need to improve upon public facilities. Ensuring continued fuel availability at Halepōhaku supports MKSS operations and helps maintain public access along the Mauna Kea Access Road at a reasonable cost, which is considered a beneficial effect.

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

The Proposed Action would not result in substantial degradation of the quality of the environment. Construction activities may cause minor, short-term impacts to noise levels, air quality, and limited biological resources in the immediate vicinity. The use of required BMPs and recommended

mitigation measures during construction will reduce the potential for adverse impacts on environmental quality. Over the long-term, replacing USTs with ASTs protects habitat quality, reduces the risk of an unwanted release of fuel, and enhances the overall safety and environmental integrity of the site. Additionally, out-planting of native plants within the project site to enhance habitat, slow run-off, and reduce erosion would be beneficial to environmental quality.

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

The Proposed Action is independent of other regional activities and does not cause significant cumulative impacts or commit to larger actions. Planned future actions within or in the vicinity of the project site would consist mainly of improvements to the built environment. Potential future projects include installing a small telescope, installing signage, paving a gravel parking area, and establishing pedestrian trails to connect with trails in the adjacent Forest Reserve. Each of these potential projects, and the Proposed Action, are relatively small in scale and would occur in already disturbed areas. CMP requirements for construction projects and natural resource management actions, such as invasive species monitoring and removal, along with ongoing habitat enhancements, benefit the environment. For these reasons, the Proposed Action in combination with other potential projects, is unlikely to result in cumulative substantial adverse impacts.

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

The project site lies within designated critical habitat for the endangered palila, a species reliant on māmane trees. While the Proposed Action would require removal of one mature māmane tree and trimming of a second tree near the planned AST location, adverse impacts to the palila are unlikely. Palila are infrequent visitors to this area, and the surrounding mature māmane trees would not be impacted. As a result, the overall habitat quality of the in the area would not be significantly altered. The removal and pruning of these two trees are considered a minor impact that would be offset by planned out-planting of native plants within the project site and sustained habitat enhancement efforts throughout Halepōhaku. No ‘take’ of palila or any other federally or state-listed species is anticipated.

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

Only minimal construction-related, short-term impacts on air quality and noise levels are anticipated. Mitigation measures would be implemented to minimize construction-related noise and dust impacts. During project implementation, the addition of pollutants or sediments to storm water run-off would be prevented through project BMPs. Groundwater levels are assumed to be at significant depths below the ground surface. There are no wells at Halepōhaku, and all potable water is trucked in and stored in tanks. As such, the Proposed Action would not have a substantial adverse effect on air or water quality or ambient noise levels.

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

Although the Proposed Action is in an area with seismic risk, the entire Island of Hawai‘i shares this risk. The Proposed Action is being designed in accordance with standards appropriate to the geologic, hydrologic, and seismic settings. While the ASTs are unlikely to suffer damage in the event

of an earthquake, having fuel storage above ground, rather than below, makes clean-up in the event of a spill significantly easier. Improvements are at or below ground level and would not pose any additional risk to life or property in the event of a seismic event. No substantial adverse effects to environmentally sensitive areas are likely.

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

Although there are no scenic vistas or view planes within this area that are identified in county or state plans, many visitors to Halepōhaku value the views of surrounding puʻu, nearby Maunaloa, and far-reaching vistas. Scenic views were considered when developing the Proposed Action and the ASTs were sited to minimize their visibility from Mauna Kea Access Road. The Proposed Action would not adversely affect any scenic vistas or view planes, as the improvements would be at ground level and, given their proposed location on the far side of the utilities building from the Mauna Kea Access Road, would be inconspicuous to visitors once completed.

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

The Proposed Action requires the use of gasoline or diesel-powered machinery to complete removal of the USTs and installation of the ASTs; however fuel use would be short-term and neither substantial nor excessive. Since the existing USTs can no longer be used to store fuel after July 2028 due to regulatory requirements, implementing the Proposed Action would reduce energy consumption by maintaining an on-mountain location for fueling, rather than having vehicles drive long distances to obtain fuel off site. The project involves only minor energy consumption and would not result in the emission of substantial greenhouse gases. As such no substantial adverse effects related to energy consumption are expected.

For the reasons outlined above, the Proposed Action would not have significant adverse impacts in the context of HRS Chapter 343 and HAR §11-200-12.

6 REFERENCES

Banko, PC, KW Brinck, C Farmer, and SC Hess. 2009. Palila. Pages 513-529 *in* Conservation Biology of Hawaiian Forest Birds: Implications for Island Avifauna (TK Pratt, CT Atkinson, PC Banko, JD Jacobi, BL Woodworth, eds.). Yale University Press, New Haven, CT.

Banko PC, RJ Camp, C Farmer, KW Brinck, DL Leonard, and RM Stephens. 2013. Response of Palila and Other Subalpine Hawaiian Forest Bird Species to Prolonged Drought and Habitat Degradation by Feral Ungulates. *Biological Conservation* 157:70-77.

Brinck K, RJ Camp, KW Brinck. 2022. Mauna Kea Palila Point Count Data from Annual Surveys 1998-2018 (ver. 2.0 January 2022). Pacific Islands Ecosystems Research Center.

Char, WP. 1999. *Botanical Resources, Hale Pohaku Mid Elevation Facilities*. Appendix G of Group 70. 2000. Mauna Kea Science Reserve Master Plan. Honolulu, HI.

Collins, S. and P. McCoy. 2014. *Burial Treatment Plan for Burial Sites in the Mauna Kea Science Reserve and the Mauna Kea Access Road Corridor, Kaʻohe Ahupaʻa, Hāmākua District, Island of Hawaiʻi. TMK (3) 4-4-015:01 (por.)* Prepared for the Office of Maunakea Management. July.

Department of Land and Natural Resources (DLNR). 2015. *Hawaii's State Wildlife Action Plan*. *Fact Sheet Palila, Loxioides bailleui*. https://dlnr.hawaii.gov/wildlife/files/2019/03/SWAP-2015-Palila-Final.pdf

Gardner, DE and EE Trujillo. 2001. Association of *Armillaria mellea* with Mamane Decline at Puʻu Laʻau. *Newsletter of the Hawaiian Botanical Society* 40:33-34.

Gerrish, G. 2011. *Botanical Baseline Survey of the University of Hawai'i's Managed Lands on Mauna Kea*. Prepared for Office of Maunakea Management. August.

Group 70 International, Inc. 2000. Mauna Kea Science Reserve Master Plan. Prepared for the University of Hawaiʻi. Vol I and Vol. II.

Kuʻiwalu. 2009. *Maunakea Comprehensive Management Plan*. Prepared for University of Hawaiʻi. April.

McCoy, P, S Collins, S Clark, and V Park. 2009. *A Cultural Resources Management Plan for the University of Hawaii Management Areas on Mauna Kea, Kaʻohe Ahupaʻa, Hāmākua District, Hawaiʻi Island State of Hawaii. A Sub-Plan of the Mauna Kea Comprehensive Management Plan*. October.

McCoy, P, R Ness, and M Mintmier. 2010. *Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor, Kaʻohe Ahupaʻa, Hāmākua District, Hawaiʻi Island, Hawaii. TMK (3) 4-4-015:01 (por.)* Prepared for the Office of Maunakea Management. February.

NASA. 2005. Final Environmental Impact Statement for the Outrigger Telescopes Project: Mauna Kea Science Reserve, Island of Hawai'i. National Aeronautics and Space Administration, Universe Division, Science Mission Directorate Washington, D.C.

Planning Solutions, Inc. and Hoʻokuleana, LLC. 2022a. *Comprehensive Management Plan 2022 Supplement: Management Actions Update*. Volume 1 and Volume 2. Prepared for the University of

Hawai‘i. Approved by University of Hawai‘i Board of Regents (May 19, 2022). Approved by the Board of Land and Natural Resources (July 22, 2022).

Planning Solutions, Inc. and Ho‘okuleana, LLC. 2022b. *Master Plan for the University of Hawai‘i Maunakea Lands, E Ō I Ka Leo (Listen to the Voice)*. Prepared for the University of Hawai‘i. Adopted by University of Hawai‘i Board of Regents (January 20, 2022).

Scott, JM, S Mountainspring, FL Ramsey, and CB Kepler. 1986. Forest Bird Communities of the Hawaiian Islands : Their Dynamics, Ecology, and Conservation. Los Angeles, CA, Cooper Ornithological Society. https://pubs.usgs.gov/publication/5200067

Stever, H. 2016. *Arthropod Diversity Estimates for Three Native Subalpine Plant Species on the Maunakea Volcano of Hawai‘i Island*. Master’s Thesis. University of Hawai‘i at Hilo. December.

Sustainable Resources Group International, Inc. (SRGII) 2009. *Natural Resources Management Plan for the UH Management Aras on Mauna Kea*. OMKM. September.

Vanderwoude, C, F Klasner, J Kirkpatrick and S Kaye. 2015. *Maunakea Invasive Species Management Plan*. Technical Report No. 191. Pacific Cooperative Studies Unit, University of Hawai‘i, Honolulu, Hawai‘i. 84 pp.

Wright, TL, JYF Chun, J Exposo, C Heliker, J Hodge, JP Lockwood, SM Vogt. 1992. *Map Showing Lava-Flow Hazard Zones, Island of Hawaii: U.S. Geological Survey Miscellaneous Field Studies Map MF-2193, Scale 1:250,000*. https://pubs.usgs.gov/mf/1992/2193/

Cover photo: Hunt, Matthew. 2019. Hale Pohaku from nearby caldera. Flickr https://www.flickr.com/photos/coneslayer/40205614583/in/photostream/

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Appendix A. Project Requirements

The Proposed Action has the potential to impact to resources within the Halepōhaku parcel. Impacts are generally mitigated by adhering to county, state, and federal laws; conditions of any DLNR approvals in the form of site plan approvals or CDUPs, and an AMP; permit conditions; stipulations of the Maunakea CMP; construction BMPs; and Kahu Kū Mauna, the CMS Environment Committee, and MKSOA recommendations. Table A1 includes details on requirements and BMPs to support information provided in Section 3 on actions to protect those resources. Construction Sheets C-103 and C-104 show detail of the required project BMPs and how some would be installed.

Required Under the Maunakea Comprehensive Management Plan. As the BLNR-approved management plan for the Maunakea Lands, the CMP contains management actions to protect the natural and cultural resources of Maunakea. The CMP states "The desired outcome with respect to construction is to minimize adverse impacts to resources during all phases of construction through use of innovative best management practices." Contractors, through their construction contracts with the applicant, must comply with all applicable requirements of the CMP.

Construction Drawings and Contractor Notes. The construction drawings and contractor notes state that "All construction activity will incorporate the listed BMPs without modification." The contractor notes that BMPs will be implemented from the first day of construction and will not be removed until work items are complete and vegetation cover is reestablished. The first day of construction refers to the first day supplies and machinery are mobilized to the project site.

Maunakea Invasive Species Management Plan. All construction requires compliance with the MKMB-approved Maunakea ISMP (Vanderwoude et al. 2015). The ISMP details measures to be taken to avoid the introduction and spread of invasive species such as cleaning and inspection procedures for machinery and materials; maintenance of the construction staging area; monitoring and control for invasive species; and trash removal.

Hawai'i Administrative Rules and Project Permits. State laws and permit requirements are in place to ensure projects do not conflict with the goals, objectives, policies, and priorities of the state. All construction requires compliance with applicable HAR and permit requirements.

USFWS Avoidance and Minimization Measures. USFWS supplies a list of measures to be followed to avoid and minimize potential project impacts on endangered and threatened species.

Table A1. Project BMPs and Requirements

GENERAL

Guidance	Instruction	Description
2022 CMP	CMP P-1 (Permitting and Enforcement)	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.
2022 CMP	CMP EO-2 (Require User Orientation and a Certificate of Completion)	All visitors must complete a Maunakea User Orientation that covers Maunakea's natural and cultural resources, and mountain safety. This includes but is not limited to visitors, employees, astronomy staff, contractors, and commercial and recreational users. Any person behaving in a manner inconsistent with the principles established in the Maunakea User Orientation will be required to leave the project site.
2022 CMP	CMP C-1 (Require Independent Construction Monitor)	Require an independent construction monitor who has oversight and authority to insure that all aspects of ground based work comply with protocols and permit requirements.
2022 CMP	CMP C-2 (Best Management Plan for Construction Practices)	Each project must have a "Best Management Practices (BMP) Plan for Construction Practices" that covers a range of topics and incorporates sustainable practices.
2022 CMP	CMP NR-1 (Limit Threats Through Management of Activities and Uses)	UH shall implement measures to minimize or prevent habitat alteration and disturbance. For the Proposed Action this includes maintaining infrastructure in a manner that is compliant with rules and regulations and limits the potential for adverse impacts to resources.
Construction Drawings	BMP (required)	The contractor will coordinate all work with a construction monitor hired by MKSS to conduct site assessment activities required by the DOH UST Section for system closures. Unless otherwise directed by the construction monitor, the contractor will only conduct work on this project when the construction monitor is present at the project site.
Construction Drawings	BMP (required)	The contractor will carry out the work in a way that allows the construction monitor to perform the required site assessment activities. This includes but is not limited to providing access to excavated material and providing access to all excavations. No material associated with this project may leave the project site until authorized by the construction monitor.

CONTROL OF EROSION, SEDIMENTATION, AND DUST (Section 3.1.1, 3.1.2, 3.1.7)

Guidance	Instruction	Description
Grading Permit	Permit Requirements	All grading operations shall be performed in conformance with the applicable provisions of HAR §11-54, Water Quality Standards and HAR §11-55, Water Pollution Control, and Hawai'i County Code Chapter 10, Erosion and Sedimentation Control Standards and Guidelines.
Grading Permit	Permit Requirements	Fugitive dust control during grubbing and grading activities shall meet requirements of HAR §11-60.1, Air Pollution Control.

Guidance	Instruction	Description
Grading Permit	Permit Requirements	Solid waste disposal during grubbing and grading activities shall meet requirements of HAR §11-58.1, Solid Waste Management Control.
HAR §11-55 Appendix C	HAR Requirements	A specific person shall be responsible for erosion and sediment controls at the project site.
HAR §11-55 Appendix C	HAR Requirements	Clearing and grubbing shall be held to the minimum necessary for grading and equipment operation.
HAR §11-55 Appendix C	HAR Requirements	Construction shall be sequenced to minimize the exposure time of the cleared surface area.
HAR §11-55 Appendix C	HAR Requirements	Construction shall be staged or phased for large projects. Areas of one phase shall be stabilized before another phase is initiated. Stabilization shall be accomplished by temporarily or permanently protecting the disturbed soil surface from rainfall impacts and runoff.
HAR §11-55 Appendix C	HAR Requirements	Erosion and sediment control measures shall be in place and functional before earth moving operations begin. These measures shall be properly constructed and maintained throughout the construction period.
HAR §11-55 Appendix C	HAR Requirements	All BMPs installed to reduce erosion shall be checked and repaired as necessary, for example, weekly in dry periods and within 24 hours after any rainfall of 0.5 inches or greater within a 24-hour period. During prolonged rainfall, daily checking is necessary. The contractor shall maintain records of checks and repairs.
HAR §11-55 Appendix C	HAR Requirements	Pre-construction vegetative ground cover shall not be destroyed, removed, or disturbed more than twenty calendar days prior to land disturbance.
HAR §11-55 Appendix C	HAR Requirements	Temporary soil stabilization with appropriate vegetation shall be applied on areas that will remain unfinished for more than thirty calendar days.
HAR §11-55 Appendix C	HAR Requirements	Permanent soil stabilization with perennial vegetation or pavement shall be applied as soon as practical after final grading. Irrigation and maintenance of the perennial vegetation shall be provided until the vegetation takes root.
HAR §11-55 Appendix C	HAR Requirements	Erosion control measures shall be designed according to the size of disturbed or drainage areas to detain runoff and trap sediment.
HAR §11-60.1-33. Fugitive Dust	HAR Requirements	The contractor shall keep the project and surrounding areas free from dust nuisances.
Construction Drawings	BMP (required)	The contractor shall remove all silt and debris deposited in drainage facilities, roadways, and other areas resulting from project work.
Construction Drawings	BMP (required)	The contractor shall sod or plant all slopes and exposed areas immediately after the grading work has been completed.
Construction Drawings	BMP (required)	Pre-construction vegetative ground cover shall not be destroyed, removed, or disturbed more than twenty calendar days prior to land disturbance.
Construction Drawings	BMP (required)	Removed vegetation will be disposed of at the East Hawaii Sanitary Station.

Guidance	Instruction	Description
Construction Drawings	BMP (required)	During construction, preventative measures shall be used to control foreseeable dust, erosion, or sedimentation problems which may arise as the job progresses.
Construction Drawings	BMP (required)	The contractor shall conduct grading operations so that excavation, embankment and imported material shall be dampened with water during grading operations at all times.
Construction Drawings	BMP (required)	Water truck and/or temporary sprinklers shall be available on the jobsite at all times to ensure bare earth does not create dust problems. However, dust control watering shall not be excessive so that runoff will not be generated from watering.
Construction Drawings	BMP (required)	Stormwater flowing towards the construction areas shall be diverted using the appropriate control measures as practical.
Construction Drawings	BMP (required)	Erosion control measures shall be designed to detain and trap sediment.

POLLUTANTS (Section 3.1.1, 3.1.2, 3.2.4)

Guidance	Instruction	Description
HAR §11-54-04	HAR Requirements	Water must be discharged in a manner that the discharge shall not cause or contribute to a violation of the basic water quality criteria.
Construction Drawings	BMP (required)	The construction site manager will conduct a site inspection daily for any potential pollution sources.
Construction Drawings	BMP (required)	All equipment stored onsite shall be in good working order with no fuel, oil, transmission fluid, or hydraulic leaks. Equipment shall be inspected daily. Any equipment found to be faulty shall be repaired immediately with necessary BMP precautions taken to prevent and contain storm water contamination. Equipment which cannot be repaired within the same working day, shall be removed from the site to an appropriate repair facility.
Construction Drawings	BMP (required)	When motorized equipment is stationary, a drain-pan must be in place for catching any fuel or fluid leaks.
Construction Drawings	BMP (required)	No fuel or hydraulic fluid shall be stored onsite. Fueling or field maintenance of equipment shall be performed in vehicle storage area that is protected with a gravel bag containment berm. Drip pans will be placed under vehicles when onsite while not in use so that in the event of a spill or leak from the equipment the spill would be contained. The contractor will be required to stop the flow of all fluid. If necessary, the spill will be contained by placing sandbags around the spill area and any contaminated soil and sandbags shall be placed in containers and removed and disposed of properly. In the case of ponding fuel, a hazardous materials vacuum truck will remove the fuel.
Construction Drawings	BMP (required)	A basin with an impermeable liner shall be installed and used for washing all equipment.

INVASIVE SPECIES (Sections 3.1.3, 3.1.4)

Guidance	Instruction	Description
2022 CMP & ISMP	CMP C-9 (Inspection of Construction Materials to Prevent Introduction of Invasive Species) & required of all projects that require a Conservation District Use Permit.	The *Maunakea Invasive Species Management Plan* requires that all equipment and materials brought on-site for construction arrive free from any invasive flora or fauna. Equipment shall be thoroughly cleaned prior to arriving at the site. All construction equipment, materials, and crates and containers carrying materials and equipment brought on-site shall be inspected for invasive species by a DLNR-approved biologist prior to those materials entering UH Managed Lands on Maunakea. Inspections shall not occur on UH Managed Lands on Maunakea, at state or county parks, along public roadsides, or on DHHL lands. The contractor will be provided with the MKMB approved Standard Operating Procedure 02: Inspection of Vehicles, Construction Materials, Scientific Equipment and Supplies, which outlines prevention strategies.
2022 CMP & ISMP	CMP NR-16 (Conduct Regular Long-Term Monitoring)	Continue long-term invasive species monitoring involving monitoring/early detection, prevention, rapid response, and control efforts.
Construction Drawings	BMP (required)	All perishable items including food, food wrappers, and containers, etc. shall be removed from the site at the end of each day.

PROTECTED SPECIES (Sections 3.1.3, 3.1.4)

Guidance	Instruction	Description
USFWS	USFWS Avoidance and Minimization Measures	Hawaiian hoary bats, ʻōpeʻapeʻa (*Lasiurus semotus*) Do not disturb, remove, or trim woody plants greater than 15 ft tall during the bat birthing and pup rearing season (June 1 through September 15).
USFWS	USFWS Avoidance and Minimization Measures	Do not use barbed wire for fencing.
USFWS	USFWS Avoidance and Minimization Measures	Use of lighting from sunset to sunrise is prohibited.
USFWS	USFWS Avoidance and Minimization Measures	Hawaiian goose, nēnē (*Branta sandvicensis*) If a nēnē appears within 100 ft (30.5 m) of ongoing work, all activity shall be temporarily suspended until the bird leaves the area of its own accord. Feeding of nēnē is prohibited.

HABITAT (Section 3.1.5)

Guidance	Instruction	Description
Construction Drawings	BMP (required)	Ensure that construction debris, personal trash (e.g. food wrappers) loose tools or equipment are not left unattended and are properly stored at the end of each day.

Guidance	Instruction	Description
2022 CMP	CMP NR-9 (Increase Native Plant Diversity Through an Outplanting Program)	UH has a greenhouse within the Halepōhaku parcel and will continue to maintain and utilize it to propagate native plants for outplanting to the UH Managed Lands on Maunakea. All plants in the greenhouse will be grown from seeds collected locally within the ecotype and approved by DLNR through CMS's seed collecting permit which will be renewed annually. CMS will continue to outplant subalpine species within Halepōhaku and potentially expand the program to the road corridor and neighboring Forest Reserve if needs are met within the UH Managed Lands on Maunakea.
2022 CMP	CMP NR-10 (Incorporate Mitigation Plans Into Project Planning and Conduct Mitigation Following New Development)	Mitigation and BMP plans are required for projects as appropriate.[25]
2022 CMP	CMP NR-12 (Plan and Conduct Habitat Restoration Activities, as Needed)	The greenhouse at Halepōhaku will continue to be used to support restoration activities. Restoration effectiveness should be monitored for at least three (3) years following completion to assess success.

FIRE (Section 3.1.9)

Guidance	Instruction	Description
Construction Drawings	BMP (required)	All running vehicles and machinery shall remain on paved or gravel surfaces whenever possible.
Construction Drawings	BMP (required)	Unattended machinery and vehicles may not be left running/idling.
Construction Drawings	BMP (required)	A water hose connected to a reliable water source shall be available on site and accessible during all work hours. Fire extinguishers shall be kept in the vicinity of active construction areas.

VEHICULAR AND PEDESTRIAN TRAFFIC (Section 3.2.1)

Guidance	Instruction	Description
Construction Drawings	BMP (required)	If needed, the contractor shall provide and install traffic control devices to divert traffic.
Construction Drawings	BMP (required)	All signage pertaining to construction activity such as "Men Working" shall be covered or laid down during non-work hours. However, all signs necessary for the safety of the public shall be maintained.

[25] The removal of USTs is not considered a 'new development,' but a decommissioning and removal of existing infrastructure. The installation of the ASTs may be considered a new development.

Guidance	Instruction	Description
Construction Drawings	BMP (required)	No construction equipment shall be parked within the road right-of-way in a manner that obstructs normal movement and sight of motorists, except during actual working hours.
Construction Drawings	BMP (required)	Contractor shall properly barricade and provide steel plates on all open trenches during all phases of construction.

POTABLE WATER AND WASTEWATER (Section 3.2.2)

Guidance	Instruction	Description
Construction Drawings	BMP (required)	Discharge during construction will be controlled by sediment waddles, silt fences, biosocks, and gravel bag filters.
HAR §11-55 Appendix C	HAR Requirements	The permittee shall maintain records of the duration and estimated volume of storm water discharge(s).
HAR §11-55 Appendix C	HAR Requirements	Storm water flowing toward the construction area shall be diverted by using appropriate control measures, as practical.
HAR §11-55 Appendix C	HAR Requirements	Water must be discharged in a manner that the discharge shall not cause or contribute to a violation of the basic water quality criteria as specified in HAR §11-55

SOLID WASTE (Section 3.2.3)

Guidance	Instruction	Description
Construction Drawings	BMP (required)	All trash containers are required to be covered and secured.
Construction Drawings	BMP (required)	Project solid waste/debris that did not previously hold petroleum must be removed from the site at regular intervals.
Construction Drawings	BMP (required)	The contractor shall remove all debris deposited in drainages, roadways and other areas resulting from this work.

ARCHAEOLOGICAL AND HISTORIC RESOURCES (Section 3.4)

Guidance	Instruction	Description
2022 CMP	CMP C-6 (Require an Archaeological Monitoring Plan)	Archaeological monitoring has been conducted in accordance with SHPD guidance for all projects involving ground disturbance that have been initiated since the *2009 CMP* was adopted. The project proponent will, in consultation with SHPD, establish whether archaeological monitoring is required during the project. If it is required, the project proponent will prepare an AMP and obtain SHPD approval of the plan prior to the start of any ground-disturbing work. Should any resources be encountered, the project proponent will strictly follow the provisions of the AMP.
Final Archaeological Monitoring Plan in Support of the Upgrading Halepōhaku Fuel Storage System Project (Appendix C)	Archaeological Monitoring Methods	The boundaries of the lithic scatter (SIHP #50-10-23-10314) will be demarcated by flagging along the western, southwestern, and southern boundaries of the site.

SITE SPECIFIC CONSTRUCTION BMP CONTROL MEASURES

CONSTRUCTION ACTIVITIES

SITE IMPROVEMENT FOR THE REPAVING OF AC DRIVEWAY. INFRASTRUCTURE TO SUPPORT THE PROPOSED IMPROVEMENTS INCLUDES AC PAVING.

ALL CONSTRUCTION ACTIVITY WILL INCORPORATE THESE BMPS WITHOUT MODIFICATION. CONSTRUCTION SITE MANAGER WILL CONDUCT A SITE INSPECTION DAILY FOR ANY POTENTIAL POLLUTION SOURCES. ALL EQUIPMENT STORED ONSITE SHALL BE IN GOOD WORKING ORDER WITH NO FUEL, OIL, TRANSMISSION FLUID, OR HYDRAULIC LEAKS. ANY EQUIPMENT FOUND TO BE FAULTY SHALL BE REPAIRED IMMEDIATELY WITH NECESSARY BMP PRECAUTIONS TAKEN TO PREVENT AND CONTAIN STORM WATER CONTAMINATION. EQUIPMENT WHICH CANNOT BE REPAIRED WITHIN THE SAME WORKING DAY, SHALL BE REMOVED FROM THE SITE TO AN APPROPRIATE REPAIR FACILITY.

CONSTRUCTION EQUIPMENT INCLUDES; EXCAVATOR, LOADER, DUMP TRUCKS, DRUM ROLLER/COMPACTOR, ETC.

QUALITY OF DISCHARGE

THE EXISTING SOIL IS ORANGISH BROWN SILTY SAND, MEDIAL FINE SANDY LOAM. THE SITE HAS AN EXISTING IMPROVEMENTS THAT HAS HIGH VEGETAL COVER. NO STORM WATER MANAGEMENT FACILITIES EXIST ON THE SITE. DISCHARGE DURING CONSTRUCTION WILL BE CONTROLLED BY, SEDIMENT WADDLES, SILT FENCE, BIOSOCKS, AND GRAVEL BAG FILTERS. ALL DISTURBED AREAS THAT ARE NOT SCHEDULED TO BE PAVED, LANDSCAPED, OR GRAVEL WILL HAVE HYDROMULCH OR GRASS SEED APPLIED TO STABILIZE THE SOIL.

CONTROL FOR LAND DISTURBANCES

THE GENERAL CONTRACTOR SHALL COMPLY WITH THE SPECIAL CONDITIONS FOR LAND DISTURBANCES (FROM HAR, CHAPTER 11-55, APPENDIX C). REFER TO THE "NOTES ON CONTROLS FOR LAND DISTURBANCES" ON THIS SHEET.

EROSION AND SEDIMENT CONTROL REQUIREMENTS

THE CONTRACTOR SHALL HAVE THE COUNTY APPROVED GRADING PERMIT AVAILABLE FOR INSPECTION 30 DAYS BEFORE THE START OF CONSTRUCTION ACTIVITIES.

POTENTIAL POLLUTANTS

REMOVED VEGETATION AND OTHER DEBRIS WILL BE DISPOSED OF AT THE EAST HAWAII SANITARY LANDFILL. DEBRIS WILL BE TEMPORARILY STORED IN THE STOCKPILE AND STORAGE AREA AS SHOWN ON THE PLANS. THE STOCKPILE AND EQUIPMENT/VEHICLE STORAGE AREA IS PROTECTED BY STACKED GRAVEL BAG FILTERS.

NO FUEL, OIL, OR HYDRAULIC FLUID SHALL BE STORED ONSITE. FUELING OR FIELD MAINTENANCE OF EQUIPMENT SHALL BE PERFORMED WITHIN VEHICLE STORAGE AREA. THE VEHICLE STORAGE AREA IS PROTECTED WITH A GRAVEL BAG CONTAINMENT BERM. DRIP PANS WILL BE PLACED UNDER VEHICLES ONSITE WHILE NOT IN USE. IN THE EVENT OF A SPILL OR LEAK FROM EQUIPMENT, THE FLOW OF FUEL WILL BE STOPPED AND ALL SOURCES OF IGNITION WILL BE REMOVED. THE SPILL WILL BE CONTAINED BY PLACING SAND BAGS AROUND THE SPILL AREA. THE CONTAMINATED EARTH WILL BE PLACED IN CONTAINERS. IN THE CASE OF PONDING FUEL, A HAZARDOUS MATERIALS VACUUM TRUCK WILL REMOVE THE FUEL.

DISTURBED AREAS WILL BE PROTECTED WITH BIOSOCKS, SEDIMENT WADDLES, SILT FENCE, AND GRAVEL BAG FILTERS. ALL DISTURBED AREAS THAT ARE NOT SCHEDULED TO BE PAVED, LANDSCAPED, OR COVERED BY A STRUCTURE OR GRAVEL WILL HAVE HYDROMULCH OR GRASS SEED APPLIED TO STABILIZE THE SOIL.

PRODUCT SPECIFICATIONS FOR BMPS

FILTER FABRIC SHALL BE: 8.0 OZ./SQ. YD. GEOTEXTILE

GRAVEL FILTER SHALL BE: 3/4" FOR GRAVEL FILTER BAGS

CONSTRUCTION SCHEDULE

CONTRACTOR SELECTION DATE: TBD
CONSTRUCTION WILL BEGIN: TBD
CONSTRUCTION WILL END: TBD

BMPS WILL BE IMPLEMENTED FROM THE FIRST DAY OF CONSTRUCTION AND WILL BE REMOVED WHEN ALL CIVIL WORK ITEMS ARE COMPLETE AND VEGETATION COVER IS REESTABLISHED.

ALL MAJOR CONSTRUCTION ACTIVITIES WILL PROCEED IN A LOGICAL SEQUENCE. MAJOR CONSTRUCTION ACTIVITIES WILL BE CONCURRENT WHEN APPROPRIATE.

CONSTRUCTION TIMETABLE

EARTHWORKS	4 WEEKS
AC PAV'T	2 WEEKS

THE FOLLOWING BMPS WILL BE IMPLEMENTED THE FIRST DAY OF CONSTRUCTION
SILT FENCE OR BIOSOCK
STABILIZED CONSTRUCTION ENTRANCE
VEHICLE/EQUIPMENT STORAGE AREA
GRAVEL BAG FILTERS OR BIOSOCK
THE FOLLOWING BMP WILL BE IMPLEMENTED AS SLOPES ARE GRADED THROUGHOUT CONSTRUCTION
SEDIMENT WADDLES OR BIOSOCK
HYDRO-SEEDING

NOTES ON CONTROLS FOR LAND DISTURBANCES

HAR CHAPTER 11-55 APPENDIX C REQUIREMENTS

THE FOLLOWING SPECIAL CONDITIONS APPLY TO ALL LAND DISTURBANCE WORK CONDUCTED UNDER THIS GENERAL PERMIT:

(A) CONSTRUCTION MANAGEMENT TECHNIQUES

(1) CLEARING AND GRUBBING SHALL BE HELD TO THE MINIMUM NECESSARY FOR GRADING AND EQUIPMENT OPERATION.

(2) CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF THE CLEARED SURFACE AREA.

(3) CONSTRUCTION SHALL BE STAGED OR PHASED FOR LARGE PROJECTS. AREAS OF ONE PHASE SHALL BE STABILIZED BEFORE ANOTHER PHASE IS INITIATED. STABILIZATION SHALL BE ACCOMPLISHED BY TEMPORARILY OR PERMANENTLY PROTECTING THE DISTURBED SOIL SURFACE FROM RAINFALL IMPACTS AND RUNOFF.

(4) EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL BEFORE EARTH MOVING OPERATIONS BEGIN. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

(5) ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY, FOR EXAMPLE, WEEKLY IN DRY PERIODS AND WITHIN 24 HOURS AFTER ANY RAINFALL OF 0.5 INCHES OR GREATER WITHIN A 24-HOUR PERIOD. DURING PROLONGED RAINFALL, DAILY CHECKING IS NECESSARY. THE PERMITTEE SHALL MAINTAIN RECORDS OF CHECKS AND REPAIRS.

(6) THE PERMITTEE SHALL MAINTAIN RECORDS OF THE DURATION AND ESTIMATED VOLUME OF STORM WATER DISCHARGE(S).

(7) A SPECIFIC INDIVIDUAL SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS ON EACH PROJECT SITE.

(B) VEGETATION CONTROLS

(1) PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN TWENTY CALENDAR DAYS PRIOR TO LAND DISTURBANCE.

(2) TEMPORARY SOIL STABILIZATION WITH APPROPRIATE VEGETATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY CALENDAR DAYS.

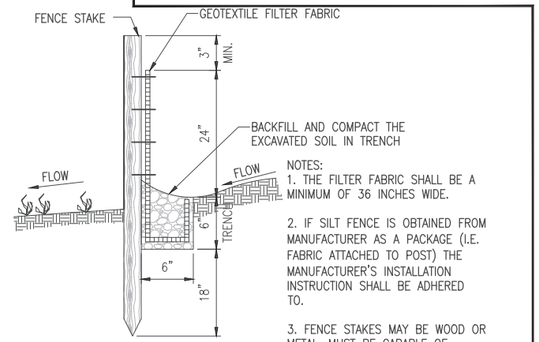
(3) PERMANENT SOIL STABILIZATION WITH PERENNIAL VEGETATION OR PAVEMENT SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING. IRRIGATION AND MAINTENANCE OF THE PERENNIAL VEGETATION SHALL BE PROVIDED FOR UNTIL THE VEGETATION TAKES ROOT.

(C) STRUCTURAL CONTROLS

(1) STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES, AS PRACTICAL.

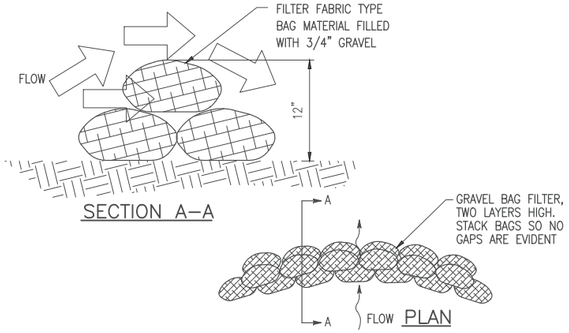
(2) EROSION CONTROL MEASURES SHALL BE DESIGNED ACCORDING TO THE SIZE OF DISTURBED OR DRAINAGE AREAS TO DETAIN RUNOFF AND TRAP SEDIMENT.

(3) WATER MUST BE DISCHARGED IN A MANNER THAT THE DISCHARGE SHALL NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE BASIC WATER QUALITY CRITERIA AS SPECIFIED IN SECTION 11-54-04.

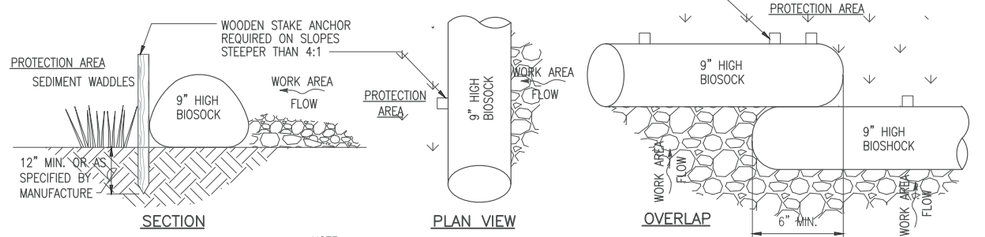


NOTES:
1. THE FILTER FABRIC SHALL BE A MINIMUM OF 36 INCHES WIDE.
2. IF SILT FENCE IS OBTAINED FROM MANUFACTURER AS A PACKAGE (I.E. FABRIC ATTACHED TO POST) THE MANUFACTURER'S INSTALLATION INSTRUCTION SHALL BE ADHERED TO.
3. FENCE STAKES MAY BE WOOD OR METAL, MUST BE CAPABLE OF SUPPORTING ANTICIPATED LOADS.

1 SILT FENCE DETAIL
SCALE: NOT TO SCALE



3 GRAVEL BAG FILTER
SCALE: NOT TO SCALE



*WOOD ANCHOR STAKES SHALL HAVE A NOMINAL CLASSIFICATION OF 3/4" BY 3/4" AND MINIMUM LENGTH OR 24 INCHES. DO NOT USE REBAR OR OTHER METAL RODS

NOTE
PRODUCT SHOWN IS A PRODUCT OF HAWAII BIOSOCKS. PRODUCT MAY BE A PRODUCT OF HAWAII BIOSOCKS OR APPROVED EQUAL

WOODEN STAKE ANCHOR SPACING

SLOPE GRADIENT	ANCHOR SPACING
<4:1	NOT REQUIRED
4:1 TO 3:1	10' ON CENTER
>3:1 TO 2:1	5' TO 10' ON CENTER
>2:1	5' ON CENTER

2 TYPICAL BIOSOCK INSTALLATION
SCALE: NOT TO SCALE

revision number	description
	100% DESIGN

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 9361-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

architect

consultant

UNIVERSITY OF HAWAII
STATE OF HAWAIII

project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
SITE SPECIFIC CONSTRUCTION BMP NOTES AND DETAILS

phase:		EPI project no. 12027-23-01	sheet no. C-103
designed by: RDC	checked by: CR	UH project no. 0010391-01-A	
drawn by: RDC	approved by: YWF	date 05/22/2024	
drawing scale: AS NOTED			

DATE PRINTED: Wednesday, May 22, 2024

SITE SPECIFIC CONSTRUCTION BMP CONTROL MEASURES

CONSTRUCTION ACTIVITIES

SITE IMPROVEMENT FOR THE CONSTRUCTION OF DRIVEWAY, INFRASTRUCTURE TO SUPPORT THE PROPOSED IMPROVEMENTS INCLUDES AC PAVING, SITE GRADING, CONCRETING, AND UNDERGROUND UTILITIES.

ALL CONSTRUCTION ACTIVITY WILL INCORPORATE THESE BMPS WITHOUT MODIFICATION. CONSTRUCTION SITE MANAGER WILL CONDUCT A SITE INSPECTION DAILY FOR ANY POTENTIAL POLLUTION SOURCES. ALL EQUIPMENT STORED ONSITE SHALL BE IN GOOD WORKING ORDER WITH NO FUEL, OIL, TRANSMISSION FLUID, OR HYDRAULIC LEAKS. ANY EQUIPMENT FOUND TO BE FAULTY SHALL BE REPAIRED IMMEDIATELY WITH NECESSARY BMP PRECAUTIONS TAKEN TO PREVENT AND CONTAIN STORM WATER CONTAMINATION. EQUIPMENT WHICH CANNOT BE REPAIRED WITHIN THE SAME WORKING DAY, SHALL BE REMOVED FROM THE SITE TO AN APPROPRIATE REPAIR FACILITY.

CONSTRUCTION EQUIPMENT INCLUDES: DOZER, EXCAVATOR, LOADER, DUMP TRUCKS, DRUM ROLLER/COMPACTOR, ETC.

QUALITY OF DISCHARGE

THE EXISTING SOIL IS ORANGISH BROWN SILTY SAND, MEDIAL FINE SANDY LOAM, THE SITE HAS AN EXISTING IMPROVEMENTS THAT HAS HIGH VEGETAL COVER. NO STORM WATER MANAGEMENT FACILITIES EXIST ON THE SITE. DISCHARGE DURING CONSTRUCTION WILL BE CONTROLLED BY, SEDIMENT WADDLES, SILT FENCE, BIOSOCKS, AND GRAVEL BAG FILTERS. ALL DISTURBED AREAS THAT ARE NOT SCHEDULED TO BE PAVED, LANDSCAPED, OR GRAVEL WILL HAVE HYDROMULCH OR GRASS SEED APPLIED TO STABILIZE THE SOIL.

CONTROL FOR LAND DISTURBANCES

THE GENERAL CONTRACTOR SHALL COMPLY WITH THE SPECIAL CONDITIONS FOR LAND DISTURBANCES (FROM HAR, CHAPTER 11-55, APPENDIX C). REFER TO THE "NOTES ON CONTROLS FOR LAND DISTURBANCES" ON THIS SHEET.

EROSION AND SEDIMENT CONTROL REQUIREMENTS

THE CONTRACTOR SHALL HAVE THE COUNTY APPROVED GRADING PERMIT AVAILABLE FOR INSPECTION 30 DAYS BEFORE THE START OF CONSTRUCTION ACTIVITIES.

POTENTIAL POLLUTANTS

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GRAVEL FILTER SHALL BE: 3/4" FOR GRAVEL FILTER BAGS

CONSTRUCTION SCHEDULE

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CONSTRUCTION WILL BEGIN:	TBD
CONSTRUCTION WILL END:	TBD

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CONSTRUCTION TIMETABLE

SITE GRADING	2 WEEKS
CONCRETING	1 WEEK

THE FOLLOWING BMPS WILL BE IMPLEMENTED THE FIRST DAY OF CONSTRUCTION
SILT FENCE OR BIOSOCK
STABILIZED CONSTRUCTION ENTRANCE
VEHICLE/EQUIPMENT WASH W/ SEDIMENT BASIN W/ IMPERMEABLE LINER
VEHICLE/EQUIPMENT STORAGE AREA
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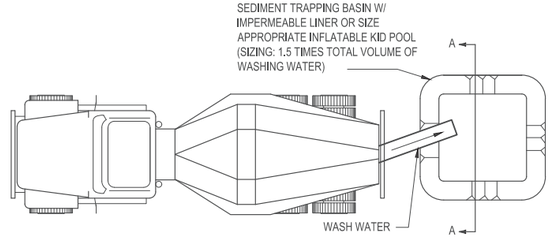
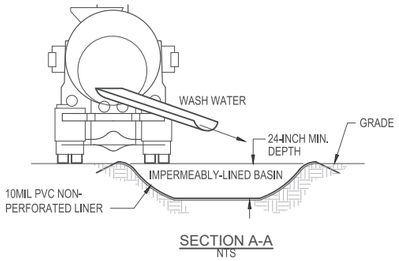


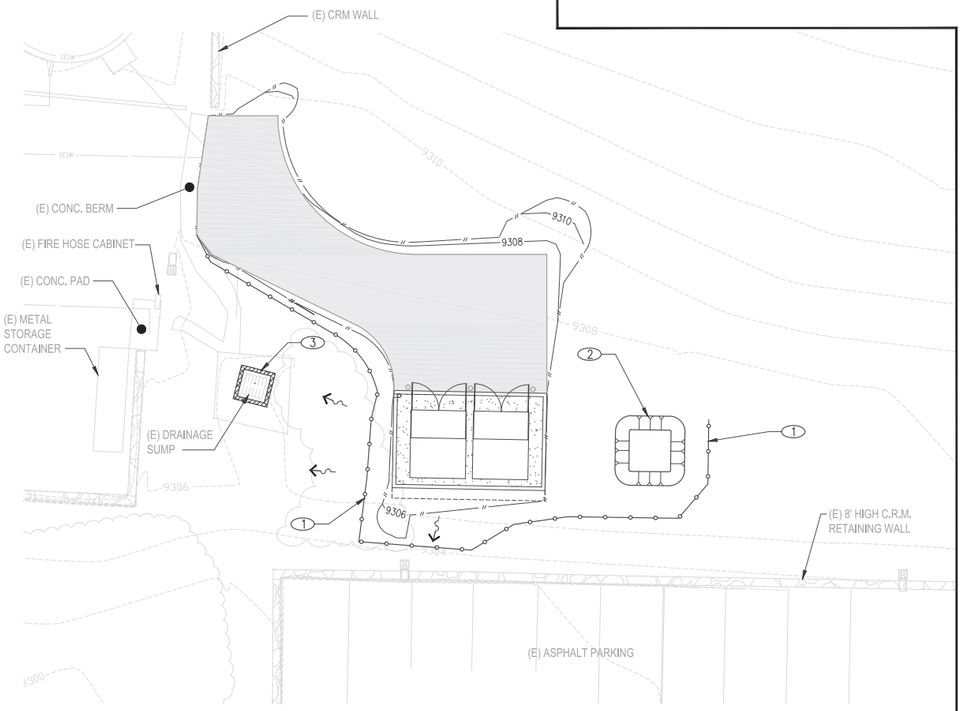
PLAN
NTS



SECTION A-A
NTS

1 CONCRETE TRUCK DRUM/CHUTE WASH WATER SEDIMENT BASIN

SCALE: NOT TO SCALE



BMP CONSTRUCTION NOTES

(ORDER OF PRECEDENCE FOR INSTALLATION)

1. CONSTRUCT SILT FENCE OR BIOSOCK PER DET. — 2/C-104, 3/C-104
2. CONSTRUCT 10'L X 10'W X 2'D CONSTRUCTION EQUIPMENT WASH SEDIMENT BASIN W/ IMPERMEABLE LINER — 1/C-104
3. PLACE BIOSOCK ON AROUND DRAINAGE SUMP, PER DETAIL — 2/C-104

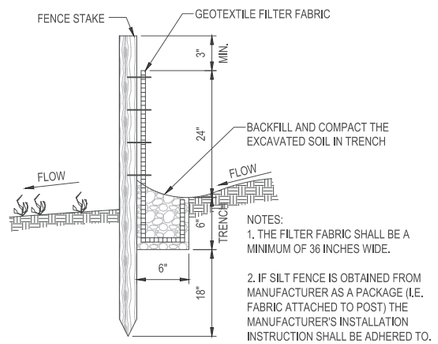
LEGEND

- NEW CONCRETE
- NEW AC PAVEMENT
- SILT FENCE/BIOSOCK
- RUNOFF FLOW DIRECTION
- SEDIMENT BASIN W/ IMPERMEABLE LINER

A SSCBMP PLAN

SCALE: 1" = 10'

0 10' 20'



NOTES:
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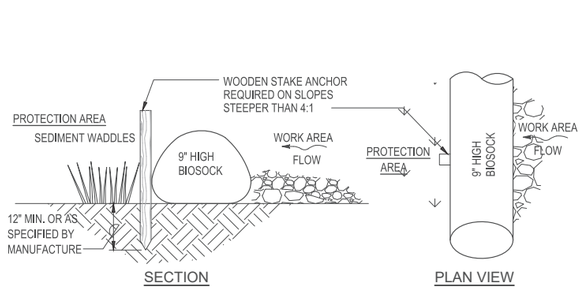
3 SILT FENCE DETAIL

SCALE: NOT TO SCALE



SECTION

PLAN VIEW

*WOOD ANCHOR STAKES SHALL HAVE A NOMINAL CLASSIFICATION OF 3/4" BY 3/4" AND MINIMUM LENGTH OR 24 INCHES. DO NOT USE REBAR OR OTHER METAL RODS

NOTE
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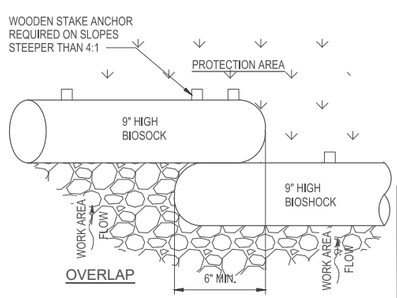


OVERLAP

WOODEN STAKE ANCHOR SPACING

SLOPE GRADIENT	ANCHOR SPACING
<4:1	NOT REQUIRED
4:1 TO 3:1	10' ON CENTER
>3:1 TO 2:1	5' TO 10' ON CENTER
>2:1	5' ON CENTER

2 TYPICAL BIOSOCK INSTALLATION

SCALE: NOT TO SCALE

revision number	description
	100% DESIGN

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 9361-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

architect

consultant

ENGINEERING PARTNERS

UNIVERSITY OF HAWAII
STATE OF HAWAIII

project:
HALE POHAKU FUEL STORAGE -2028 COMPLIANCE UPGRADE - REPLACEMENT
TMK: (3) 4-4-015:012
UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
SSCBMP PLAN, NOTES AND DETAILS

phase:		EPI project no. 12027-23-01	sheet no. C-104
designed by: RDC	checked by: CR	UH project no. 0010391-01-B	
drawn by: RDC	approved by: YWF	date 12/17/2024	
drawing scale: AS NOTED			

DATE PRINTED: Wednesday, May 22, 2024

Appendix B. Consultation and Comments

Agencies, citizen groups, and individuals provided comments as part of the early consultation provisions of HAR §11-200-9(a)(1), HAR §11-200-9(b)(1), or HAR §11-200-15, and statutorily prescribed public review periods.

Appendix B1 (Agency Consultation) contains correspondence and comments in response to early consultation from federal, state, and county agencies.

Appendix B2 (Community Consultation) contains correspondence and comments in response to request for information from community members for the Ka Paʻakai Analysis.

Appendix B3 (Draft EA Comments and Responses) comments received during the Draft EA public review period, along with responses.

Appendix B1. Agency Consultation

Contains correspondence and comments in response to early consultation from federal, state, and county agencies. The 3-page Project Description was included in initial correspondence to each agency.

Federal
U.S. Fish and Wildlife Service

U.S. Geological Survey Pacific Islands Ecosystems Research Center

State
Hawai‘i Department of Health

Hawai‘i Department of Hawaiian Homelands

Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife

Hawai‘i Department of Land and Natural Resources, Land Division

Hawai‘i Department of Land and Natural Resources, Office of Conservation and Coastal Lands

Hawai‘i Department of Land and Natural Resources, State Historic Preservation Division

Office of Hawaiian Affairs

Office of Planning and Sustainable Development

County
County of Hawai‘i Planning Department

County of Hawai‘i Fire Administration

Upgrading Halepōhaku Fuel Storage System

The Center for Maunakea Stewardship (CMS) proposes to decommission three single-wall fiberglass underground fuel storage tanks (USTs) within the maintenance facility area at Halepōhaku on Maunakea and replace them with two aboveground storage tanks (ASTs). The USTs would be removed in accordance with the 2028 regulatory deadline pursuant to Hawai'i Administrative Rules (HAR) Chapter 11-280.1-21, "Upgrading UST Systems". The rule stipulates that "Not later than July 15, 2028, tanks with piping installed before August 9, 2013 must be provided with secondary containment that meets the requirements of HAR Section 11-280.1-24." Additionally, "Tanks not upgraded by the deadline will be required to permanently close". The USTs were originally approved under Conservation District Use Permit (CDUP) 1430, "Subdivision and Construction of the Hale Pōhaku Mid-Level Facilities" at the Board of Land and Natural Resources meeting on April 23, 1982. The three tanks (a 12,000-gallon diesel tank, a 4,000-gallon gasoline tank, and a 2,000-gallon gasoline tank) were installed between 1982–1983. Since its installation in 1998 the Veeder-Root TLS-350 Leak Detection System, which continuously monitors for leaks and undergoes annual inspections and certifications, has never detected a leak. The two new ASTs each have a capacity of approximately 3,000 gallons, which will result in an overall decrease of fuel storage capacity of 12,000 gallons at Halepōhaku.

Diesel is used to fuel heavy equipment used for road maintenance and snow removal as well as one of the two boilers that heats buildings at Halepōhaku. There is one diesel boiler and one propane boiler. Diesel use averages 250 to 500 gallons per month and is highest during months with heavy snow or during propane shortages. The diesel boiler may eventually be replaced by a propane boiler, but diesel will still be required for heavy equipment. The minimum delivery load for diesel is 2,500 gallons. Gasoline is less critical than diesel, however the tanks provide fueling capability for on-mountain fleets for CMS, Maunakea Shared Services, and Maunakea Observatories including ranger vehicles, snow removal equipment, and observatory vehicles. Gasoline use averages 2,000 to 2,500 gallons per month. The minimum delivery load for gasoline is 2,500 gallons.

The decommissioning involves removal of all three tanks, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines. Buried lines for the diesel tank run from the USTs to the dispensing pump, to the old generator room, and to the boiler room in the common building at Halepōhaku. Buried lines for the two gasoline tanks run from the USTs to the two gasoline dispensing pumps. Removal of the buried lines requires trenching (width of two feet) of approximately 240 linear feet of asphalt concrete and approximately 225 linear feet of previously disturbed soil. Lines will be disconnected and capped at building terminations. Removal of the dispensing pumps concrete pad requires disturbing 65 sq ft (13' x 5'). Removal of the USTs requires digging out approximately 385 sq ft (35' x 11') for the diesel tank and 600 sq ft (30' x 20') for the two gasoline tanks combined. Excavation depths vary across the project site. Excavated material will be temporarily stockpiled. Voids created by equipment removal will be backfilled in layers, utilizing on-site excavated material, drain rock from both on-site and off-site sources, and cinder from on-site or pre-existing Maunakea stockpiles. After USTs and pipelines are removed, the soil and cinder lining will be checked for hydrocarbons. This check will involve visual inspection for discoloration and air monitoring using a hydrocarbon probe. If signs of hydrocarbons are found, soil samples will be sent for laboratory

analysis. Confirmed hydrocarbon contamination will result in the removal of contaminated fill, following an approved remediation protocol.

Since fuel will still be required at the Halepōhaku mid-level facilities once the USTs are removed, two Transtank Pro P12[1] (or similar) ASTs with a safe fill capacity of 3,068 gallons will be installed for fuel storage. The tank size was selected based on the minimum order amount required for fuel delivery. These ASTs are double walled, providing secondary containment in the event of any leaks as required by HAR 11-280.1-24. They have an access manway that allows for inspection and maintenance of the inner tank. The ASTs measure 118" x 96" x 114" and have fully integrated dispensing pumps. One will be used for diesel and one for gasoline. The tanks will sit on a single concrete slab with approximate dimensions of 14' x 23' (322 sq ft) and an 8-inch-high spill containment berm. The proposed location for the new ASTs is on previously disturbed ground that is free of vegetation and is already graded and compacted. The proposed location has existing electrical nearby and is not visible from the Maunakea Access Road.

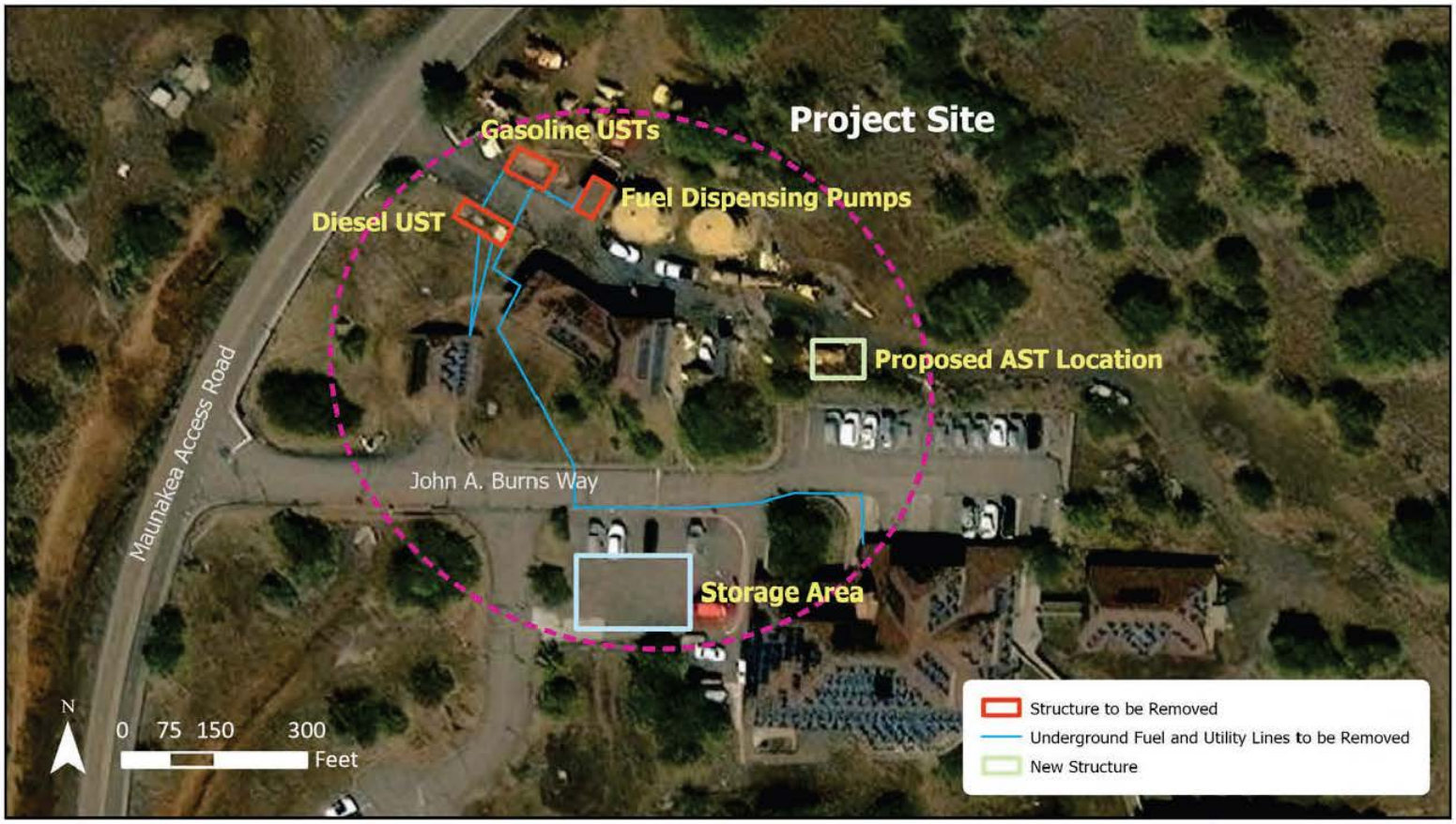
The Department of Land and Natural Resources has advised CMS to conduct an Environmental Assessment pursuant to Hawai'i Revised Statutes Chapter 343, in addition to obtaining the required CDUP for the removal of the USTs and ancillary infrastructure and the installation of the ASTs. An Archaeological Monitoring Plan will be developed for this project in accordance with the Maunakea Comprehensive Management Plan and Hawai'i Revised Statutes Chapter 6E.

[1] https://western-global.com/us/products/transtank-pro/; Brim fill capacity: 3,223 gallons, Safe fill capacity: 3,068 gallons.

Upgrading Halepōhaku Fuel Storage System

TMK (3) 4-4-15:12

Project proposed by:
Maunakea Shared Services in coordination with
Center for Maunakea Stewardship



SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 24, 2025

Chelsie Javar-Salas
Fish and Wildlife Administrator
U.S. Fish and Wildlife Service
Pacific Islands Field and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850
Via email: pifwo_admin@fws.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*

Dear Ms. Javar-Salas,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

The subalpine ecosystem at Halepōhaku features a vegetative community comprised of a mixture of abundant non-native grasses, native māmane (*Sophora chrysophylla*), and xerophytic scrub. Of native plant species, the most abundant are māmane and native grasses. There are no federally listed threatened or endangered plant species within the Halepōhaku parcel, although planted 'āhinahina (*Argyroxiphium sandwicense* subsp. *sandwicense*) are found within the silversword enclosure in the adjacent Mauna Kea Forest Reserve. Although māmane trees are not federally listed as threatened or endangered, they are a critical food source of federally and state listed birds including the endangered palila. Māmane trees are scattered throughout the Halepōhaku parcel, with only one large māmane located within the project site. While no removal of māmane trees is anticipated, some pruning may be required for site access and placement of the new storage tanks. Should the project require removal or pruning of any māmane trees, new māmane seedlings will be planted on at least a one-to-one basis for any tree that is disturbed.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*), which is federally and state listed as endangered, has not been recorded within the Halepōhaku parcel but is known to inhabit māmane woodlands on Maunakea. While no removal of māmane trees is anticipated, some pruning may be required. Trees will be checked for the presence of bats prior to any pruning. Should a bat be found, the tree would not be disturbed until the bat leaves of its own accord. Because the project site is not considered regular habitat or roosting area for the Hawaiian hoary bat, no adverse impacts are anticipated.

Nine native bird species occur or could potentially occur at Halepōhaku, four of which are federally listed as endangered or threatened (Table 1). Of these species, only the Hawaiian honeycreepers–palila, Hawai'i 'amakihi, 'apapane, and 'i'iwi, have been sighted at Halepōhaku in recent years. Although two native bird species, the Hawaiian owl and the Hawaiian hawk, could utilize habitat at Halepōhaku for foraging, they have never been recorded there and tend to occur downslope. These two wide-ranging species are

unlikely to breed in the project area due to the high elevation. Hawaiian petrels (*Pterodroma sandwichensis*) are occasionally found in subalpine and alpine habitats on Maunakea. They have not been observed near Halepōhaku in recent times, although potentially fly over the project area. Although nēnē have never been recorded at Halepōhaku, they do occur at lower elevations on Maunakea and could potentially visit the project site.

The Hawai‘i ‘amakihi, the most commonly observed native bird species at Halepōhaku, forages on a variety of food sources, while the other three honeycreeper species-palila, ‘apapane, and ‘i‘iwi–are more specialized. Palila forage on seeds from māmane trees and insects that inhabit the trees. ‘Apapane and ‘i‘iwi feed on nectar from māmane and naio (*Myoporum sandwicense*) flowers and may traverse the upper slopes of Maunakea searching for flowering māmane. Hawai‘i ‘elepaio are insectivores and are mainly found in koa-‘ōhi‘a (*Acacia koa-Metrosideros polymorpha*) forests. Palila, Hawai‘i ‘amakihi, and Hawai‘i ‘elepaio all nest in māmane trees. No impact to federally protected birds or any native birds is anticipated.

Table 1. Native Bird Species of Halepōhaku

Scientific Name	Common Name	Origin	Occurrence	Legal Status
Asio flammeus sandwichensis	pueo (Hawaiian owl)	Endemic	Potentially	Federal Species of Concern
Branta sandvicensis	nēnē	Endemic	Potentially	Federal / State Endangered
Buteo solitaries	‘io (Hawaiian hawk)	Endemic	Potentially	None
Chasiempis sandwichensis	Hawai‘i ‘elepaio	Endemic	Potentially	Federal Species of Concern
Chlorodrepanis virens	Hawai‘i ‘amakihi	Endemic	Known	Federal Species of Concern
Himatione sanquinea	‘apapane	Endemic	Known intermittent	Federal Species of Concern
Loxioides bailleui	palila	Endemic	Known intermittent	Federal / State Endangered
Pterodroma sandwichensis	‘ua‘u	Endemic	Unlikely	Federal / State Endangered
Vestiaria coccinea	‘i‘iwi	Endemic	Known intermittent	Federal Threatened

The purpose of this correspondence is to solicit any input or concerns of the U.S. Fish and Wildlife Service regarding this project for consideration in the EA. We look forward to your comments within 30 days of receipt of this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

Outlook

comments for EA Upgrading Halepōhaku Fuel Storage System

From Cole, Colleen <colleen_cole@fws.gov>
Date Thu 6/5/2025 5:32 PM
To Michelle Roberts <mroberts@srgii.com>
Cc Javar-Salas, Chelsie <chelsie_javar-salas@fws.gov>; PIFWO_Admin, FW1 <pifwo_admin@fws.gov>

3 attachments (2 MB)

Halepohaku_Animal Avoidance and Minimization Measures - FINAL May 2023.docx; Hawai'i_Invasive Species Biosecurity Protocols_w_notes_FINAL_Feb 2022.docx; IPaC Info Letter_Species List Instructions_PIFWO_20Apr2022_Final.pdf;

Aloha Michelle Roberts,

We received your request for early consultation for the draft environmental assessment for the proposed project "Upgrading Halepōhaku Fuel Storage System" on Maunakea on April 24, 2025.

First, if you have not done so already, we recommend you obtain an official species list using the Information for Planning and Consultation (IPaC) online tool by accessing this link: https://ipac.ecosphere.fws.gov/.

Please see the attached pdf with detailed directions on how you obtain an official species list in IPaC. You will receive the US Fish and Wildlife Service (Service) recommended avoidance and minimization measures (AMMs) for the listed species potentially impacted by the project activities. We recommend you incorporate those AMMs into the project description. I have attached a copy of AMMs for the commonly occurring species.

We appreciate your assessment of which listed species may be in the proposed project area. We would like to make the additional recommendations:

- Instead of relying on visual searches for roosting ʻōpeʻapeʻa or Hawaiian hoary bats, we recommend you follow the Service AMMs and do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15)
- Please be sure to incorporate all listed Hawaiian seabirds in your project planning as it is possible that they may transit through the area at night to access nesting sites. Listed seabirds potentially in the area include the ʻuaʻu or Hawaiian petrel (*Pterodroma sandwichensis*), ʻaʻo or Newell's shearwater (*Puffinus newelli*), and the ʻakēʻakē or band-rumped storm-petrel, (*Hydrobates castro*). We recommend you incorporate AMMs for listed seabirds, including the use of lighting at the site.

- Please be sure to incorporate nēnē or Hawaiian goose (*Branta sandvicensis*) in your project planning as they are regularly observed in the area on adjacent ranchlands. Because they are found nearby and often along the road to the site, we recommend incorporating nēnē AMMs into your planning effort.

-
  - We recommend you include biosecurity protocols in your project activities. We have attached the Service recommended protocols.
  - We appreciate the efforts to plant māmane seedlings if any existing māmane trees need to be removed or trimmed. Please be sure to source seedlings from a nursery that follows best management practices to minimize accidental pest and disease introduction to the site.

Please let me know if you have any questions regarding these comments. We appreciate the opportunity to provide comments on this notice.

Mahalo,

Colleen Cole
Biologist - Maui Nui & Hawai'i Island Team
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service
154 Waiānuenue Avenue Suite 103
PO Box 10225
Hilo, Hawai'i 96720-2452

Desk Phone: (808) 460-7697
Cell Phone: (808) 859-1002
Email: colleen_cole@fws.gov

FINAL Avoidance and Minimization Measures (AMMs)
Final revised May 2023

ESA Listed Species

Endangered ōpeʻapeʻa (Hawaiian hoary bat, *Lasiurus cinereus semotus*): The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

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

Endangered ʻuaʻu (Hawaiian petrel, *Pterodroma sandwichensis*), Threatened ʻaʻo, (Newell's shearwater, *Puffinus newelli*), and Endangered Hawaiʻi Distinct Population Segment of the ʻakēʻakē (band-rumped storm-petrel, *Hydrobates castro*):
Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following measures into your project description:

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

Threatened nēnē (Hawaiian goose, *Branta (Nesochen) sandvicensis*): Nēnē are found on the islands of Hawaiʻi, Maui, Molokaʻi, and Kauaʻi. They are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

To avoid and minimize potential project impacts to nēnē we recommend you incorporate the following measures into your project description:

- Do not approach, feed, or disturb nēnē.
- If nēnē are observed loafing or foraging within the project area during the breeding season (September through April), have a biologist familiar with nēnē nesting behavior survey for nests in and around the project area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the Service for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
- In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Endangered Hawaiian forest birds

Hawaiian forest birds' current ranges are predominately restricted to montane forests above 3,500 feet in elevation due to habitat loss and threats at lower elevations. Hawaiian forest bird habitat has been lost due to development, agriculture, grazing, wildfire, and spread of invasive habitat-altering species. Forest birds are also affected by mosquito-borne diseases. Mosquitoes are not native to Hawai‘i; their occurrence increases in areas where ungulate presence results in small pools of standing water. Actions such as road construction and development increase human access and result in increased wildfire and invasive species threats. Grazing results in reductions in woody vegetation and increased grass cover, which reduces forest habitat quality and results in increased wildfire risk on the landscape.

Avoid conducting activities within forest bird habitat that:

- Promote the spread or survival of invasive species.
- Increase mosquito populations or stagnant water habitat.
- Increase wildfire threat to montane forest habitats.
- Remove tree cover during the peak breeding season between January 1 and June 30.

PIFWO Invasive Species Biosecurity Protocols

The following biosecurity protocol is recommended to be incorporated into planning for your project to avoid or minimize transportation of invasive species with potential to impact to fish, wildlife, and their habitat. Cleaning, treatment, and/or inspection activities are the responsibility of the equipment or vehicle owner and operator. However, it is ultimately the responsibility of the action agency to ensure that all project materials, vehicles, machinery, equipment, and personnel are free of invasive species before entry into a project site. Please refer to the resources listed below for current removal/treatment recommendations that may be relevant to your project.

1. Cleaning and treatment:
   Project applicants should assume that all project materials (i.e., construction materials, or aggregate such as dirt, sand, gravel, etc.), vehicles, machinery, and equipment contain dirt and mud, debris, plant seeds, and other invasive species, and therefore require thorough cleaning. Treatment for specific pests, for example, trapping and poison baiting for rodents, or baiting and fumigation for insects, should be considered when applicable. For effective cleaning we offer the following recommendations prior to entry into a project site:
   a. Project materials, vehicles, machinery, and equipment must be pressure washed thoroughly (preferably with hot water) in a designated cleaning area. Project materials, vehicles, machinery, and equipment should be visibly free of mud/dirt (excluding aggregate), seeds, plant debris, insects, spiders, frogs (including frog eggs), other vertebrate species (e.g., rodents, mongoose, feral cats, reptiles, etc.), and rubbish. Areas of particular concern include bumpers, grills, hood compartments, wheel wells, undercarriage, cabs, and truck beds. Truck beds with accumulated material are prime sites for hitchhiking invasive species.
   b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food, which can attract pests (i.e., rodents and insects). The interiors of vehicles and the cabs of machinery should be vacuumed clean particularly for any plant material or seeds.

2. Inspection:
   a. Following cleaning and/or treatment, project materials, vehicles, machinery, and equipment, must be visually inspected by its user, and be free of mud/dirt (excluding aggregate), debris, and invasive species prior to entry into a project site. For example, careful visual inspection of a vehicle's tires and undercarriage is recommended for any remaining mud that could contain invasive plant seeds.
   b. Any project materials, vehicles, machinery, or equipment found to contain invasive species (e.g., plant seeds, invertebrates, rodents, mongoose, cats, reptiles, etc.) must not enter the project site until those invasive species are properly removed/treated.

3. For all project site personnel:
   a. Prior to entry into the project site, visually inspect and clean your clothes, boots or other footwear, backpack, radio harness, tools and other personal gear and

equipment for insects, seeds, soil, plant parts, or other debris. We recommend the use of a cleaning brush with sturdy bristles. Seeds found on clothing, footwear, backpacks, etc., should be placed in a secure bag or similar container and discarded in the trash rather than being dropped to ground at the project site or elsewhere.

4. Additional considerations:
    a. Consider implementing a Hazard Analysis and Critical Control Point (HACCP) plan (https://www.fws.gov/policy/A1750fw1.html) to improve project planning around reducing the risk of introducing or spreading invasive species.
    b. When applicable, use pest-free or low-risk sources of plants, mulch, wood, animal feed or other materials to be transported to a project site.
    c. For projects involving plants from nurseries (e.g., outplanting activities, etc.), all plants should be inspected, and if necessary, appropriately cleaned or treated for invasive species prior to being transported to the project site.
    d. Avoid unnecessary exposure to invasive species at a particular site (to the extent practical) to reduce contamination and spread. For example, if your project involves people or equipment moving between multiple locations, plan and organize timelines so that work is completed in native habitat prior to working in a disturbed location to reduce the likelihood of introducing a pest into the native habitat.
    e. Maintain good communication about invasive species risks between project managers and personnel working on the project site (e.g., conduct briefings and training about invasive species). Ensure prevention measures are communicated to the entire project team. Also consider adding language on biosecurity into contracts or permitting mechanisms to provide clarity to all involved in the project. Report any species of concern or possible introduction of invasive species to appropriate land managers.

For current removal/treatment recommendations please refer to the following:
Hawaiian Islands:

- Hawai‘i Island – https://www.biisc.org/
- Maui – https://mauiinvasive.org/
- Moloka‘i - https://www.molokaiisc.org/
- Lāna‘i – https://pulamalanai.com/
- O‘ahu – https://www.oahuisc.org/
- Kaua‘i – https://www.kauaiisc.org/

Species-Specific Biosecurity Protocols

Rapid ‘Ōhi‘a Death (ROD)

Rapid ʻŌhiʻa Death (ROD) is caused by a fungal pathogen (*Ceratocystis* spp.) that attacks and kills ʻōhiʻa trees (*Metrosideros polymorpha*). ʻŌhiʻa is endemic to the Hawaiian Islands and is the most abundant native tree species, comprising approximately 80 percent of Hawaiʻi's remaining native forests.

For more information about ROD including its current distribution, ROD science updates, and the latest on ROD protocol, please visit www.rapidohiadeath.org.

To reduce the risk of spreading ROD, the following best management practices and decontamination protocol are recommended:

Best Management Practices for ROD

1. Never transport any part of an ʻōhiʻa tree between different areas of an island or to a different island.

2. Do not use equipment from ROD infected islands on another island unless it is very specialized equipment and follows the decontamination protocol described below.

3. Avoid wounding ʻōhiʻa trees and roots with mowers, chainsaws, weed eaters, and other tools. If an ʻōhiʻa receives a minor injury like a small broken branch, then give the injury a clean, pruning-type cut (close to the main part of the truck or branch) to promote healing, and then spray the entire wounded area with a pruning seal.

4. Always report suspect ROD ʻōhiʻa trees observed within you project area. ROD is a wilt disease that cuts off the supply of water and nutrients to the tree. The primary symptom to look for is an entire canopy or a large branch with dying leaves or red discolored leaves. Please record the GPS coordinates and location and take a picture of the tree if possible. Please report suspected ROD ʻōhiʻa trees to the following agencies:
    a. Island of Hawaiʻi – BIISC: 808-969-8268 (ohialove@hawaii.edu)
    b. Maui – MISC: 808-573-6472 (miscpr@hawaii.edu)
    c. Molokaʻi – TNC: 808-553-5236 ext. 6585 (lbuchanan@tnc.org)
    d. Oʻahu – OISC: 808-266-7994 (oisc@hawaii.edu)
    e. Kauaʻi – KISC: 808-821-1490 (kisc@hawaii.edu)

ROD Decontamination Protocol

1. Clothes, footwear, backpacks, and other personal equipment
    a. Before leaving the project site, remove as much mud and other contaminants as possible. Use of a brush with soap and water to clean gear is preferred. Footwear, backpacks, and other gear must be sanitized by spraying with a solution of >70 percent isopropyl alcohol or a freshly mixed 10 percent bleach solution.

2. Vehicles, machinery, and other equipment
    a. Vehicles, machinery, and other equipment must be thoroughly hosed down with water (pressure washing preferred) and visibly free of mud and debris, then

sprayed with a solution of >70 percent isopropyl alcohol or a freshly mixed 10 percent bleach solution. Use of a "pump-pot" sprayer is recommended for the solution and a hot water wash is preferred. Be sure to thoroughly clean the undercarriage, truck bed, bumpers, and wheel wells.

b. If non-decontaminated personnel or items enter a vehicle, then the inside of the vehicle (i.e., floor mats, etc.) must be subsequently decontaminated by removing mud and other contaminants and sprayed with the one of the same aforementioned sanitizing solutions.

3. Cutting tools
    a. All cutting tools, including machetes, chainsaws, and loppers must be sanitized to remove visible mud and other contaminants. Tools must be sanitized using a solution of >70 percent isopropyl alcohol or a freshly mixed 10 percent bleach solution. One minute after sanitizing, one may apply an oil-based lubricant to chainsaw chains or other metallic parts to prevent corrosion as bleach is corrosive to metal.

NOTE: When using a 10 percent bleach solution, surfaces should be cleaned with a minimum contact time of 30 seconds. Bleach must be mixed daily and used within 24 hours, as once mixed it degrades. Bleach will not work to disinfect surfaces that have high levels of organic matter such as sawdust or soil. Because bleach is also corrosive to metal, a water rinse after proper sanitization is recommended to avoid corrosion.

Little Fire Ant (LFA)

The little fire ant (*Wasmannia auropunctata*), or LFA, is an invasive species with a painful sting that can inhabit many different environments. In Hawai‘i, it often infests agricultural fields and farms, damaging crops and stinging unsuspecting workers. Little fire ants are also highly disruptive to native tropical ecosystems and harmful to wildlife. Slow moving, but tiny and capable of foraging 24 hours a day with multiple queens per colony, LFA is a formidable threat to biodiversity, agriculture, and quality of life on tropical islands in the Pacific.

For more information about LFA including helpful guides and workshops for treating or detecting LFA, please visit www.littlefireants.com.

To reduce the risk of spreading LFA, the following biosecurity protocol is recommended:

Biosecurity Protocol for LFA

1. For projects involving plants from nurseries (e.g., outplanting activities, etc.), all plants should be inspected for little fire ants and other pests prior to being transported to the project site. If plants are found to be infested by ants of any species, plants should be sourced from an alternative nursery and the infested nursery should follow treatment protocols recommended by the Hawai‘i Ant Lab (https://littlefireants.com/wp-content/uploads/2020-Management-of-Pest-Ants-in-Nurseries-min.pdf).

2. All work vehicles, machinery, and equipment should follow steps 1 and 2 in the "Invasive Species Biosecurity Protocol" for (1) cleaning and treatment and (2) inspection for invasive ants prior to entering a project site.

3. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter the project site until it is properly treated (https://littlefireants.com/how-to-treat-for-little-fire-ants-for-homeowners/#recommended-bait-products) and re-tested. Infested vehicles must be treated following recommendations by the Hawai'i Ant Lab (https://littlefireants.com/resource-center/) or another ant control expert and in accordance with all State and Federal laws. Treatment is the responsibility of the equipment or vehicle owner. Ultimately however, it is the responsibility of the action agency to ensure that all project materials, vehicles, machinery, and equipment follow the appropriate protocol(s).

4. General Vehicle Ant Hygiene: Even the cleanest vehicle can pick up and spread little fire ant. Place MaxForce Complete Brand Granular Insect Bait (1.0 percent Hydramethylnon; https://labelsds.com/images/user_uploads/Maxforce%20Complete%20Label%201-5-18.pdf) into refillable tamper resistant bait stations. An example of a commercially available refillable tamper resistant bait station is the Ant Café Pro (https://www.antcafe.com/). Place a bait station (or stations) in the vehicle and note that larger vehicles, such as trucks, may require multiple stations. Monitor bait stations frequently (every week at a minimum) and replace bait as needed. If the bait station does not have a sticker to identify the contents, apply a sticker listing contents to the station.

5. Gravel, building materials, or other equipment such as portable buildings should be baited using MaxForce Complete Brand Granular Insect Bait (1.0 percent Hydramethylnon; https://labelsds.com/images/user_uploads/Maxforce%20Complete%20Label%201-5-18.pdf) or AmdroPro (0.73 percent Hydramethylnon; https://connpest.com/labels/AMDROPRO.pdf) following label guidance.

6. Storage areas that hold field tools, especially tents, tarps, and clothing should be baited using MaxForce Complete Brand Granular Insect Bait (1.0 percent Hydramethylnon; https://labelsds.com/images/user_uploads/Maxforce%20Complete%20Label%201-5-18.pdf) or AmdroPro (0.73 percent Hydramethylnon; https://connpest.com/labels/AMDROPRO.pdf) following label guidance.

7. Vehicles that have entered a project site known or thought to overlap with areas infested with LFA should subsequently be tested for LFA with baiting in accordance with protocol recommended by the Hawai'i Ant Lab (https://littlefireants.com/survey-your-home-for-lfa/).

8. If LFA are detected, please report it to 808-643-PEST (Hawai'i), 671-475-PEST (Guam), or 684-699-1575 (American Samoa). Please visit https://littlefireants.com/identification-of-little-fire-ants/ for assistance in identifying LFA.

Coconut Rhinoceros Beetle (CRB)

The coconut rhinoceros beetle (*Oryctes rhinoceros*), or CRB, is a large, horned scarab beetle native to Southeast Asia. An invasive pest where it occurs outside of its native range, the adult beetles primarily attack coconut palms by boring into the crowns to feed on developing leaves. It is also known to feed on bananas, sugarcane, pineapples, oil palms, and pandanus trees. The larval grub stage burrow into and feed upon decomposing mulch and vegetation. On most Pacific Islands it lacks natural predators, leading to severe declines and extirpations of palm species where it has become established. On Guam, researchers have recently documented a shift of CRB to the island's native and threatened cycad tree (*Cycas micronesica*) (Marler et al. 2020). In the Hawaiian Islands, CRB is a documented threat to archipelago's native *Pritchardia* palm species.

For more information about CRB including the current situation in Guam and high/low-risk areas on O'ahu, please visit http://cnas-re.uog.edu/crb/ or https://www.crbhawaii.org/.

To reduce the risk of spreading CRB, the following biosecurity protocol is recommended:

Biosecurity Protocol for CRB

1. Never transport green waste between islands and minimize the creation, storage, and transport of green waste within O'ahu, this also includes:
    a. Mulch, bark, compost
    b. Soil of any kind
    c. Potted plants of any kind

    Additional consultation is recommended if the project involves transportation of materials, soil, equipment, vehicles, etc. between islands.

2. If felling or trimming palms, contact CRB Response for a free inspection ((808) 679-5244 or email at info@crbhawaii.org)

3. Keep green waste whole until it is ready to be treated and removed.
    a. Chip green waste on site and transport it on the same day to a secure and managed green waste disposal site/facility.
    b. For chipped green waste in high-risk areas, re-chip prior to movement outside the infested area, treat with pesticide (when applicable), heat treatment (>130 degrees F), spread and dry, or store in sealed durable containers.

4. Minimize accumulations of green waste by regularly treating mulch piles or depositing it in sealed green waste bins. In low-risk areas, we also recommend thinly spreading mulch (less than 2 inches deep) and allowing it to dry (no irrigation).

5. If injured or dying coconut palm trees are observed or if CRB are detected, contact CRB Response at (808) 679-5244 or email at info@crbhawaii.org or online at https://www.crbhawaii.org/report

References Cited

Marler, T.E., Marler, F.C. Matanane, and L.I. Terry. 2020. Burrowing activity of coconut rhinoceros beetle on Guam cycads. Communicative & Integrative Biology, 13:1, 74-83. (https://www.tandfonline.com/doi/full/10.1080/19420889.2020.1774310)

Rogers, H.S., E.R. Buhle, J. Hille Ris Lambers, E.C. Fricke, R.H. Miller, and J.J. Tewksbury. 2017. Effects of an invasive predator cascade to plants via mutualism disruption. Nature Communications. 8:14557. https://www.nature.com/articles/ncomms14557/

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 24, 2025

Paul Banko, Research Wildlife Biologist
Pacific Islands Ecosystems Research Center
Kilauea Field Station
P.O. Box 44
Hawaii National Park, HI 96718
Via email: pbanko@usgs.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System* within Palila Designated Critical Habitat.

Dear Mr. Banko,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

As you know, the Halepōhaku parcel lies within federally designated critical habitat for the endangered palila (*Loxioides bailleui*), although palila have only been seen there infrequently in the past couple of decades. Māmane trees, a primary food source of the palila, are scattered throughout the Halepōhaku parcel, with only one large māmane located within the project site. While no removal of māmane trees is anticipated, some pruning may be required for site access and placement of the new storage tanks. Should the project require removal or pruning of any māmane trees, new māmane seedlings will be planted on at least a one-to-one basis for any tree that is disturbed.

As a leading expert in bird ecology and conservation biology in Hawai'i, particularly the palila, we are soliciting: 1) your opinion on implementation of the proposed action is likely to significantly adversely affect the palila population; and 2) general input or concerns regarding this project for consideration in the Environmental Assessment.

We are aware of the overall decline in palila population and that there have been few detections outside the core survey area. We understand that since 2008 annual surveys have been focused on the core use area, with transects outside the core use area surveyed every five years. Can you confirm (or update) the following regarding palila surveys and observations around Halepōhaku? Have there been any recent detections in the area (including along transect #109) worth mentioning?

> "Palila were consistently detected along transect #109 up until 1990, but since then have only been recorded on a few occasions, specifically in 1997 and 2006. While there have been incidental sightings at Halepōhaku since 2000, biologists currently consider the species' use of this area to be infrequent and tied to times when māmane pod availability is high and birds move freely around a larger range, or low within their core area and birds are expanding their foraging area to search for food."

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

We look forward to your comments within 30 days of receipt of this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc: Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 24, 2025

Roxanne Kwan, Section Supervisor
Department of Health
Solid and Hazardous Waste Branch
Underground Storage Tank Program
2827 Waimano Home Road #100
Pearl City, Hawaii 96782
Via email: Roxanne.kwan@doh.hawaii.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

Development agreements between the University of Hawai'i at Hilo (UH Hilo)/Maunakea Shared Services and individual observatories require UH Hilo to provide services or utilities, including fuel, to observatory facilities. In addition, onsite diesel and gasoline are needed for MKSS staff to fulfill a variety of duties including Ranger patrol for public safety and resource protection, road maintenance, and snow removal. Because the three existing underground storage tanks (UST) must be removed by July 2028 in accordance with Hawai'i Department of Health requirements for single-wall UST (Hawai'i Administrative Rules Chapter 11-280.1), new aboveground fuel storage and dispensing units are proposed to continue the provision of fuel.

The purpose of this correspondence is to solicit any input or concerns of the UST Program regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

JOSH GREEN, M.D.
GOVERNOR OF HAWAI'I
KE KIA'ĀINA O KA MOKU'ĀINA 'O HAWAI'I

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

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

In reply, please refer to:
File:

May 23, 2025 U0520RK

Ms. Michelle Roberts
Natural Resources Specialist
Sustainable Resources Group Intn'l, Inc.
111 Hekili Street, Suite A373
Kailua, Hawaii 96734

Dear Ms. Roberts:

SUBJECT: Upgrading Halepōhaku Fuel Storage System
Hale Pohaku, Hilo, Hawaii
Facility ID No. 9-600476

The Hawai'i Department of Health (DOH), Underground Storage Tank (UST) Section received your letter, dated April 24, 2025, requesting comments on the Halepōhaku Fuel Storage System UST removal project. The Center for Mauna Kea Stewardship proposes to permanently close a 12,000-gallon diesel UST, a 4,000-gallon gasoline UST, and a 2,000-gallon gasoline UST. All three (3) USTs are single-walled fiberglass-reinforced plastic and the workplan states that associated piping, fuel transfer pumps, dispensing pumps, and electrical lines will be excavated and removed.

DOH-UST Compliance has the following comments:

1. Clarify the facility name.

    a. The "Application for Renewal of an Underground Storage Tank Permit," owner certified on November 22, 2021, and received by the DOH on December 2, 2021, indicates the facility name as: "Mauna Kea Observatories Support Services" (Section I Location of Tanks)

    b. The "Project Description: Upgrading Halepōhaku Fuel Storage System" attached to your letter, dated April 24, 2025, indicates the facility name as "Halepōhaku Fuel Storage System."

2. "Project Description: Upgrading Halepōhaku Fuel Storage System" Page 2, second paragraph, fourth line: "These ASTs [aboveground storage tanks] are double walled, providing secondary containment in the event of any leaks as required by Hawai'i Administrative Rules (HAR) 11-280.1-24." This is incorrect. HAR Chapter 11-280.1 regulates USTs. The DOH-UST Section does not regulate ASTs. Contact the County of Hawai'i Fire Prevention Bureau for AST requirements.

3. Subchapter 7 of the HAR, *Underground Storage Tanks*, contain specific requirements for UST owners and operators when completing a permanent closure or change-in-service to their UST system(s).

4. If evidence of a confirmed UST release is discovered, owners and operators must:

    a. Immediately notify the DOH-Hazard Evaluation and Emergency Response (HEER) Office of any release of a hazardous substance in accordance with Hawai'i Revised Statutes, Section 128D-3. The DOH-HEER Office can be reached at (808) 586-4249 from Monday to Friday, 7:45 a.m. to 4:30 p.m. After business hours or during weekends and holidays, call (808) 236-2800.

    b. Notify the DOH-UST Section within 24 hours at (808) 586-4226 and immediately begin release response actions in accordance with HAR Chapter 11-280.1, Subchapter 6 *Release Response Action*. Within seven (7) days of UST release confirmation, submit a *Confirmed Release Notification* form found on our website under *Forms*: https://health.hawaii.gov/shwb/underground-storage-tanks/.

DOH-UST Release Response has the following comments:

5. If native soil is present with grain size <2 millimeters (mm), then Multi Increment (MI) soil samples are requested in accordance with MI soil sampling guidance in the DOH-HEER Office *Technical Guidance Manual* (TGM), available for download at our website under Leaking Underground Storage Tank Program: https://health.hawaii.gov/ust.

6. For UST excavations of combined UST capacity over 6,000 gallons, five (5) MI soil decision units (DUs) of the four (4) walls and floor are requested with triplicate MI soil samples requested for 10% of samples collected. We request the triplicate MI soil sample be obtained from the UST excavation floor following UST removal.

Pea gravel will be removed or moved to one half of the floor to obtain MI soil increments of native soil on the exposed floor, followed by moving the pea gravel to the other side to obtain the rest of the floor DU. Piping trenches should have 60-foot DUs. That is, 30 to 75+ soil increments collected from native soil beneath the pea gravel of piping trenches with additional DUs for longer piping trenches. Fuel dispensers need their own DU as it is a common location for UST releases.

7. For UST excavations with combined UST capacity less than 6,000 gallons, the four (4) walls and the floor may be combined into one (1) DU of 30 to 75+ increments to obtain one (1) analytical result. Please note, for either method the excavator will scrape the floor or walls from the bottom up and allow staff to obtain three (3) to five (5) soil increments from the bucket.

8. If native soil <2 mm grain size is not available in sufficient quantities for MI soil collection of a DU, then an alternative site assessment procedure is recommended for that DU: For UST excavations >12,000 gallons capacity, obtain 20 or more equally spaced trowels of pea gravel from the floor of the excavation following UST removal. This will also necessitate a sample from the excavator bucket, from which one (1) trowel of pea gravel will be obtained.

   Place the trowel of pea gravel into a ziplock bag and sample with a photoionization detector (PID) after three (3) to five (5) minutes. After recording the PID value, deposit the bag of pea gravel into a bucket of water and take a photo. If no sheen and PID <80 parts per million by volume (ppmv), it can be re-used as backfill. If greater than 80 ppmv or presence of sheen on water, then stockpile and re-sample later or transport for disposal at a permitted landfill. The UST closure report should contain a table of all PID measurements, including ambient readings, and a photo gallery of all buckets with water surface and potential sheen visible. For UST excavation of combined UST capacity less than 6,000 gallons, obtain ten (10) equally spaced trowels of pea gravel from the excavation floor instead of 20+ trowels.

9. The DOH-UST Section requests disposal manifests for rinsate, the USTs and removed equipment, and stockpiled soil transported for disposal.

The DOH-UST Section has adopted the DOH-HEER TGM and guidance for sampling and analysis of soil, groundwater, and soil vapor. Please ensure sampling and analysis are in accordance with the TGM, DOH-HEER guidance, and/or DOH-UST guidance in this letter or website. For stockpiling or transportation of excavated soil off-site or importation of clean fill, please follow the DOH-HEER *Fill Material and Stockpile Testing (October 2017)* and available for download at our website.

If you have any questions regarding permanent closure or change-in-service of a UST or UST system, please contact the Solid and Hazardous Waste Branch at (808) 586-4226 or by email at: roxanne.kwan@doh.hawaii.gov.

Sincerely,

JOANNA L. SETO, P.E., CHIEF
Environmental Management Division

c: Mr. Stewart Hunter, Mauna Kea Observatory Support Services

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

May 15, 2025

Department of Hawaiian Homelands
91-5420 Kapolei Parkway
Kapolei, HI 96707

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

Development agreements between the University of Hawai'i at Hilo (UH Hilo)/Maunakea Shared Services and individual observatories require UH Hilo to provide services or utilities, including fuel, to observatory facilities. In addition, onsite diesel and gasoline are needed for MKSS staff to fulfill a variety of duties including Ranger patrol for public safety and resource protection, road maintenance, and snow removal. Because the three existing underground storage tanks (UST) must be removed by July 2028 in accordance with Hawai'i Department of Health requirements for single-wall UST (Hawai'i Administrative Rules Chapter 11-280.1), new aboveground fuel storage and dispensing units are proposed to continue the provision of fuel.

The purpose of this correspondence is to solicit any initial input or concerns from the Department of Hawaiian Homelands regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 24, 2025

Ian Cole
Joshua Pang-Ching
Department of Land and Natural Resources
Division of Forestry and Wildlife
19 E. Kawili Street
Hilo, HI 96720
Via email: Ian.W.Cole@hawaii.gov
Joshua.M.Pang-Ching@hawaii.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

The subalpine ecosystem at Halepōhaku features a vegetative community comprised of a mixture of abundant non-native grasses, native māmane (*Sophora chrysophylla*), and xerophytic scrub. Of native plant species, the most abundant are māmane and native grasses. There are no federally listed threatened or endangered plant species within the Halepōhaku parcel, although planted 'āhinahina (*Argyroxiphium sandwicense* subsp. *sandwicense*) are found within the silversword enclosure in the adjacent Mauna Kea Forest Reserve. Although māmane trees are not federally listed as threatened or endangered, they are a critical food source of federally and state listed birds including the endangered palila. Māmane trees are scattered throughout the Halepōhaku parcel, with only one large māmane located within the project site. While no removal of māmane trees is anticipated, some pruning may be required for site access and placement of the new storage tanks. Should the project require removal or pruning of any māmane trees, new māmane seedlings will be planted on at least a one-to-one basis for any tree that is disturbed.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*), which is federally and state listed as endangered, has not been recorded within the Halepōhaku parcel but is known to inhabit māmane woodlands on Maunakea. While no removal of māmane trees is anticipated, some pruning may be required. Trees will be checked for the presence of bats prior to any pruning. Should a bat be found, the tree would not be disturbed until the bat leaves of its own accord. Because the project site is not considered regular habitat or roosting area for the Hawaiian hoary bat, no adverse impacts are anticipated.

Nine native bird species occur or could potentially occur at Halepōhaku, four of which are federally listed as endangered or threatened (Table 1). Of these species, only the Hawaiian honeycreepers–palila, Hawai'i 'amakihi, 'apapane, and 'i'iwi, have been sighted at Halepōhaku in recent years. Although two native bird species, the Hawaiian owl and the Hawaiian hawk, could utilize habitat at Halepōhaku for foraging, they have never been recorded there and tend to occur downslope. These two wide-ranging species are

unlikely to breed in the project area due to the high elevation. Hawaiian petrels (*Pterodroma sandwichensis*) are occasionally found in subalpine and alpine habitats on Maunakea. They have not been observed near Halepōhaku in recent times, although potentially fly over the project area. Although nēnē have never been recorded at Halepōhaku, they do occur at lower elevations on Maunakea and could potentially visit the project site.

The Hawai‘i ‘amakihi, the most commonly observed native bird species at Halepōhaku, forages on a variety of food sources, while the other three honeycreeper species-palila, ‘apapane, and ‘i‘iwi–are more specialized. Palila forage on seeds from māmane trees and insects that inhabit the trees. ‘Apapane and ‘i‘iwi feed on nectar from māmane and naio (*Myoporum sandwicense*) flowers and may traverse the upper slopes of Maunakea searching for flowering māmane. Hawai‘i ‘elepaio are insectivores and are mainly found in koa-‘ōhi‘a (*Acacia koa-Metrosideros polymorpha*) forests. Palila, Hawai‘i ‘amakihi, and Hawai‘i ‘elepaio all nest in māmane trees. No impact to federally protected birds or any native birds is anticipated.

Table 1. Native Bird Species of Halepōhaku

Asio flammeus sandwichensis	pueo (Hawaiian owl)	Endemic	Potentially	Federal Species of Concern
Branta sandvicensis	nēnē	Endemic	Potentially	Federal / State Endangered
Buteo solitaries	‘io (Hawaiian hawk)	Endemic	Potentially	None
Chasiempis sandwichensis	Hawai‘i ‘elepaio	Endemic	Potentially	Federal Species of Concern
Chlorodrepanis virens	Hawai‘i ‘amakihi	Endemic	Known	Federal Species of Concern
Himatione sanquinea	‘apapane	Endemic	Known intermittent	Federal Species of Concern
Loxioides bailleui	palila	Endemic	Known intermittent	Federal / State Endangered
Pterodroma sandwichensis	‘ua‘u	Endemic	Unlikely	Federal / State Endangered
Vestiaria coccinea	‘i‘iwi	Endemic	Known intermittent	Federal Threatened

The purpose of this correspondence is to solicit any input or concerns of DLNR-DOFAW regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

Outlook

Re: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

---

From Michelle Roberts <mroberts@srgii.com>
Date Fri 4/25/2025 1:30 PM
To Pang-Ching, Joshua M <joshua.m.pang-ching@hawaii.gov>; Cole, Ian W <Ian.W.Cole@hawaii.gov>
Cc Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>

Joshua,

It would be an improvement of an existing site/footprint. Yes there will be excavation involved in order to remove the three buried fuel tanks and buried fuel lines. Please see the project description for detail on the amount. We are happy to answer any other questions and thank you for your review of this proposed project.

Michelle

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

From: Pang-Ching, Joshua M <joshua.m.pang-ching@hawaii.gov>
Sent: Thursday, April 24, 2025 1:51 PM
To: Michelle Roberts <mroberts@srgii.com>; Cole, Ian W <ian.w.cole@hawaii.gov>
Cc: Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Re: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

Mahalo for reaching out. Is project a new construction project or an improvement on an existing facility or site/footprint? Any excavation involved?

From: Michelle Roberts
Sent: Thursday, April 24, 2025 12:39 PM
To: Cole, Ian W; Pang-Ching, Joshua M

Cc: Rodrigo Romo; Kristin Duin
Subject: [EXTERNAL] Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

Mr. Cole and Mr. Pang-Ching,

Sustainable Resources Group Intn'l Inc., under contract with University of Hawai'i Hilo Maunakea Shared Services, is preparing an Environmental Assessment for the proposed upgrade of the fuel storage system at Halepōhaku on Maunakea. We are reaching out to seek your agency's consultation and welcome any input or concerns you might have about this proposed project.

Please refer to the attached document, which contains a cover letter tailored to your agency, a detailed project description, and maps showing the project location. We would appreciate receiving any comments you wish to share by May 31, 2025. Please reach out with any questions.

Mahalo,
Michelle Roberts

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

Outlook

Re: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

From Michelle Roberts <mroberts@srgii.com>
Date Tue 4/29/2025 9:33 AM
To Cole, Ian W <ian.w.cole@hawaii.gov>; Pang-Ching, Joshua M <Joshua.M.Pang-Ching@hawaii.gov>
Cc Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>

1 attachment (817 bytes)
pgrading Halepōhaku Fuel Storage System_Project Site Figure_04292025.jpg.ezdetachlink;

Aloha Ian,

Yes, the majority of the site is in the footprint of the previously disturbed area at Halepōhaku.

Please see the attached figure which shows Proposed AST Location. Two tanks would be placed in that location. The proposed location for the new ASTs is on previously disturbed ground that is free of vegetation and is already graded and compacted. Some site prep will be required to install a single concrete slab with approximate dimensions of 14’ x 23’ (322 sq ft) and an 8-inch-high spill containment berm for the tanks to sit on. The ASTs measure 118” x 96” x 114” and have fully integrated dispensing pumps. One will be used for diesel and one for gasoline.

The EA will include the measures you listed regarding required protections for Hawaiian hoary bats and palila. No take of indigenous species is anticipated.

Thank you for reviewing the proposed project and providing comments. We are happy to answer any further questions.

Michelle

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

From: Cole, Ian W <ian.w.cole@hawaii.gov>
Sent: Monday, April 28, 2025 4:35 PM
To: Michelle Roberts <mroberts@srgii.com>; Pang-Ching, Joshua M <joshua.m.pang-ching@hawaii.gov>
Cc: Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: RE: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

Aloha,
Looks like the majority of the site is in the footprint of the previously disturbed Hale Pohaku facility. Will

additional site prep be needed for new tanks or are they to rest on the filled holes from the current fuel tanks?

Depending on the time of year any removal of Mamane trees or trees taller than 15' should be surveyed for active nests of any indigenous species and Hawaiian hoary bats. Unlikely put a Palila nest or Opaepae rookery would be a stop work until fledged (potential Palila Jan-Aug, BMP Opaepae no tree removal >15'Jan-June) . Any common species would require an indigenous specie take permit per 13-124 not a long process for common specie.

Ian W. Cole
East Hawaii Wildlife Biologist V
19 E. Kawili St
Hilo HI 96720
PH (808) 974-4232
Email: ian.w.cole@hawaii.gov

From: Michelle Roberts [mailto:mroberts@srgii.com]
Sent: Thursday, April 24, 2025 12:39 PM
To: Cole, Ian W <ian.w.cole@hawaii.gov>; Pang-Ching, Joshua M <joshua.m.pang-ching@hawaii.gov>
Cc: Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: [EXTERNAL] Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

Mr. Cole and Mr. Pang-Ching,

Sustainable Resources Group Intn'l Inc., under contract with University of Hawai'i Hilo Maunakea Shared Services, is preparing an Environmental Assessment for the proposed upgrade of the fuel storage system at Halepōhaku on Maunakea. We are reaching out to seek your agency's consultation and welcome any input or concerns you might have about this proposed project.

Please refer to the attached document, which contains a cover letter tailored to your agency, a detailed project description, and maps showing the project location. We would appreciate receiving any comments you wish to share by May 31, 2025. Please reach out with any questions.

Mahalo,
Michelle Roberts

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 25, 2025

Candace Martin
Department of Land and Natural Resources
Land Division
75 Aupuni Street, Room 204
Hilo, HI 96720
Via email: Candace.M.Martin@hawaii.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

Implementation of this project will also require a Conservation District Use Permit. The application will be submitted after the Environmental Assessment is finalized.

The purpose of this correspondence is to solicit any input or concerns of DLNR Land Division regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 25, 2025

Michael Cain, Administrator
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
Kalanimoku Building
1151 Punchbowl St., Room 131
Honolulu, HI 96813

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

Implementation of this project will also require a Conservation District Use Permit. The application will be submitted after the EA is finalized.

The purpose of this correspondence is to solicit any initial input or concerns from the Office of Conservation and Coastal Lands regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
Office of Conservation and Coastal Lands
P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
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ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:MK

COR HA 25-179
May 20, 2025

Michelle Roberts, Natural Resources Specialist
Sustainable Resources Group Intn'l, Inc
111 Hekili Street, Suite A373
Kailua, HI 96734

SUBJECT: Correspondence HA 25-179 Pre-consult for Environmental Assessment for Upgrading Halepōhaku Fuel Storage System, Located at Halepōhaku Maunakea, Ka'ohe, Hamakua, Island of Hawai'i
Tax Map Key (TMK): (2) 1-2-001:026

Dear Michelle Roberts:

The Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter regarding the subject matter. According to the information you have provided, the Center for Maunakea Stewardship (CMS), represented by Sustainable Resources Group Intn'l Inc., is seeking comments on the preparation of an Environmental Assessment for a project to decommission three single-wall fiberglass underground fuel storage tanks within the maintenance facility area at Halepōhaku on Maunakea, and replace them with two aboveground storage tanks. The underground storage tanks would be removed in accordance with the 2028 regulatory deadline pursuant to Hawai'i Administrative Rules (HAR) Chapter 11-280.1-21, "Upgrading Underground Storage Tank Systems". The proposed project is located within the Resource Subzone of the State Land Use Conservation District.

The maintenance facility area and underground storage tanks were approved by the Board of Land and Natural Resources on April 23, 1982 under Conservation District Use Permit (CDUP) HA-1430 for the Halepōhaku visitor center.

The decommissioning involves the removal of all three underground storage tanks, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines. The removal of buried lines requires trenching (two feet (ft) wide) of approximately 240 linear feet (lf) of asphalt concrete, and approximately 225 lf of previously disturbed soil. Lines will be disconnected and capped at building terminations. Removal of the dispensing pumps concrete pad requires disturbance an area of 13' x 5'. Removal of the underground storage tanks requires digging out approximately 385 ft² for the diesel tank and 600 ft² for the two gasoline tanks combined. Voids created by equipment removal will be backfilled, utilizing on-site excavated material, drain rock from on-site and off-site sources, and cinder from on-site or pre-existing Maunakea stockpiles.

After the underground storage tanks and pipelines are removed, the soil and cinder lining will be checked for hydrocarbons. This involves visual inspection for discoloration and air monitoring using a hydrocarbon probe. If any signs of hydrocarbons are found, soil samples will be sent for laboratory analysis. Confirmed hydrocarbon contamination will result in the removal of contaminated fill, following an approved remediation protocol.

Two, double walled, aboveground storage tanks with a safe fill capacity of 3,068 gallons will be installed for fuel storage. The tanks measure 118" x 96" x 114" and will sit on a single concrete slab with approximate dimensions of 14' x 23' (322 ft²) and an 8-inch containment berm. The tanks provide secondary containment in the event of any leaks and have an access manway that allows for inspection and maintenance of the inner tank. The proposed location for the new aboveground storage tanks is on previously disturbed ground that is free of vegetation and is already graded and compacted. The proposed location has existing electrical nearby and is not visible from the Maunakea Access Road.

After reviewing the application, the OCCL has determined that the proposed project is consistent with the following identified land uses in Hawai'i Administrative Rules (HAR): §13-5-22 P-8 STRUCTURES AND LAND USES, EXISITING (B-1) *Demolition, removal, or minor alteration of existing structures, facilities, land, and equipment. Any historic property shall be evaluated by the department for historical significance;* and §13-5-22 P-9 STRUCTURES, ACCESSORY (B-1) *Construction or placement of structures accessory to existing facilities.* This requires the filing of a Site Plan Approval Application (SPA). Applications can be found at https://dlnr.hawaii.gov/occl/application-process/.

Please consult with the Department of Health for their review of the proposed decommissioning plan, prior to the SPA submittal.

Should you have any further questions, please contact Mari Kurosawa of our Office at (808) 587-0381 or at mari.i.kurosawa@hawaii.gov.

Sincerely,

S Michael Cain

S. Michael Cain, Administrator
Office of Conservation and Coastal Lands

CC: *Hawai'i District Land Office*
County of Hawai'i- Department of Planning

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 24, 2025

Sean Naleimaile
Hawai'i Department of Land and Natural Resources
State Historic Preservation Division
40 Po'okela Street
Hilo, HI 96720
Via email: Sean.P.Naleimaile@hawaii.gov
CC: Susan.A.Lebo@hawaii.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

The purpose of the project is to decommission three single-wall fiberglass underground fuel storage tanks (USTs) within the maintenance facility area at Halepōhaku and replace them with two metal double-walled aboveground storage tanks (ASTs) in accordance with the 2028 regulatory deadline pursuant to HAR Chapter 11-280.1-21, "Upgrading UST Systems".

An Archeological Monitoring Plan is being prepared for the implementation phase of the project and will be submitted to the State Historic Preservation Division (SHPD) for approval prior to any on-site work. Per the *Maunakea Comprehensive Management Plan*, the AMP will include provisions for an archeologist to be on-site throughout the project monitoring all ground disturbance. The AMP will include a description of the Pu'ukalepeamoa Complex, SIHP #50-10-23-10311, the only historic property that has been recorded near the project site. There are no previously recorded historic properties within the project site.

The purpose of this correspondence is to solicit any initial input or concerns from SHPD regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Outlook

Re: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

From Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>
Date Tue 5/20/2025 2:18 PM
To Michelle Roberts <mroberts@srgii.com>
Cc Lebo, Susan A <susan.a.lebo@hawaii.gov>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>

Aloha
Has this project been uploaded to HICRIS for SHPD review? If the University of Hawaii is the proponent for this project, it is their responsibility to initiate consultation with the SHPD. SHPD would need a letter from the UH under Chapter 6E8 requesting concurrence with a project effect determination for the proposed project. Additionally, if there is any federal involvement, funding, permitting, etc., that would trigger a Section 106 review as well. Before you submit an AMP, this part of the review process must be completed.

Sean

Sean P. Naleimaile, MA.
Hawaii Island Archaeologist
40 Po'okela St. Hilo HI 96720
ph., (808) 933-7651

State of Hawaii DLNR
STATE HISTORIC PRESERVATION - HAWAII ISLAND

Beginning on Monday, April 8, 2019, SHPD will institute "I MUA MONDAYS". Every Monday, until terminated or suspended in writing by the Administrator, SHPD will be closed to the public; we will not accept meetings, phone calls, emails, or "walk-ins" on Mondays. The SHPD Library will be closed to the public. This policy has been approved at the highest levels in the Administration.

From: Michelle Roberts <mroberts@srgii.com>
Sent: Tuesday, May 20, 2025 1:56 PM
To: Naleimaile, Sean P <sean.p.naleimaile@hawaii.gov>
Cc: Lebo, Susan A <susan.a.lebo@hawaii.gov>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: [EXTERNAL] Re: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

Mr. Naleimaile,

We wanted to send a friendly reminder to provide any input or concerns you might have on the proposed upgrade of the fuel storage system at Halepōhaku on Maunakea (see email and attachments below). We will be submitting an AMP for this project for your review soon, and will send notification on when the Draft EA is published for agency and public review.

Thank you for your time,
Michelle

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

From: Michelle Roberts
Sent: Thursday, April 24, 2025 12:37 PM
To: Sean P Naleimaile <sean.p.naleimaile@hawaii.gov>
Cc: Susan.A.Lebo@hawaii.gov <Susan.A.Lebo@hawaii.gov>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Request for Input: EA for Upgrading Halepōhaku Fuel Storage System

Mr. Naleimaile,

Sustainable Resources Group Intn’l Inc., under contract with University of Hawai‘i Hilo Maunakea Shared Services, is preparing an Environmental Assessment for the proposed upgrade of the fuel storage system at Halepōhaku on Maunakea. We are reaching out to seek your agency's consultation and welcome any input or concerns you might have about this proposed project.

Please refer to the attached document, which contains a cover letter tailored to your agency, a detailed project description, and maps showing the project location. We would appreciate receiving any comments you wish to share by May 31, 2025. Please reach out with any questions.

Mahalo,
Michelle Roberts

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

May 15, 2025

Stacy Ferreira, CEO
Kai Kahele, Board Chair
Office of Hawaiian Affairs
560 N. Nimitz Hwy, Suite 200
Honolulu, HI 96817

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

Development agreements between the University of Hawai'i at Hilo (UH Hilo)/Maunakea Shared Services and individual observatories require UH Hilo to provide services or utilities, including fuel, to observatory facilities. In addition, onsite diesel and gasoline are needed for MKSS staff to fulfill a variety of duties including Ranger patrol for public safety and resource protection, road maintenance, and snow removal. Because the three existing underground storage tanks (UST) must be removed by July 2028 in accordance with Hawai'i Department of Health requirements for single-wall UST (Hawai'i Administrative Rules Chapter 11-280.1), new aboveground fuel storage and dispensing units are proposed to continue the provision of fuel.

The purpose of this correspondence is to solicit any initial input or concerns from the Office of Hawaiian Affairs regarding this project for consideration in the EA. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Kai Markell, OHA Compliance Manager
Kamakana Ferreira, OHA Compliance Specialist
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Outlook

OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

From Kaweni Ibarra <kawenii@oha.org>
Date Tue 6/3/2025 7:25 AM
To Michelle Roberts <mroberts@srgii.com>
Cc Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>

Aloha e Michelle,
The Office of Hawaiian Affairs (OHA) is in receipt of the your letter dated May 15, 2025, initiating early Hawaii Revised Statutes (HRS) 343 consultation for upgrading fuel storage tanks at Halepohaku on Maunakea [TMK (3)4-4-015: 012], Hawaii.

At this time, OHA requests more information about how the HRS 6E progress is being integrated into the HRS 343 process through this project. In the past, OHA has advocated for completion of the HRS 6E process prior to HRS 343 drafting.

If the HRS 6E process is ongoing, OHA requests to be provided with copies of any submittals, as well as any current or future correspondence from the State Historic Preservation Division (SHPD). Also, please share any information you have on this process for the project. We are assuming there will be some level of community outreach to assess impacts to cultural resources and practices.

Mahalo for your time. We look forward to receiving the requested information. Please feel free to contact me should you have any questions.

Mahalo,

Kaweni Ibarra

Kaweni Ibarra
Compliance Advocate
Office of Hawaiian Affairs
OFFICE OF HAWAIIAN AFFAIRS

Outlook

OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

1 attachment (126 KB)
OHA_Consultation_Upgrading Halepōhaku Fuel Storage System_061025.pdf;

From: Michelle Roberts <mroberts@srgii.com>
Sent: Tuesday, June 10, 2025 1:23 PM
To: Kaweni Ibarra <kawenii@oha.org>
Cc: Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>; Stacy Ferreira <stacyf@oha.org>; Kaiali'i Kahele <kaik@oha.org>; Gregory Chun <gchun711@hawaii.edu>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Re: OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

Kaweni,

Thank you for reaching out regarding the EA for Upgrading Halepohaku Fuel Storage. We have attached a memo that provides further information on the items requested.

Mahalo,
Michelle

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

June 10, 2025

Kaweni Ibarra, Compliance Advocate
Office of Hawaiian Affairs
560 N. Nimitz Hwy, Suite 200
Honolulu, HI 96817

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. is in receipt of your email dated June 3, 2025 in response to our request for input on the above-referenced project. We appreciate OHA's comments during this preliminary stage of Environmental Assessment (EA) development and look forward to continued consultation.

The State Historic Preservation Division (SHPD) is included in the review process for this proposed project as required under HRS Chapter 6E. The HRS Chapter 6E process is being conducted simultaneous to the development of the EA to ensure that all of the required elements for initiation of the proposed project (including the EA and the Conservation District Use Permit (CDUP)) can be reviewed within a timeline that provides for the removal of the underground fuel storage tanks by the regulatory deadline of July 2028.

During the initial stages of determining the process for complying with the Hawai'i Department of Health requirements for Upgrading Underground Fuel Storage Systems (HAR Chapter 11-280.1) and the regulatory deadline, the Center for Maunakea Stewardship (CMS) met with Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) to determine the requirements and timeline for an EA and a CDUP. Since the application for a CDUP requires a draft or final EA be submitted with the application (HAR Chapter 13-5), and the processing time for a Conservation District Use Application can be up to 210 days, the process of completing these requirements can be lengthy.

As part of the HRS Chapter 6E process, an Archeological Monitoring Plan (AMP) is being prepared for the implementation phase of the project and will be submitted to SHPD for approval prior to any on-site work. Per the *Maunakea Comprehensive Management Plan*, the AMP will include provisions for an archeologist to be on-site throughout the project monitoring all ground disturbance. The AMP is currently being drafted.

Additionally, Kahu Kū Mauna, a volunteer, community-based council whose members are from the native Hawaiian community, which advises on all matters impacting the cultural integrity of University of Hawai'i managed lands on Maunakea, has been and will continue to be consulted regularly on this proposed project.

The Draft EA will be made available for public comment under Hawai'i's environmental review process (HRS Chapter 343) later this fall, and public comments considered before finalizing. We anticipate holding public meetings as part of the process for obtaining a CDUP sometime in early 2026.

We are happy to inform OHA on submittals and correspondence with SHPD. Correspondence with SHPD will also be included in the EA.

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Sincerely,

Michelle Roberts
Natural Resources Specialist

cc:
Stacy Ferreira, OHA CEO
Kai Kahele, OHA Board Chair
Kai Markell, OHA Compliance Manager
Kamakana Ferreira, OHA Compliance Specialist
Gregory Chun, Center for Maunakea Stewardship Executive Director
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

Outlook

OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

From: Kaweni Ibarra <kawenii@oha.org>
Sent: Thursday, June 26, 2025 8:29 AM
To: Michelle Roberts <mroberts@srgii.com>
Cc: Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>; Stacy Ferreira <stacyf@oha.org>; Kaiali'i Kahele <kaik@oha.org>; Greg Chun (Guest) <gchun711@hawaii.edu>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Re: OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

Aloha Michelle,

Mahalo for the response.

Once available, OHA requests that we be provided with a copy of the draft Archaeological Monitoring Plan (AMP) for review, and afforded an opportunity to comment. We agree that SHPD correspondence should be included in the EA as well as status on completion of the HRS 6E process.

Please feel free to contact me should you have any concerns.

Aloha,

Kaweni

Kaweni Ibarra
Compliance Advocate
Office of Hawaiian Affairs
OFFICE OF HAWAIIAN AFFAIRS

Outlook

OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

1 attachment (11 MB)
Draft AMP_UpgradingHalepōhakuFuelStorageSystem_112525.pdf;

From: Michelle Roberts <mroberts@srgii.com>
Sent: Wednesday, November 26, 2025 2:08 PM
To: Kaweni Ibarra <kawenii@oha.org>
Cc: Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>; Stacy Ferreira <stacyf@oha.org>; Kaiali'i Kahele <kaik@oha.org>; Greg Chun (Guest) <gchun711@hawaii.edu>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Re: OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

Kaweni,

SRGII is happy to provide OHA with copy of the *Draft Archaeological Monitoring Plan: Upgrading Halepōhaku Fuel Storage System* for review and comment. This Draft AMP was also submitted to SHPD today through the HICRIS system. Comments in the pdf are fine, or by email. If you would prefer a comment form, please let me know.

Thanks,
Michelle

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

Outlook

OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

From: Kaweni Ibarra <kawenii@oha.org>
Sent: Friday, December 12, 2025 11:11 AM
To: Michelle Roberts <mroberts@srgii.com>
Cc: Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>; Stacy Ferreira <stacyf@oha.org>; Kaiali'i Kahele <kaik@oha.org>; Greg Chun (Guest) <gchun711@hawaii.edu>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Re: OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

Aloha Michelle,

Mahalo for providing us with the draft AMP for the project.

OHA requests assurance that the traditional lithic scatter (SIHP # -31382) will be flagged ahead of ground disturbing work. Additionally, OHA requests more information about that site because the Maunakea area is known for adze quarries.

Mahalo for your time. We look forward to receiving the requested information. If you have any questions, please feel free to contact me.

Mahalo,

Kaweni Ibarra

Kaweni Ibarra
Compliance Advocate
Office of Hawaiian Affairs
OFFICE OF HAWAIIAN AFFAIRS

Outlook

OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

From: Michelle Roberts <mroberts@srgii.com>
Sent: Wednesday, December 17, 2025 8:26 AM
To: Kaweni Ibarra <kawenii@oha.org>
Cc: Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>; Stacy Ferreira <stacyf@oha.org>; Kaiali'i Kahele <kaik@oha.org>; Greg Chun (Guest) <gchun711@hawaii.edu>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>
Subject: Re: OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

Kaweni,

Thank you for your input on the Draft AMP. As we hope you are aware, the Draft EA, which includes the Draft AMP, was published in *The Environmental Review* on December 8, 2025, to solicit public and agency review and comment. The deadline to submit comments is January 7, 2026. We have included the link to the document on the Environmental Review Program's website below. The link also includes the email address for submitting comments.

We have included the OHA comments you provided in the agency comments received and will be addressing those, along with all agency and public comments, once the comment period has closed. You can expect to hear back from us at that time.

Https://files.hawaii.gov/dbedt/erp/Doc_Library/2025-12-08-HA-DEA-Upgrading-Halepohaku-Fuel-Storage-System.pdf

Happy Holidays,

Michelle Roberts

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

Outlook

Re: OHA Comment Re: Sustainable Resources Group Intnl Inc, EA for Upgrading Halepohaku Fuel Storage, Maunakea

From Michelle Roberts <mroberts@srgii.com>
Date Tue 3/17/2026 2:38 PM
To Kaweni Ibarra <kawenii@oha.org>
Cc Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>; Stacy Ferreira <stacyf@oha.org>; Kaiali'i Kahele <kaik@oha.org>; Greg Chun (Guest) <gchun711@hawaii.edu>; Rodrigo Romo <rromo@hawaii.edu>; Kristin Duin <kduin@srgii.com>

Kaweni,

In preparation for publication of the Final Environmental Assessment (EA) for the Upgrading Halepōhaku Fuel Storage System project, all public and agency comments submitted during the Draft EA review period were considered. Comments from the Office of Hawaiian Affairs and the State Historic Preservation Division on the Draft Archaeological Monitoring Plan (AMP) were also reviewed and incorporated in the Final EA and Final AMP, as appropriate.

In response to OHA's comment regarding the historic property closest to the project site, the lithic scatter (SIHP #50-10-23-10314), the Final EA and the Final AMP include measures to ensure resource protection. Specifically, the boundaries of the lithic scatter (SIHP #50-10-23-10314) will be demarcated by flagging along the western, southwestern, and southern boundaries of the site.

Per your request for further information on SIHP #50-10-23-10314, please refer to the following publications:

McCoy, P, S Collins, S Clark, and V Park. 2009. *A Cultural Resources Management Plan for the University of Hawaii Management Areas on Mauna Kea, Kaʻohe Ahupaʻa, Hāmākua District, Hawaiʻi Island State of Hawaii. A Sub-Plan of the Mauna Kea Comprehensive Management Plan*. October. https://hilo.hawaii.edu/maunakea/library/ref/933

McCoy, P, R Ness, and M Mintmier. 2010. *Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor, Kaʻohe Ahupaʻa, Hāmākua District, Hawaiʻi Island, Hawaii. TMK (3) 4-4-015:01 (por.)* Prepared for the Office of Maunakea Management. February. Available upon request from the Center from Maunakea Stewardship https://hilo.hawaii.edu/maunakea/stewardship/

Mahalo for your review of the Draft AMP,
Michelle

Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

April 24, 2025

Jeff Darrow, Planning Director
Michelle Ahn, Deputy Planning Director
County of Hawai'i Planning Department
101 Pauahi Street, Suite 3
Hilo, HI 96720
Via email: planning@hawaiicounty.gov

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

The purpose of the project is to decommission three single-wall fiberglass underground fuel storage tanks (USTs) within the maintenance facility area at Halepōhaku and replace them with two metal double-walled aboveground storage tanks (ASTs) in accordance with the 2028 regulatory deadline pursuant to Hawai'i Administrative Rules (HAR) Chapter 11-280.1-21, "Upgrading UST Systems".

The proposed project is consistent with the goals, objectives, policies and actions sets forth in the County's *Final Recommended Draft General Plan 2045* in that the project is aimed at minimizing impacts to natural and cultural resources by reducing the chance of a fuel storage tank leak at Halepōhaku, would be implemented using best management practices to avoid negative impacts to native flora and fauna, and brings the facility in compliance with the HAR prior to the July 2028 deadline.

The purpose of this correspondence is to solicit any input or concerns of the County of Hawai'i Planning Department regarding this project. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.

Sincerely,

Michelle Roberts

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

July 3, 2025

Jordan Carter
County of Hawai'i Fire Administration
25 Aupuni Street, Suite 2501
Hilo, HI 96720

Subject: Request for Input: Environmental Assessment for *Upgrading Halepōhaku Fuel Storage System*.

Aloha,

Sustainable Resources Group Intn'l Inc. has been contracted by University of Hawai'i Hilo Maunakea Shared Services to prepare an Environmental Assessment in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes, and its implementing regulations, Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) to analyze impacts of upgrading the fuel storage system at the Maintenance Facility Area within the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). A detailed project description and figures depicting the site are attached.

The purpose of this correspondence is to solicit any initial input or concerns from the County of Hawai'i Fire Administration regarding this project for consideration in the EA. We understand the need to obtain a permit for Aboveground Storage Tanks containing flammable or combustible liquids in excess of 60 gallons. We look forward to your comments within 30 days of receiving this request. If you have any questions or require additional information please contact me at 808-772-1836 or mroberts@srgii.com. Thank you in advance for your assistance.
Sincerely,

Michelle Roberts
Natural Resources Specialist

cc:
Rodrigo Romo, Maunakea Shared Services General Manager
Kristin Duin, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Appendix B2. Community Consultation

Contains correspondence and comments in response to request for information from community members for the Ka Paʻakai Analysis.

Upgrading Halepōhaku Fuel Storage System

The Center for Maunakea Stewardship (CMS) proposes to decommission three single-wall fiberglass underground fuel storage tanks (USTs) and associate infrastructure within the maintenance facility area at Halepōhaku on Maunakea and replace them with two aboveground storage tanks (ASTs). The USTs would be removed in accordance with the 2028 regulatory deadline pursuant to Hawai'i Administrative Rules (HAR) Chapter 11-280.1-21, "Upgrading UST Systems". The rule stipulates that "Not later than July 15, 2028, tanks with piping installed before August 9, 2013 must be provided with secondary containment that meets the requirements of HAR Section 11-280.1-24." Additionally, "Tanks not upgraded by the deadline will be required to permanently close". The USTs were originally approved under Conservation District Use Permit (CDUP) 1430, "Subdivision and Construction of the Hale Pōhaku Mid-Level Facilities" at the Board of Land and Natural Resources meeting on April 23, 1982. The three tanks (a 12,000-gallon diesel tank, a 4,000-gallon gasoline tank, and a 2,000-gallon gasoline tank) were installed between 1982–1983. In 1998 a Veeder-Root TLS-350 Leak Detection System, which continuously monitors for leaks and undergoes annual inspections and certifications, was installed. It has never detected a leak. The two new ASTs each have a capacity of approximately 3,000 gallons, which will result in an overall decrease of fuel storage capacity at Halepōhaku from 18,000 gallons to 12,000 gallons.

Diesel is used to fuel heavy equipment used for road maintenance and snow removal as well as one of the two boilers that heats buildings at Halepōhaku. There is one diesel boiler and one propane boiler. Diesel use averages 250 to 500 gallons per month and is highest during months with heavy snow or during propane shortages. The diesel boiler may eventually be replaced by a propane boiler, but diesel will still be required for heavy equipment. The minimum delivery load for diesel is 2,500 gallons. Gasoline is less critical than diesel, however the tanks provide fueling capability for on-mountain fleets for CMS, Maunakea Shared Services, and Maunakea Observatories including ranger vehicles, snow removal equipment, and observatory vehicles. Gasoline use averages 2,000 to 2,500 gallons per month. The minimum delivery load for gasoline is 2,500 gallons.

The decommissioning involves removal of all three tanks, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines. Buried lines for the diesel tank run from the USTs to the dispensing pump, to the old generator room, and to the boiler room in the common building at Halepōhaku. Buried lines for the two gasoline tanks run from the USTs to the two gasoline dispensing pumps. Removal of the buried lines requires trenching (width of two feet) of approximately 240 linear feet of asphalt concrete and approximately 225 linear feet of previously disturbed soil. Lines will be disconnected and capped at building terminations. Removal of the dispensing pumps concrete pad requires disturbing 65 sq ft (13' x 5'). Removal of the USTs requires digging out approximately 385 sq ft (35' x 11') for the diesel tank and 600 sq ft (30' x 20') for the two gasoline tanks combined. Excavation depths vary across the project site. Excavated material will be temporarily stockpiled. Voids created by equipment removal will be backfilled in layers, utilizing on-site excavated material, drain rock from both on-site and off-site sources, and cinder from on-site or pre-existing Maunakea stockpiles. Before excavation and removal of the USTs and pipelines, each feature will be sampled to check for the presence of hydrocarbons. This will be done using a hydrocarbon probe, or "sniffer," which detects vapor levels through small diameter holes placed around the features. If no hydrocarbons vapors are detected, no further sampling or mitigation will be required. If

hydrocarbons are detected, additional sampling will be conducted after the tanks and pipelines are removed. This will involve collecting soil samples at each feature to confirm the presence and concentration of hydrocarbons. If concentrations meet or exceed actionable thresholds, mitigation actions will be carried out in accordance with an approved remediation protocol and HAR §11-280.1, Subchapter 6 (*Release Response Action*), that includes clean-up and removal of contaminated soil.

Since fuel will still be required at the Halepōhaku mid-level facilities once the USTs are removed, two Transtank Pro P12[1] (or similar) ASTs with a safe fill capacity of 3,068 gallons will be installed for fuel storage. The tank size was selected based on the minimum order amount required for fuel delivery. These ASTs are double walled, providing secondary containment in the event of any leaks as required by HAR 11-280.1-24. They have an access manway that allows for inspection and maintenance of the inner tank. The ASTs measure 118" x 96" x 114" and have fully integrated dispensing pumps. One will be used for diesel and one for gasoline. The tanks will sit on a single concrete slab with approximate dimensions of 14' x 23' (322 sq ft) and a 6-inch-high spill containment berm. The proposed location for the new ASTs is on previously disturbed ground that is free of vegetation and is already graded and compacted. The proposed location for the ASTs has existing electrical nearby and is not visible from the Maunakea Access Road.

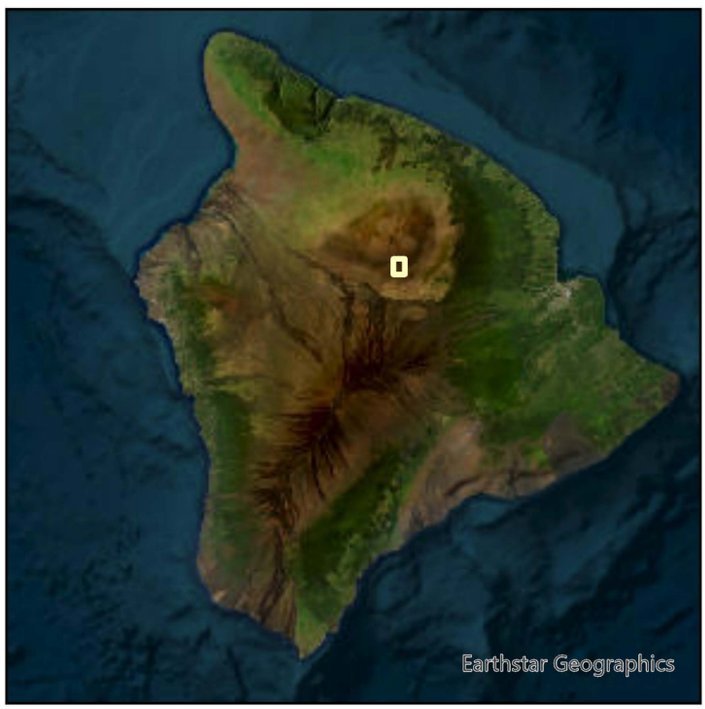
The Department of Land and Natural Resources has advised CMS to conduct an Environmental Assessment pursuant to Hawai'i Revised Statutes Chapter 343, in addition to obtaining the required permit for land use within the Conservation District for the removal of the USTs and ancillary infrastructure and the installation of the ASTs. An Archaeological Monitoring Plan will be developed for this project in accordance with the Maunakea Comprehensive Management Plan and Hawai'i Revised Statutes Chapter 6E.

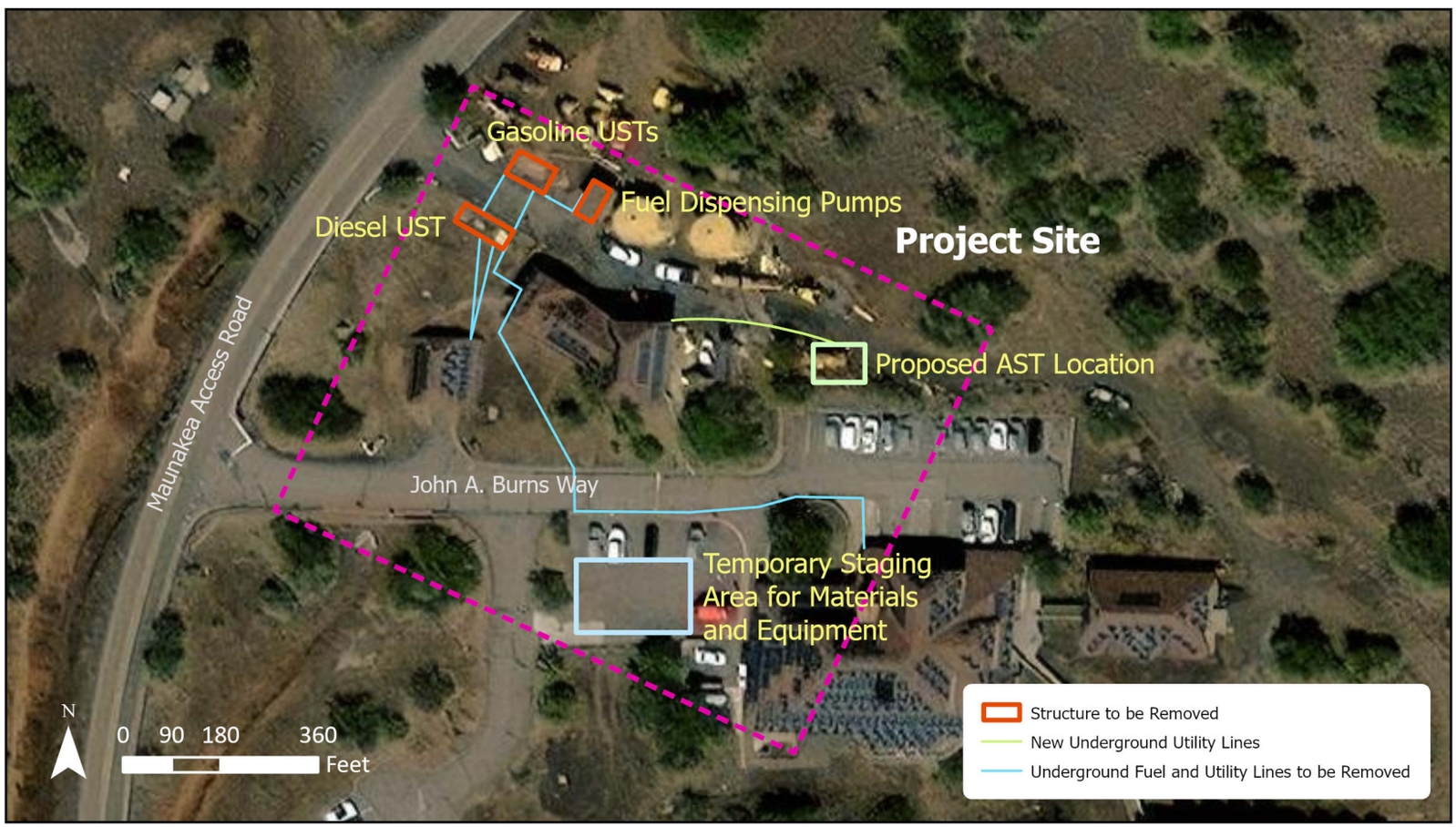
[1] https://western-global.com/us/products/transtank-pro/; Brim fill capacity: 3,223 gallons, Safe fill capacity: 3,068 gallons.

Upgrading Halepōhaku Fuel Storage System

TMK (3) 4-4-15:12

Project proposed by:
Maunakea Shared Services in coordination with
Center for Maunakea Stewardship





SUSTAINABLE RESOURCES GROUP INTN'L, INC.

June 13, 2025

Tom Eisen
Office of Planning and Sustainable Development, Environmental Review Program
via email: Thomas.H.Eisen@hawaii.gov
Re: Ka Pa'akai Analysis

Tom,
Thank you for speaking with me to clarify the process of the Ka Pa'akai Analysis, both in general and with regards to a current project (Environmental Assessment (EA) for Upgrading Halepōhaku Fuel Storage System). Per our conversation we understand the following.

Since the University of Hawai'i (UH) is the proposing agency for the EA, and charged with the HEPA determination, it is up to UH to decide whether a Ka Pa'akai Analysis needs to be included in the EA. If, for example, DLNR was the approving agency for the EA (as opposed to UH), they would have us do a screening to determine if it is likely that the Proposed Action would impact cultural resources or the exercise of Native Hawaiian traditional and customary rights. If the answer is yes or potentially yes, then a Ka Pa'akai Analysis should be included in the EA. If the answer is no, it is like other topics that one might omit from an EA as there are no potential adverse effects and thus does not need to be included in the discussion.

The discussion included in the body of an EA is to provide context for evaluating the Significance Criteria under HAR §11-200.1-13, which is used to evaluate the cumulative effects of an action on the environment. If it is anticipated that the answer to #4 of the Significance Criteria (*Has a substantial adverse effect on the economic welfare, and social welfare, and cultural practices of the community and state*), would be yes, then a Ka Pa'akai Analysis should be included in the EA.

It is far more typical for a Ka Pa'akai Analysis to be included in an Environmental Impact Statement (EIS), than an EA, as the significant impact to resources would trigger the need for an EIS.

You indicated that it would be prudent to consult with OCCL regarding the CDUA and if they anticipate that a Ka Pa'akai Analysis would be needed. Even if the analysis is not included in the EA, OCCL could request one be completed as part of that process if they think the DLNR Board would want the information to consider when determining whether to issue a CDUP.

Currently there is no official process or written protocols for conducting a Ka Pa'akai Analysis. The best suggestion is to review other EAs similar in location or scope.

We agreed that sending scoping letters out to cultural practitioners that utilize the UH Managed Lands on Maunakea, or the surrounding area, to inform on the Proposed Action and ask for input would be reasonable. It gives them a heads up that the EA will be forthcoming and offers stakeholders a chance to comment early in the process.

Mahalo,
Michelle Roberts
Michelle Roberts, Natural Resource Specialist

cc: Kristin Duin, SRGII Principal; Andrew Hood, SRGII Principal

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Outlook

Re: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System

From Stewart Hunter <eshunter@hawaii.edu>
Date Fri 7/18/2025 1:10 PM
To Michelle Roberts <mroberts@srgii.com>

Aloha Michelle,

During my tenure as MKSS General Manager (2010 - 2023), I did not observe any Native Hawaiian traditional and customary rights or practices that took place within or nearby the project site. In my discussions with others over the years, including Native Hawaiian cultural practitioners, none mentioned any Native Hawaiian traditional and customary rights or practices that took place within or nearby the project area.

Feel free to contact me at 808-936-5569 if you have any further questions.

Mahalo, Stewart

On Thu, Jul 17, 2025 at 12:13 PM Michelle Roberts <mroberts@srgii.com> wrote:

> Aloha,
>
> Sustainable Resources Group Intn'l Inc. has been hired by the University of Hawai'i at Hilo Center for Maunakea Stewardship (CMS) to prepare an Environmental Assessment (EA) for a proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The EA is being prepared in accordance with State regulations. A detailed project description and site maps are attached.
>
> Development of the EA includes evaluating potential impacts to cultural resources. This includes conducting a Ka Pa'akai Analysis to identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site and consider if they would be affected by the proposed project.
>
> Your contact information was provided by the CMS, who thought you might have relevant information to contribute. We are seeking any knowledge you may have about Native Hawaiian traditional and customary rights or practices that take place within or near the project site. While we recognize that many cultural practices are associated with the higher elevations of Maunakea, our focus is on those occurring in the area around Halepōhaku.

The EA will address potential impacts to cultural resources, including the contemporary ahu located within the DLNR-managed silversword enclosure, two historic shrines just south of the Halepōhaku parcel within the Mauna Kea Forest Reserve near the dirt jeep road, and the practice of collecting koʻokoʻolau and māmane for medicinal or cultural purposes. Although the proposed project may temporarily restrict access to or through the project site during active construction, it is our understanding that cultural practitioners are not known to frequent this particular area of Halepōhaku.

In addition to helping identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site, we would appreciate your thoughts on whether the proposed project might any impact on those practices. If you believe the project could negatively impact any traditional and customary rights, we welcome your suggestions on possible measures to help protect them.

Please note, the proposed project requires consultation with the Hawaiʻi State Historic Preservation Division to determine any impacts to historic properties and what action should be taken to avoid them. Although the project site does not contain any known historic resources, an archeological monitor will be present during all ground disturbing activities, as required by the Maunakea Comprehensive Management Plan. This plan guides the management and protection of cultural, historic, and natural resources within the UH managed lands on Maunakea.

We appreciate your response as it will help ensure a meaningful and thoughtful analysis. Please feel free to share this email with others in the community who may have knowledge of cultural practices within or near the project site.

We kindly ask that you submit any comments or information by August 18, 2025.

The EA will be made available for public review through the Environmental Review Program, and we will notify you once it is released.

If you have any questions or would like to discuss, you can reach me at 808-772-1836. If you do not wish to receive future updates about this project, please let me know.

Thank you,

Michelle Roberts
Michelle Roberts
Sustainable Resources Group Intn'l, Inc.
808.772.1836 (direct)
808.356.0552 (ph/fx)
www.srgii.com

Outlook

Re: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System

From Leinani Lozi <leinani.lozi@noirlab.edu>
Date Wed 8/20/2025 11:54 AM
To Michelle Roberts <mroberts@srgii.com>; Leilehua Yuen <leilehua.yuen@noirlab.edu>
Cc Kristin Duin <kduin@srgii.com>; Rodrigo Romo <rromo@hawaii.edu>

Aloha,

We (myself and our in-house Hawai'i Culture and Language Resident, Leilehua Yuen) have no comments on this area of Maunakea as our personal cultural and traditional knowledge for the area is scarce.

Mahalo,
Leinani

On Wed, Aug 20, 2025 at 10:59 AM Michelle Roberts <mroberts@srgii.com> wrote:

> Aloha,
>
> Sustainable Resources Group Intn'l Inc. is following up on the previously sent email regarding input on the proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The project requires the development of an Environmental Assessment including a Ka Pa'akai Analysis to identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site and consideration of if they would be affected by the proposed project.
>
> Please see the email below sent on July 17, 2025 for more information as well as the attached project description and site location. We appreciate any information you wish to provide, and kindly ask that you submit comments by August 27, 2025 (an extension of the previously requested date of August 18, 2025).
>
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> 808.772.1836 (direct)
> 808.356.0552 (ph/fx)
> www.srgii.com
>
> ---
>
> **From:** Michelle Roberts
> **Sent:** Thursday, July 17, 2025 11:22 AM
> **Cc:** Kristin Duin <kduin@srgii.com>; Rodrigo Romo <rromo@hawaii.edu>
> **Subject:** Input Requested on Project to Upgrade Halepōhaku Fuel Storage System
>
> Aloha,
>
> Sustainable Resources Group Intn'l Inc. has been hired by the University of Hawai'i at Hilo Center for Maunakea Stewardship (CMS) to prepare an Environmental Assessment (EA) for a proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The EA is being prepared in accordance with State regulations. A detailed project description and site maps are attached.
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> The EA will address potential impacts to cultural resources, including the contemporary ahu located within the DLNR-managed silversword enclosure, two historic shrines just south of the Halepōhaku parcel within the Mauna Kea Forest Reserve near the dirt jeep road, and the practice of collecting ko'oko'olau and māmane for medicinal or cultural purposes. Although the proposed project may temporarily restrict access to or through the project site during active construction, it is our understanding that cultural practitioners are not known to frequent this particular area of Halepōhaku.
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> Please note, the proposed project requires consultation with the Hawai'i State Historic Preservation Division to determine any impacts to historic properties and what action should be taken to avoid them. Although the project site does not contain any known historic resources, an archeological monitor will be present during all ground disturbing activities, as required by the Maunakea Comprehensive Management Plan. This plan guides the management and protection of cultural, historic, and natural resources within the UH managed lands on Maunakea.
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> www.srgii.com

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Leinani Lozi
Hawai'i Education & Engagement Manager
670 N. A'ohōkū Place, Hilo, HI, USA
W: +1 808-974-2603 / C: +1 808-785-9331
Maunakea, kuahiwi ku ha'o i ka mālie

Outlook

Re: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System

From Lanakila Mangauil <lanakilamaunakea@gmail.com>
Date Tue 8/26/2025 9:55 PM
To Michelle Roberts <mroberts@srgii.com>
Cc Kristin Duin <kduin@srgii.com>; Rodrigo Romo <rromo@hawaii.edu>

Aloha e Michelle,

Forgive me I missed your e-mail in a busy summer. Looking at the project there doesn't seem to be any active practices in the area. The area to be disturbed is previously disturbed ground to remove the old tanks. This being up above the base yard area it is away from the general public and out of sight of the kuahu in Hinahina reserve. My only thought is sound disturbance during people's prayers or ceremonies.

Lanakila

On Wed, Aug 20, 2025 at 11:14 AM Michelle Roberts <mroberts@srgii.com> wrote:

> Aloha,
>
> Sustainable Resources Group Intn'l Inc. is following up on the previously sent email regarding input on the proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The project requires the development of an Environmental Assessment including a Ka Pa'akai Analysis to identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site and consideration of if they would be affected by the proposed project.
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>
> ---
>
> **From:** Michelle Roberts
> **Sent:** Thursday, July 17, 2025 11:22 AM
> **Cc:** Kristin Duin <kduin@srgii.com>; Rodrigo Romo <rromo@hawaii.edu>
> **Subject:** Input Requested on Project to Upgrade Halepōhaku Fuel Storage System
>
> Aloha,
>
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> Michelle Roberts
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> www.srgii.com

Comments regarding the Upgrading of the Halepōhaku Fuel Storage System
Leilani Lindsey Kaʻapuni
25 August 2025

Maunakea is part of Hawaiian Crown Lands, illegally seized by the United States after the illegal overthrow of Queen Liliʻuokalani in 1893. Maunakea continues to be illegally occupied by the State of Hawaii and mismanaged by the University of Hawaii's Center for Maunakea Stewardship (CMS).

The area known as Halepōhaku, which is located on Maunakea at approximately 9,200 foot elevation, is a place of high reverence and cultural significance to Hawaiians knowledgeable about this area. Halepōhaku was the name of a heiau erected there by Umialiloa, ruling chief of Hawaiʻi island in the 15th and 16th centuries. The heiau Halepōhaku was a place of ceremony in the sacred realm of the gods. Ceremony on Maunakea has been an enduring, dedicated commitment by families, chiefly orders, kāne and wāhine practitioners who have upheld religious reciprocal conduct of kapu aloha from time immemorial.

Stone houses built at the 9,220 elevation of Maunakea in 1936 and 1939 by the Civilian Conservation Corps (CCC) were named Hale Pohaku. Those structures, however, were not the origin of the name of this culturally significant landscape. The construction of mid-level astronomy facilities and a visitor center at Halepōhaku have devastated the natural beauty and the sacred nature of that high plain. Many have testified in the past before UH's previous Office of Mauna Kea Management in opposition to the industrialization and exploitation of the Halepōhaku area. Our voices to stop the clear cutting and removal of native māmane trees in 2015-2016 were ignored in order to expand a parking lot for tourists, impacting the critical natural habitat and food source of the endangered palila bird. Even at this current time, tourists regularly enter the silversword enclosed area, interrupting cultural ceremonies conducted at the Ahu ʻĀpapalani.

Regarding the proposed Upgrading of the Halepōhaku Fuel Storage System, it is critical to decommission and remove fuel tanks originally installed between 1982-1983, along with buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines, in order to protect the sacred water sources of ka wai kapu a Kāne that flow from the summit of Maunakea. I am opposed to the installation of new fuel tanks that put at risk our water sources and impact the natural environment and the sacred landscape of Halepōhaku.

Me ke aloha ʻāina mauna,
Leilani Lindsey Kaʻapuni
Wahine ʻĀpapalani

Outlook

Fwd: FW: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System - [UNCLASSIFIED]

From Breathe Hawaiian <breathehawaiian@gmail.com>
Date Tue 8/26/2025 11:55 PM
To Michelle Roberts <mroberts@srgii.com>
Cc Auld, Lyle CIV (USA) <lyle.auld.civ@army.mil>; Kristin Duin <kduin@srgii.com>; rromo@hawaii.edu <rromo@hawaii.edu>; halealohahapai64@gmail.com <halealohahapai64@gmail.com>; Ku Kahakalau <kukahakalau@gmail.com>; Luana Busby Neff <luanabusbyneff@gmail.com>; Leilani Lindsey Kaapuni <lkaapuni@gmail.com>; iinikahakalau@gmail.com <iinikahakalau@gmail.com>; haloa@kalo.org <haloa@kalo.org>; kualiic@gmail.com <kualiic@gmail.com>; guanson@me.com <guanson@me.com>; hawnforce@gmail.com <hawnforce@gmail.com>; leihuluokealiilani@gmail.com <leihuluokealiilani@gmail.com>; Mary Maxine Kahaulelio <mmkahaulelio@yahoo.com>; E. Flores <08ef80@gmail.com>; eleelekupuna1@icloud.com <eleelekupuna1@icloud.com>; Debralee Kailiwai-Ray <kairay808@gmail.com>; kahunaiwi@yahoo.com <kahunaiwi@yahoo.com>; pilago@hawaii.edu <pilago@hawaii.edu>; gchun711@hawaii.edu <gchun711@hawaii.edu>

Ms. Roberts,

In answer to your email regarding cultural and traditional rights and in alignment with the history, culture, and tradition of Ko Hawai'i Pae 'Āina, the wartime convention/treaty of truce of January 17, 1893, more commonly known as the Queen's Protest, concluded to establish a suspension of hostilities, "to avoid any collision of armed forces and perhaps the loss of life" (bloodshed) during the course of a war, perpetually bars the US government from claims against the government, territories and dependencies of the Hawaiian Kingdom.

A violation of the terms and stipulations of said Treaty - the supreme law of the land - constitutes a breach of contract and raises the question as to the right of the state and Federal governments' exercise of authority over land usage in this Aupuni o Hawai'i.

Therefore, the continued effort of governmental agencies to perpetuate acts of hostility, as in said project, constitutes a violation of international law and the rights of the Hawaiian people, historical, cultural and traditional.

Na'u,
Mana Kapele

---------- Forwarded message ---------
From: **Edward Halealoha Ayau** <halealohahapai64@gmail.com>
Date: Tue, Aug 26, 2025, 4:02 PM
Subject: Re: FW: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System - [UNCLASSIFIED]
To: Auld, Lyle CIV USARMY IMCOM PACIFIC (USA) <lyle.auld.civ@army.mil>
Cc: Kū Kahakalau <kukahakalau@gmail.com>, Luana Busby Neff <luanabusbyneff@gmail.com>, Leilani Lindsey Kaapuni <lkaapuni@gmail.com>, Iini Kahakalau <iinikahakalau@gmail.com>, Nalei Kahakalau <haloa@kalo.org>, Joseph Camara <kualiic@gmail.com>, guanson@me.com <guanson@me.com>, Craig Neff <hawnforce@gmail.com>, leihuluokealiilani@gmail.com <leihuluokealiilani@gmail.com>, matthewkahoopii@gmail.com <matthewkahoopii@gmail.com>, mmkahaulelio@yahoo.com <mmkahaulelio@yahoo.com>, Breathe Hawaiian <breathehawaiian@gmail.com>, E. Flores <08ef80@gmail.com>, kairay808@gmail.com <kairay808@gmail.com>, eleelekupuna1@icloud.com <eleelekupuna1@icloud.com>, kahunaiwi@yahoo.com <kahunaiwi@yahoo.com>, Kaleo <pilago@hawaii.edu>, Gregory Chun <gchun711@hawaii.edu>

The cultural input is simple: 'A'ole. Cannot do

On Tue, Aug 26, 2025 at 3:59 PM Auld, Lyle CIV USARMY IMCOM PACIFIC (USA) <lyle.auld.civ@army.mil> wrote:

> **UNCLASSIFIED**
>
> FYI
>
> Aloha Kākou,
>
> I got the below email the other day while I was in O'ahu (section 106 training) and the University of Hawai'i Center for Mauna Kea Stewardship (CMS) has hired Sustainable Resources Group Intn'l Inc. to prepare an Environmental Assessment (EA) for a proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The EA is being prepared in accordance with State regulations.
>
> They need some feedback from a cultural usage perspective. Please send in your comments or concerns and consider any impacts to the cultural properties and lifeways of this region. Please forward this email to family and friends who can assist in this request.
>
> I apologize for not seeing this earlier to send out to our neighbors and consulting parties, but I know many of you, **are always ready to protect!** Please see the below correspondence of the project details and let's fill up this inbox.
>
> Due: 27 August 2025 – tomorrow., www.srgii.com
>
> kduin@srgii.com
>
> rromo@hawaii.edu
>
> Me ka ha'aha'a,
>
> Lyle
>
> **Lyle Auld B.A.**
>
> Archaeologist
>
> USAG-HI Cultural Resources
>
> Cell: (808) 936-6515
>
> Desk: (808) 787-7802
>
> **UNCLASSIFIED**

From: Michelle Roberts <mroberts@srgii.com>
Sent: Wednesday, August 20, 2025 10:59 AM
Cc: Kristin Duin <kduin@srgii.com>; Rodrigo Romo <rromo@hawaii.edu>
Subject: Re: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System

You don't often get email from mroberts@srgii.com. Learn why this is important

Aloha,

Sustainable Resources Group Intn'l Inc. is following up on the previously sent email regarding input on the proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The project requires the development of an Environmental Assessment including a Ka Pa'akai Analysis to identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site and consideration of if they would be affected by the proposed project.

Please see the email below sent on July 17, 2025 for more information as well as the attached project description and site location. We appreciate any information you wish to provide, and kindly ask that you submit comments by August 27, 2025 (an extension of the previously requested date of August 18, 2025).

If you have any questions or would like to discuss, you can reach me at 808-772-1836. If you do not wish to receive future updates about this project, please let me know.

Thank you,

Michelle Roberts

Michelle Roberts

Sustainable Resources Group Intn'l, Inc.

808.772.1836 (direct)

808.356.0552 (ph/fx)

www.srgii.com

From: Michelle Roberts
Sent: Thursday, July 17, 2025 11:22 AM
Cc: Kristin Duin <kduin@srgii.com>; Rodrigo Romo <rromo@hawaii.edu>
Subject: Input Requested on Project to Upgrade Halepōhaku Fuel Storage System

Aloha,

Sustainable Resources Group Intn'l Inc. has been hired by the University of Hawai'i at Hilo Center for Maunakea Stewardship (CMS) to prepare an Environmental Assessment (EA) for a proposed fuel storage system upgrade at the Maintenance Facility Area in the Halepōhaku parcel on Maunakea (Tax Parcel ID (3) 4-4-15:12). The EA is being prepared in accordance with State regulations. A detailed project description and site maps are attached.

Development of the EA includes evaluating potential impacts to cultural resources. This includes conducting a Ka Pa'akai Analysis to identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site and consider if they would be affected by the proposed project.

Your contact information was provided by the CMS, who thought you might have relevant information to contribute. We are seeking any knowledge you may have about Native Hawaiian traditional and customary rights or practices that take place within or near the project site. While we recognize that many cultural practices are associated with the higher elevations of Maunakea, our focus is on those occurring in the area around Halepōhaku.

The EA will address potential impacts to cultural resources, including the contemporary ahu located within the DLNR-managed silversword enclosure, two historic shrines just south of the Halepōhaku parcel within the Mauna Kea Forest Reserve near the dirt jeep road, and the practice of collecting ko'oko'olau and māmane for medicinal or cultural purposes. Although the proposed project may temporarily restrict access to or through the project site during active construction, it is our understanding that cultural practitioners are not known to frequent this particular area of Halepōhaku.

In addition to helping identify any Native Hawaiian traditional and customary rights or practices that may occur within or near the project site, we would appreciate your thoughts on whether the proposed project might any impact on those practices. If you believe the project could negatively impact any traditional and customary rights, we welcome your suggestions on possible measures to help protect them.

Please note, the proposed project requires consultation with the Hawai'i State Historic Preservation Division to determine any impacts to historic properties and what action should be taken to avoid them. Although the project site does not contain any known historic resources, an archeological monitor will be present during all ground disturbing activities, as required by the Maunakea Comprehensive Management Plan. This plan guides the management and protection of cultural, historic, and natural resources within the UH managed lands on Maunakea.

We appreciate your response as it will help ensure a meaningful and thoughtful analysis. Please feel free to share this email with others in the community who may have knowledge of cultural practices within or near the project site.

We kindly ask that you submit any comments or information by August 18, 2025.

The EA will be made available for public review through the Environmental Review Program, and we will notify you once it is released.

If you have any questions or would like to discuss, you can reach me at 808-772-1836. If you do not wish to receive future updates about this project, please let me know.

Thank you,

Michelle Roberts

Michelle Roberts

Sustainable Resources Group Intn'l, Inc.

808.772.1836 (direct)

808.356.0552 (ph/fx)

www.srgii.com

Appendix B3. Draft EA Comments and Responses

Contains comments received during the Draft EA public review period, along with responses.

Review Comments: Draft Environmental Assessment: Upgrading Halepōhaku Fuel Storage System

Reviewer Name and Affiliation: Department of Health Clean Air Branch
Contact Information (for clarification): Lisa Kitahara
Document: Draft EA: Upgrading Halepōhaku Fuel Storage System

Page	Comment	Response
General	Thank you for the opportunity to review the Upgrading Halepōhaku Fuel Storage System Draft Environmental Assessment- Anticipated Finding of No Significant Impact (DEA- (AFNSI) published in December 08, 2025 edition of The Environmental Notice. Please visit the Clean Air Branch (CAB) website to download and reference our Standard Comments for Land Use Reviews. The link is provided https://health.hawaii.gov/cab/files/2024/07/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-July_2024.pdf	All items in the Standard Comments for Land Use Reviews have been addressed in the Environmental Assessment.

Reviewer Name and Affiliation: Maunakea Stewardship and Oversight Authority
Date: Draft EA Review Meeting November 13, 2025
Document: Draft EA: Upgrading Halepōhaku Fuel Storage System

Page	Comment	Response
General	Thank you for the opportunity to review the Upgrading Halepōhaku Fuel Storage System Draft Environmental Assessment- Anticipated Finding of No Significant Impact (DEA- (AFNSI) published in December 08, 2025 edition of The Environmental Notice. Please visit the Clean Air Branch (CAB) website to download and reference our Standard Comments for Land Use Reviews. The link is provided https://health.hawaii.gov/cab/files/2024/07/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-July_2024.pdf	All items in the Standard Comments for Land Use Reviews have been addressed in the Environmental Assessment.

Review Comments: Draft Environmental Assessment: Upgrading Halepōhaku Fuel Storage System

Reviewer Name and Affiliation: Joy Yoshina, CMS
Contact Information (for clarification): yoshina9@hawaii.edu
Document: Draft EA: Upgrading Halepōhaku Fuel Storage System

Page	Section/ Line	Comment	Response
9	Table 3	Rangers have recently (Dec 2025 and Jan 2026) observed ʻIo and pueo flying around HP – suggest changing their Occurrence to "Known intermittent"?	Table and text changed to be reflective of these new sightings.
10	Habitat	Suggest editing to "A long history of feral ~~mammal~~ ungulate browsing around [HP]…"	Changed.

Appendix C. Documentation for Compliance with HRS 6E-8

SHPD Letter of Concurrence (September 26, 2025)

SHPD Letter of Acceptance (December 1, 2025)

Final Archaeological Monitoring Plan in Support of the Upgrading Halepōhaku Fuel Storage System Project Within a University of Hawai‘i Management Area on Maunakea, Ka‘ohe Ahupua‘a, Hāmākua District, Hawai‘i Island, State of Hawaii. TMK (3) 4-4-015:012. (January 2026)

FINAL

Archaeological Monitoring Plan in Support of the Upgrading Halepōhaku Fuel Storage System Project Within a University of Hawai‘i Management Area on Maunakea, Ka‘ohe Ahupua‘a, Hāmākua District, Hawai‘i Island, State of Hawaii

TMK (3) 4-4-015:012

HICRIS Project 2025PR00823

Prepared For:
Sustainable Resources Group Intn’l, Inc.
111 Hekili Street, Suite A373
Kailua, HI 96734

January 2026

PACIFIC CONSULTING SERVICES, INCORPORATED
1130 NORTH NIMITZ HWY, SUITE C-300, HONOLULU HAWAII 96817

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

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

September 26, 2025

IN REPLY REFER TO:
Project No. 2025PR00823
Doc. No. 2509JG12
Archaeology

Gregory Chun, Executive Director
Center for Maunakea Stewardship
University of Hawai‘i at Hilo
200 W. Kawili St.
Hilo, HI 96720
E-mail: cmshilo@hawaii.edu

Dear Gregory Chun:

SUBJECT: **Hawaii Revised Statutes (HRS) Chapter 6E-8 Historic Preservation Review – Request for Concurrence with an Effect Determination**
University of Hawai‘i at Hilo – Upgrading Halepōhaku Fuel Storage System Project
Ka‘ohe Mauka Ahupua‘a, Hāmākua District, Island of Hawai‘i
TMK: (3) 4-4-015:012

This letter provides the State Historic Preservation Division’s (SHPD) review of the subject University of Hawai‘i at Hilo Center for Maunakea Stewardship (CMS) proposed project received on July 17, 2025. The submittal included a cover letter, maps of the project area, construction plans, and photos and satellite images of the project area.

The proposed project area comprises a 0.85-acre portion of the subject project parcel. The CMS proposes decommissioning three single-wall fiberglass underground fuel storage tanks (UST) and associated infrastructure within the Maintenance Facility Area at Halepōhaku on Maunakea and replacing them with two aboveground storage tanks (AST). Removal of the USTs will require excavating an ~385-sq.-ft. area for the diesel tank and a ~ 600-sq.-ft. area for the two gasoline tanks combined. Removal of the buried lines will require trenching (~240 ft. by 2 ft.) within an area comprised of asphalt concrete and trenching (~22.5 ft. by 2 ft.) in an area of previously disturbed soil. Removal of the dispensing pumps concrete pad will require excavation of a ~65-sq.-ft. area. The proposed ASTs will be installed on a single concrete slab that will measure ~ 322 sq. ft.

The HICRIS submittal materials indicate that the project area was previously impacted by the development of the existing facility and that a historic property (Site # 50-10-23-10314 [lithic scatter]) is located 50 m. north/northeast of the project area. A review of SHPD records indicates that the project area was included as part of a previous reconnaissance survey (Robbins and Hammatt 1991) and that it is also within Site # 50-10-23-31382 [Mauna Kea Traditional Cultural Property and District]. Site # 50-10-23-31382 has been assessed as significant under criteria a, b, c, d, and e and recommended for preservation. Additionally, contemporary aerial imagery confirms that the project area has been previous impacted by the development of the existing facilities.

Based on the information provided above, and the limited scope of the proposed ground-disturbing activities, **the SHPD concurs** with a project determination of “No historic properties affected” for the subject project, pursuant to HAR §13-275-7(a)(1) with the understanding that archaeological monitoring will occur during the subject project per the Maunakea Comprehensive Management Plan. The proposed project will not impact any character-defining features contributing to the significance and eligibility of Site 50-10-23-31382 to be listed in the Hawaii Register of Historic

Places. Additionally, per HAR §13-275-7(e), when the SHPD agrees that the action will not affect any significant historic properties, this is the SHPD's written concurrence and the HRS §6E-8 historic preservation review ends.

The SHPD looks forward to receiving for review and acceptance an archaeological monitoring plan meeting the requirements of HAR §13-279-4 prior to project initiation per the requirement as presented in the Maunakea Comprehensive Management Plan. Please submit the requested archaeological monitoring plan and associated filing review fees to HICRIS Project No. 2025PR00823 in response to our HICRIS request.

SHPD will notify the CMS when the AMP is reviewed and accepted and project initiation may proceed.

The CMS is the office of record for this project. Please maintain a copy of this letter with your environmental review record for this project.

Please contact Joshua Gastilo at (808) 933-7653 or at Joshua.gastilo@hawaii.gov for any questions regarding this letter.

Aloha,

Jessica L. Puff
Administrator, State Historic Preservation
Deputy State Historic Preservation Officer

cc: Kristin Duin, kduin@srgii.com
Michelle Roberts, mroberts@srgii.com
Rodrigo Romo, rromo@hawaii.edu

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

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

December 1, 2025

IN REPLY REFER TO:
Project No. 2025PR00823
Doc. No. 2512JG01
Archaeology

Gregory Chun, Executive Director
Center for Maunakea Stewardship
University of Hawai‘i at Hilo
200 W. Kawili St.
Hilo, HI 96720
c/o cmshilo@hawaii.edu

Dear Gregory Chun:

SUBJECT: **Hawaii Revised Statutes (HRS) Chapter 6E-8 Historic Preservation Review –**
University of Hawai‘i at Hilo, Center for Maunakea Stewardship
Upgrading Halepōhaku Fuel Storage System Project
Archaeological Monitoring Plan
Ka‘ohe Mauka Ahupua‘a, Hāmākua District, Island of Hawai‘i
TMK: (3) 4-4-015:012

This letter provides the State Historic Preservation Division's (SHPD) review of the subject archaeological monitoring plan (AMP) titled, *Draft Archaeological Monitoring Plan in Support of the Upgrading Halepōhaku Fuel Storage System Project Within a University of Hawai‘i Management Area on Maunakea, Ka‘ohe Ahupua‘a, Hāmākua District, Hawai‘i Island, State of Hawaii, TMK (3) 4-4-015:012, HICRIS Project 2025PR00823* (Gosser, August 2025) prepared in support of the project and received by SHPD on November 26, 2025 (HICRIS Submission No. 2025PR00823.003). SHPD previously reviewed the project and concurred with a project effect determination of "No historic properties affected" (Doc. No. 2509JG12); however, the proponent indicated that archaeological monitoring would be conducted per the Maunakea Comprehensive Management Plan. The initial submittal received on July 17, 2025 included a letter dated July 16, 2025 from the University of Hawai‘i at Hilo, Center for Maunakea Stewardship (CMS), maps of the project area, construction plans, satellite images of the project area, and photos of the project area (HICRIS Submission No. 2025PR00823.001).

The proposed project area comprises a 0.85-acre portion of the subject project parcel. The CMS proposes decommissioning three single-wall fiberglass underground fuel storage tanks (UST) and associated infrastructure within the Maintenance Facility Area at Halepōhaku on Maunakea and replacing them with two aboveground storage tanks (AST). Removal of the USTs will require excavating an ~385-sq.-ft. area for the diesel tank and 600 sq. ft. for the two gasoline tanks combined. Removal of the buried lines will require a trenching of ~240 ft. of asphalt concrete and ~225 ft. of previously disturbed soil. Removal of the dispensing pumps concrete pad will require excavation of a 65-sq.-ft. area. The proposed ASTs will be installed on a single concrete slab that will measure ~322 sq. ft.

The Gosser (August 2025) AMP meets the minimum requirements of HAR §13-279-4. **It is accepted. Please include the following in the Final:**

- General comment. Revise the document so that "SIHP" is defined prior to using the acronym. Revise document to indicate that the project area is a 0.85-acre portion of the project parcel.
- Page 4, Figure 3. Revise image to include a close-up inset of the current project area.

- Pages 6 through 8, Previous Archaeological Investigations. Insert a map that displays where the discussed previous studies and previously identified sites are located relative to the current project area. Alternative to a map, you can indicate the distance and heading of the previous studies and historic properties relative to the project area in-text.
- Page 9, Archaeological Monitoring Methods. Revise this section to indicate that a map of the profile locations will be provided as part of the archaeological monitoring report.
- Pages 9 and 10, Treatment of Historic Properties. Revise this section to indicate that all collected artifacts and materials (except for radiocarbon samples) will be kept on Hawaii island.
- Page 11, Report Preparation. Revise this section to indicate that a brief archaeological monitoring letter report of findings as specified in HAR §13-282-3(f)(1) will be submitted to SHPD within 30 days of completion of archaeological monitoring fieldwork.

Please send one hard copy of the document, clearly marked FINAL, along with a copy of this letter and a text-searchable PDF version of the Final AMP to the Kapolei SHPD office, attention SHPD Library and another copy of the AMP and letter to the Hilo SHPD Office, attention Joshua Gastilo. Also submit a text-searchable PDF copy of the Final AMP to SHPD to HICRIS Project No. 2025PR00823 in response to our request, and a text-searchable PDF copy of the Final AMP to SHPD.Archaeology.Library@hawaii.gov.

SHPD hereby notifies the University of Hawai‘i at Hilo that the AMP has been accepted and the project initiation process may continue.

SHPD requests written notification via email and HICRIS at the start of archaeological monitoring. Within 30 days of completion of archaeological monitoring fieldwork, SHPD looks forward to receiving a brief archaeological monitoring letter report of findings as specified in HAR §13-282-3(f)(1). Within 60 days of the completion of archaeological monitoring field work, SHPD looks forward to receipt of an archaeological monitoring report meeting the requirements of HAR §13-279-5 for review and acceptance.

Please submit the AMR and associated review fee and any other project documents and correspondence to HICRIS Project No. 2025PR00823 in response to our request.

Please contact Joshua Gastilo at Joshua.gastilo@hawaii.gov for any questions regarding this letter.

Aloha,

Jessica L. Puff, PhD
Administrator, State Historic Preservation
Deputy State Historic Preservation Officer

cc: Kristin Duin, kduin@srgii.com
Michelle Roberts, mroberts@srgii.com
Rodrigo Romo, rromo@hawaii.edu
Dennis Gosser, info@pcsihawaii.com

FINAL

Archaeological Monitoring Plan in Support of the Upgrading Halepōhaku Fuel Storage System Project Within a University of Hawai‘i Management Area on Maunakea, Ka‘ohe Ahupua‘a, Hāmākua District, Hawai‘i Island, State of Hawaii

TMK (3) 4-4-015:012

Prepared By
Dennis Gosser, M.A.

Pacific Consulting Services, Inc.
1130 North Nimitz Hwy, Suite C-300
Honolulu, Hawaii 96817

Prepared For:
Sustainable Resources Group Intn’l, Inc.
111 Hekili Street, Suite A373
Kailua, HI 96734

HICRIS Project 2025PR00823

January 2026

MANAGEMENT SUMMARY

Document Title:	Archaeological Monitoring Plan in Support of the Upgrading Halepōhaku Fuel Storage System Project Within a University of Hawai‘i Management Area on Maunakea, Ka‘ohe Ahupua‘a, Hāmākua District, Hawai‘i Island, State of Hawaii
Date/Revised Date:	Draft: August 2025; Final January 2026
Archaeological Permit #:	SHPD Permit No. 25-01, 26-37
HICRIS Project #	2025PR00823
Project Location:	Maunakea, Ka‘ohe Ahupua‘a, Hāmākua District, Hawai‘i Island, State of Hawaii
Project TMK:	TMK (3) 4-4-015:012
Landowner:	State of Hawaii
Project Proponents:	Center for Maunakea Stewardship (formerly Office of Maunakea Management
Project Tasks:	Archaeological Monitoring Plan
Parcel Acreage:	Halepōhaku: 19.3 ac.; Project Area: 0.85 ac.
Principal Investigator:	Dennis Gosser, M.A.
Regulatory Oversight:	Chapter 6E-7 and 6E-8, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HAR) Chapters 279
Statewide Inventory of Historic Places (SIHP) #:	The current project is within the Mauna a Wākea Traditional Cultural Property and District (SIHP 50-10-23-31382) and approximately 50 m west and southwest of SIHP 50-10-23-10314
Project Summary	The Center for Maunakea Stewardship (CMS) proposes to decommission three single-wall fiberglass underground fuel storage tanks (USTs) within the maintenance facility area at Halepōhaku and replace them with two aboveground storage tanks (ASTs). The three tanks (a 12,000-gallon diesel tank, a 4,000-gallon gasoline tank, and a 2,000-gallon gasoline tank) were installed between 1982 and 1983.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Under contract to the Sustainable Resources Group Intn'l, Inc. (SRGII), Pacific Consulting Services, Inc. (PCSI) has prepared this archaeological monitoring plan (AMP) in support of the Upgrading Halepōhaku Fuel Storage System Project located within the Mid-Level Facilities at Halepōhaku (TMK: [3] 4-4-015:012) on Maunakea[1], Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i, State of Hawaii (Figures 1, 2, 3). The AMP has been prepared in accordance with Hawaii Revised Statutes (HRS), Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division [SHPD] Rules), Chapter 279 (Rules Governing Standards for Archaeological Monitoring Studies and Reports).

PROJECT SITE AREA DESCRIPTION AND BACKGROUND

The current project area, roughly 0.85-acres, is situated within a 19.3-acre leased parcel (Lease No. S-5529) at Halepōhaku (CDUP No. HA-1819, TMK: [3] 4-4-015:012) which includes the Onizuka Center for International Astronomy (OCIA) Visitor Information Station (VIS), the mid-level observatory support facilities, and a mid-1980s-era construction laborer camp (see Figure 2).

The Center for Maunakea Stewardship (CMS) proposes to decommission three single-wall fiberglass underground fuel storage tanks (USTs) within the maintenance facility area at Halepōhaku on Maunakea and replace them with two above-ground storage tanks (ASTs) (Figure 4). The USTs would be removed in accordance with the 2028 regulatory deadline pursuant to Hawaii Administrative Rules (HAR) Chapter 11-280.1-21, "Upgrading UST Systems." The USTs were originally approved under Conservation District Use Permit (CDUP) 1430. The three tanks (a 12,000-gallon diesel tank, a 4,000-gallon gasoline tank, and a 2,000-gallon gasoline tank) were installed between 1982 and 1983. The two new ASTs each have a capacity of approximately 3,000 gallons, which will result in an overall decrease of fuel storage capacity of 12,000 gallons at Halepōhaku.

The decommissioning involves the removal of all three tanks, buried fuel lines, fuel transfer pumps, dispensing pumps, and electrical lines. Buried lines for the diesel tank run from the USTs to the dispensing pump, to the old generator room, and to the boiler room in the common building at Halepōhaku. Buried lines for the two gasoline tanks run from the USTs to the two gasoline dispensing pumps. Removal of the buried lines requires trenching (0.6 m [2 ft.] width) of approximately 73.2 m (240 linear ft.) of asphalt concrete and approximately 68.6 m (225 linear ft.) of previously disturbed soil. Lines will be disconnected and capped at building terminations. Removal of the dispensing pumps concrete pad requires disturbing approximately 6 m^2 (65 $ft.^2$). Removal of the USTs requires digging out approximately 35.8 m^2 (385 $ft.^2$) for the diesel tank and 55.7 m^2 (600 $ft.^2$) for the two gasoline tanks combined.

Excavation depths vary across the project site. Excavated material will be temporarily stockpiled. Voids created by equipment removal will be backfilled in layers, utilizing on-site excavated material, drain rock from both on-site and off-site sources, and cinder from on-site or pre-existing Maunakea stockpiles (see Appendix A).

[1] PCSI follows the latest edition of the Society for American Archaeology (SAA) Style Guide regarding textual elements (e.g., numbers, dates, statistical copy, italicization, capitalization, hyphenation, accents and diacritical marks, and citations). The authority for English spelling is the most recent edition of Merriam-Webster's Collegiate Dictionary. Unless noted, the authorities for Hawaiian spelling and geographic place names are the Hawaiian Dictionary (Pukui and Elbert 2003), the most recent listing of the Hawai'i Board on Geographic Names (HBGN), and Place Names of Hawaii (Pukui et al. 1984). Maunakea and Halepōhaku are CMS's preferred spelling. PCSI uses the official spelling of Hawaii in reference to the State and its agencies (with some exceptions) and Hawai'i in reference to Hawai'i Island. Quotations retain original spellings.

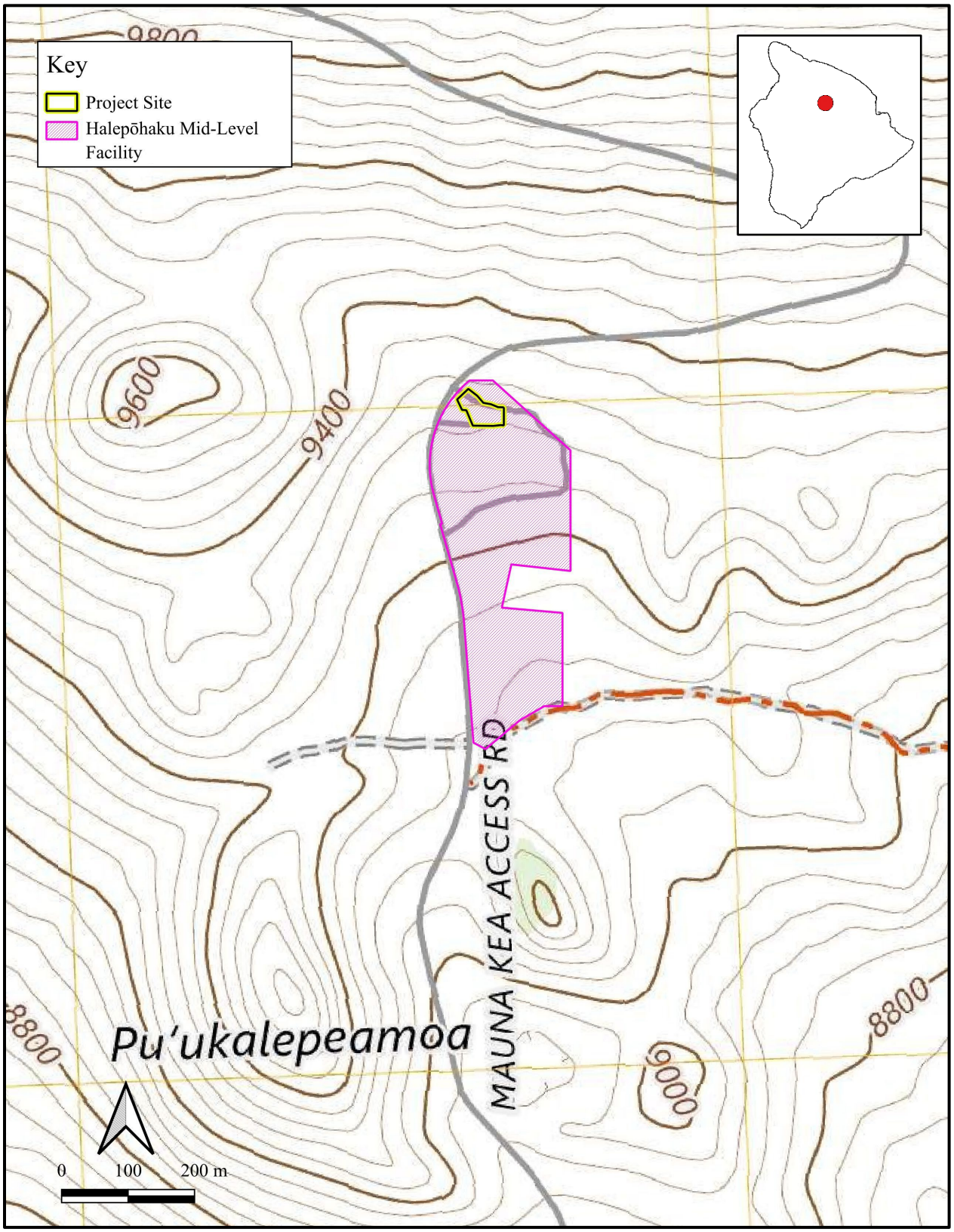

Figure 1. Project Site Within the Halepōhaku Mid-Level Facilities on Maunakea Shown on the 2024 USGS Mauna Kea Topographic Quadrangle.

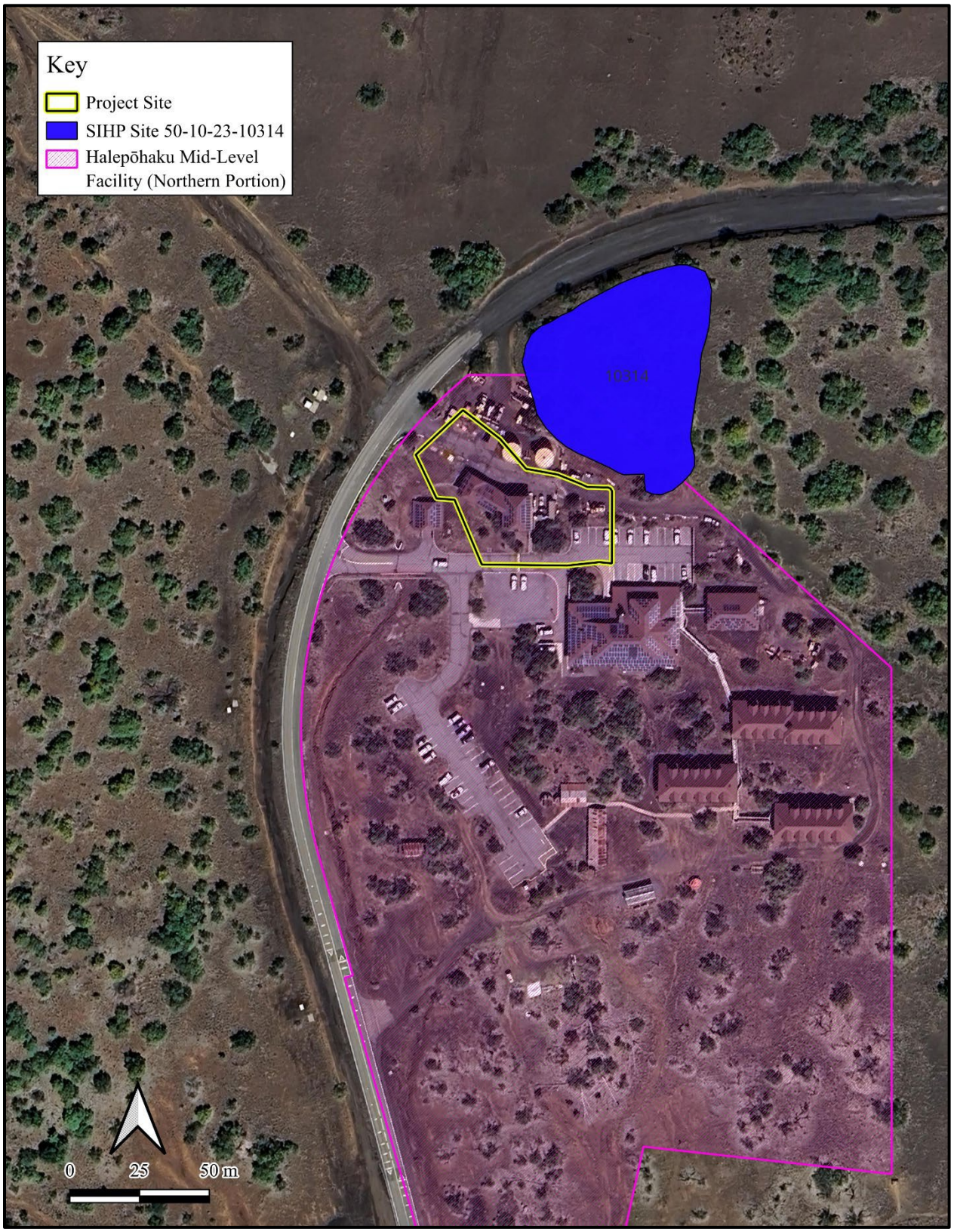

Figure 2. Project Site Area Within the Halepōhaku Mid-Level Facilities on Maunakea Showing SIHP Site 50-10-23-10314.

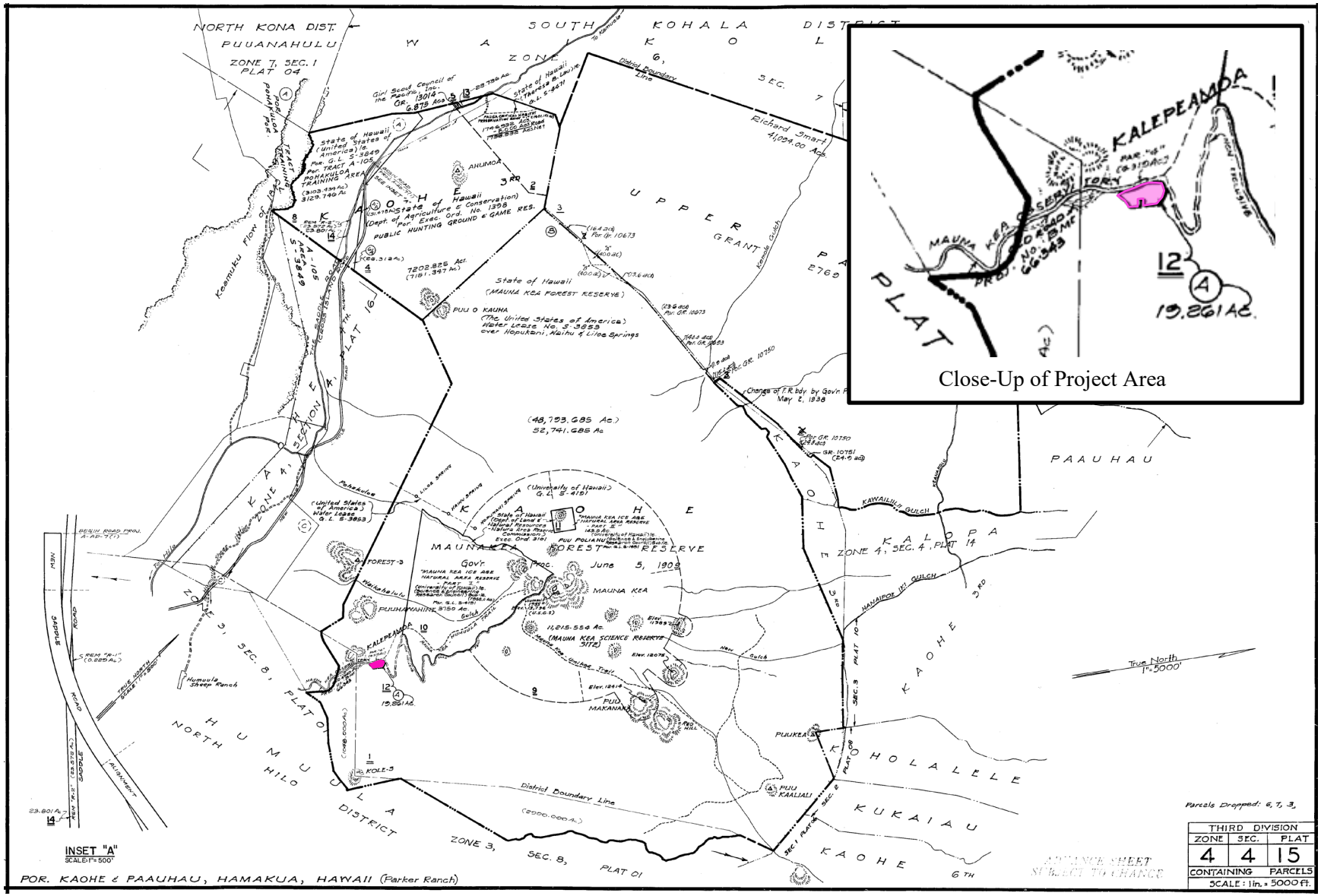

Figure 3. The Halepōhaku Mid-Level Facilities (Pink) Shown on the TMK Map.

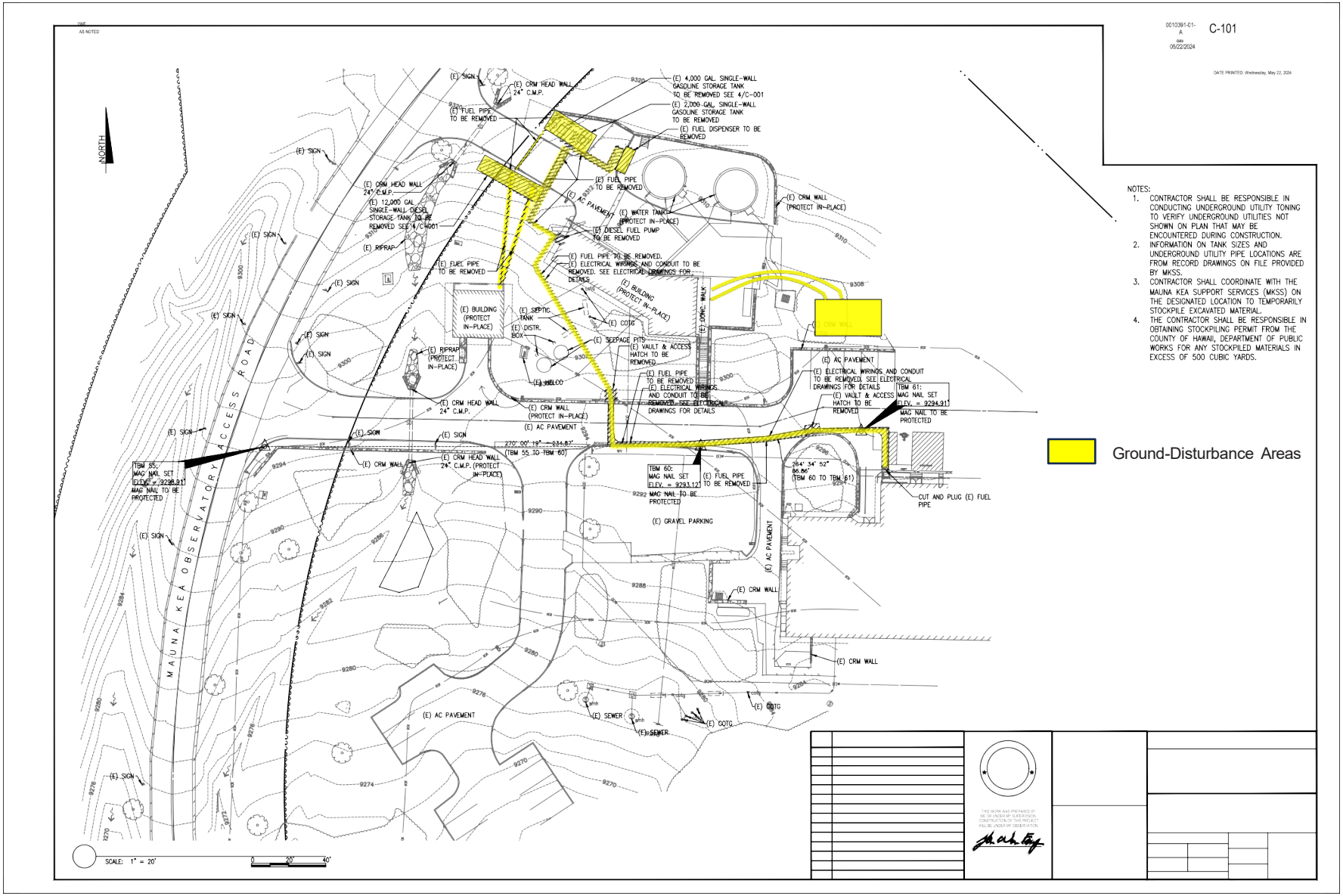

Figure 4. The Halepōhaku Mid-Level Facilities Showing Areas of Anticipated Ground-Disturbance.

ENVIRONMENTAL BACKGROUND

GEOLOGY OF THE SUMMIT REGION

Maunakea is the tallest (13,796 feet above mean sea level) and second largest of five shield volcanoes forming Hawai‘i Island. Numerous cinder cones and associated lava flows make up the summit plateau of Maunakea, which is characterized as an alpine stone desert (Gerrish 2013). Soils, like those in other alpine environments, are poorly developed and lack vegetative cover (Ugolini 1974, 1975). Evidence of a periglacial environment on Maunakea includes diverse forms of patterned ground such as stone stripes and polygons (Washburn 1956, 1979). On Maunakea, the most common type of mass-movement landform in the summit region are the stone-banked terraces or lobes (Davies 1972:49-51), which are variably called solifluction or gelifluction terraces and lobes.

FLORA AND FAUNA OF HALEPŌHAKU

The higher elevations of Maunakea include two zones: the subalpine zone (5,600 ft. to 9,500 ft. elevation) and the alpine zone (above 9,500 ft.); Halepōhaku is at the upper boundary of the subalpine zone and its plant community includes māmane trees (*Sophora chrysophylla*) interspersed with open areas of soil or basalt outcrop. Understory plants include grasses (alpine hairgrass and *pili uka [Trisetum glomeratum]*), shrubs (*‘āheahea [Chenopodium oahuense]*, *pūkiawe [Leptecophylla tameiameiae]*, and *nohoanu [Geranium cuneatum]*), ferns (*kalamoho [Pallaea ternifolla]*, and *‘iwa‘iwa [Adiantum capillus- veneris]*), and vines (little leaf stenogyne and *ma‘ohi‘ohi [Stenogyne calaminthoides]*).

The māmane woodlands are home to several native arthropods, and several native birds such as the *palila [Loxiodes bailleui]*, *‘amakihi [Chlorodrepanis virens]*, *‘apapane [Himatione sanguinea]*, *‘elepaio [Chasiempis sandwichensis]*, *‘akiapola‘au [Hemignathus wilsoni]*, and *‘i‘iwi [Drepanis coccinea]*. The māmane woodlands are also inhabited by non-native birds and mammals such as cats, rats, barn owls, and mongoose.

SOILS

Soils within the project site area include Pohakulehu-Lanapohaku complex, which are very stony highly organic sandy loams derived from basic volcanic ash over aa lava.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Historic preservation investigations began at Halepōhaku in 1979 in conjunction with preparing the Halepōhaku Mid-Level Facilities Complex Development Plan (Figure 5;Table 1). No archaeological sites were found in a one-day reconnaissance of the Mid-Level Facilities area and a second parcel of land at the 8,000 ft. elevation on the east side of the summit road (McCoy 1979).

Between 1984 and 1985, five noncontiguous pre-Contact lithic scatters and two pre-Contact shrines (Pu’u Kalepeamoa Site) were recorded within and adjacent to the Halepōhaku Mid-Level Facilities as part of archaeological surveys in support of a supplemental Environmental Impact Statement (EIS) for a permit to build a new construction laborer camp (McCoy 1985).

Bonk (1986) conducted an archaeological reconnaissance survey of the overhead transmission line corridor from Hwy 200 (Saddle Road) to the HELCO substation to the west of the Halepōhaku Mid-Level Facilities; no evidence of pre-Contact archaeological sites was recorded.

Several lithic scatters were subsequently found by Patrick McCoy near the Halepōhaku Mid-Level Facilities and the HELCO substation in 1986. A second reconnaissance level survey of the overhead transmission line corridor, in the vicinity of the substation, was conducted on May 11-22, 1987 (Sinoto letter report dated May 29, 1987). Seven previously unrecorded archaeological sites were recorded at that time.

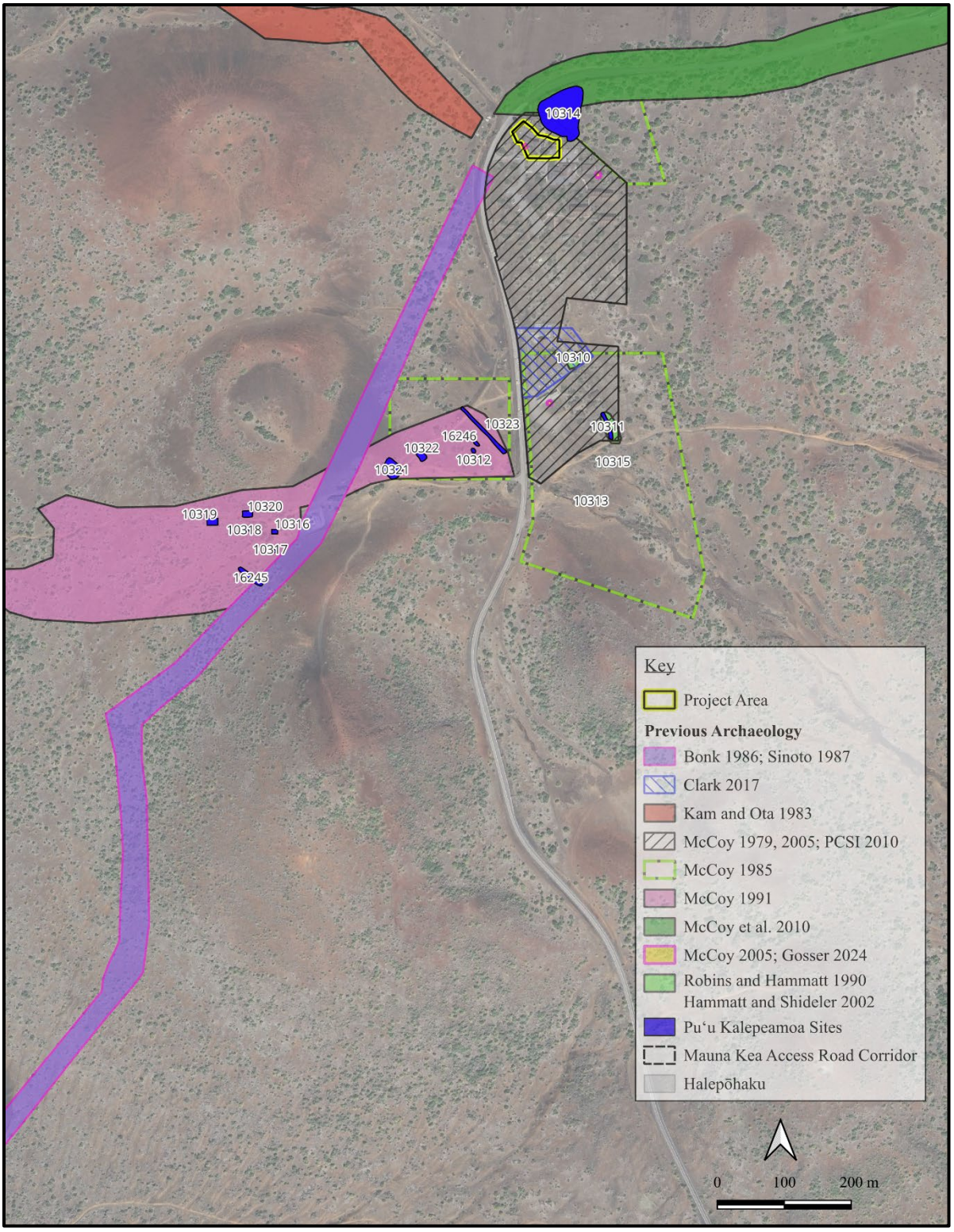

Figure 5. Previous Archaedological Projects and Sites Near the Project Area.

Table 1. Previous Historic Preservation Studies Within or Near the Mid-Level Facilities at Halepōhaku.

Year	Project	Study Type	References
1979	Hale Pōhaku Mid-Level Facilities Complex Development Plan	Reconnaissance	McCoy 1979
1984-1985	Supplemental EIS for Construction Laborer Camp	Reconnaissance	McCoy 1985
1986	HELCO transmission line and substation	Reconnaissance	Bonk 1986
1987	HELCO transmission line and substation	Reconnaissance	Sinoto 1987
1987	HELCO substation and the surrounding area	Data recovery	McCoy 1991
1990	Japan National Large Telescope Dormitories	Reconnaissance	Robins and Hammatt 1990
1993	Japan National Large Telescope Dormitories	Data Recovery	Hammatt and Shideler 2002
2005	Septic Tank Excavations	Monitoring	McCoy 2005
2009	Architectural Inventory	Inventory	PCSI 2010
2005-2009	OMKM AIS of MKSR	AIS	McCoy and Nees 2010
2010	OMKM AIS of the Maunakea Access Road Management Corridor	AIS	McCoy et al. 2010
2012-present	Long-Term Historic Property Monitoring	Assessment	Gosser et al. 2015
	VIS Ingress/Egress	Archaeological Site Visit	Clark 2017
	Cesspool removals at HP	Monitoring	Gosser 2024

McCoy (McCoy 1990, 1991) undertook data recovery investigations at 11 localities of the Pu‘u Kalepeamoa Site complex in September 1987. A total of 2,364 artifacts and 129 non-human faunal remains were collected. Analysis of the artifact collection, which is comprised of mostly adze manufacturing by-products from the Mauna Kea Adze Quarry and octopus sinker manufacturing by-products, provided new information on these two craft activities.

Robins and Hammatt (1990) conducted an archaeological reconnaissance survey at the Halepōhaku Mid-Level Facilities on 9 August 1990. The survey, which was undertaken in connection with the construction of dormitories for the Japan National Large Telescope (JNLT), covered a portion of the area surveyed by McCoy in 1985. The survey, which relocated lithic scatters 1 and 2, recommended data recovery investigations prior to the construction of the dormitories.

Data recovery investigations of two lithic scatters, Statewide Inventory of Historic Places (SIHP) 50-10-23-10310 and SIHP 50-10-23-10311), both located to the south of the current project site, were undertaken between 19 and 20 October 1993 (Hammatt and Shideler 2002). These scatters, which were subsequently assigned individual site numbers by the SHPD, are located east and south of the Visitor Information Station (McCoy 1991: Figure 5; Hammatt and Shideler 2002: Figure 1). Two radiocarbon dates indicate a late pre-Contact occupation of the camp site.

Between 2005 and 2009, intensive archaeological inventory surveys (AIS) were undertaken within the three UH management areas on Maunakea (McCoy et al. 2010; McCoy and Nees 2010; PCSI 2010), which included the Halepōhaku Mid-Level Facilities. Between 2012 and 2025, yearly historic preservation assessments of sites within

the UH management areas have not documented significant changes to traditional Hawaiian sites within the Halepōhaku Mid-Level Facilities. In addition, no previously undocumented traditional Hawaiian sites within the Halepōhaku Mid-Level Facilities have been recorded as part of the assessment program.

In October 2016, PCSI conducted a pedestrian survey of an approximately 7.3-acre project area near the Mauna Kea Visitor Information Center (VIS) before planned improvements. No previously recorded archaeological sites were recorded and no cultural material was recorded within two previously recorded sites (SIHP 50-10-23-10310 and SIHP 50-10-23-10311), which were subject to data recovery investigations (Hammatt and Shideler 2002).

In 2024, PCSI conducted archaeological monitoring in support of removing three cesspools at the Halepōhaku Mid-Level Facilities, and one cesspool at the James Clerk Maxwell Telescope at the Maunakea summit. No historic properties were recorded during the project.

ANTICIPATED FINDS

The current project is within the Mauna a Wākea Traditional Cultural Property and District (SIHP 50-10-23-31382) and approximately 50 m west and southwest of SIHP 50-10-23-10314, a traditional lithic scatter. SIHP 10314 has been monitored annually since 2012; some localized erosion has been recorded along the north and southeast boundaries. Because the project site area is within a highly disturbed area within SIHP 31382 and at a lower elevation SIHP 10314, the current project is unlikely to impact either historic property.

MONITORING PROCEDURES

All archaeological monitoring activities will be conducted in compliance with Chapter 6E of the HRS and HAR Chapter §13-279 (*Rules Governing Standards for Archaeological Monitoring Studies and Reports*).

PROJECT PERSONNEL

A senior archaeologist, qualified under HAR §13-281, will serve as principal investigator (PI) for the project. The PI will be responsible for overall project organization and quality assurance of field and laboratory work, as well as report content. The archaeological monitor will have two years of fieldwork experience in Hawaii.

PRE-CONSTRUCTION CONFERENCE

Before work begins the on-site archaeologist will give a presentation to the construction crew regarding what archaeological materials may be encountered and the procedures to follow if archaeological materials are found, as well as the role of the archaeological monitor. At this time, it will be made clear that the archaeologist has the authority to stop work *immediately* to investigate and document, if necessary, potential archaeological deposits, subsurface features, or human burials.

During the pre-construction meeting, the PI will distribute copies of the AMP, review the archaeological provisions detailed within the AMP, discuss the types of archaeological remains or historic properties that are anticipated, including the potential for human burials, and note that it is the responsibility of the construction contractor to ensure that no ground disturbing activity is conducted without an archaeological monitor present. Hard copies of the SHPD-approved AMP will be provided on-site for both the construction contractor and the monitoring archaeologist for consultation and reference during the project.

EXTENT OF ARCHAEOLOGICAL MONITORING

Archaeological monitoring will be conducted during all ground disturbance related to the project. The monitoring schedule is dependent on the construction schedule and there may be days when no ground-disturbing activities are occurring, and archaeological monitoring is not needed.

Archaeological monitoring will consist of the identification, evaluation, collection, and recording of

archaeological remains during ground disturbing activities, and subsequent analysis and reporting. The data retrieved will be sufficient to characterize the nature of all major deposits and strata, regardless of the cultural content, and discuss their known extent through time and space. The PI and archaeological monitor are responsible for following the procedures outlined in HAR §13-280 (*Rules Governing General Procedures for Inadvertent Discoveries of Historic Properties During a Project Covered by Historic Preservation Review Process*).

ARCHAEOLOGICAL MONITORING METHODS

On-site archaeological monitoring will be conducted for all ground-disturbing activities. Any changes to the archaeological monitoring scope of work will be requested in writing via the HCIRIS Project Supplement option. Changes can only be implemented after written approval from SHPD.

Due to the proximity of ground-disturbing activities, boundaries of Site SIHP # 10314, a lithic scatter, will be demarcated by flagging along the west, southwestern, and south.

The purpose of the archaeological monitoring will be to identify and record any historic properties or human burials within the project site area. The archaeological monitor will closely observe excavations and examine soils as they are removed. After excavations, wall faces (to the extent possible) will be cleaned and examined for cultural material, subsurface features, and human burials. If any archaeological materials are encountered during the monitoring of ground-disturbing activities, work will be stopped immediately in that area and the monitoring archaeologist will investigate the nature of the discovery.

Locations of any historic properties encountered will be recorded with a handheld GPS unit with sub-meter accuracy capabilities.

Photographs of excavations and the stratigraphic sequences will be documented and included in the report even if no historically significant sites are documented during the field work. Non-cultural soils will be profiled at representative localities, as deemed appropriate by the on-site archaeologist. A map will be provided of the locations of recorded profiles.

Documentation during fieldwork shall include, as appropriate, recording stratigraphy using United States Department of Agriculture (USDA) soil descriptions, GPS point collection (with sub-meter accuracy capabilities), recordation of feature contents through excavation or sampling of features, screening of features, representative scaled profile drawings (a minimum of 2-m in length), and photo documentation using a scale and north arrow. Documentation of subsurface conditions will include one profile per excavation, overview photos and photos of individual excavations where profiles are recorded. Appropriate laboratory analysis of collected samples and artifacts will be conducted (see Laboratory Work section below).

One archaeological monitor is required for each piece of excavation machinery during the project, unless multiple machines are working in tandem at the same location. The archaeological monitor will compile daily monitoring logs. These logs will minimally include a description of daily activities, sites or features recorded, personnel on-site, and problems encountered and corrective action taken. The SHPD shall be notified in writing at the completion of archaeological monitoring field work.

NON-COMPLIANCE

Non-compliance with this AMP or the provisions and procedures established in HAR §13-279 (e.g., excavating without a monitor present, undertaking ground-disturbing activities not authorized either in this AMP or as part of any required permit) must be reported to the archaeological monitor. The archaeological monitor will report the non-compliance event to SHPD. SHPD will work with the project proponent to develop an action plan to resolve or correct the non-compliance event. Work must cease until an action plan is agreed upon with SHPD (in writing), allowing work to resume.

TREATMENT OF HISTORIC PROPERTIES (EXCLUDING HUMAN BURIALS)

If any historic properties (excluding human burials or human skeletal remains; see below) are encountered during the monitoring of ground-disturbing activities, work will be stopped immediately in that area and the archaeological monitor will investigate the nature of the discovery. If an intact cultural layer, living surface, structural components (e.g., foundations), archaeological subsurface features (e.g., hearths, pits, and postholes), artifacts, charcoal or midden deposits or trash pits are encountered, then the following actions will be taken:

- Selected, sorted charcoal samples will be collected for the possibility of radiocarbon analysis (particularly if the charcoal appears in a pre-Contact or early post-Contact context).
- Bulk samples of midden (faunal/floral material) if present will be collected.
- All traditional Hawaiian artifacts will be collected.
- All historic artifacts will be collected unless large trash or refuse pits are encountered, in which case a controlled sample be collected. The controlled sampling will include documentation of where the samples were collected (e.g., a column sampling strategy).
- Standard documentation will be carried out, including scale maps, profiles, photographs, detailed soil and provenience descriptions, and interpretation.
- Photographs of excavations will be included in the monitoring report even if no historically significant sites are documented during the monitoring fieldwork.

All collected artifacts and materials, except for radiocarbon samples selected for analysis, will remain on Hawaii Island.

TREATMENT OF HUMAN BURIALS OR HUMAN SKELETAL REMAINS

If human remains are identified, work will immediately stop in the immediate area (within 10 ft. [3.048 m]), the area will be secured, and the SHPD Archaeology Branch and Historic and Culture Branch staff will be notified immediately of the find in accordance with HAR §13-280 (see below for additional notification). No further work will take place—including screening of back dirt, cleaning and/or excavation of the burial area, or exploratory work of any kind—unless explicitly requested by the SHPD.

An archaeologist qualified in osteology will assess the human remains or possible human remains to determine whether the find is human and at least 50 years old. In addition, any bone fragments not immediately identified as non-human will be assessed in the field to avoid removing potential human remains from the site.

Any human skeletal remains identified during monitoring shall be classified as an inadvertent discovery and treated in accordance with HAR §13-300-40, which includes notification of the following parties:

1. The SHPD, unless discovery occurs on Saturday, Sunday, or holiday at which time the report shall be made to the Division of Conservation and Resource Enforcement;
2. The medical examiner or coroner from the county in which the inadvertent discovery occurred; and
3. The police department of the county in which the inadvertent discovery occurred.

The SHPD, in consultation with the landowner and the Hawai‘i Island Burial Council (HIBC), will determine whether to preserve in place or relocate. If the SHPD makes a determination for removal of the human remains, the consulting archaeologist will remove and treat the human remains in accordance with HAR §13-300-40.

LABORATORY WORK

Artifacts will be catalogued and analyzed, along with any samples of midden materials that have been collected. If charcoal samples are collected for the purpose of radiocarbon dating, then they will be submitted for taxonomic identification prior to submission. Charcoal and other datable materials submitted for dating analysis should be selected from contexts with the highest possible integrity that can be justified. For example:

1. Specimens from a single short-lived Native species from a specific provenience or context within a subsurface feature with no evidence of pre-Contact/post-Contact mixing has priority over:
2. Specimens from multiple short-lived Native species from a specific provenience or context within a subsurface feature with no evidence of pre-Contact/post-Contact mixing has priority over:
3. Specimens from a single short-lived Native species from a general provenience or context within a subsurface feature with no evidence of pre-Contact/post-Contact mixing has priority over:
4. Specimens from multiple short-lived Native species from a general provenience or context within a subsurface feature with no evidence of pre-Contact/post-Contact mixing.
5. Specimens with an integrity rating less than #4 (e.g., specimens with a general layer provenience, or mixed specimens that include long-lived species) should not be submitted for dating unless there is an explicit, justifiable argument for doing so.

REPORT PREPARATION

Following completion of fieldwork, a brief archaeological monitoring letter report of findings will be prepared and submitted via HICRIS within 30 days to the SHPD/DLNR as specified in HAR§13-282-3(f)(1) for review. The draft archaeological monitoring report will be prepared and submitted within 60 days following the completion of fieldwork. PCSI will submit a final archaeological monitoring report after receiving any comments on the draft report. Should burials and/or human remains be identified, other letters, memos, and/or reports may be requested by the SHPD and will be provided in accordance with applicable statutes and regulations, and as contractual obligations permit.

DISPOSITION OF MATERIALS

All field records, maps, photographs, and related documents and archaeological materials will be temporarily curated at the consulting archaeologist's firm or with the landowner. Final disposition of these records and related materials in an archive will be determined in consultation with the landowner and the SHPD.

REFERENCES

Allen, Melinda Sue. 1981. *An Analysis of the Mauna Kea Adze Quarry Archaeobotanical Assemblage*. Master's thesis, Department of Anthropology, University of Hawai'i, Mānoa.

Bonk, William J. 1986. An Archaeological Survey at the Middle Level, Southern Flank of Mauna Kea, Hawaii. *Papers in Ethnic & Cultural Studies* 86-2.

Clark, Stephan D. 2017. *Results of a Site Visit to Hale Pōhaku in Support of an Environmental Assessment (EA) for The Mauna Kea Visitor Information Station Infrastructure Ingress/Egress 22 Phase 1 Improvement Areas, Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i (TMK: (3) 4-4-015:09).* Letter Report dated 11 January 2017 to Andrew P. Hood, Sustainable Resources Group International, Inc. Pacific Consulting Services, Inc., Honolulu.

Collins, Sara L., Patrick McCoy, and Stephan D. Clark. 2014. *Burial Treatment Plan for Burial Sites in the Mauna Kea Science Reserve and the Mauna Kea Access Road Corridor, Ka'ohe Ahupua'a, Hamakua District, Island of Hawai'i*. Final Report prepared for the Office of Mauna Kea Management. Pacific Consulting Services, Inc., Honolulu.

Davies, J.L. *Landforms of Cold Climates*. Australian National University Press, Canberra.

Duman, J.G., and Steven L. Montgomery. 1991. Subzero Temperature Adaptations in Arthropods from the Summit of Mauna Kea, Hawaii. *Journal of Experimental Zoology*: Volume 259: pp 409-412. https://doi.org/10.1002/jez.1402590318. Accessed 12_15_2023.

Gerrish, Grant. 2013. Botanical Baseline Survey (2011) of the University of Hawaii's Managed Lands On Mauna Kea. Manuscript available online at: https://hilo.hawaii.edu/maunakea/uploads/environment/EnvironmentDocuments/GerrishG_2011MaunaKeaBotanicalSurvey_web.pdf (accessed 02/05/2021).

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. Online Rainfall Atlas of Hawai'i. Bull. Amer. *Meteor. Soc* 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Gosser, Dennis. 2024. *Archaeological Monitoring Report in Support of Mauna Kea Cesspool Closures Project, Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i, Hawaii, TMKs: (3) 4-4-015:009 and (3) 4-4-015:012*. Pacific Consulting Services, Inc., Honolulu.

Gosser, Dennis, Stephan D. Clark, and Richard C. Nees. 2014. *Long-Term Historic Property Monitoring Plan for the Three University of Hawaii Management Areas on Mauna Kea, Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawaii*. Pacific Consulting Services, Inc., Honolulu.

Hammatt, Hallett H., and David W. Shideler. 2002. *Data Recovery Report for Two Archaeological Lithic Scatters, Sites 50-10-23-10,310 and 50-10-23-10,311 at The Pu`u Kalepeamoa Complex, Hale Pōhaku, Ka'ohe Ahupua'a, Mauna Kea, Hawai'i Island* (TMK 4-4-15:12). Prepared for The Institute of Astronomy, University of Hawaii. Cultural Surveys Hawaii, Kailua.

Howarth, Francis G., and Steven L. Montgomery. 1980. Notes on the Ecology of the High Altitude Aeolian Zone on Mauna Kea. '*Elepaio* 41:21-22.

McCoy, Patrick C. 1979. Letter Report Dated August 22, 1979 to Mr. Francis Oda on Archaeological Reconnaissance Survey for the Preparation of the Mauna Kea Mid-Elevation Facilities Master Plan. Department of Anthropology Bernice P. Bishop Museum.

McCoy, Patrick C. 1981. Letter Report Dated June 9, 1981 to J. Jeffries on archaeological survey for the proposed Kitt Peak National Observatory. Department of Anthropology, Bishop Museum.

McCoy, Patrick C. 1985. *Preliminary Archaeological Survey of the Pu‘u Kalepeamoa Site, Mauna Kea, Hawai‘i.* Prepared for MCM Planning for Draft Supplemental Impact Statement for Construction Camp Housing at Hale Pōhaku, Hāmākua, Hawai‘i. Ms. on file at the Department of Anthropology, Bishop Museum.

McCoy, Patrick C. 1991. *Survey and Test Excavations of the Pu‘u Kalepeamoa Site, Mauna Kea, Hawai‘i.* Prepared for Facilities Planning and Management Office, University of Hawaii. Ms. on file in the Department of Anthropology, Bernice P. Bishop Museum. Honolulu.

McCoy, Patrick C. 2005. *Archaeological Monitoring of Four Septic Tank Excavations at the Mid-Level Facilities Located at Hale Pōhaku, Mauna Kea, Ka‘ohe, Hāmākua. Island of Hawai‘i* (TMK: [3]:4-4-015:012. Prepared for the University of Hawai‘i Institute for Astronomy.

McCoy, Patrick C., and Richard C. Nees. 2010. *Archaeological Inventory Survey of the Mauna Kea Science Reserve Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i* TMK: (3) 4-4-015: 09 (por.). Ms on file at SHPD, Kapolei.

McCoy, Patrick C., Richard C. Nees, and Melanie Mintmier. 2010. *Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i* TMK: (3) 4-4-015: 01 (por.). Ms on file at SHPD, Kapolei.

Medeiros, Camilla, D., Christine Scoffoni, Grace P. John, Megan K. Bartlett, Faith Inman-Narahari, Rebecca Ostertag, Susan Cordell, Christian Giardina, and Lawren Sack. 2019. An Extensive suite of functional traits distinguishes Hawaiian wet and dry forests and enables prediction of species vital rates. *Functional Ecology*. https://sites.lifesci.ucla.edu/eeb-sacklab/wp-content/uploads/sites/71/2019/09/Medeiros_et_al_2019_FE.pdf. Accessed 12_15_2023.

Pacific Consulting Services, Inc. (PCSI). 2010. *Architectural Inventory Survey of Hale Pohaku Rest Houses 1 and 2 and Comfort Station, Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i* TMK: (3) 4-4-015:12 (por.). Ms on file at SHPD, Kapolei.

Papp, R.P. 1981. High Altitude Aeolian Ecosystems in the Hawaiian Islands. *Proceedings of the 3rd Conference in Natural Sciences, Hawaii Volcanoes National Park.* National Park Resources Studies Unit, University of Hawaii. pp. 295-264.

Pukui, Mary Kawena, and Samuel H. Elbert. 2003. *Hawaiian Dictionary*. University of Hawaii Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther T. Mookini. 1984. *Place Names of Hawaii*. University of Hawaii Press, Honolulu.

Robins, Jennifer, and Hallett H. Hammatt. 1990. *Archaeological Reconnaissance for Summit and Mid-Level Facilities for the Proposed Japan National Large Telescope*. Prepared for MCM Planning, Honolulu.

Sinoto, Aki. 1987. Post-Field Report on the Archaeological Surface Survey of the Halepōhaku Substation Site and Overland Transmission Line-Mauka Approach Areas, Halepōhaku, Mauna Kea, Hawai‘i Island. Mountain Archaeology Research, and Bishop Museum Anthropology Department, Honolulu. Letter Report Submitted to Clyde Akita, Facilities Planning and Management Office, University of Hawai‘i, Honolulu.

Ugolini, F.C. 1974. Hydrothermal Origin of the Clays from the Upper Slopes of Mauna Kea, Hawaii. *Clays and Clay Minerals* 22:189-194.

Ugolini, F.C. 1975. Soils of the High Elevations of Mauna Kea, Hawaii, an Analogy to Martian Soils? *International Colloquium of Planetary Geology* 1:531-524. Rome, Italy.

Washburn, A.L. 1956. Classification of Patterned Ground and Review of Suggested Origins. *Geological Society of America Bulletin* 67:823-865.

Washburn, A.L. 1979. *Geocryology: A Survey of Periglacial Processes and Environments*. Edward Arnold, London.

APPENDIX A

Site Plans

HALE POHAKU FUEL STORAGE-2028 COMPLIANCE UPGRADE - REMOVAL

TMK: (3) 4-4-015:012

44-374 MAUNA KEA ACCESS ROAD
MAUNA KEA STATE PARK

FOR THE

UNIVERSITY OF HAWAII
INSTITUTE FOR ASTRONOMY
UH PROJECT NO. 0010391-01-A

DRAWING INDEX	
DWG. NO.	DESCRIPTION
T-001	TITLE SHEET
C-001	CIVIL NOTES
C-101	EXISTING/DEMOLITION PLAN
C-102	OVERALL SITE PLAN
C-103	SITE SPECIFIC CONSTRUCTION BMP NOTES AND DETAILS
C-104	SITE SPECIFIC CONSTRUCTION BMP PLAN
E-001	ELECTRICAL SYMBOLS, ABBREVIATIONS AND IECC
E-101	OVERALL ELECTRICAL PLAN
E-201	SINGLE LINE DIAGRAM AND ELECTRICAL SCHEDULES

Approved :

DIRECTOR DATE
DEPARTMENT OF PUBLIC WORKS
COUNTY OF HAWAII

PROJECT TEAM

ENGINEERING CONSULTANT
ENGINEERING PARTNERS, INC
455 E. LANIKAULA ST., HILO, HAWAII 96720
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SIGNATURE

architect

consultant

UNIVERSITY OF HAWAII
STATE OF HAWAIII

project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII,
INSTITUTE FOR ASTRONOMY

drawing title:
TITLE SHEET

phase:		EPI project no. 12027-23-01	sheet no. T-001
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DATE PRINTED: Wednesday, May 22, 2024

GENERAL CONSTRUCTION NOTES

1. All work shall be done in accordance with the "Standard Details for Public Works Construction", dated May 2013, "Standard Specifications for Public Works Construction", dated September 1986, as amended, of the Department of Public Works, County of Hawaii, the "Hawaii Standard Specification for Road and Bridge Construction", Department of Transportation, Highways Division, 2005, and AASHTO LRFD Bridge Construction Specifications, 3rd Edition with 2010 Interim Revisions (AASHTO Construction Specifications), unless indicated otherwise in the plans, these notes, or the special provisions. In the event of conflicting provisions in the AASHTO Construction Specifications and the State Standard Specifications, the State Standard Specifications shall apply.
2. The contractor shall verify the location of all existing utilities, whether shown on the plan or not, and shall be responsible for the repair or replacement of same in the event of damages due to his construction practices. The contractor shall coordinate his work with the respective utility companies.
3. The contractor shall maintain vehicular and pedestrian access to existing facilities at all times and shall schedule and prosecute his work in such a manner as to avoid interruption of normal activities at the existing facilities. The contractor shall provide early notification of and obtain approval for any anticipated interruptions. Contractor shall submit a construction phasing plan for approval prior to beginning construction. Temporary safe pedestrian passageways around or through a construction site shall comply with ADAAG Sections 206.1 and 402.1.
4. The contractor shall provide and install all traffic control devices in conformance with the current version of the "Manual of Uniform Traffic Control Devices for Streets and Highways", and to the satisfaction of the engineer.
5. Except during actual working hours, all signs which do not pertain to the construction activity, such as "Men Working" and "Flagman Ahead" shall be covered or laid down. However all signs necessary for the safety of the public shall be maintained.
6. No construction equipment shall be parked within the road right-of-way in such a manner that the equipment will obstruct the normal movement and sight distance of the driving motorist, except during actual working hours.
7. All existing pavements, walks, utilities, and other facilities whether shown on the plans or not, which are damaged by the contractor shall be reconstructed or replaced by the contractor at his own expense to the original undamaged condition.
8. Contractor shall properly barricade and provide temporary steel plates on all open trenches during all phases of construction to allow passage of vehicular traffic.
9. Existing conditions are shown to the best of our knowledge. Discrepancies shall be promptly reported to the owner and be resolved before proceeding with the work.
10. Prior to commencement of construction, the contractor shall verify the locations of all utilities, which may be affected by his work. Interference with the structure shall be promptly reported to the owner and be resolved before proceeding with the work.
11. Should a discrepancy occur on the drawings between any project special notes/ special details, and the typical specs/typical details, said special notes/special details shall take precedence.

ABBREVIATIONS

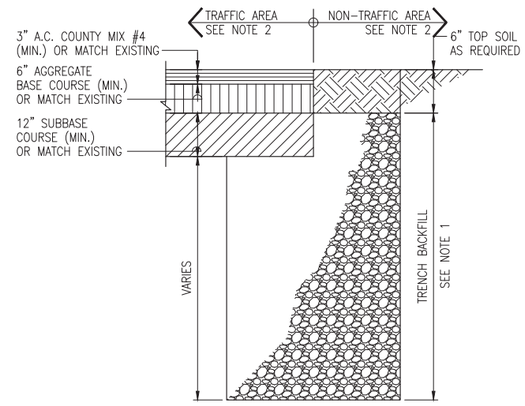
AB	Aggregate Base Course	Mech	Mechanical
AC	Asphalt Concrete	Min.	Minimum
Arch	Architectural	MJ	Mechanical Joint
CL	Centerline	N	North/Northing
CF	Curb Face	Pav't	Pavement
Conc	Concrete	PCC	Portland Cement Concrete
Cont	Continued/Continuous	PE	Plain End
CRM	Concrete Rubble Masonry	PL	Property Line
DPW	Department of Public Works	PO	Push On
DWS	Department of Water Supply	Reinf.	Reinforcing
Det	Detail	ROW	Right of Way
Diag	Diagonal	O.C.	On Center
Dwy	Driveway	O.D.	Outside Diameter
E	East/Easting	S	Slope
EL	Elevation	S.L.	Service Lateral
Elev	Elevation	Sect	Section
Ex	Existing	Std	Standard
FF	Finished Floor	TBM	Temporary Benchmark
FG	Finished Grade	TC	Top of Curb/Concrete
FL	Flowline	TG	Top of Grate
Flg	Flanged	Thk.	Thick/Thickness
FS	Finished Surface	TOF	Top of Footing
GV	Gate Valve	TOP	Top of Pipe
HDPE	High Density Polyethylene	TW	Top of Wall
ID	Inside Diameter	Typ	Typical
Inv	Invert	U.O.N.	Unless Otherwise Noted
Max	Maximum	WV	Water Valve

UNDERGROUND STORAGE TANK CLOSURE NOTES

1. Contractor to conduct utility clearance at planned excavation areas. Contractor responsible to protect all aboveground and below ground utilities within the work area and is responsible for repair of any damaged aboveground or below ground utilities on the project property.
2. Contractor to coordinate work with and Environmental Professional (EP) hired by MKSS to conduct site assessment activities required by the HDOH SHWB UST Section for the closure of UST system. Unless otherwise directed by the EP, Contractor will only conduct work on this project when EP is present on the project site.
3. Contractor will conduct work in a manner that allows the EP to perform the required site assessment activities. This includes but is not limited to providing access to excavated material and providing access to all excavations. No material associated with this project may leave the property until authorized by the EP.
4. Unless otherwise directed by the EP, Contractor should be prepared to remove all bedding material from all project excavations to reach intact native material where site assessment activities will be conducted by the EP.
5. Contractor is responsible to disconnect and cap product lines at building terminations. Contractor will coordinate with MKSS maintenance personnel on the desired termination method and location. Concrete demolition and patching will not be required for product line termination at buildings.

BACKFILLING AFTER TANKS REMOVAL NOTES

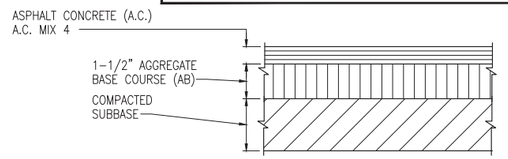
1. 2-1/2" minus drain rock to within 3-feet of ground surface. Place material in lifts not to exceed 18". Place geotextile fabric on top 2-1/2" minus drain rock.
2. 1-1/2" minus base course to within 1-feet of ground surface. Backfill in minimum 2 lifts of 12" maximum and compacted to 90% maximum density.
3. Backfill remaining 1-foot with cinder.
4. Equipments to be brought in and used during construction shall be thoroughly cleaned to avoid the introduction on invasive species. All imported materials to be brought in by the contractor shall comply with the requirements of the Mauna Kea Invasive Species Management Plan. Obtain copy of the management plan from the Mauna Kea Support Services.



NOTES:

1. TRENCH BACKFILL SHALL BE 2.5" MINUS GRANULAR BACKFILL OR SUITABLE NATIVE MATERIAL NO LARGER THAN 6". TRENCH BACKFILL SHALL BE COMPACTED TO 95% MAX. DRY DENSITY.
2. TRAFFIC AREA SHALL INCLUDE BUT NOT BE LIMITED TO PAVED OR UNPAVED ROADWAY, SHOULDER, DRIVEWAY, CARTPATH, PARKING, LOADING ZONE, STORAGE AREA AND AREAS NOT PROTECTED FROM TRAFFIC LOAD. NON-TRAFFIC AREA SHALL BE PROTECTED FROM TRAFFIC LOAD BY MEANS OF CONCRETE CURBS, GUARDRAILS, BARRICADE, AND AREAS INACCESSIBLE BY VEHICLES.

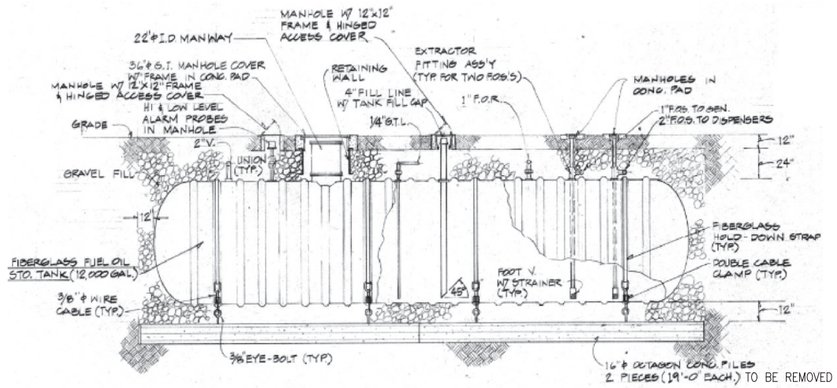
3 TRENCH REPAIR DETAIL
SCALE: NOT TO SCALE



U.O.N. MINIMUM PAVEMENT SECTION SHALL BE 3" A.C. / 6" A.B . ON 90% COMPACTED SUBGRADE

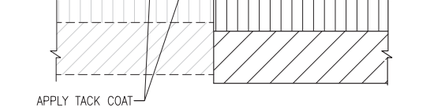
COMPACTION OF THE SUBGRADE, SUBBASE, AND A.B. MUST BE OBSERVED AND CERTIFIED BY THE GEOTECHNICAL ENGINEER. WHERE THERE IS NO GEOTECHNICAL ENGINEER AVAILABLE, COMPACTION MAY BE DONE BY MAKING A MINIMUM OF EIGHT (8) PASSES WITH AT D-9 DOZER OR EQUIVALENT.

1 TYPICAL A.C PAVEMENT SECTION
SCALE: NOT TO SCALE



NOTE:
1. UHH SHALL EMPTY THE FUEL TANK AS MUCH AS POSSIBLE AND CONTRACTOR SHALL EMPTY THE REMAINING 100 GAL. OR LESS ON THE FUEL TANK PRIOR TO REMOVAL.
2. THE INFORMATION REGARDING THE EXISTING UNDERGROUND STORAGE TANKS WAS FROM RECORD DRAWINGS AVAILABLE ON FILE (MID LEVEL FACILITIES AT HALE POHAKU – MAUMA KEA OBSERVATORY DATED DECEMBER 1981)

4 EXISTING SINGLE-WALL FUEL STORAGE TANK AND SUPPORT TO BE REMOVED
SCALE: NOT TO SCALE



DISTURBED AGGREGATE BASE BELOW EXISTING PAVEMENT SHALL BE RE-COMPACTED PRIOR TO PAVING. FILLING OF ANY VOIDS IN AGGREGATE BASE SHALL BE CONSIDER INCIDENTAL TO THE WORK.

2 NEW TO EXIST. PAVEMENT DETAIL
SCALE: NOT TO SCALE

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	100% DESIGN

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UNIVERSITY OF HAWAII
STATE OF HAWAIII

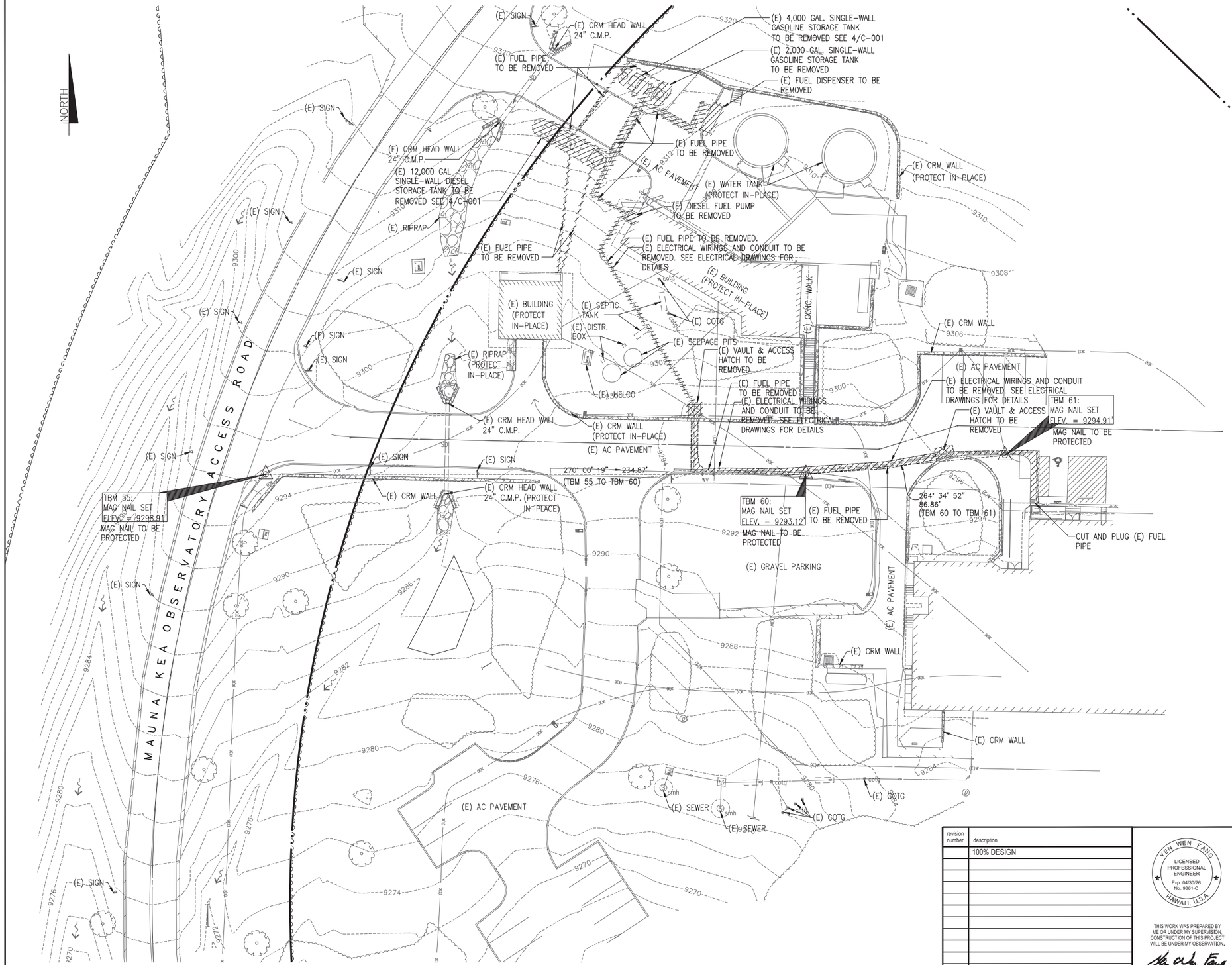
project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
CIVIL NOTES

phase:		EPI project no. 12027-23-01	sheet no. C-001
designed by: RDC	checked by: CR	UH project no. 0010391-01-A	
drawn by: RDC	approved by: YWF	date 05/22/2024	
drawing scale: AS NOTED			

DATE PRINTED: Wednesday, May 22, 2024



A EXISTING/DEMOLITION PLAN
SCALE: 1" = 20' 0 20' 40'

NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE IN CONDUCTING UNDERGROUND UTILITY TONING TO VERIFY UNDERGROUND UTILITIES NOT SHOWN ON PLAN THAT MAY BE ENCOUNTERED DURING CONSTRUCTION.
2. INFORMATION ON TANK SIZES AND UNDERGROUND UTILITY PIPE LOCATIONS ARE FROM RECORD DRAWINGS ON FILE PROVIDED BY MKSS.
3. CONTRACTOR SHALL COORDINATE WITH THE MAUNA KEA SUPPORT SERVICES (MKSS) ON THE DESIGNATED LOCATION TO TEMPORARILY STOCKPILE EXCAVATED MATERIAL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE IN OBTAINING STOCKPILING PERMIT FROM THE COUNTY OF HAWAII, DEPARTMENT OF PUBLIC WORKS FOR ANY STOCKPILED MATERIALS IN EXCESS OF 500 CUBIC YARDS.

LEGEND

TO BE REMOVED OR DEMOLISHED

revision number	description
	100% DESIGN

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HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
EXISTING/DEMOLITION PLAN

phase:		EPI project no. 12027-23-01	sheet no. C-101
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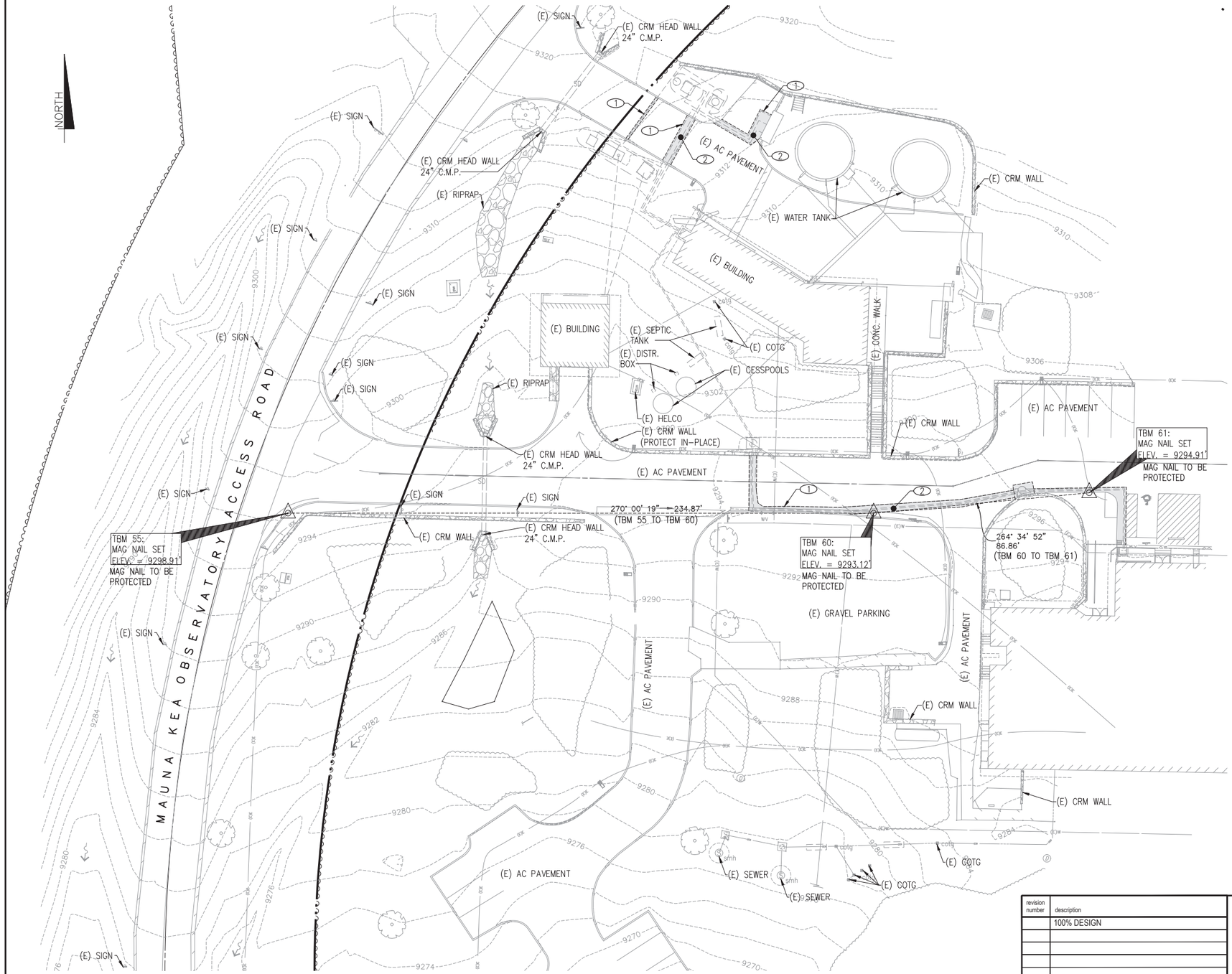

PAV'T CONST. NOTES

1. SAWCUT EXISTING PAVEMENT TO ALLOW FOR THE REMOVAL OF UNDERGROUND UTILITIES. BACKFILLING AND TRENCH RESTORATION SHALL PROVIDE SMOOTH TRANSITION WHEN JOINING NEW PAVEMENT TO EXISTING PER DETAIL 2/C-001 — 2/C-001
2. CONSTRUCT 3" COUNTY MIX 4 A.C. PAV'T / 6" A.B. / 12" SUB-BASE WITH TYPE 1 SEAL COAT PER DETAIL — 1/C-001

LEGEND

NEW PAVEMENT

A OVERALL SITE PLAN
SCALE: 1" = 20'
0 20' 40'

revision number	description
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UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
OVERALL SITE PLAN

phase:		EPI project no. 12027-23-01	sheet no. C-102
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SITE SPECIFIC CONSTRUCTION BMP CONTROL MEASURES

CONSTRUCTION ACTIVITIES

SITE IMPROVEMENT FOR THE REPAVING OF AC DRIVEWAY. INFRASTRUCTURE TO SUPPORT THE PROPOSED IMPROVEMENTS INCLUDES AC PAVING.

ALL CONSTRUCTION ACTIVITY WILL INCORPORATE THESE BMPS WITHOUT MODIFICATION. CONSTRUCTION SITE MANAGER WILL CONDUCT A SITE INSPECTION DAILY FOR ANY POTENTIAL POLLUTION SOURCES. ALL EQUIPMENT STORED ONSITE SHALL BE IN GOOD WORKING ORDER WITH NO FUEL, OIL, TRANSMISSION FLUID, OR HYDRAULIC LEAKS. ANY EQUIPMENT FOUND TO BE FAULTY SHALL BE REPAIRED IMMEDIATELY WITH NECESSARY BMP PRECAUTIONS TAKEN TO PREVENT AND CONTAIN STORM WATER CONTAMINATION. EQUIPMENT WHICH CANNOT BE REPAIRED WITHIN THE SAME WORKING DAY, SHALL BE REMOVED FROM THE SITE TO AN APPROPRIATE REPAIR FACILITY.

CONSTRUCTION EQUIPMENT INCLUDES; EXCAVATOR, LOADER, DUMP TRUCKS, DRUM ROLLER/COMPACTOR, ETC.

QUALITY OF DISCHARGE

THE EXISTING SOIL IS ORANGISH BROWN SILTY SAND, MEDIAL FINE SANDY LOAM. THE SITE HAS AN EXISTING IMPROVEMENTS THAT HAS HIGH VEGETAL COVER. NO STORM WATER MANAGEMENT FACILITIES EXIST ON THE SITE. DISCHARGE DURING CONSTRUCTION WILL BE CONTROLLED BY, SEDIMENT WADDLES, SILT FENCE, BIOSOCKS, AND GRAVEL BAG FILTERS. ALL DISTURBED AREAS THAT ARE NOT SCHEDULED TO BE PAVED, LANDSCAPED, OR GRAVEL WILL HAVE HYDROMULCH OR GRASS SEED APPLIED TO STABILIZE THE SOIL.

CONTROL FOR LAND DISTURBANCES

THE GENERAL CONTRACTOR SHALL COMPLY WITH THE SPECIAL CONDITIONS FOR LAND DISTURBANCES (FROM HAR, CHAPTER 11-55, APPENDIX C). REFER TO THE "NOTES ON CONTROLS FOR LAND DISTURBANCES" ON THIS SHEET.

EROSION AND SEDIMENT CONTROL REQUIREMENTS

THE CONTRACTOR SHALL HAVE THE COUNTY APPROVED GRADING PERMIT AVAILABLE FOR INSPECTION 30 DAYS BEFORE THE START OF CONSTRUCTION ACTIVITIES.

POTENTIAL POLLUTANTS

REMOVED VEGETATION AND OTHER DEBRIS WILL BE DISPOSED OF AT THE EAST HAWAII SANITARY LANDFILL. DEBRIS WILL BE TEMPORARILY STORED IN THE STOCKPILE AND STORAGE AREA AS SHOWN ON THE PLANS. THE STOCKPILE AND EQUIPMENT/VEHICLE STORAGE AREA IS PROTECTED BY STACKED GRAVEL BAG FILTERS.

NO FUEL, OIL, OR HYDRAULIC FLUID SHALL BE STORED ONSITE. FUELING OR FIELD MAINTENANCE OF EQUIPMENT SHALL BE PERFORMED WITHIN VEHICLE STORAGE AREA. THE VEHICLE STORAGE AREA IS PROTECTED WITH A GRAVEL BAG CONTAINMENT BERM. DRIP PANS WILL BE PLACED UNDER VEHICLES ONSITE WHILE NOT IN USE. IN THE EVENT OF A SPILL OR LEAK FROM EQUIPMENT, THE FLOW OF FUEL WILL BE STOPPED AND ALL SOURCES OF IGNITION WILL BE REMOVED. THE SPILL WILL BE CONTAINED BY PLACING SAND BAGS AROUND THE SPILL AREA. THE CONTAMINATED EARTH WILL BE PLACED IN CONTAINERS. IN THE CASE OF PONDING FUEL, A HAZARDOUS MATERIALS VACUUM TRUCK WILL REMOVE THE FUEL.

DISTURBED AREAS WILL BE PROTECTED WITH BIOSOCKS, SEDIMENT WADDLES, SILT FENCE, AND GRAVEL BAG FILTERS. ALL DISTURBED AREAS THAT ARE NOT SCHEDULED TO BE PAVED, LANDSCAPED, OR COVERED BY A STRUCTURE OR GRAVEL WILL HAVE HYDROMULCH OR GRASS SEED APPLIED TO STABILIZE THE SOIL.

PRODUCT SPECIFICATIONS FOR BMPS

FILTER FABRIC SHALL BE: 8.0 OZ./SQ. YD. GEOTEXTILE

GRAVEL FILTER SHALL BE: 3/4" FOR GRAVEL FILTER BAGS

CONSTRUCTION SCHEDULE

CONTRACTOR SELECTION DATE: TBD
CONSTRUCTION WILL BEGIN: TBD
CONSTRUCTION WILL END: TBD

BMPS WILL BE IMPLEMENTED FROM THE FIRST DAY OF CONSTRUCTION AND WILL BE REMOVED WHEN ALL CIVIL WORK ITEMS ARE COMPLETE AND VEGETATION COVER IS REESTABLISHED.

ALL MAJOR CONSTRUCTION ACTIVITIES WILL PROCEED IN A LOGICAL SEQUENCE. MAJOR CONSTRUCTION ACTIVITIES WILL BE CONCURRENT WHEN APPROPRIATE.

CONSTRUCTION TIMETABLE

EARTHWORKS	4 WEEKS
AC PAV'T	2 WEEKS

THE FOLLOWING BMPS WILL BE IMPLEMENTED THE FIRST DAY OF CONSTRUCTION
SILT FENCE OR BIOSOCK
STABILIZED CONSTRUCTION ENTRANCE
VEHICLE/EQUIPMENT STORAGE AREA
GRAVEL BAG FILTERS OR BIOSOCK
THE FOLLOWING BMP WILL BE IMPLEMENTED AS SLOPES ARE GRADED THROUGHOUT CONSTRUCTION
SEDIMENT WADDLES OR BIOSOCK
HYDRO-SEEDING

NOTES ON CONTROLS FOR LAND DISTURBANCES

HAR CHAPTER 11-55 APPENDIX C REQUIREMENTS

THE FOLLOWING SPECIAL CONDITIONS APPLY TO ALL LAND DISTURBANCE WORK CONDUCTED UNDER THIS GENERAL PERMIT:

(A) CONSTRUCTION MANAGEMENT TECHNIQUES

(1) CLEARING AND GRUBBING SHALL BE HELD TO THE MINIMUM NECESSARY FOR GRADING AND EQUIPMENT OPERATION.

(2) CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF THE CLEARED SURFACE AREA.

(3) CONSTRUCTION SHALL BE STAGED OR PHASED FOR LARGE PROJECTS. AREAS OF ONE PHASE SHALL BE STABILIZED BEFORE ANOTHER PHASE IS INITIATED. STABILIZATION SHALL BE ACCOMPLISHED BY TEMPORARILY OR PERMANENTLY PROTECTING THE DISTURBED SOIL SURFACE FROM RAINFALL IMPACTS AND RUNOFF.

(4) EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL BEFORE EARTH MOVING OPERATIONS BEGIN. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

(5) ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY, FOR EXAMPLE, WEEKLY IN DRY PERIODS AND WITHIN 24 HOURS AFTER ANY RAINFALL OF 0.5 INCHES OR GREATER WITHIN A 24-HOUR PERIOD. DURING PROLONGED RAINFALL, DAILY CHECKING IS NECESSARY. THE PERMITTEE SHALL MAINTAIN RECORDS OF CHECKS AND REPAIRS.

(6) THE PERMITTEE SHALL MAINTAIN RECORDS OF THE DURATION AND ESTIMATED VOLUME OF STORM WATER DISCHARGE(S).

(7) A SPECIFIC INDIVIDUAL SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS ON EACH PROJECT SITE.

(B) VEGETATION CONTROLS

(1) PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN TWENTY CALENDAR DAYS PRIOR TO LAND DISTURBANCE.

(2) TEMPORARY SOIL STABILIZATION WITH APPROPRIATE VEGETATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY CALENDAR DAYS.

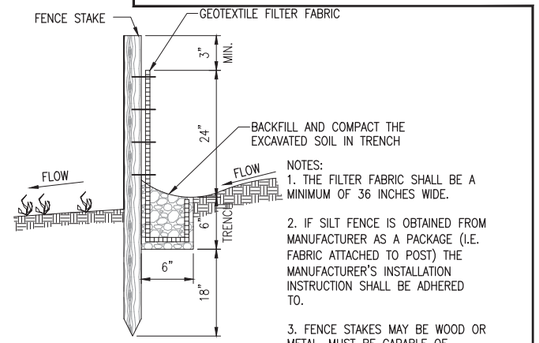
(3) PERMANENT SOIL STABILIZATION WITH PERENNIAL VEGETATION OR PAVEMENT SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING. IRRIGATION AND MAINTENANCE OF THE PERENNIAL VEGETATION SHALL BE PROVIDED FOR UNTIL THE VEGETATION TAKES ROOT.

(C) STRUCTURAL CONTROLS

(1) STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES, AS PRACTICAL.

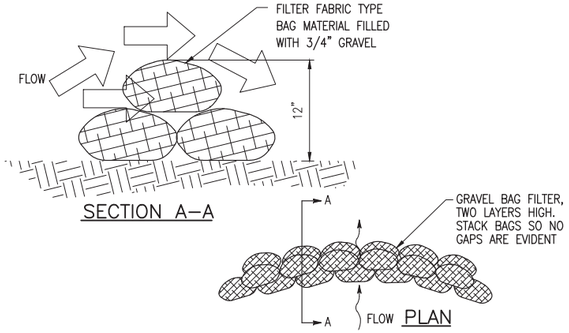
(2) EROSION CONTROL MEASURES SHALL BE DESIGNED ACCORDING TO THE SIZE OF DISTURBED OR DRAINAGE AREAS TO DETAIN RUNOFF AND TRAP SEDIMENT.

(3) WATER MUST BE DISCHARGED IN A MANNER THAT THE DISCHARGE SHALL NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE BASIC WATER QUALITY CRITERIA AS SPECIFIED IN SECTION 11-54-04.

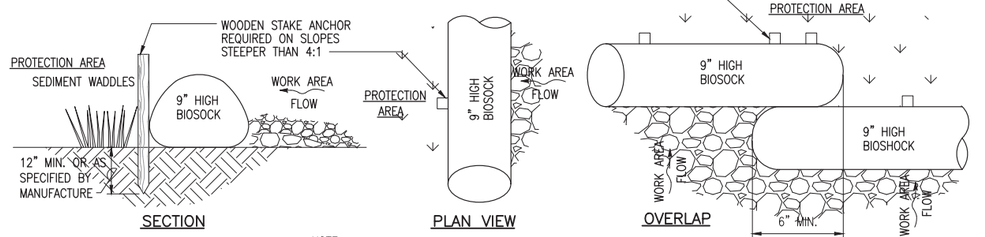


NOTES:
1. THE FILTER FABRIC SHALL BE A MINIMUM OF 36 INCHES WIDE.
2. IF SILT FENCE IS OBTAINED FROM MANUFACTURER AS A PACKAGE (I.E. FABRIC ATTACHED TO POST) THE MANUFACTURER'S INSTALLATION INSTRUCTION SHALL BE ADHERED TO.
3. FENCE STAKES MAY BE WOOD OR METAL, MUST BE CAPABLE OF SUPPORTING ANTICIPATED LOADS.

1 SILT FENCE DETAIL
SCALE: NOT TO SCALE



3 GRAVEL BAG FILTER
SCALE: NOT TO SCALE



*WOOD ANCHOR STAKES SHALL HAVE A NOMINAL CLASSIFICATION OF 3/4" BY 3/4" AND MINIMUM LENGTH OR 24 INCHES. DO NOT USE REBAR OR OTHER METAL RODS

NOTE
PRODUCT SHOWN IS A PRODUCT OF HAWAII BIOSOCKS. PRODUCT MAY BE A PRODUCT OF HAWAII BIOSOCKS OR APPROVED EQUAL

WOODEN STAKE ANCHOR SPACING

SLOPE GRADIENT	ANCHOR SPACING
<4:1	NOT REQUIRED
4:1 TO 3:1	10' ON CENTER
>3:1 TO 2:1	5' TO 10' ON CENTER
>2:1	5' ON CENTER

2 TYPICAL BIOSOCK INSTALLATION
SCALE: NOT TO SCALE

revision number	description
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UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
SITE SPECIFIC CONSTRUCTION BMP NOTES AND DETAILS

phase:		EPI project no. 12027-23-01	sheet no. C-103
designed by: RDC	checked by: CR	UH project no. 0010391-01-A	
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drawing scale: AS NOTED			

DATE PRINTED: Wednesday, May 22, 2024

A SSCBMP PLAN
SCALE: 1" = 20' 0 20' 40'

BMP CONSTRUCTION NOTES

(ORDER OF PRECEDENCE FOR INSTALLATION)

1. CONSTRUCT SILT FENCE OR BIOSOCK PER DET. (1/C-103) (2/C-103)
2. BIOSOCK AROUND DRAINAGE SUMP PER DETAIL (2/C-103)
3. CONSTRUCT GRAVEL BAG FILTERS AROUND STOCK PILE/ DEBRIS/VEHICLE/EQUIPMENT STORAGE AREA. COORDINATE FINAL LOCATION WITH DIRECTOR (3/C-105)

LEGEND

- PAVED AREAS
- SILT FENCE/BIOSOCK
- RUNOFF FLOW DIRECTION
- PROTECTED STOCKPILE, DEBRIS, AND VEHICLE/EQUIPMENT STORAGE AREA

revision number	description
	100% DESIGN

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 9361-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

architect

consultant

UNIVERSITY OF HAWAII
STATE OF HAWAIII

project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII,
INSTITUTE FOR ASTRONOMY

drawing title:
SITE SPECIFIC CONSTRUCTION BMP PLAN

phase:		EPI project no. 12027-23-01	sheet no. C-104
designed by: RDC	checked by: CR	UH project no. 0010391-01-A	
drawn by: RDC	approved by: YWF	date 05/22/2024	
drawing scale: AS NOTED			

DATE PRINTED: Wednesday, May 22, 2024

GENERAL ELECTRICAL SPECIFICATIONS

1. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO BID.
2. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. ROUTE CONDUITS AND LOCATE EQUIPMENT BASED ON THE INTENT IDENTIFIED ON DRAWINGS, MODIFY TO SUITE FIELD CONDITIONS. PROVIDE ALL CONDUITS, FITTINGS, BOXES, WIRING, CONDUIT SEALS, ETC., AS REQUIRED FOR COMPLETION OF THE RACEWAY SYSTEM IN COMPLIANCE WITH THE NEC AND THE CONTRACT DOCUMENTS.
3. FINAL CONNECTIONS & ROUGH-IN REQUIREMENTS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
4. CONTRACTOR SHALL REVIEW DRAWINGS AND SPECIFICATIONS BY ALL OTHER DIVISIONS. ELECTRICAL WORK NOTED OR OTHERWISE REQUIRED UNDER OTHER DIVISIONS SHALL BE REVIEWED AND INCLUDED UNDER THE ELECTRICAL CONTRACTOR'S SCOPE.
5. CONTRACTOR SHALL VISIT SITE AND VERIFY EXISTING CONDITIONS PRIOR TO BID. ALL COSTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID. NO ADDITIONAL ALLOWANCE AFTER BID WILL BE CONSIDERED DUE TO LACK OF SUCH DUE DILIGENCE OR FIELD EXAMINATION.
6. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
7. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES, OR THOSE CURRENTLY ADOPTED BY THE LOCAL JURISDICTION.
8. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
9. PROVIDE PERMITS AND INSPECTIONS REQUIRED.
10. PREPARE SUBMITTALS FOR ALL PRODUCTS TO BE FURNISHED BY THE CONTRACTOR, INCLUDING BUT NOT LIMITED TO EQUIPMENT, RACEWAYS AND BOXES, WIRING, LIGHT FIXTURES, AND SIMILAR ITEMS. SHOULD CONTRACTOR PROCEED WITH ORDERING OR INSTALLING PRODUCTS PRIOR TO SUBMITTAL REVIEW, ALL COSTS REQUIRED TO MODIFY OR REPLACE SUCH PRODUCTS SHALL BE BORNE BY THE CONTRACTOR. THE PROPOSED USE OF ITEMS SPECIFIED ON THESE DRAWINGS DOES NOT ALLEVIATE THE CONTRACTOR FROM ITS RESPONSIBILITY TO PREPARE SUBMITTALS.
17. SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR. START OF GUARANTEE PERIOD SHALL COMMENCE AFTER 30 DAYS OF TROUBLE FREE OPERATION AFTER AFTER PROJECT ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT ADDITIONAL COST.
18. PROVIDE RECORD DRAWINGS AND ALL OTHER CLOSEOUT MATERIALS REQUIRED AS A PART OF THIS CONTRACT. RECORD DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
19. VERIFY EXACT LOCATION AND ELECTRICAL CHARACTERISTICS OF EQUIPMENT TO BE FURNISHED BY OTHER DISCIPLINES PRIOR TO ROUGH-IN.
20. SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO ADDITIONAL COST.
21. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
22. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS OR EQUIPMENT.
23. PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. FIRESTOP ALL PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
24. PROTRUDING OBJECTS SHALL COMPLY WITH ADAAG 307. WALL MOUNTED FIXTURES OR SIMILAR WALL MOUNTED DEVICES SHALL NOT PROTRUDE MORE THAN 4" HORIZONTALLY INTO THE CIRCULATION PATH, OR OTHERWISE SHALL BE INSTALLED 80" MINIMUM TO THE BOTTOM OF THE FIXTURE.
25. WHERE PROJECT WORK INVOLVES COORDINATION WITH THE LOCAL UTILITY, IMMEDIATELY UPON AWARD OF CONTRACT CONTRACTOR SHALL CONTACT UTILITY TO ENSURE ALL UTILITY AGREEMENTS, PROPOSAL, AND UTILITY DRAWINGS ARE COMPLETE AND APPROVED. PROVIDE PROPOSED DATE OF ENERGIZING SERVICE IN ORDER TO FACILITATE PROPER SCHEDULING WITH THE UTILITY SERVICE.

ELECTRICAL SYMBOLS

- (D) or -x-x-x-x-x- : ELECTRICAL DEMOLITION. REMOVE EQUIPMENT AND APPURTENANCES IN THEIR ENTIRETY U.N.O. COORDINATE WORK RESTRICTIONS PRIOR TO DEMOLITION.
- HOMERUN CONDUIT – STROKES INDICATE QUANTITY OF CONDUCTORS
- CONDUIT/WIRE CONCEALED IN WALL OR ABOVE CEILING EXCEPT IN EXPOSED STRUCTURE AREAS 1/2"-2 #12 & 1 #12 GND THWN U.N.O.
- CONDUIT AND/OR WIRE BELOW FLOOR OR GRADE 3/4"-2 #12 & 1 #12 GND THWN UNLESS NOTED
- EXISTING CONDUIT AND/OR CONDUCTORS TO REMAIN (SHOWN LIGHT)
- —OH—OH— : OVERHEAD POWER LINES
- CONDUIT RISER UP/DOWN
- CONDUIT STUB OUT
- S^a_b : SINGLE POLE SWITCH @ +48" TO TOP UNLESS NOTED
  a = DEVICE SWITCH IDENTIFICATION (LOWERCASE)
  IF b:
  F = 3 SPEED SWITCH; D = DIMMER SWITCH
  2 = 2 POLE SWITCH; M = VACANCY SENSOR SWITCH
  3 = 3-WAY SWITCH; T = THERMAL OVERLOAD SWITCH
- S_A : SWITCH BANK (IDENTIFIED WITH UPPERCASE)
- SINGLE RECEPTACLE @ +18" TO CENTER UNLESS NOTED
- WALL MOUNTED DUPLEX RECEPTACLE @ +18" TO CENTER U.N.O.
  = RECEPTACLE PROTECTED BY GFCI BREAKER, OR GFCI TYPE RECEPTACLE INSTALLED PER NEC 210.8.
  = DOUBLE DUPLEX RECEPTACLE
- ^a_b :
  IF a:
  C = RECEPTACLE INSTALLED ABOVE COUNTER
  H = RECEPTACLE INSTALLED HORIZONTALLY
  IG = ISOLATED GROUND TYPE (ORANGE) RECEPTACLE
  IF b:
  MOUNTING HEIGHT IN INCHES TO TOP OF RECEPTACLE
- FLOOR MOUNT RECEPTACLE
- CEILING MOUNT RECEPTACLE
- SPECIAL RECEPTACLE @ +18" TO CENTER UNLESS NOTED
- (M) : CEILING MOUNTED VACANCY SENSOR
- (PC) : PHOTOCELL (INSTALL ON ROOF FACING NORTH)
- [a] : IF a:
  R = RELAY; CB = CIRCUIT BREAKER
  C = CONTACTOR; TS = TIMESWITCH
  P = POWER SUPPLY; PB = PUSH BUTTON TYPE CONTROL STATION
- ^{a} A : LUMINAIRE IDENTIFICATION
  A = LUMINAIRE DESIGNATION (UPPERCASE)
  a = SWITCH DESIGNATION (LOWERCASE)
- POLE MOUNTED LUMINAIRE
- SURFACE MOUNTED PANELBOARD
- FLUSH MOUNTED PANELBOARD
- MAIN SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD
- CONCRETE PULLBOX WITH HEAVY DUTY STEEL TRAFFIC COVER
- UTILITY PULLBOX
- TRANSFORMER (SIZE AND CLEARANCES BASED ON KVA RATING)
- METER
- N : NON-FUSED DISCONNECT SWITCH
- F : FUSED DISCONNECT SWITCH
- J^a : JUNCTION BOX, IF a:
  FS = FIRE/SMOKE DAMPER CONNECTION
  V = VARIABLE AIR VOLUME BOX CONNECTION
  CF = CEILING FAN
  S = SIGNAGE
  WH = WATER HEATER
- COMBINATION METER/MAIN
- FUSIBLE SWITCH
- (M) : SINGLE METER WITH CT,
- CIRCUIT BREAKER
- TRANSFORMER
- (HP) : MOTOR LOAD
- AUTOMATIC TRANSFER SWITCH
- GROUND BUS & GROUND ELECTRODES
- GROUNDING BUSBAR
- TV : TELEVISION OUTLET
  (1) SERIES 6 COAX CABLE FROM TV TAP TO TV OUTLET
- ^{x} : TELEPHONE/DATA OUTLET
  (X) 4-PAIR CAT-6 CABLES (TYPE 'H')
  PROVIDE CORRESPONDING FACEPLATE WITH QTY OF PORTS AS REQUIRED, WHERE "X" INDICATED NUMBER OF PORTS.

HAWAII COUNTY ENERGY CODE 2018 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII ADMINISTRATIVE RULES
CHAPTER HAR 3-181.1 COMMERCIAL BUILDING ENERGY EFFICIENCY STANDARDS

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THIS PROJECTS DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE COMMERCIAL PROVISIONS FOR ELECTRICAL & LIGHTING SYSTEMS (C405, & C408) OF THE 2018 IECC WITH AMENDMENTS PER HAR 3-181.1:

COMPLIANCE METHOD				
X	2018 IECC AS AMENDED. MANDATORY AND PRESCRIPTIVE			
	2018 IECC AS AMENDED. MANDATORY AND TOTAL BUILDING PERFORMANCE			
	ASHRAE STANDARD 90.1-2013. MANDATORY AND PRESCRIPTIVE			
	ASHRAE STANDARD 90.1-2013. MANDATORY AND TOTAL BUILDING PERFORMANCE			
INFORMATION IN CONSTRUCTION DOCUMENTS			YES	N/A
INTERIOR LIGHTING				
	OCCUPANT SENSOR CONTROLS	C405.2.1		X
	TIME SWITCH CONTROLS	C405.2.2		X
	DAYLIGHT RESPONSIVE CONTROLS	C405.2.3		X
	DAYLIGHT ZONES ON PLANS	C405.2.3.2 & C405.2.3.3		X
	GUEST ROOM CONTROLS	C405.2.4		X
	INTERIOR LIGHTING FIXTURE SCHEDULE			X
	INTERIOR LIGHTING POWER ALLOWANCES	C405.3.2		X
	INTERIOR LIGHTING FIXTURE LOCATIONS			X
	LIGHTING CONTROL FUNCTIONAL PERFORMANCE TESTING REQUIREMENT	C408.3		X
EXTERIOR LIGHTING				
	EXTERIOR LIGHTING CONTROLS	C405.2.6		X
	EXTERIOR LIGHTING FIXTURE SCHEDULE			X
	EXTERIOR LIGHTING POWER ALLOWANCES	C405.4.2		X
	EXTERIOR LIGHTING FIXTURE LOCATIONS			X
ELECTRICAL				
	ELECTRICAL TRANSFORMER EFFICIENCY	C405.6		X
	ELECTRICAL MOTOR EFFICIENCY	C405.7		X
	VOLTAGE DROP LESS THAN 5%	C405.9		X
	TENANT SUBMETERING	C405.10		X

NOTES:

SIGNATURE:
DATE: 05/20/2024
NAME: ELI B. WALTZ
TITLE: ELECTRICAL ENGINEER
LICENSE NO.:18572-E

ELECTRICAL ABBREVIATIONS

+18"	INDICATES MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE AFF OR AFG	AFCI	INDICATES ARC FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL	TYP	TYPICAL
AF	AMP FUSE (FOR FUSES), AMP FRAME (FOR CIRCUIT BREAKERS)	GFCI	GROUND FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL	UPS	UNINTERRUPTIBLE POWER SYSTEM
AFF	ABOVE FINISHED FLOOR	GFP	GROUND FAULT PROTECTION	WP	WEATHER-PROOF (NEMA 3R)
AFG	ABOVE FINISHED GRADE	GND	GROUND	XFMR	TRANSFORMER
AHJ	LOCAL AUTHORITY HAVING JURISDICTION	HELCO	ELECTRICAL UTILITY COMPANY	UNO	UNLESS NOTED OTHERWISE
AT	AMP TRIP	IWP	IN-USE WEATHER-PROOF (NEMA 3R)	(D)	DEMOLITION
ATS	AUTOMATIC TRANSFER SWITCH	LO	LUGS ONLY (SEE ALSO MLO)	(E)	EXISTING
MTS	MANUAL TRANSFER SWITCH	MCB	MAIN CIRCUIT BREAKER	(N)	NEW
C	CONDUIT	MLO	MAIN LUGS ONLY	(R)	RELOCATE/RELOCATED
CONT	CONTINUATION	NEC	NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE AHJ		
CU	COPPER	P	POLE		
CW	COLD WATER PIPE	PH	PHASE		
FACP	FIRE ALARM CONTROL PANEL	PNL	INDICATES PANEL		

revision number	description
	100% DESIGN

LICENSED PROFESSIONAL ENGINEER
ELI B. WALTZ
Exp. 04/30/26
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.
SIGNATURE

architect

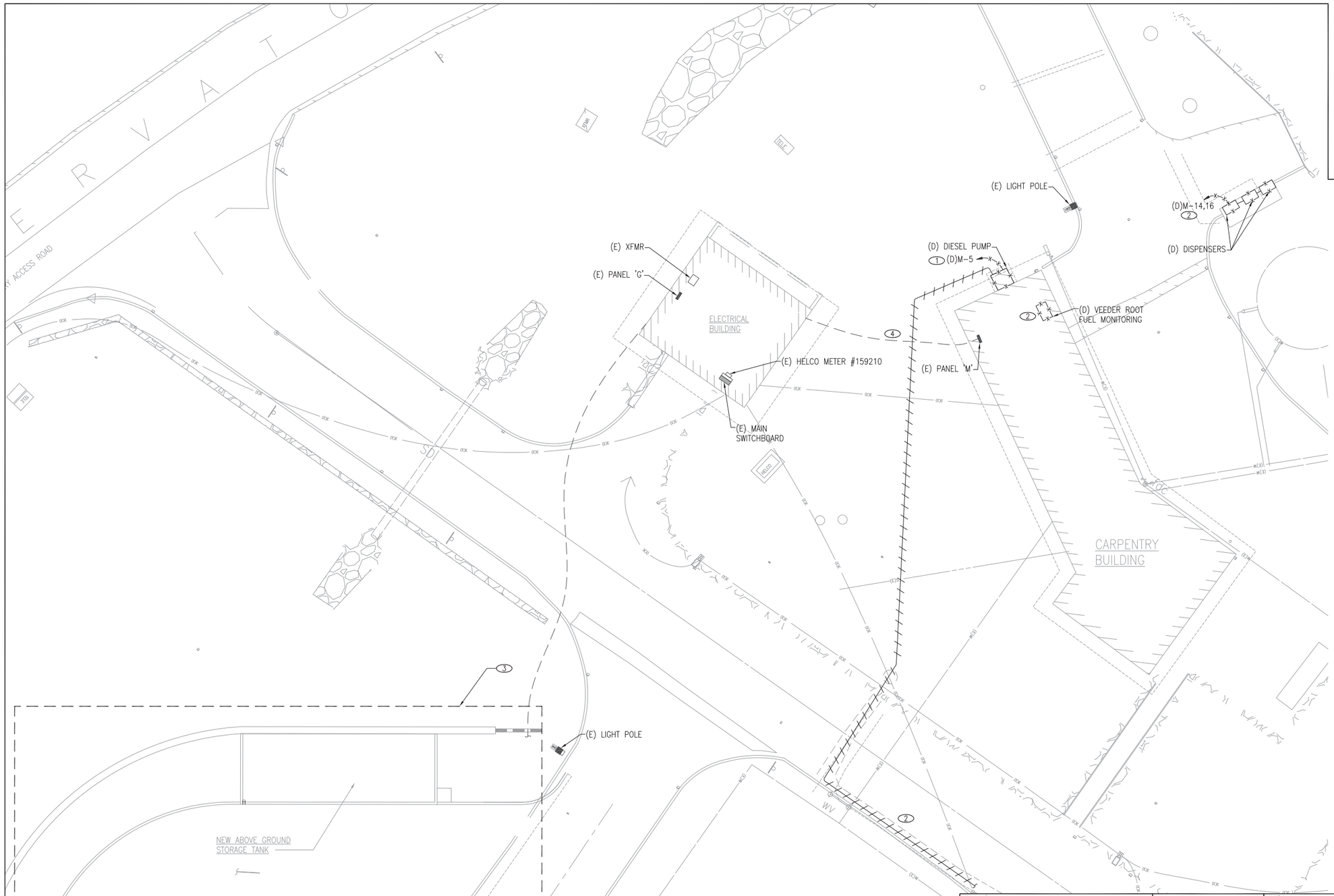
consultant
ENGINEERING PARTNERS

UNIVERSITY OF HAWAII
STATE OF HAWAII

project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL
UNIVERSITY OF HAWAII, INSTITUTE FOR ASTRONOMY

drawing title:
ELECTRICAL SYMBOLS, ABBREVIATIONS AND IECC

phase:		EPI project no. 12027-23-01	sheet no.
designed by: CF	checked by: EW	UH project no. 0010391-01-A	E-001
drawn by: CF	approved by: EW	date 05/22/2024	
drawing scale: AS NOTED			



NOTES

1. DIESEL FUEL PUMP TO BE REMOVED. RETAIN EXISTING STRUCTURE, REMOVE ALL UNDERGROUND FUEL LINES AND ELECTRICAL CONDUIT BACK TO SOURCE.
2. REMOVE ALL ELECTRICAL CONDUIT AND CONDUCTORS BACK TO SOURCE.
3. SCOPE OF WORK NOT IN REMOVAL PHASE (II). CONTRACTOR TO REFER TO SCOPE OF WORK IN REPLACEMENT PHASE (I).
4. PROTECT ELECTRICAL CONDUIT IN PLACE.

A OVERALL ELECTRICAL PLAN
SCALE: 1" = 10' 0 10' 20'

revision number	description
	100% DESIGN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

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UNIVERSITY OF HAWAII
STATE OF HAWAII

project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII,
INSTITUTE FOR ASTRONOMY

drawing title:
OVERALL ELECTRICAL PLAN

phase:		EPI project no.	sheet no.
designed by: CF	checked by: EW	12027-23-01	E-101
drawn by: CF	approved by: EW	UH project no. 0010391-01-A	
drawing scale: AS NOTED		date 05/22/2024	

EXISTING

PANEL: M

VOLTAGE: 208 / 120 3Ø 4W | CIRCUIT CODE: blank or N: NON-CONTINUOUS
BUS: 225A | L: LONG-CONTINUOUS
DATE: 2/2/24 5:11 PM | MAINS: 150A | LOCATION: INTERIOR | R: DEMANDABLE RECEPTACLES
JOB: 12027-23-01 | A/C RATING: 10,000 | MOUNTING: SURFACE | K: KITCHEN NO. OF EQUIPMENT: 0

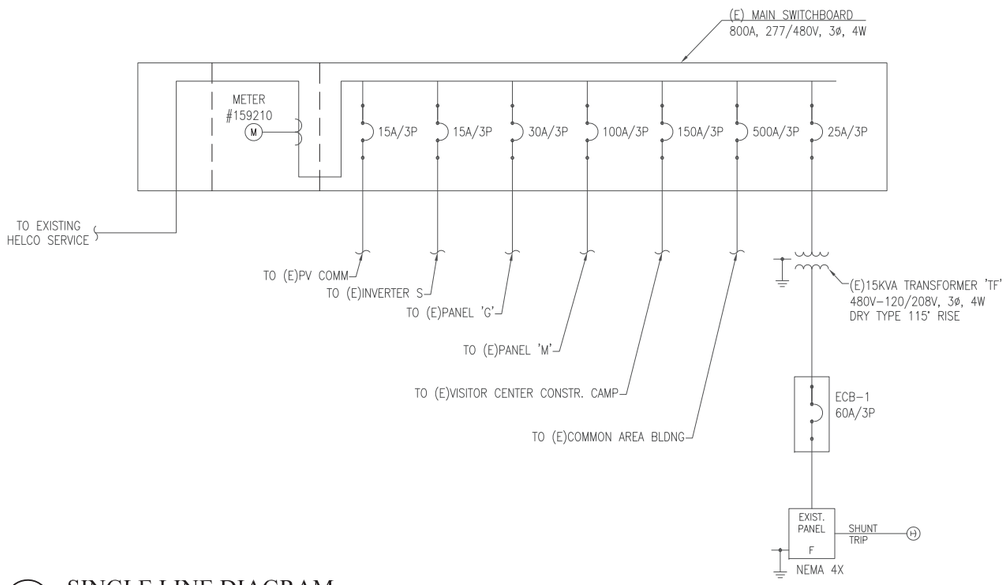
CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION	(NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE)	LOAD DESIGNATION DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		20	1	A. LIGHTS & B. LIGHTS					-			•			-								INVERTER 1	50			2
3		20	1	GARAGE WEST WALL						-			•			-							--				4
5		20	1	DIESEL PUMP	1						-			•			-						--		3		6
7		90		WATER PUMPS					-			•			-								PFFB				8
9				--						-			•			-							PFFB				10
11			3	--							-			•			-						PFFB				12
13		30		HEAT PUMP					-			•			-						1	GAS PUMPS	20			14
15			2	--						-			•			-					1	--		2		16
17		50		SUB. BOX CARPENTER SHOP							-			•			-						PLUGS	30	1		18
19			2	--					-			•			-							FANS	30	1		20
21				PFFB						-			•			-						AC TEL ROOM	20	1		22
23		15	1	EXISTING LOAD							-			•			-					SHOP RECEPTS & DRILL PRESS	20	1		24
25		30	1	EXISTING LOAD					-			•			-							OFFICE	20	1		26
27		20	1	EXISTING LOAD						-			•			-						BOILER	20	1		28
29		20	1	EMERGENCY STOP	1						-			•			-					BOILER	20	1		30
31									-			•			-											32
33										-			•			-										34
35											-			•			-									36
37									-			•			-											38
39										-			•			-										40
41											-			•			-										42

PANEL NOTES:

1. LABEL AS SPARE AFTER DEMOLISHING CONDUIT AND CIRCUIT TO DEVICE.

PHASE TOTALS: ØA: 0 | ØB: 0 | ØC: 0

TOTAL CONNECTED VA	0
CONNECTED VA (CODE N)	0
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	0.0
PANEL DEMAND KVA	0.0
PANEL DEMAND AMPS	0.0
HIGH Ø AMPS w/ DEMAND	0.0



1 SINGLE LINE DIAGRAM
NO SCALE

revision number	description
	100% DESIGN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
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ENGINEERING PARTNERS

UNIVERSITY OF HAWAII
STATE OF HAWAII

project:
HALE POHAKU FUEL STORAGE - 2028 COMPLIANCE UPGRADE - REMOVAL

UNIVERSITY OF HAWAII
INSTITUTE FOR ASTRONOMY

drawing title:
SINGLE LINE DIAGRAM & ELECTRICAL SCHEDULES

phase:		EPI project no. 12027-23-01	sheet no. E-201
designed by: CF	checked by: EW	UH project no. 0010391-01-A	
drawn by: CF	approved by: EW	date 05/22/2024	
drawing scale: AS NOTED			