

Environmental Assessment for the Air Force Downrange Facilities at Molokai, Hawaii



United States Air Force
30th Space Wing
Vandenberg AFB, California



December 2011

S-I.0 Project Summary

S-I.1 Project Proponent and Project Summary

The United States Air Force (USAF) Downrange Facilities, located on Molokai, Hawaii (Molokai Facilities) served as a high frequency (HF) receiver site for radio communications to the Hawaiian area of the Western Range (WR). The facility was operated by the USAF 30th Space Wing (30 SW), based at Vandenberg Air Force Base (VAFB) in California beginning in 1965. Prior to use by the USAF 30 SW, the site was utilized by the Federal Aviation Administration (FAA) since 1961. In August 2007, the USAF determined that the service provided by the Molokai Facilities was no longer necessary to support 30 SW activities. The USAF is currently in the process of terminating their lease (General Lease 254, commencement date of January 1, 1998) with the State of Hawaii Department of Hawaiian Home Lands (DHHL).

S-I.2 Purpose and Need of the Environmental Assessment

The Proposed Action involves the termination of the lease of the property and the need to decommission (i.e., demolish, remove, dispose of) the instrumentation and transfer leased Federal property and existing structures onsite back to DHHL, as desired by the State. Therefore, the purpose of this Environmental Assessment (EA) is to ensure that an environmental review process is properly carried out in accordance with both Federal and State laws, since both Federal and State agencies are involved in this joint project. This EA has been prepared to comply with:

- The National Environmental Policy Act (NEPA);
- Chapter 343 of the Hawaii Revised Statutes (HRS); and
- Title 11, Chapter 200 of the Hawaii Administrative Rules (HAR).

S-I.3 Alternatives

Alternatives to the proposed action include the Alternative Action and No Action. The Alternative Action consists of demolition of the existing buildings onsite. The No Action alternative consists of no change to the existing conditions.

S-I.4 Environmental Impacts

Table S-1 on the following page includes an outline of the resource areas evaluated and a brief summary of the potential impacts of the Proposed Action, Alternative Action, and No Action alternatives.

S-I.5 Anticipated Determination

A Finding of No Significant Impact (FONSI) is anticipated after a review of this EA and the Significance Criteria described in HAR Section 11-200-12(b) (described in Section 5 of this EA).

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Table S-1: Summary of Environmental Impacts

Resource Areas	Proposed Action – Land Transfer (Buildings to Remain)	Alternative Action – Land Transfer (with Demolition of Buildings)	No Action
Land Use	No change in land use classification or zoning.	No change in land use classification or zoning.	No change in land use classification or zoning. State cannot use the property as they see fit.
Transportation	No impacts. Temporary short-term impacts due to construction activities.	Temporary short-term impacts due to construction activities.	No impacts.
Social and Economic	No impacts.	Temporary short-term beneficial impacts due to construction activities.	No social impacts. Adverse economic impacts to both USAF and DHHL.
Climate and Air Quality, Noise	No impacts. Need to recover refrigerants from scrap refrigerators and air conditioning systems in abandoned vehicles.	Temporary short-term impacts due to construction activities. Need for BMPs during construction and remediation. Need to recover refrigerants from refrigerators and air conditioning systems in buildings and abandoned vehicles.	No impacts.
Flora and Fauna	No impacts. No naturally occurring threatened or endangered plants or animals within the project site.	Minimal impacts due to construction activities. No naturally occurring threatened or endangered plants or animals within the project site.	No impacts.

Resource Areas	Proposed Action – Land Transfer (Buildings to Remain)	Alternative Action – Land Transfer (with Demolition of Buildings)	No Action
Historic and Archaeological Resources	No impacts.	No impacts to known archaeological and cultural resources. Archaeological Monitoring Plan required.	No impacts.
Hazardous Materials, Visual Setting, Water Resources, Geographic Setting, and Utilities	Beneficial impacts due to partial remediation of hazardous materials.	Beneficial impacts due to complete remediation of hazardous materials.	Negative impacts due to potential hazardous materials remaining onsite.

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List of Acronyms and Abbreviations

30 SW	30 th Space Wing
ACM	asbestos-containing material
AG	agricultural
BMP	Best Management Practice
CFR	Code of Federal Regulations
CMU	concrete masonry unit
CZM	Coastal Zone Management
dBA	decibel
DHHL	State of Hawaii, Department of Hawaiian Home Lands
DOH	State of Hawaii, Department of Health
DOPAA	description of proposed action and alternatives
E2	Element Environmental, LLC
EA	Environmental Assessment
EBS	environmental baseline survey
EIS	Environmental Impact Statement
EPA	United States, Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
GPS	global positioning system
HAR	Hawaii Administrative Rule
HED	Honolulu Engineer District
HF	high frequency
HRS	Hawaii Revised Statutes
HVAC	heating, ventilation, and air conditioning
LBP	lead-based paint
MECo	Maui Electric Company
mg/L	milligram per liter
msl	mean sea level
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
ODS	ozone-depleting substance

PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PPE	personal protective equipment
RLP	Rotatable Log Periodic
RTI	Research Triangle Institute
SIHP	State Inventory of Historic Properties
SMA	Special Management Area
SOW	scope of work
TMK	tax map key
UBC	Uniform Building Code
UPS	uninterruptible power supply
US	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
VAFB	Vandenberg Air Force Base
VLP	Vertically-Polarized (Four-Curtain Rosette) Log Periodic
WR	Western Range

Section I Purpose and Need for Action

This section presents the purpose of and need for the Proposed Action, the project background, and the purpose of this Environmental Assessment (EA).

I.1 Purpose and Need of Proposed Action

The United States Air Force (USAF) Downrange Facilities, located on Molokai, Hawaii (Molokai Facilities) served as a high frequency (HF) receiver site for radio communications to the Hawaiian area of the Western Range (WR). The facility was operated by the USAF 30th Space Wing (30 SW) based at Vandenberg Air Force Base (VAFB) in California beginning in 1965. Prior to use by the USAF 30 SW, the site was utilized by the Federal Aviation Administration (FAA) since 1961. In August 2007, the USAF determined that the service provided by the Molokai Facilities was no longer necessary to support 30 SW activities, so the USAF is terminating their lease (General Lease 254, commencement date of January 1, 1998) with the landowner, the State of Hawaii Department of Hawaiian Home Lands (DHHL). The purpose of the proposed action involves the need or requirement to terminate the lease, to decommission (demolish, remove, and dispose of) the instrumentation, and to transfer the leased property and the existing structures onsite back to the DHHL, as desired by the State.

The Molokai Facilities are located in the north-central part of the island of Molokai, approximately 500 feet south of the shoreline of the Pacific Ocean, within the Hawaiian Home Lands of Hoolehua and Palaa. The property is located at tax map key (TMK) 5-2-06: Parcel 63, Lot A (a rectangular lot 363.673 acres in size) (State of Hawaii, 1980), and is bordered to the east by Nenehanaupo Avenue and to the south by Puu Kapele Avenue. Figure 1-1 provides the project site location and vicinity map and Figure 1-2 provides the tax map.

I.2 Project Background

The Molokai Facilities are located on land currently owned by the DHHL and leased to the United States (US), Secretary of the Air Force, acting by and through the 30 SW Commander, VAFB, by General Lease No. 254. The facility improvements are owned and operated by the USAF and are part of the WR, which is managed by the 30 SW, headquartered at VAFB in California. The 30th Range Squadron manages all WR resources and conducts space, ballistic, and aeronautical operations in the area of the Pacific Ocean. Launches occur primarily from VAFB, and all mainland instrumentation is located in California. Downrange instrumentation is located in Hawaii and Kwajalein. Generally, the launch facilities on north VAFB support ballistic missile launches into broad ocean areas and the Kwajalein Missile Range, while the space launch complexes support southerly over-ocean polar space launches. 30 SW instrumentation sites are located along the continental Pacific coast and on the Hawaiian Islands.

In conjunction with other ranges, principally the Naval Air Warfare Center Weapons Division, Point Magu, and the Army Kwajalein Missile Range, the WR provides continuous and complimentary instrumentation coverage over a broad portion of the Pacific Ocean. The West Coast Offshore Operating Area, which extends along the Pacific coast from Mexico as far north as the Canadian border, provides an aeronautical and guided-missile test corridor. The Hawaiian Islands are located in the midrange area for ballistic missile tests, between

Vandenberg launch head and the Kwajalein terminal areas. Support facilities for the WR are located on the islands of Oahu, Molokai, and Kauai.

There are three significant sites on Oahu that belong to the WR: Wheeler, Kaena Point Radar Facility, and Ewa Beach. The Ewa Beach Facilities site, located northwest of Honolulu, is the transmitter site for HF communications from Hawaii back to the mainland and serves as a backup to other forms of communication. This site was originally chosen because it is in a relatively uninhabited part of the island where the operation of high power transmitter produces minimal interference. The USAF has designated the Ewa Beach Facilities for decommissioning and disposal of USAF assets.

VAFB leases land on the Island of Molokai, which serves as a site for a HF receiver for radio communications to the Hawaiian area of the WR. This site was originally chosen because it is in a relatively undeveloped area where the operation of a high power transmitter produces minimal interference (Research Triangle Institute [RTI], 2000). The USAF has determined that the instrumentation at the Molokai Facilities is no longer necessary to support 30 SW activities and the lease is in the process of being terminated. The USAF has designated the Molokai Facilities for decommissioning and transfer back to the landowner, the DHHL.

In accordance with the lease agreement between the USAF and DHHL, the property must be returned to its original condition prior to transfer. All site improvements constructed by the USAF and/or their predecessor agency, the FAA, including instrumentation and supporting infrastructure, must be demolished and removed from the site. DHHL, however, has requested that the three existing buildings onsite remain.

On November 2, 2011, the USAF gave priority to the removal, transport, and disposal of all Prime Mission Equipment assets located at the site as a result of a safety issue concerning severe corrosion of Rotatable Log Periodic (RLP) antenna support structure (guy wires broke). Project activities were divided into two Phases. Phase I, completed in December 2011, included the removal and disposal of all above ground Prime Mission Equipment, which consisted of existing antennas, towers, and related support hardware; along with existing equipment racks, the uninterruptible power supply (UPS) unit, and related cabling and cable trays in Building 1. Phase II, to be completed upon release of the Final EA and contract funding, will include the excavation, containment, transport, and disposal of all (past and present) antenna-related concrete anchors, piers, wooden support poles, ground screens, and associated underground conduit, cabling, and hardware.

Contamination, which was identified on the property during the Phase I Environmental Baseline Survey (EBS) to document the condition of the property prior to decommissioning and transfer (Element Environmental, LLC [E2], 2010a), and during a follow-on Phase II EBS (E2, 2010b), must be remediated to acceptable contaminant levels in accordance with Federal, State, and local regulations.

1.3 Purpose of the EA

The Molokai Facilities property transfer also requires that an EA be completed to assess the impact that the proposed property transfer actions may have on the environment.

This EA has been prepared to comply with the National Environmental Policy Act (NEPA); Chapter 343 of the Hawaii Revised Statutes (HRS); and Title 11, Chapter 200 of the Hawaii

Administrative Rules (HAR). Compliance with both Federal and State laws is required because of the transfer of property from a Federal entity to a State entity.

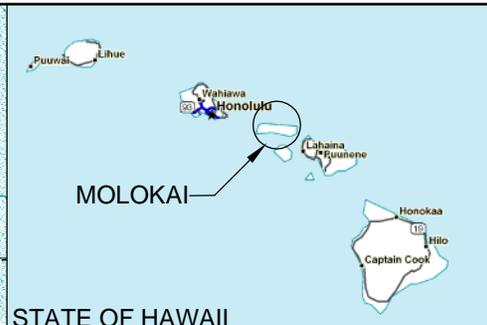
This EA evaluates the social and environmental impacts that could result from the proposed property transfer as described in Section 2. Construction-phase impacts, which involve demolition of the existing facilities, are also assessed. Coordination with interested and affected parties is required. This EA will be distributed to the agencies listed in Section 7.

A Final EA will be prepared once comments generated by this Preliminary Final EA are received. A Finding of No Significant Impact (FONSI) is presently anticipated for this project as discussed in Section 5. The FONSI can only be determined appropriate after all comments generated from the Preliminary Final EA have been assessed. If the project is determined to have a FONSI, the Final EA will conclude the procedures required under HRS 343, HAR Chapter 200, and NEPA.

This EA was prepared by E2 for the 30 SW based at VAFB through the United States Army Corps of Engineers (USACE) Honolulu Engineer District (HED) under Contract No. W9128A-09-0045. The work performed was based on the scope of work (SOW) included in the contract dated 29 September 2009 (USACE, 2009).

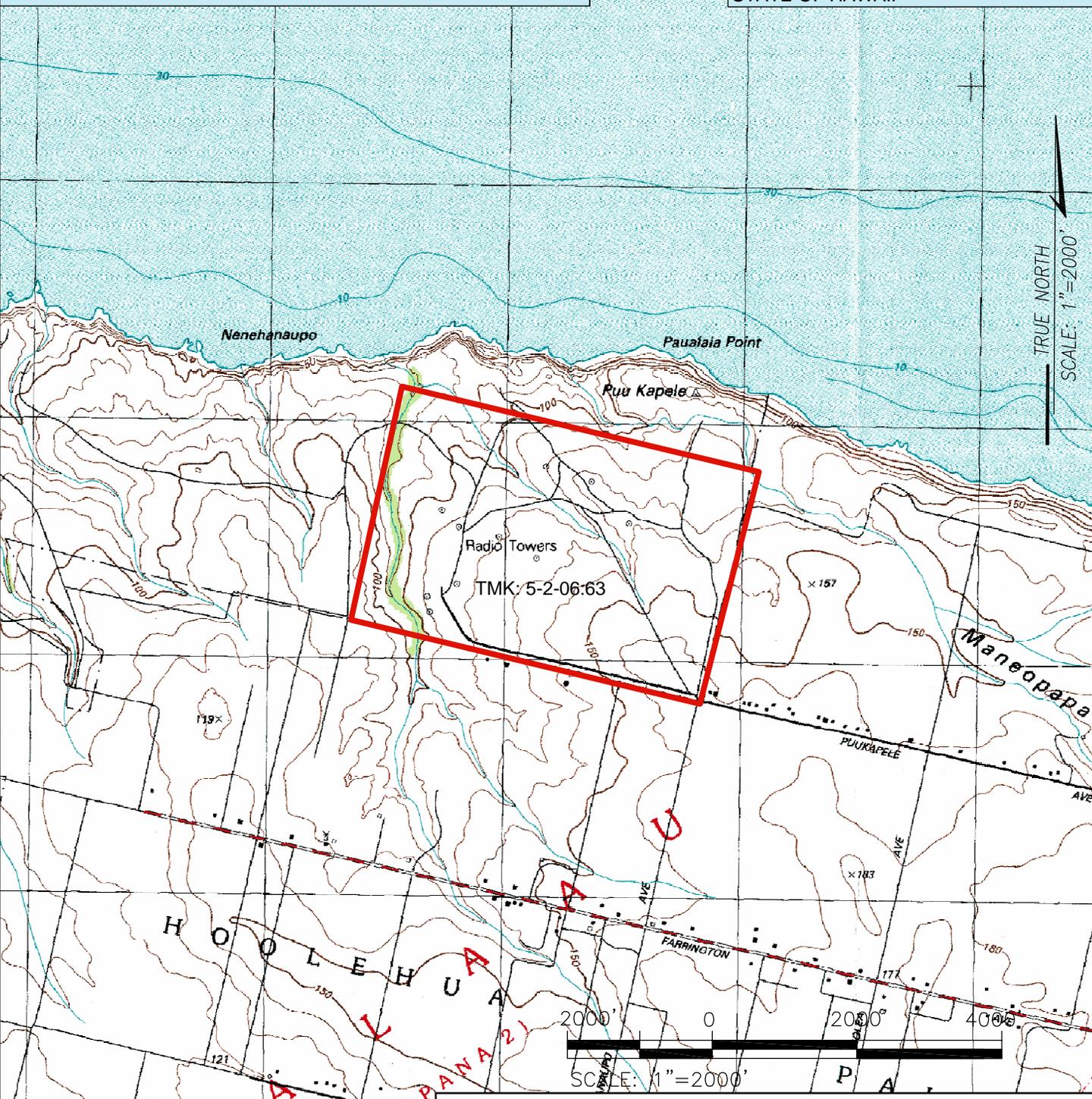
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SUBJECT PROPERTY



ISLAND OF MOLOKAI

STATE OF HAWAII

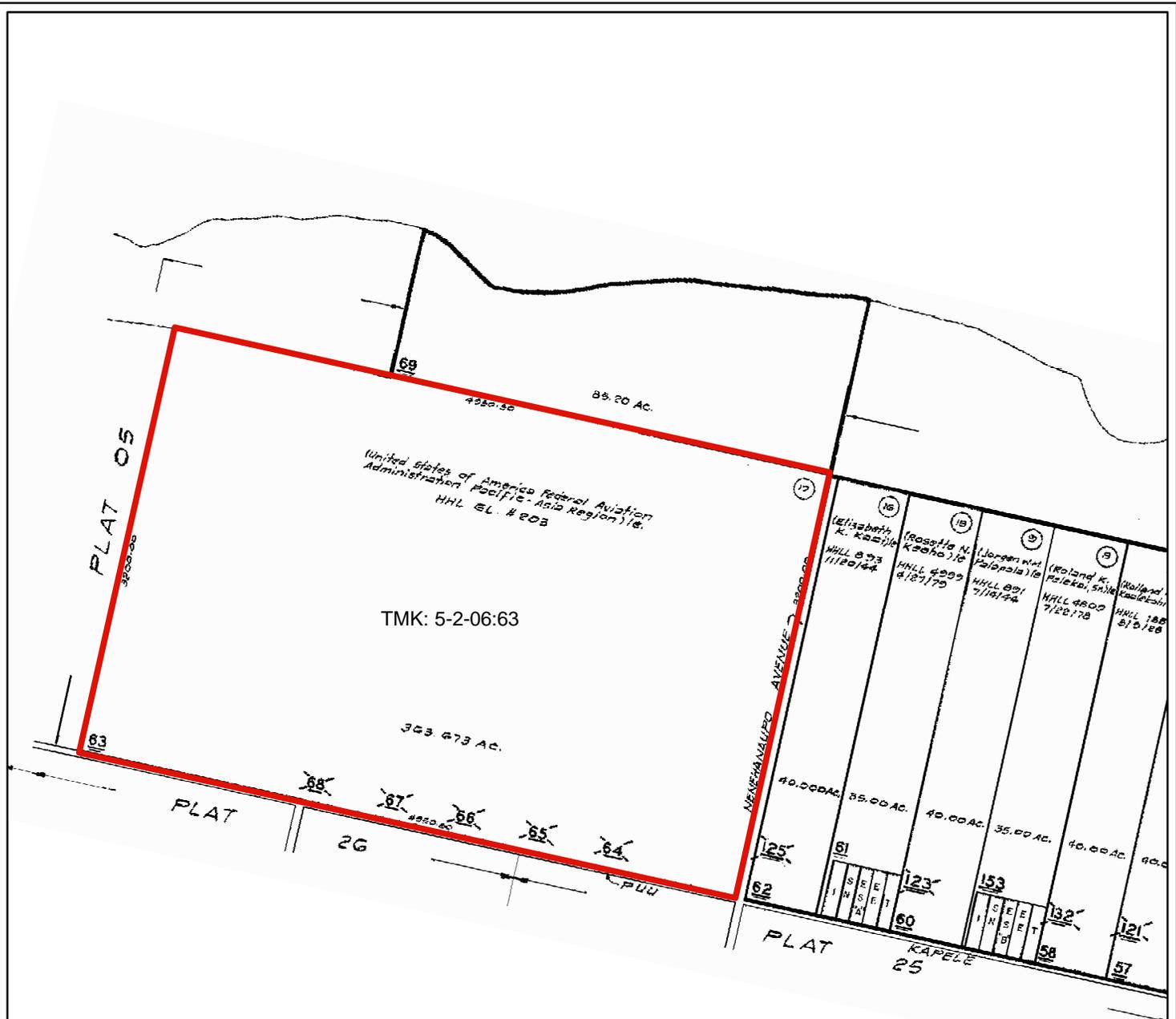


PROPERTY BOUNDARY

REFERENCE:
1. DELORME, 2002.
KEONG

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: SITE LOCATION MAP	FIGURE NO.: 1-1

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APPROXIMATE SCALE: 1"=1000'

TRUE NORTH
SCALE: 1"=1000'

PROPERTY BOUNDARY

REFERENCE:
1. STATE OF HAWAII, DEPT. OF TAXATION,
REVISED JUNE 1980.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: TAX MAP	FIGURE NO.: 1-2

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Section 2 Proposed Action and Alternatives

This section provides a description of the proposed action and alternatives (DOPAA) developed and evaluated to address the project purpose and need described in Section 1. A description of the affected environment is presented in Section 3, and an evaluation of the impact the Proposed Action and Alternatives has on the environment is presented in Section 4.

2.1 Proposed Action

The USAF has determined that the instrumentation and 363.673 acres of land at the Molokai Facilities are no longer necessary to support the 30th Space Wing (VAFB) activities and the lease is in the process of being terminated. Therefore, the USAF has designated the structures remaining at the project site for decommissioning (i.e., transfer, demolition, removal, and/or disposal) and the land for transfer back to the landowner, the State of Hawaii DHHL.

In accordance with the lease agreement between the USAF and DHHL, the property must be returned to its original condition prior to transfer. Based on the lease agreement, the land is required to be returned to DHHL to pre-existing original conditions and this is why action at the site is required and why the EA is required. All site improvements constructed by the USAF and/or their predecessor agency, the FAA, including instrumentation and supporting infrastructure, must be demolished and removed from the site; however, the DHHL has expressed interest in keeping the buildings. Therefore, under the proposed action the three buildings would not be demolished, as desired by the State. The following structures/improvements and ancillary instrumentation will be part of the decommissioning:

- Antenna-related concrete anchors, piers, wooden support poles, ground screens, and associated underground conduit, cabling, and hardware will be removed.
- Re-vegetation of disturbed soil areas will be performed as a soil erosion minimization measure.
- Building 1 (Receiver Building), a two-story concrete structure, with a basement under part of the ground floor with associated concrete slabs will remain.
- Building 2 (Generator/Storage Building), a one-story concrete structure with associated concrete slabs will remain.
- Building 3 (Vehicle Storage Shed/Garage), a one-story corrugated metal structure with associated concrete slabs will remain.
- Contamination will be remediated to acceptable contaminant levels in accordance with Federal, State, and local regulations. Contamination includes hazardous materials, creosote-treated poles, asbestos containing materials (ACM), lead-based paint (LBP), canec, and soils impacted with metals, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). Remediation activities will address solid waste debris piles (and ODSs or GHGs), creosote-treated poles, and PCBs.

- Solid waste/debris piles, associated with unauthorized dumping activities on the site, will be properly disposed of in a landfill or recycled, if appropriate.

The three buildings at the site include the following:

- Building 1, the Receiver Building, is a two-story concrete structure with a basement below grade and a floor at grade. This building was completed in 1962 after the FAA obtained a land use license from the DHHL. The ground level of this building consists of a large equipment room and 11 smaller offices and/or storage rooms. Building plans from 1995 show the equipment room occupied by equipment racks on the east end of the room.

The basement level consists of a much smaller floor plan, including a storage room and a bathroom with a shower.

- Building 2, the Former Shop/Generator Building, is a one-story concrete structure, which has two large rooms and a smaller room divided by concrete masonry unit (CMU) walls. This building was also completed in 1962 after the FAA obtained a land use license from the DHHL.

The first of the larger rooms (approximately one-half of the building), houses the emergency generator, two transfer panels (switches, breakers), and a cabinet used to store generator parts (e.g., filters, fuses, etc.). The emergency generator has an internal 350-gallon diesel tank; however, the generator is no longer in use (Bush, 2010). Building plans from 1995 show a 100 amp telephone panel service disconnect, a 200 amp tech power service disconnect, two surge protectors, a 400 amp panel, wireways, and a cable trench on the north wall and a telephone transfer switch and a tech power transfer switch on the south wall (USAF, 1995), as observed during E2's January 2010 site reconnaissance.

The second of the larger rooms was formerly used as a workshop and for storage, and is currently empty.

The third, smaller room, referred to as a paint locker, is located in the west corner of the building (USAF, 1995) and is also currently empty.

- Building 3, the Vehicle Storage Shed/Garage, a corrugated metal structure built in November 1984, is located on the site of the old vehicle operations storage shed (FAA, 2009), and is currently used to store a tractor, weed eater, and fuel. This shed was reportedly the former accumulation point for hazardous materials/wastes produced by the FAA (Bush, 2010).

Figure 2-1 provides a depiction of the current and former structures and improvements on the site, and Figure 2-2 shows the building structures and concrete slabs in detail.

2.2 Alternative Action

The Alternative Action consists of property transfer and underground antenna infrastructure and building demolition. Costs (minimization/abatement vs. demolition) will play a role in determining the selected action. Therefore, in addition to decommissioning of the

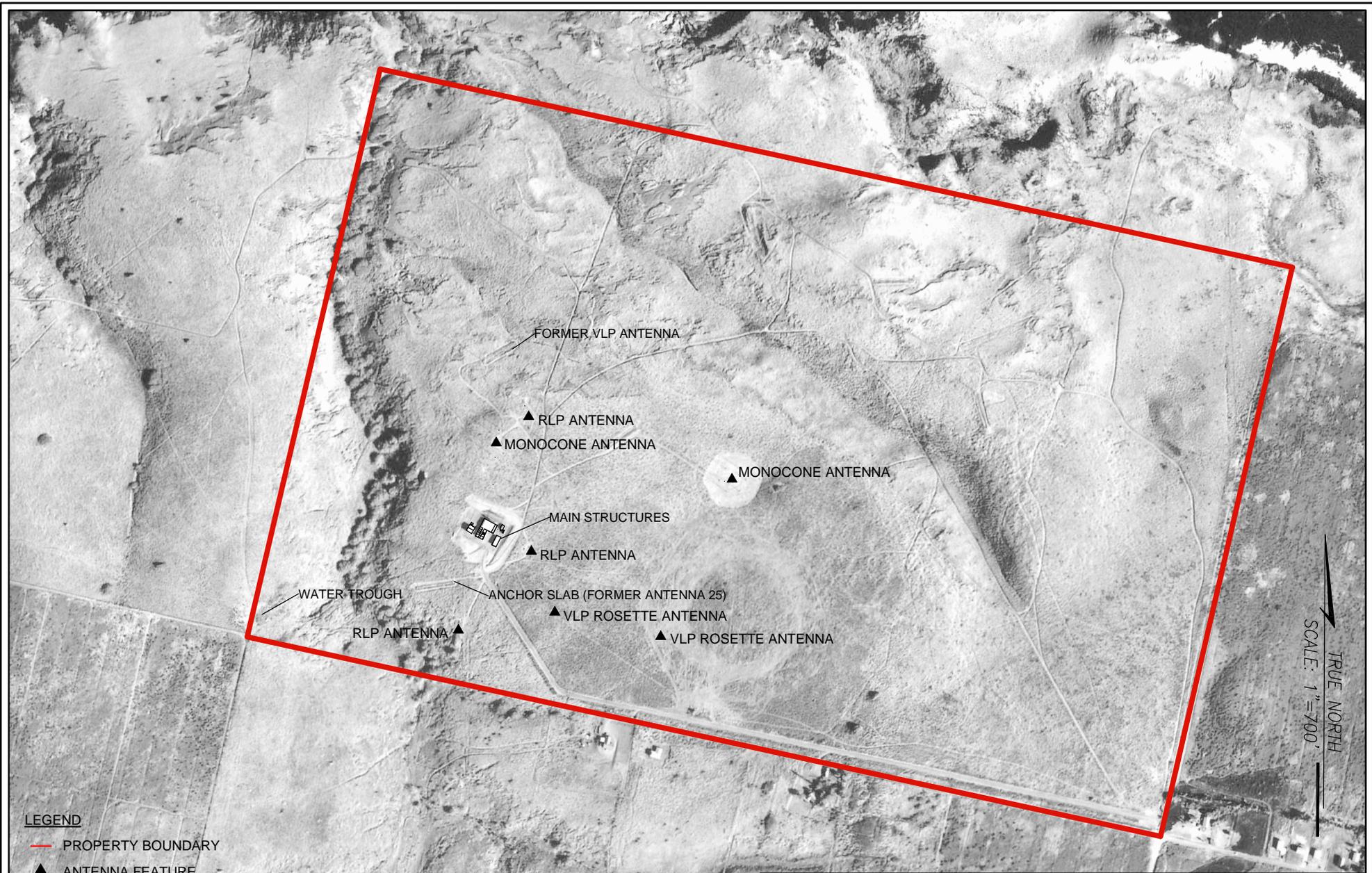
structures/improvements and ancillary instrumentation described above, the Alternative Action includes building demolition as detailed below:

- Building 1 (Receiver Building), a two-story concrete structure, with a basement under part of the ground floor with associated concrete slabs will be removed.
- Building 2 (Generator/Storage Building), a one-story concrete structure with associated concrete slabs will be removed.
- Building 3 (Vehicle Storage Shed/Garage), a one-story corrugated metal structure with associated concrete slabs will be removed.
- The cesspool associated with Building 1 will be removed and closed.
- Antenna-related concrete anchors, piers, wooden support poles, ground screens, and associated underground conduit, cabling, and hardware will be removed.
- Re-vegetation of disturbed soil areas will be performed as a soil erosion minimization measure.
- Contamination will be remediated to acceptable contaminant levels in accordance with Federal, State, and local regulations. Contamination includes hazardous materials creosote-treated poles, ACM, LBP, canec, PCBs, and soils impacted with metals, PAHs and PCBs.
- Solid waste/debris piles, associated with unauthorized dumping activities on the site, will be properly disposed of in a landfill or recycled, if appropriate.

2.3 No Action

This alternative would maintain the status quo for the Molokai Facilities. Current conditions would remain unchanged. This action is actually not a viable option because the USAF no longer has a need for the site, is in the process of terminating its lease, and is required by its lease agreement with the DHHL to return the property to its original condition prior to transfer.

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LEGEND

- PROPERTY BOUNDARY
- ▲ ANTENNA FEATURE



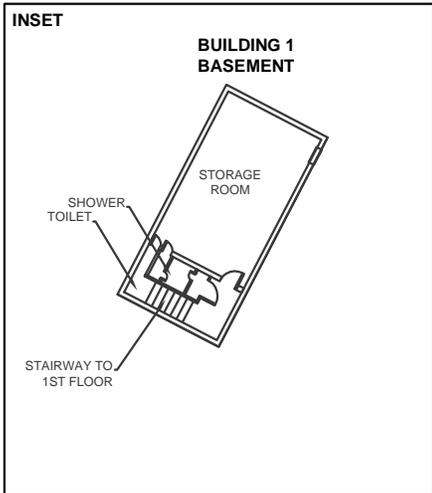
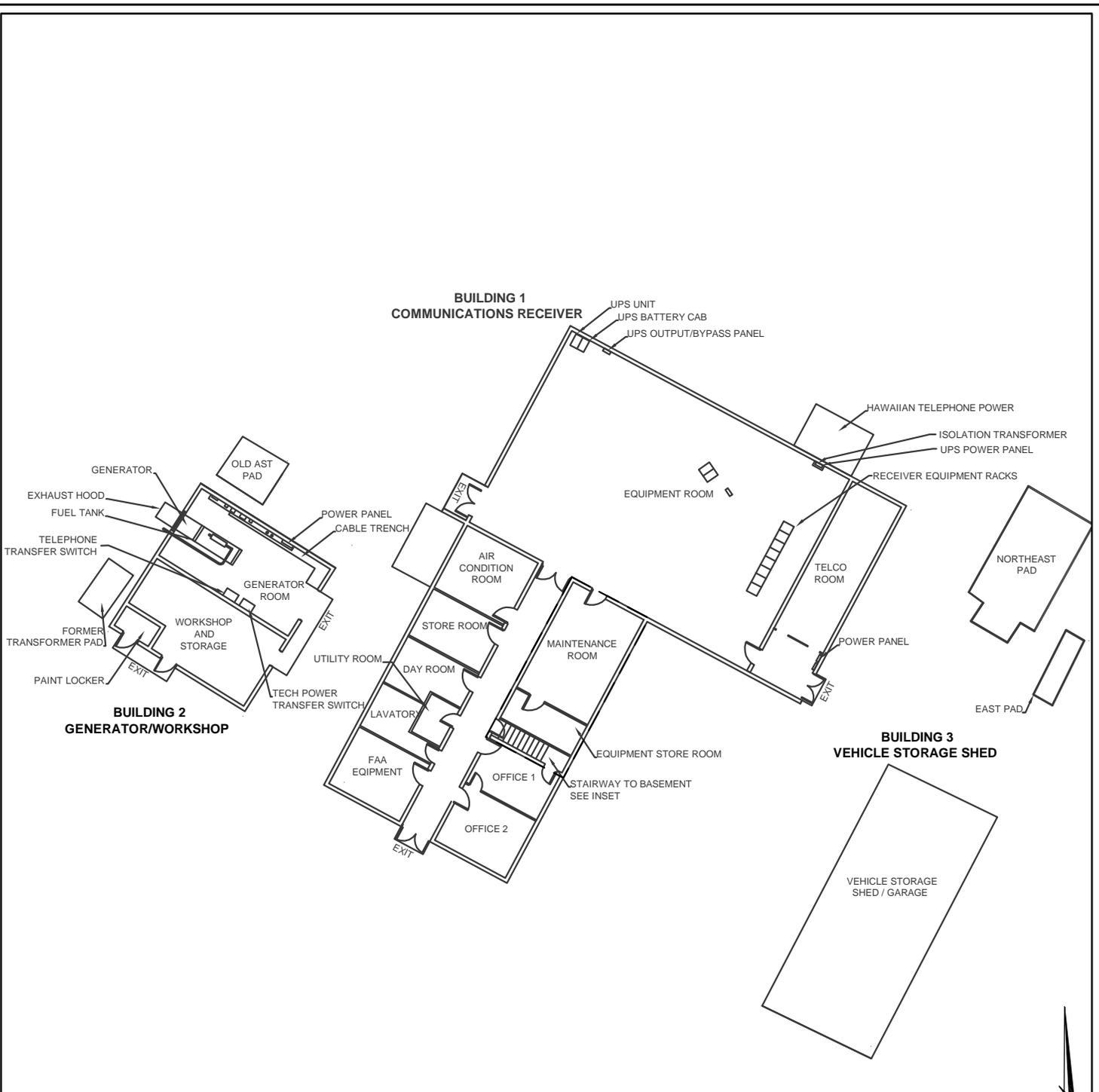
APPROXIMATE SCALE: 1" = 700'

LOCATIONS ARE APPROXIMATE.

REFERENCE:
1. USAF, 2008.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: STRUCTURES AND IMPROVEMENTS	FIGURE NO.: 2-1

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APPROXIMATE SCALE: 1"=30'

TRUE NORTH
SCALE: 1"=30'

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: BUILDINGS AND CONCRETE SLABS	FIGURE NO.: 2-2

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Section 3 Affected Environment

This section describes the environment of the project area. Impacts of the Proposed Action and the Alternative Actions on existing environmental conditions are presented in Section 4.

3.1 General Site Description

The subject property consists of 363.673 acres, within the Hoolehua-Palaau Homesteads in Hoolehua, Molokai, near the north-central shore of the island, which is characterized by steep cliffs and a rocky shoreline. The site lies approximately 3 miles north of the Molokai Airport, and approximately 500 feet south of the shoreline of the Pacific Ocean at its closest point (northwest corner) and is designated as a portion of TMK (2) 5-2-06: Parcel 63. The parcel is rectangular in shape, with 4,950.50 feet of frontage along Puu Kapele Avenue (east-west direction) and 3,200 feet of frontage along Nenehanaupo Avenue (north-south direction). Puu Kapele Avenue is a two-way, asphalt-paved road facilitating traffic in the area and access to the site at its southeast corner where Puu Kapele and Nenehanaupo Avenues intersect. Aside from the buildings and the remaining underground antennae-related structures, the site is covered by heavy brush and kiawe trees.

The Molokai Facilities are comprised of the Receiver Station (with three buildings) and the remaining antenna-related underground structures and instruments in the former Antenna Field. A site facilities map, which shows the overall site with the former antenna locations, is provided in Figure 3-1, and a diagram of the buildings and concrete slabs is provided in Figure 2-2.

3.2 Land Use

3.2.1 Existing Communities and Land Uses

The project site is located in Hoolehua, a rural community located approximately ten miles northwest of Kaunakakai, the island's main town. Land uses in Hoolehua are primarily agricultural intermixed with residential dwellings (Goto, 2004). Land use of adjacent properties to the north and west of the subject property are undeveloped, vacant land, and adjacent properties to the south and east consist of rural homestead residences.

3.2.2 Development Trends and Proposed Land Uses

After decommissioning of the remaining antenna-related underground structures and instruments in the former Antenna Field and transferring the property back to the DHHL, the site land use will likely remain agricultural, similar to land uses of adjacent properties.

3.2.3 Government Plans, Policies, and Controls

3.2.3.1. Hawaii State Land Use Controls

According to the State Land Use Ordinance, Lands within the State have been classified into four categories of land use districts: urban, rural, agricultural, and conservation (Chapter 205, HRS; Chapter 15-15, HAR). The site was originally zoned for agricultural use and consisted of

nine 40-acre parcels (Lots 90 to 98) designated for homestead use. At some subsequent date, the agricultural zoning (cultivation of crops, aquaculture, raising livestock, wind-farming, forestry, agriculture-support activities) was changed to include conservation (Goto, 2004 and Lum, 1978). The State Land Use classification of the site is agricultural, as shown on Figure 3-2.

3.2.3.2. The Hawaii State Plan

The Hawaii State Plan, HRS Chapter 226-9 (State of Hawaii, 2010a), gives the State's objectives and policies related to the economy and Federal expenditures. Chapter 226-9 states that:

- “(a) Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaii's economy.
- (b) To achieve the federal expenditures objective, it shall be the policy of this State to:
 - (1) Encourage the sustained flow of federal expenditures in Hawaii that generates long-term government civilian employment;
 - (2) Promote Hawaii's supportive role in national defense, in a manner consistent with Hawaii's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaii's economy;
 - (3) Promote the development of federally supported activities in Hawaii that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaii's environment;
 - (4) Increase opportunities for entry and advancement of Hawaii's people into federal government service;
 - (5) Promote federal use of local commodities, services, and facilities available in Hawaii;
 - (6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaii; and
 - (7) Pursue the return of federally controlled lands in Hawaii that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.”

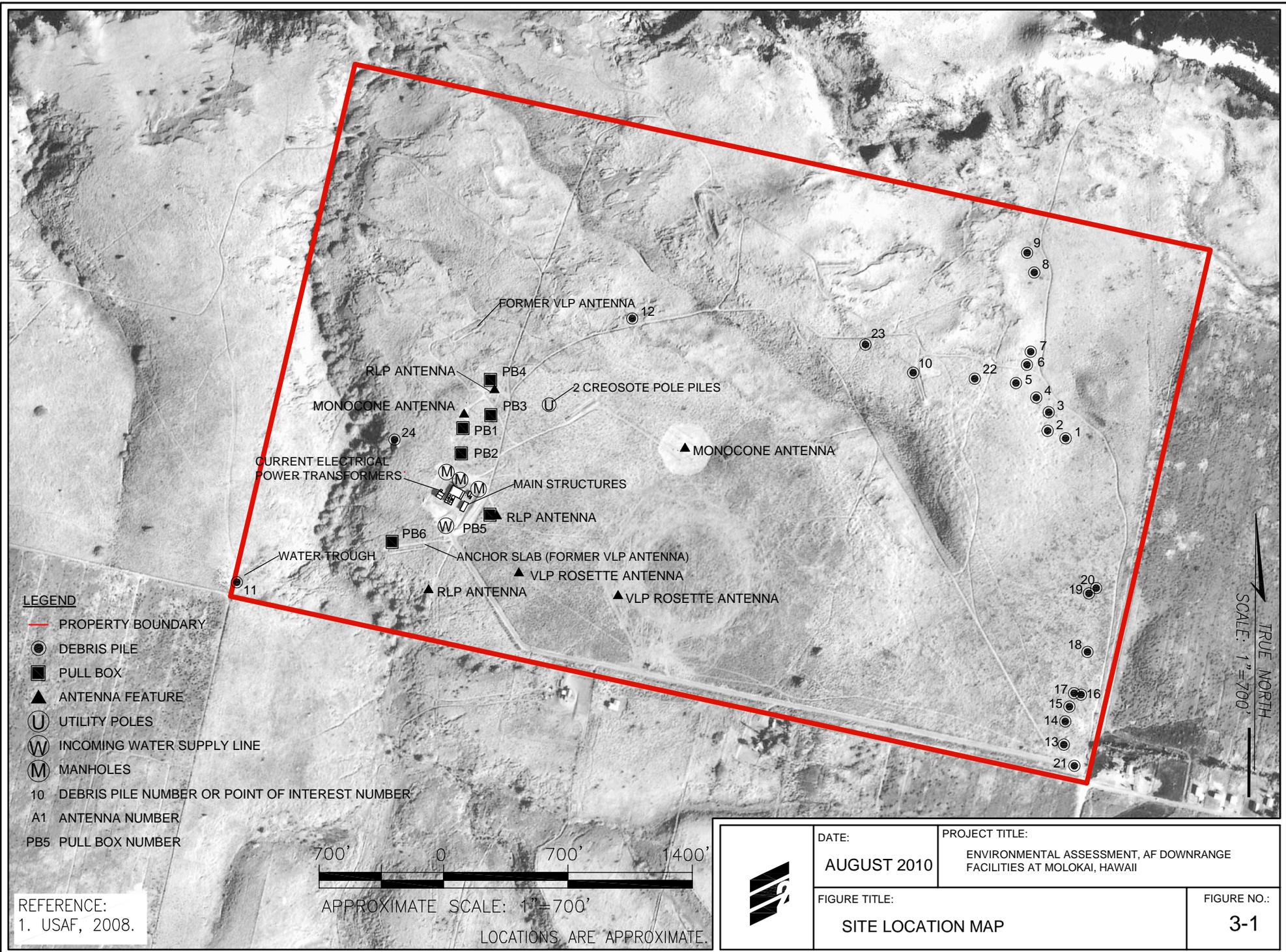
The policies most pertinent to the proposed action include numbers (6) and (7).

3.2.3.3. Hawaii State Coastal Zone Management

The site is not located in the Hawaii Coastal Zone Management (CZM) Program (Chapter 205A, HRS) area; therefore an application for a CZM Federal Consistency Review is not required.

3.2.3.4. Special Management Area

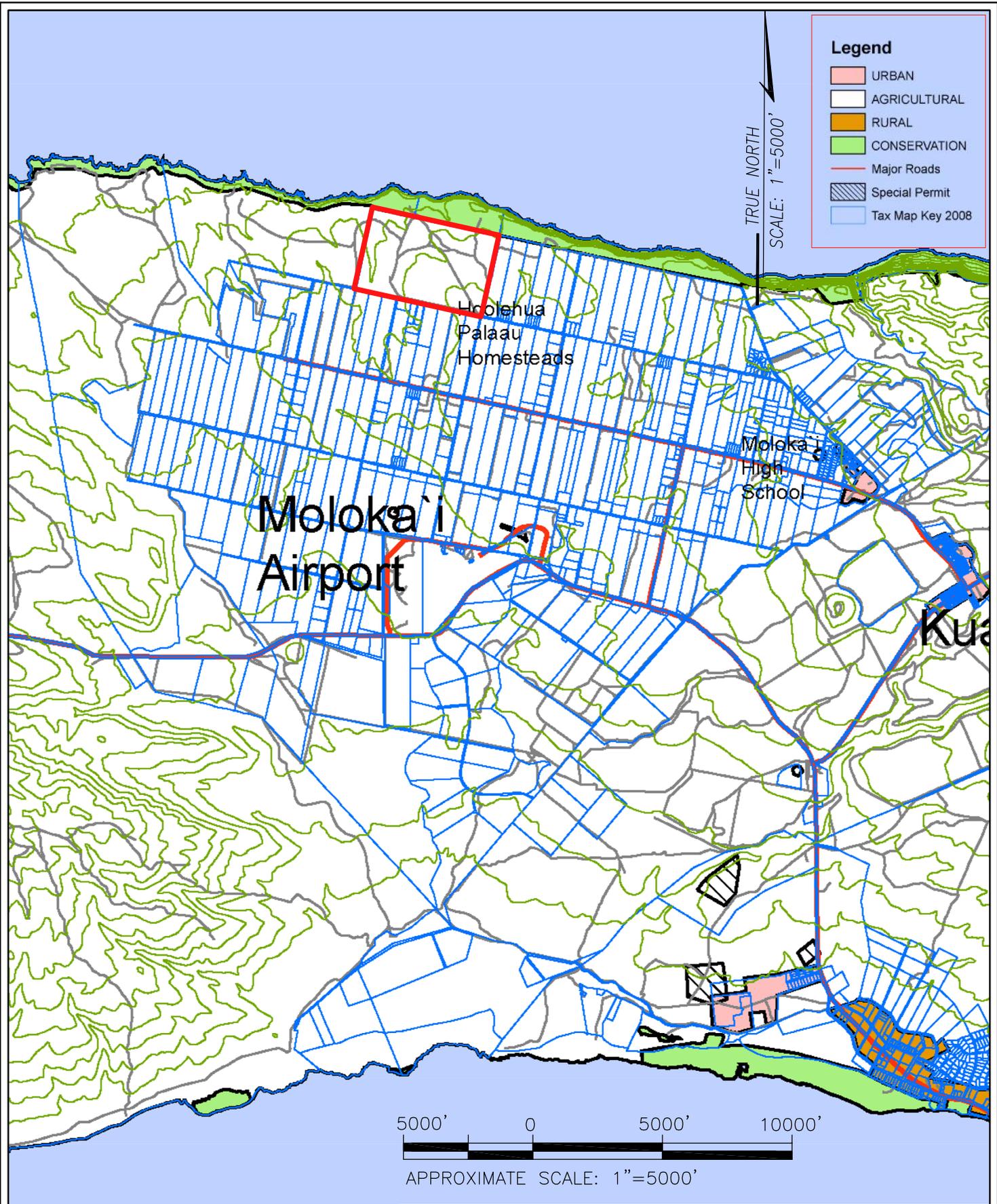
The site is not located in the Special Management Area (SMA, State of Hawaii, 2010b), as shown in Figure 3-3.



REFERENCE:
1. USAF, 2008.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: SITE LOCATION MAP	FIGURE NO.: 3-1

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Legend

- URBAN
- AGRICULTURAL
- RURAL
- CONSERVATION
- Major Roads
- Special Permit
- Tax Map Key 2008

TRUE NORTH
SCALE: 1"=5000'



APPROXIMATE SCALE: 1"=5000'

PROPERTY BOUNDARY

REFERENCE:
1. STATE LAND USE COMMISSION, COUNTY OF MAUI AGIS, 2004.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: STATE LAND USE MAP	FIGURE NO.: 3-2

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3.2.3.5. County of Maui 2030 General Plan Countywide Policy Plan

The County of Maui 2030 General Plan Countywide Policy Plan presents a comprehensive policy plan for the islands of Maui County to the year 2030 and provides the basis for updating the Maui Island Plan as well as nine detailed Community Plans that include Lanai, Molokai, and Kahoolawe.

The Countywide Policy Plan provides broad goals, objectives, policies, and implementing actions that portray the desired direction of the County's future. This includes: (1) a vision statement and core values for the County to the year 2030; (2) an explanation of the plan-making process; (3) a description and background information regarding Maui County today; (4) identification of guiding principles; and (5) a list of countywide goals, objectives, policies, and implementing actions related to the following core themes: (a) protect the natural environment, (b) preserve local cultures and traditions, (c) improve education, (d) strengthen social and healthcare services, (e) expand housing opportunities for residents, (f) strengthen the local economy, (g) improve parks and public facilities, (h) diversify transportation options, (i) improve physical infrastructure, (j) promote sustainable land use and growth management, and (k) strive for good governance.

3.2.3.6. County of Maui Zoning

According to the County of Maui Planning Department, the site is zoned as an Agriculture District, which provides areas for agricultural development in keeping with the economic base of the County and the regulations of the Land Use Commission (Goto, 2004). Current zoning as designated by the County of Maui in the vicinity of the project site is presented in Figure 3-4.

3.2.3.7. Molokai Community Plan

The site is located on the Molokai Community Plan Map in an area designated AG, Agricultural, which indicates areas for agricultural activity in keeping with the economic base of the County and the requirements and procedures of Chapter 205 HRS, as amended (Goto, 2004).

3.2.3.8. Easements and Restrictions

No easements or restrictions are identified in the legal description (Goto, 2004).

3.2.3.9. Greenhouse Gases, Federal Council on Environmental Quality

The 2010 Memorandum from the Council on Environmental Quality promotes Federal agencies to consider opportunities to reduce the effects of greenhouse gas (GHG) emissions and climate change under proposed Federal NEPA actions, adapt climate change impacts throughout the NEPA process, and address these issues in the NEPA procedures. Emissions from many proposed Federal actions would not typically be expected to produce an environmental effect that would trigger or otherwise require a detailed discussion in an Environmental Impact Statement (EIS). However, significant national policy decisions for which the action's GHG impacts are expected to be substantive have required more detailed quantitative analysis of their GHG effects (United States Executive Office of the President, 2010).

3.3 Transportation

The subject property is located at the intersection of Puu Kapele Avenue and Nenehanaupo Avenue. Puu Kapele Avenue is an asphalt-paved, light-duty, two-way, two-lane road within the Hoolehua area. It is one of several routes that lead into and out of the immediate area. There are no signalized intersections. The current right-of-way width along the project is 50-feet. Nenehanaupo Avenue is an unpaved, lightly-duty, two-way road. The other side streets within the project area are all two-lane, two-way roads. Side streets are stop-controlled at their intersections with Puu Kapele Avenue.

3.4 Social and Economic Conditions

In 2000 and 2007, the populations of Hoolehua were 1,075 and 6,782, respectively, with a median age of 36. Between 2000 and 2007, the population in the Hoolehua area increased by about 30 percent each subsequent year. The highest median annual household income is approximately \$41,000 per year (CityMelt.Com, 2010).

The island of Molokai has an elementary school, two middle schools, and two high schools. Molokai Intermediate School has 181 students and Molokai High School 712 students - the two public schools closest to the project site (3.5 miles to the east) (CityMelt.Com, 2010).

Hoolehua is enjoyed for its rural character. Consequently, many employment opportunities in Hoolehua are agriculturally related, including farming. Horse stables are also important to the community (CityMelt.Com, 2010).

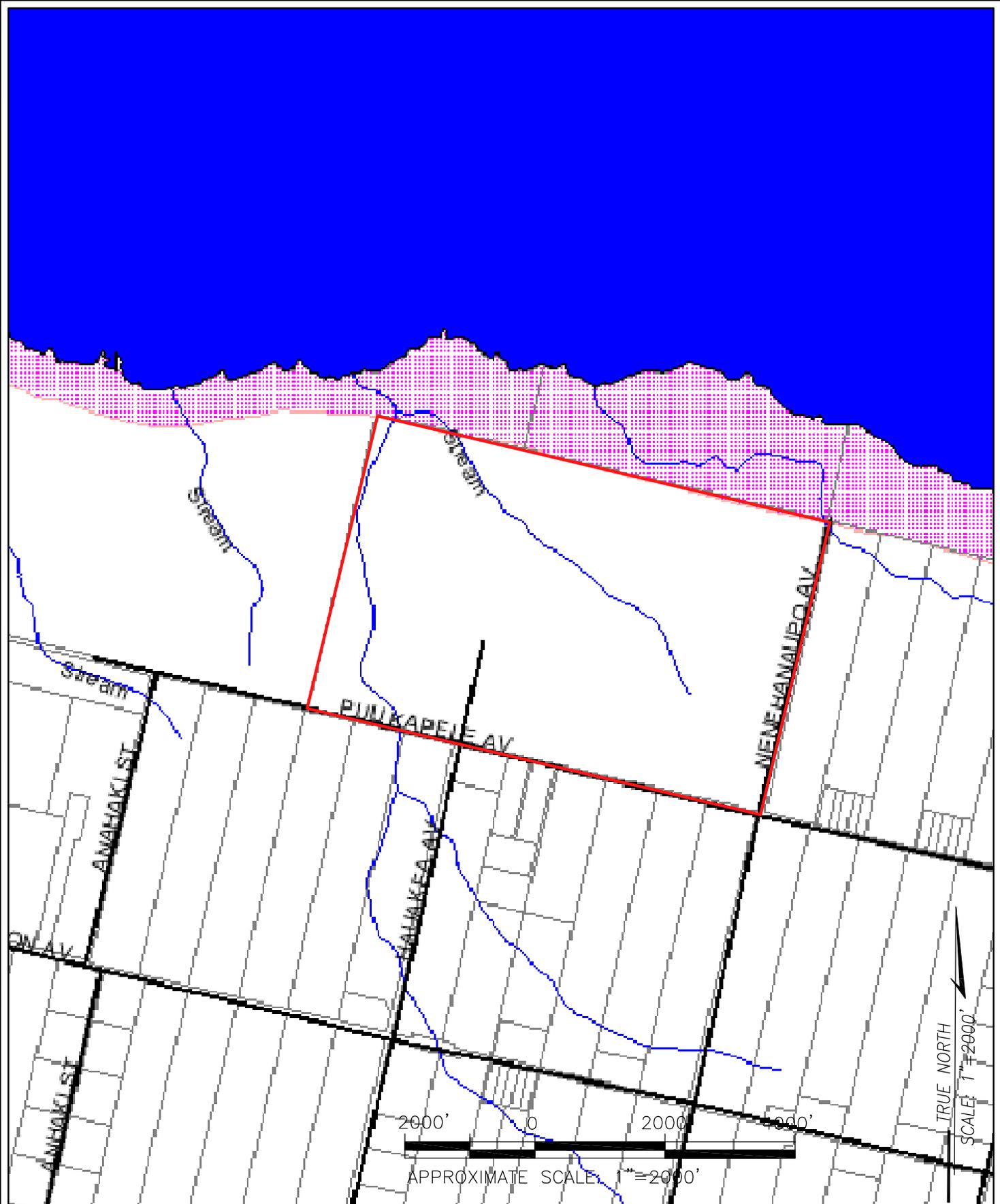
3.5 Climate and Air Quality

The climate on Molokai is considered semitropical, with average temperatures ranging from about 75 to 85 degrees Fahrenheit, with slightly higher temperatures in the late summer months and slightly lower temperatures in the winter months. Prevailing trade winds come from the northeast and keep the climate comfortable for most of the year. Southerly winds usually occur during winter months, often bringing heavy rainfall.

The Molokai Facilities lie on the windward coast of Molokai. Mean annual precipitation at the Molokai Airport, approximately three miles south of the subject property, was measured at 25.79 inches over 39 years (Western Regional Climate Center, 2006).

3.6 Noise

The primary factor affecting noise levels in the site vicinity is traffic along Puu Kapele Avenue. Other noise sources include wind, birds, and small planes. The site is approximately three miles north of the airport.



— PROPERTY BOUNDARY
 SPECIAL MANAGEMENT AREA

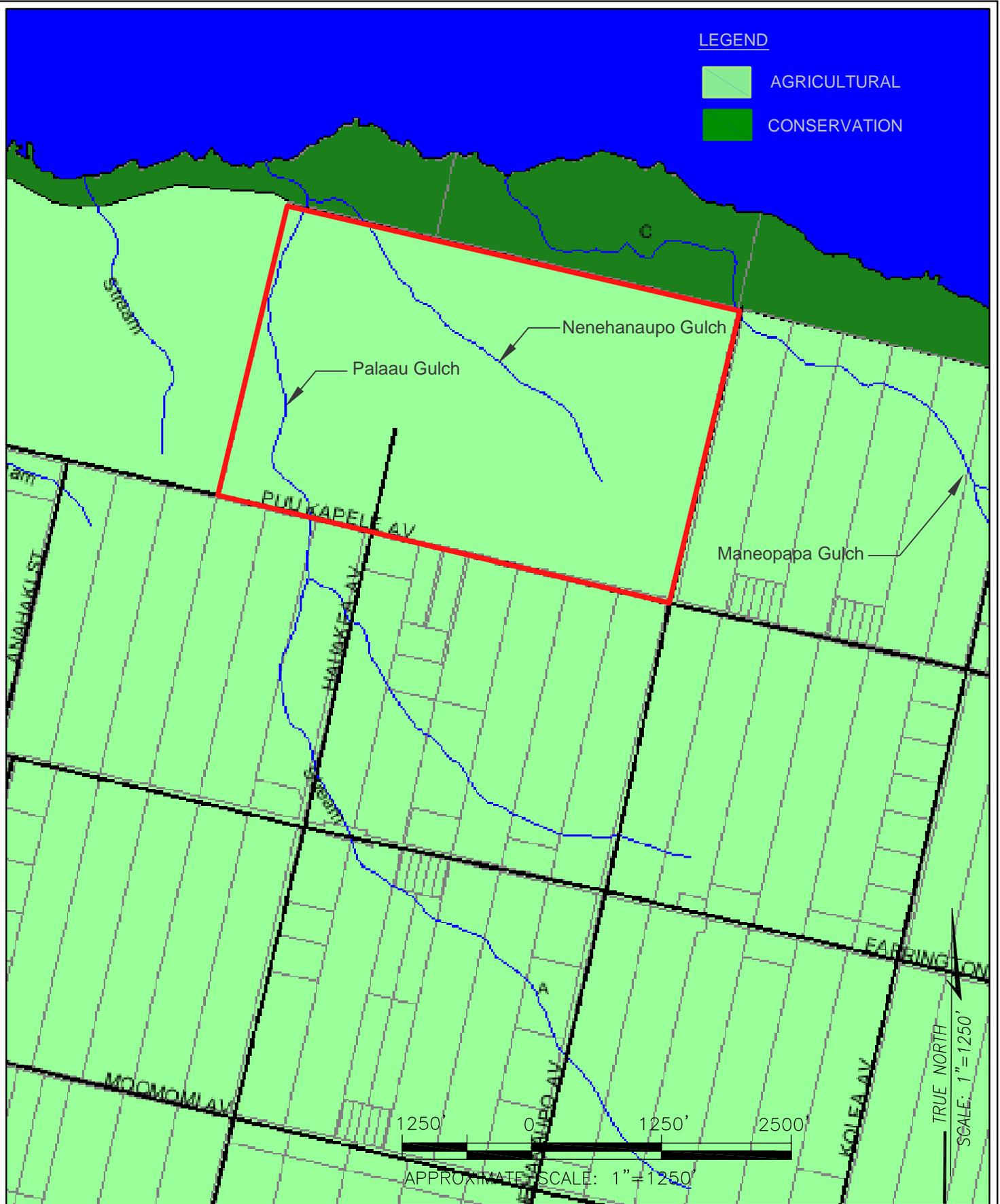
REFERENCE:
 1. SPECIAL MANAGEMENT AREA, COUNTY OF MAUI, AGIS, 2004.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: SPECIAL MANAGEMENT AREA MAP	

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LEGEND

-  AGRICULTURAL
-  CONSERVATION



 PROPERTY BOUNDARY

REFERENCE:
1. COUNTY OF MAUI AGIS, 2004.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: COUNTY OF MAUI ZONING MAP	
		FIGURE NO.: 3-4

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3.7 Flora and Fauna

A Flora and Fauna Resources Assessment for the project site was performed by LeGrande Biological Surveys, Inc. in January and April 2010. No threatened or endangered plant species or plant species of concern identified by the US Fish and Wildlife Service (USFWS) occur within the project site. In addition, no sensitive or otherwise regulated habitats (e.g., wetlands) occur within the project site. A summary of native species present onsite is provided below, and the complete assessment report is provided in Appendix A.

Twenty-four percent (24%) of the plant species observed onsite is native. Indigenous ilima is numerous onsite and in the general area. The majority of the native species are located near the northern property boundary and coast and cliffs. These include naupaka (*Scaevola sericea*) shrubs, pauohiika vines (*Jacquemontia ovalifolia*), and alena (*Boerhavia acutifolia*). Near the northwestern corner of the site are the greatest density of native species, including kakonakona grass (*Panicum torridum*), native poppy or pua kala (*Argemone glauca*), pili grass (*Heteropogon contortus*), and Ihi (*Potulaca lutea*).

Two native bird species were observed onsite during the survey: the endemic Pueo or Hawaiian Short-eared Owl (*Asio flammeus sandwichensis*) in the gulch near the eastern property boundary and the indigenous Kolea or Pacific Golden Plover (*Pluvialis fulva*) in the mowed grassy areas under the antennae. The Ruddy Turnstone (*Arenaria interpres*), a migratory shorebird that is protected by Federal law under the Migratory Bird Treaty Act and by State law under the HAR 13-124, may occasionally occur onsite. In addition, evidence (e.g., droppings, tracks, etc.) of feral cats (*Felis catus*), small Indian mongoose (*Herpestes auropunctus*), and axis deer (*Axis axis*) was observed on bare soil onsite. Feral pigs (*Sus scrofa*) are also likely to occur occasionally onsite. A herd of goats (*Capra hirus*) was observed just outside the eastern boundary of the project site in the gulch area.

3.8 Water Resources

3.8.1 Surface Water and Drainage

There are no permanent surface water bodies on the project site. Storm water runoff episodically flows in the three gulches that cross portions of the project site. In addition, the Pacific Ocean is located approximately 500 feet north of the project site's northern boundary, at its closest point (the northwest corner).

There are three intermittent streams located in gulches on the site, the bottoms of which have thick deposits of silt accumulated from runoff during heavy rains and flash flood events. Two of the three gulches are shallow; Palaau Gulch, which runs along the western margin of the site and Nenehanaupo Gulch, which is located along the coast, west of the third and largest gulch on the site, Maneopapa Gulch. Maneopapa Gulch, which bisects the northeastern corner of the project site, is oriented in a northwesterly direction (skirting the project site's northern boundary) and extends far into the central area of the island (Hartzell, 2000).

Aside from two road culverts under Pua Kapele Avenue, the project site does not have any other storm water management infrastructure.

3.8.2 Groundwater

The Molokai Facilities site is located within the Hoolehua Aquifer System of the Central Aquifer Sector. The groundwater system that underlies the project site occurs in horizontally extensive lavas as a basal lens, where fresh water floats on seawater. The aquifer is unconfined, where the water table is the upper surface of the saturated aquifer. The groundwater quality is appropriate for agricultural uses or drinking water, but at present groundwater is not being used at the Molokai Facilities. The salinity is low (i.e., 250 to 1,000 milligrams per liter [mg/L] chloride), and the groundwater resource is classified as irreplaceable and highly vulnerable to contamination (Mink and Lau, 1992).

3.8.3 Floodplains

Flood Hazard Districts are delineated on Flood Boundary and Floodway Maps and the Federal Insurance Rate Maps (FIRM) prepared by the Federal Insurance Administration and Federal Emergency Management Agency (FEMA). The site is located on the FIRM Community Panel Number 150003 0050 C, Map Revised September 6, 1989, in an area designated Zone C, areas of minimal flooding (Goto, 2004).

3.8.4 Wetlands

No tidal, non-tidal, wetlands, or navigable waters occur within the project site.

3.9 Geographic Setting

3.9.1 Geology

The Island of Molokai is formed primarily by shield- and post-shield stage volcanic rocks of the West and East Molokai Volcanoes, and secondarily by rejuvenated-stage volcanic rocks on the Kalaupapa Peninsula. Coastal deposits consisting of sedimentary material and limestone reefs occur along the south coast of the island. The project site is located on the Hoolehua Plain where the surface lava flows are associated with the Upper Member of the East Molokai Volcanics. These upper member volcanics consist of post-shield stage mugearite and lesser amounts of hawaiite and trachyte composition rock that form a relatively thin (approximately 50 to 500 feet thick) veneer of lava over the lower volcanic member volcanics that are predominately composed of basalt composition rock (Langenheim and Clague, 1987).

3.9.2 Soils

According to the US Soil Conservation Service (Foote et al., 1972), soils at the Molokai Facilities closer to the coastline along the project site's northern boundary consist of very stony land belonging to the rock land and rock outcrop associations. Soils on inland portions of the site belong to the Kahanui-Kalae-Kanepuu association. Further in from the northern boundary, the project site soils include Hoolehua silty clay loam and silty clay (3 to 10% slopes). The majority and remaining portions of the project site soils include Molokai silty clay loam (ranging from 3 to 7% up to 15 to 25% slopes) (Foote et al., 1972). Figure 3-5 presents a map of soils occurring at the site.

The dominant soil at the project site is the silty clay loam and silty clay, clayey soils that are deep and moderately deep, moderately well and well-drained, with coarse textures. Some

areas to the north and south of the project site may also be underlain by a cobbly clay loam, with the same soil classification.

3.9.3 Topography

The subject property is located on a coastal plain (the Hoolehua Plain) that is relatively flat and slopes down toward the northwest (toward the coast), with ground elevations ranging from approximately 300 to 500 feet above mean sea level (msl). Figure 1-1 shows a topographic map of the site and vicinity. There are three intermittent streams located in gulches on the subject property, as discussed in Section 3.8.1.

3.9.4 Earthquakes and Tsunami

The Uniform Building Code (UBC) contains six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10% chance of severe shaking in a 50-year interval). Except for the island of Hawaii, the Hawaiian Islands are not a highly seismic area (Armstrong, 1973). Six years ago, the seismic hazard zone for Molokai was upgraded from 1 to 2B. Seismic zone 2B is not associated with a particular fault zone (Iowa Department of Natural Resources, 2010).

According to the Tsunami Evacuation Zone Map provided by the Oahu Civil Defense Agency, the area north (makai) of project site is not located within the tsunami evacuation zone.

3.9.5 Radon

There is low potential for concerns related to radon exposure. The geology of Molokai is not favorable for generating radon gases. Molokai, and the entire state of Hawaii, is in Zone 3, meaning these locations have a predicted average indoor radon screen level less than the US Environmental Protection Agency (EPA) threshold of 2 picocuries per liter (USEPA, 2010).

3.10 Hazardous Materials

An Environmental Baseline Survey of the project area was conducted in January 2010 (E2, 2010a) and a follow-up Phase II EBS was conducted in June 2010 (E2, 2010b). Several areas of concern were identified during this investigation: 1) solid waste debris piles; 2) creosote poles; 3) hazardous materials such as ACM, LBP, canec, and PCBs used in building construction; 4) previous corrosion maintenance of antennas (see LBP discussion); and 5) former electrical transformer pad (see PCBs discussion).

- **Solid Waste:** No traditional landfill activities are associated with the project site. However, unauthorized dumping has occurred along the dirt access roads. The solid waste/debris includes vehicles, appliances, tires, vehicle batteries, propane tanks, building materials, and remnants of drums and several smaller containers. Releases of regulated and/or hazardous wastes (e.g., gasoline and oil from vehicles, etc.) may have occurred in these areas. Ozone-depleting substances (ODSs) may be present in the scrap refrigerators and air conditioners in the abandoned vehicles.
- **Creosote-treated Poles:** These poles are used to anchor the antennas onsite. There were piles of creosote-treated poles and remnant poles also onsite.

- **Asbestos-Containing Materials:** ACM was used in building construction, specifically the floor tile and mastic, fiberboard walls, roof flashing caulk, and electrical junction box piping and conduit putty. There is also transite in the underground cable conduits that extend from the receiver building to the antennas (International Telephone and Telegraph Corporation, 2009). In addition, Mr. Bush (2010) stated that the original heating, ventilation, and air conditioning (HVAC) duct covering and exhaust piping in the Generator Room were ACM and subsequently removed.
- **Lead-Based Paint, Lead-Acid Batteries, and Other Metals:** LBP was found on the fire extinguisher cabinets and a wooden cabinet and fiberboard work table in Building 2. In addition, the remnant cables in the equipment room may be covered with lead sheathing (Bush, 2010), and the UPS system in Building 1 contains multiple lead-acid batteries that require removal/recycling prior to disposal and/or demolition. The two Vertically-Polarized (Four-Curtain Rosette) Log Periodic (VLP) antenna towers were likely constructed of galvanized steel, which could have been periodically cleaned, treated to prohibit rust, then coated with a zinc organic compound (Denham, 2010).
- **Arsenic-Containing Materials:** Canec ceiling panels were observed in the Receiver Building. These canec panels contain arsenic.
- **Polychlorinated Biphenyls:** Behind the Generator Building, there are three pole-mounted transformers, the dielectric fluid of which is PCB-free according to the Maui Electric Company (MECo, 2010). The Generator Building also previously had several pad-mounted transformers stored on a concrete slab located outside the building (Bush, 2010). These transformers may have contained PCBs. All of the fluorescent light tubes contain mercury and about 72 light ballasts in the onsite buildings contain PCBs since no "non-PCB" labels were observed. The transmission lines running from the building to the antenna are filled with a polyethylene foam, not oil (Denham, 2010).

3.11 Historic and Archaeological Resources

An Archaeological Assessment for the project site was performed by Cultural Surveys Hawaii, Inc. in May 2010. No historic sites were found in the survey area at the project site. In addition, two of three previously-identified historic features were relocated (located again) during the current survey, and should be avoided and protected, or preserved according to the preservation plan (to be prepared if work will occur within 100 feet of the features). A summary of historic survey results is provided below, and the complete assessment report is provided in Appendix B.

- The entire project site was previously surveyed by the Bishop Museum (Major & Dixon, 1995). The current investigation was conducted in order to relocate archaeological sites previously identified by the Bishop Museum (Major & Dixon, 1995), and to thoroughly inspect the immediate area surrounding the USAF receiver facility, located in the southwest corner of the study area, to determine if there are any major archaeological concerns.
- In 2000, the Bishop Museum, Department of Anthropology, completed a supplemental archaeological inventory survey of a portion of the northeastern *makai* edge of the current study area for the USAF Molokai Receiver Station. The survey was conducted in

response to newly identified archaeological features discovered in the vicinity of the northeastern boundary of the USAF Molokai Receiver Station by receiver station staff. The survey identified one historic property: State Inventory of Historic Properties (SIHP) #50-60-02-843 (a.k.a. The Pu'u Kapele Wall Complex), a pre-contact traditional Hawaiian site complex previously identified by Marshall Weisler in 1985. The historic site consists of 37 surface features, including: 26 stacked stone walls, five alignments, four enclosures, a depression, and a large, prominent boulder. The site was recommended eligible to the National Register under significance criterion C, as an excellent example of a traditional Hawaiian construction technique, and under criterion D, for its information potential. Preservation was the recommended minimization measure for this historic property (Hartzell, 2000).

- The survey area comprised six acres, and consisted of a circular area extending 60 meters from the outer perimeter of the facility. Approximately 75% of the survey area was observed to have been disturbed by land modifications associated with the development of the receiver facility. Documented land disturbances, estimated to be around 1962 at the latest, included extensive grading and excavations associated with the construction of single story structures, radio towers, and access roads.

The center of the survey area consisted of three modest single story structures. The southern portion of the survey area consisted of graded areas and an access road with associated infrastructure (i.e., cattle guards and drainage culverts). The northern and eastern portions of the survey area contained radio towers and associated infrastructure (i.e., access roads and tower footings and winches). The western quarter of the survey area was unmodified by human activity, and is situated along the eastern edge of Pālā'au Gulch. No historic properties were observed within the survey area.

A walk-through reconnaissance was also conducted within the study area to relocate two historic properties (SIHP # 50-60-02-1623 & SIHP # 50-60-02-1624) previously identified by the Bishop Museum (Major & Dixon, 1995). SIHP # 50-60-02-1623 (Features 1 and 2) and SIHP # 50-60-02-1624 (Feature 1) were relocated in the northeast corner of the study area within a natural, shallow basin approximately 450 meters south-southeast of Pu'u Kapele, and their positions recorded with global positioning system (GPS) technology. However, SIHP-1623 Feature 3 (a historic refuse scatter) and SIHP-1624 Feature 2 (an isolated basalt flake) could not be relocated. It is believed that soil erosion, both natural and human induced, has displaced and/or buried these ephemeral surface features in the intervening 15 years since they were initially documented. Figure 3-6 provides the approximate locations of these historic features.

In addition, Cultural Surveys Hawaii, Inc. also prepared a Cultural Impact Assessment (Appendix C) of the project site. Various community members and organizations were consulted and historical research was conducted.

3.12 Recreational Resources

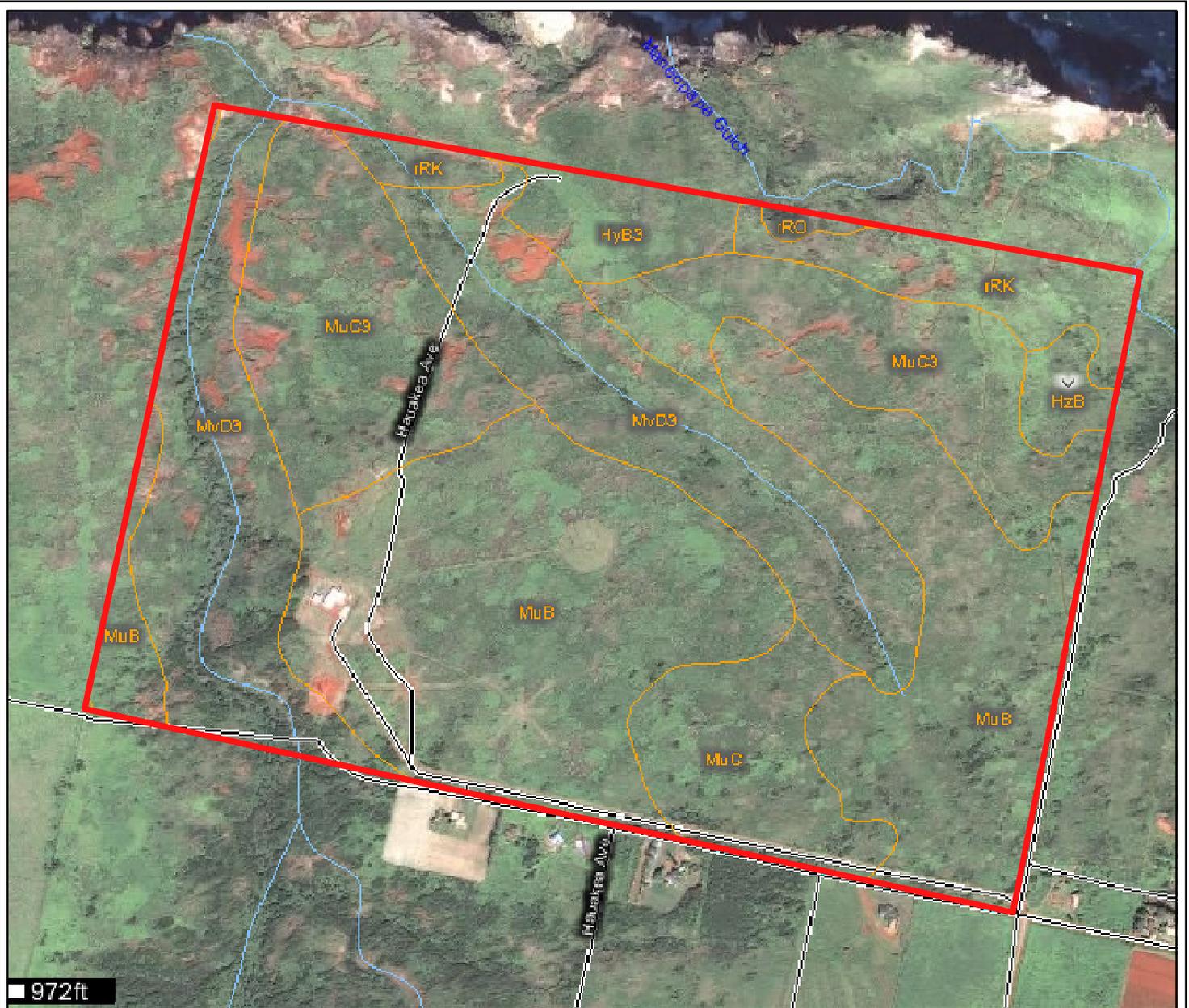
Hunting and ocean activities are the predominate form of recreation in the Hoolehua area. There are no official County or local recreation facilities in the immediate area. However, about five miles to the east of the project site is Palaau State Park, located south of Kalaupapa National Historic Park.

3.13 Visual Environment

Hoolehua is a rural, agriculturally oriented area. All development is single-family one-story residences, which allows for broad vistas. The ocean is in close proximity to the site. The landscape is dramatic, with steep cliffs along the coast.

3.14 Utilities

Potable water is supplied to the project site by the landowner's (DHHL) water system (Goto, 2004) from their private water supply via a line running along Puu Kapele Avenue along the site's frontage (Lum, 1978). There are no drinking water wells, or other types of wells, onsite. Telephone and electricity services are available by way of overhead conduits along Puu Kapele Avenue (Goto, 2004). Electricity is provided to the project site by MECo. There is no natural gas service onsite. Wastewater is managed by an onsite cesspool, per Doug Bush (2010). There are sinks/drains in the kitchen, utility room, two bathrooms, and basement shower and bathroom. Aside from two road culverts under Puu Kapele Avenue, the project site does not have any other storm water management infrastructure.



Legend

- HyB3 HyB3 Hoolehua silty clay loam, 3 to 10 percent slopes
- HzB HzB Hoolehua silty clay, 3 to 7 percent slopes
- MuB MuB Molokai silty clay loam, 3 to 7 percent slopes
- MuC3 MuC3 Molokai silty clay loam, 7 to 15 percent slopes
- MvD3 MvD3 Molokai silty clay loam, shallow variant 15 to 25 percent slopes
- MuC MuC Molokai silty clay loam, 7 to 15 percent slopes
- rRK rRK Rock land
- rRO rRO Rock outcrop



APPROXIMATE SCALE: 1"=800'

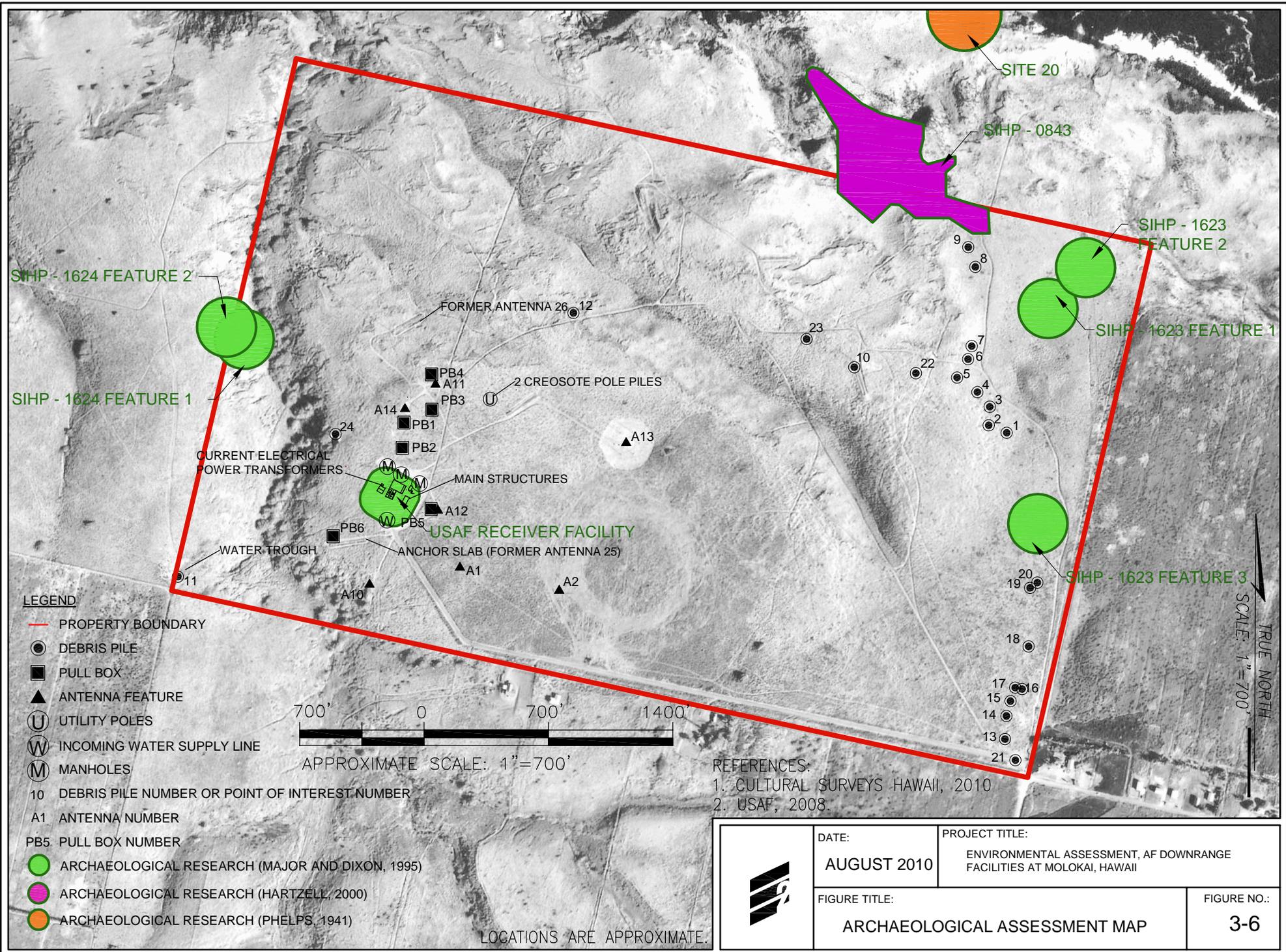


PROPERTY BOUNDARY

REFERENCE:
1. USDA, 2010.

	DATE:	PROJECT TITLE:	
	AUGUST 2010	ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII	
FIGURE TITLE:		FIGURE NO.:	
SOILS MAP		3-5	

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SIHP - 1624 FEATURE 2

SIHP - 1624 FEATURE 1

SITE 20

SIHP - 0843

SIHP - 1623 FEATURE 2

SIHP - 1623 FEATURE 1

SIHP - 1623 FEATURE 3

FORMER ANTENNA 26 12

2 CREOSOTE POLE PILES

CURRENT ELECTRICAL POWER TRANSFORMERS

MAIN STRUCTURES

USAF RECEIVER FACILITY

WATER TROUGH

ANCHOR SLAB (FORMER ANTENNA 25)

LEGEND

— PROPERTY BOUNDARY

● DEBRIS PILE

■ PULL BOX

▲ ANTENNA FEATURE

⊕ UTILITY POLES

Ⓜ INCOMING WATER SUPPLY LINE

Ⓜ MANHOLES

10 DEBRIS PILE NUMBER OR POINT OF INTEREST NUMBER

A1 ANTENNA NUMBER

PB5 PULL BOX NUMBER

● ARCHAEOLOGICAL RESEARCH (MAJOR AND DIXON, 1995)

● ARCHAEOLOGICAL RESEARCH (HARTZELL, 2000)

● ARCHAEOLOGICAL RESEARCH (PHELPS, 1941)



APPROXIMATE SCALE: 1"=700'

REFERENCES:

1. CULTURAL SURVEYS HAWAII, 2010
2. USAF, 2008.

TRUE NORTH
SCALE: 1"=700'

LOCATIONS ARE APPROXIMATE.

	DATE: AUGUST 2010	PROJECT TITLE: ENVIRONMENTAL ASSESSMENT, AF DOWNRANGE FACILITIES AT MOLOKAI, HAWAII
	FIGURE TITLE: ARCHAEOLOGICAL ASSESSMENT MAP	
		FIGURE NO.: 3-6

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Section 4 Potential Environmental Impacts and Minimization Measures

This section describes the impacts of the Proposed Action, Alternative Action, and No Action Alternative on the resource areas presented in Section 3.

- The Proposed Action consists of decommissioning of all remaining structures and transfer of land back to the landowner, the State of Hawaii DHHL. All site improvements constructed by the USAF and/or their predecessor agency, the FAA, including the remaining antennae infrastructure and instrumentation, will be demolished and removed from the site; however, the DHHL has expressed interest in keeping the buildings. Therefore only the remaining antennae infrastructure and ancillary instrumentation will be demolished.
- The Alternative Action also consists of land transfer and decommissioning of the remaining antennae infrastructure and ancillary instrumentation; however, the three buildings and associated concrete slabs will also be demolished.
- The No Action Alternative would maintain the status quo. This action is actually not a viable option because the USAF no longer has a need for the site, is in the process of terminating its lease, and is required by its lease agreement with DHHL to return the property to its original condition prior to transfer.

4.1 Land Use

4.1.1 Potential Impacts on Land Use in the Project Area

For the Proposed Action and the Alternative Action, the overall impact on land use will be beneficial, with the Federal government decommissioning the facilities and returning the site back to the landowner. Upon removal of the remaining antenna infrastructure, the land use will be more in line with the agricultural land use classification and zoning. The No Action Alternative will have a negative impact on land use because the antennas will remain onsite in an agricultural area.

4.1.2 Government Plans, Policies and Controls

4.1.2.1 Hawaii State Land Use Controls

The Proposed Action, the Alternative Action, and the No Action Alternative will not impact the Hawaii State Land Use controls. The agricultural (homestead) and conservation land uses in the area will not change.

4.1.2.2. The Hawaii State Plan

The Proposed Action and the Alternative Action uphold the applicable objectives and policies of the Hawaii State Plan by pursuing the return of Federally controlled lands in Hawaii that are not required for either the defense of the nation or for other purposes of national importance, and promoting the mutually beneficial exchange of land between Federal agencies and the State. In addition, completion of this EA assists in strengthening Federal, State, and County communication and coordination. The No Action Alternative has a negative impact as it relates to the Hawaii State Plan because it does not pursue the return of Federally-controlled lands. The property and infrastructure would not be returned to the State for use as they see fit if the No Action Alternative were selected.

4.1.2.3. Hawaii State Coastal Zone Management

The proposed improvements included in the Proposed Action and the Alternative Action are consistent with the objectives and policies of the State's CZM Program. The proposed improvements will not have any impacts on recreational resources, coastal ecosystems, economic uses, coastal hazards, management development, beach protection, and marine resources. Discussions on the remaining areas of the State's CZM Program are presented in other sections of the EA. They are as follows:

- Historic Resources – see Section 4.10
- Scenic and Open Spaces – see Section 4.12
- Public Participation – see Section 7.

An application for a CZM Federal Consistency Review is not required since the project site is not located in the CZM area.

4.1.2.4. Special Management Area

The site is not located in the SMA; therefore, a SMA permit is not required.

4.1.2.5. County of Maui 2030 General Plan Countywide Policy Plan

The proposed improvements included in the Proposed Action and the Alternative Action are consistent with the objectives and policies of the County of Maui 2030 General Plan Countywide Policy Plan. The proposed improvements will not have any impacts on education, social and healthcare services, housing opportunities for residents, parks and public facilities, transportation options, physical infrastructure, or good governance. Discussions on the remaining areas of the Countywide Policy Plan are presented in other sections of the EA. They are as follows:

- protect the natural environment – see Sections 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, and 4.12;
- preserve local cultures and traditions – see Sections 4.10 and 4.11;
- strengthen the local economy – see Section 4.3; and
- promote sustainable land use and growth management – see Section 4.1.

The No Action Alternative will have no impact as it relates to the Countywide Policy Plan.

4.1.2.6. County of Maui Zoning

The Proposed Action and the Alternative Action comply with the current zoning designated by the County of Maui. The agricultural land use in the area will not change. The No Action Alternative will have no impact on the zoning in the project area.

4.1.2.7. Molokai Community Plan

The Proposed Action, Alternative Action, and No Action Alternative comply with the Molokai Community Plan. The agricultural land use in the area will not change.

4.1.2.8. Easements and Restrictions

No easements or restrictions will be affected by the Proposed Action or Alternative Action. The No Action Alternative prevents the required lease agreement termination and return of the property to the landowner.

4.1.2.9. Occupational Safety and Health

Impacts of the Proposed Action or Alternative Action on the safety and health of site employees may include air emissions, noise exposure, contaminant exposure, and other hazards associated with demolition activities. Temporary changes in work practices include protective measures such as dust control, avoidance of site activities, and/or use of personal protective equipment (PPE), in order to limit exposures and maintain an adequate level of health and safety for site personnel.

4.1.2.10. Greenhouse Gases, Federal Council on Environmental Quality

Emissions from many proposed Federal actions, including this particular project, are not typically expected to produce an environmental effect that would trigger or otherwise require a detailed discussion in an EIS. A temporary reduction in air quality may occur during remediation and construction activities (e.g., equipment exhaust, soil disturbance, etc.). However, Best Management Practices (BMPs) (e.g., water mist, etc.) will be used to control dust and containment procedures and air monitoring will occur to ensure action levels are not exceeded. During solid waste removal/disposal, air quality should be improved by recovery of refrigerants from abandoned refrigerators, and air conditioning systems in abandoned vehicles.

4.2 Transportation

Demolition of the infrastructure for both the Proposed Action and Alternative Action will cause minimal delays for those traveling through the immediate area. Lane closures and temporary roadway modifications will divert what little traffic there is in the immediate area to adjacent routes. Traffic is not expected to increase significantly as a result of demolition work, since the demolition work will be conducted onsite, since there is very little traffic in the immediate area, and since the site and neighboring residences can be accessed by more than one route. Traffic increases will occur during initial staging operations and later during transportation of consolidated wastes offsite. Upon completion of the proposed improvements, traffic flow is expected to return to preconstruction conditions. Therefore, the Proposed Action and the Alternative Action will not have overall long-term detrimental impacts to the traffic in the project area. The No Action Alternative will have no impact on traffic.

4.3 Social and Economic Conditions

The Proposed Action and the Alternative Action will have no significant affect on population and employment in Hoolehua. It is likely that Hoolehua will continue to grow at its current rate. It is possible that during demolition work, members of the crew would come from Hoolehua. The No Action Alternative will have no social impacts, but will economically impact both the USAF and DHHL. The USAF will be required to devote funds to maintain the project site even if there is no longer a beneficial mission use for the facilities. The DHHL will lose possible income from the development and use of the project site.

4.4 Climate and Air Quality

The climate should not be affected by the Proposed Action, Alternative Action, or the No Action Alternative. There will not be significant change to the landscape, and the amount of paved surface will not increase. The factors that can cause higher surface temperatures will remain fundamentally unchanged upon completion of the project.

A temporary reduction in air quality will occur during remediation and construction activities. The primary effects on air quality will come from construction equipment exhaust and the removal of possibly contaminated soil and movement of soil, in general. BMPs, such as spraying with a water mist, will be used to control dust. During possible hazardous material abatement (e.g., ACM, etc.), stringent containment procedures will be used and monitoring will occur to ensure action levels are not exceeded. During solid waste cleanup, air quality should be improved by recovery of refrigerants from abandoned refrigerators, and air conditioning systems in abandoned vehicles. No violations of Federal or State air quality standards are expected. In the No Action Alternative recovery of refrigerants from abandoned refrigerators and air conditioning systems in abandoned vehicles will not occur; thus, there will be no improvement of air quality.

Per OSHA 23 Code of Federal Regulations (CFR) 989.30, NEPA requires pertinent Federal agencies to make their own air quality conformity determination. Both the USAF and USACE have had the opportunity to address the conformity analysis applicability or necessity, with no significant concerns. It appears a conformity analysis is not necessary.

4.5 Noise

The Proposed Action and the Alternative Action will have temporary adverse impacts to the noise levels in the area due to construction activities. Proposed improvements at the site will involve demolition, excavation, and grading. The various phases of the project may generate the occasional significant amount of noise. This will affect surrounding residential properties along Nenehanaupo and Puu Kapele Avenues due to their location adjacent to the project.

The actual noise levels produced during construction will be a function of the methods used during each stage of the construction process. Earthmoving equipment, such as tractors and backhoes, cause some of the highest noise levels, ranging from approximately 72 decibels (dBA) to more than 95 dBA at 50 feet.

When construction noise exceeds, or is expected to exceed, the State of Hawaii, Department of Health's (DOH's) "maximum permissible" property line noise levels, a permit must be obtained

from the DOH. The permit will only allow construction between the hours of 7:00AM and 6:00PM Monday through Friday, and 9:00AM to 6:00PM on Saturdays. The permit does not limit the level of noise generated by construction.

During construction, the contractor will use reasonable and standard practices, which include limited construction hours, to minimize noise impacts. However, the DOH may require additional noise minimization treatments if they consider the proposed measures sub-standard. After the demolition work is completed, noise levels will return to preconstruction levels.

The No Action Alternative will have no noise impacts.

4.6 Flora and Fauna

According to the Flora and Fauna Resources Assessment (Appendix A), no threatened or endangered plant species, no plant species of concern identified by the USFWS, and no sensitive or otherwise regulated habitats (e.g., wetlands) occur on the project site. Mowing of grasses has occurred around the buildings to the former antennas, which is critical for controlling fire hazards. However, removal of most of the native plants onsite will not occur, as they grow primarily along the northern boundary of the project site. Therefore, the Proposed Action and the Alternative Action, which will primarily affect already highly disturbed areas, are expected to have beneficial impacts on the botanical or faunal resources. The No Action Alternative will have no impact.

4.7 Water Resources

4.7.1 Surface and Drainage

Project construction will not significantly affect the intermittent streams located on the subject property. Construction activities are limited to removing existing structures. Some foundations may be removed, but it does not entail significant grading that would change the drainage patterns at the site. Since more than an acre of the project site is expected to be disturbed for the Alternative Action, the contractor will be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge from a construction site and will be required to follow standard BMPs. The BMPs may include silt barriers and fabric bags, and vegetation to prevent erosion from wind and rain. The Proposed Action and Alternative Action assume that no additional off-site flows or discharge into a water body are required to be managed. The proposed improvements will have limited impacts on hydrology. The No Action Alternative will have no surface and drainage impacts.

4.7.2 Groundwater

Since the proposed improvements require minimal excavation, it is unlikely that groundwater will be encountered during construction, and therefore, no significant impact to groundwater is anticipated. The No Action Alternative will have no groundwater impacts.

4.7.3 Floodplains

Hazards to surrounding residential properties due to flooding will not be increased due to construction proposed in the Proposed Action and the Alternative Action. The elevation of the

project site will not be significantly changed after construction, and hazard levels will be unchanged. The No Action Alternative will have no flooding impacts.

4.7.4 Wetlands

No tidal, non-tidal, wetlands, or navigable waters will be affected by the Proposed Action, the Alternative Action, or the No Action Alternative.

4.8 Geographic Setting

4.8.1 Geology

Because the proposed construction lies within the project site, negative environmental impacts to the geological setting of the area by the Proposed Action and the Alternative Action are not expected. Earth moving will take place to a limited extent to remove instrumentation and foundations; however, the terrain will remain essentially the same on the project site. The No Action Alternative will have no impacts on project site geology.

4.8.2 Soils

The proposed construction is not expected to significantly impact soils. Construction will occur within the project site, within an already highly disturbed area. Construction will entail earth moving activities to remove instrumentation and foundations. This may result in some soil erosion, the severity of which will be dependent on weather conditions. If possible, construction will not take place during the rainy season (i.e., the winter months) in order to minimize site erosion and sediment runoff during excavation and grading activities. Drainage will remain fundamentally the same; however, necessary improvements will be made in order to eliminate existing ponding problems. Therefore, the Proposed Action and the Alternative Action will not have any adverse impacts to the soils in the project area. The No Action Alternative will have no impacts on project site soils.

4.8.3 Topography

Earth moving will take place to a limited extent; however, the terrain will remain essentially the same. Therefore, the Proposed Action and the Alternative Action will not have any adverse impacts to the topography in the project area. The No Action Alternative will have no impacts on project site topography.

4.8.4 Earthquakes and Tsunami

Neither the Proposed Action, the Alternative Action, nor the No Action Alternative will increase hazards to the surrounding residential properties due to seismic activity.

4.8.5 Radon

Neither the Proposed Action, the Alternative Action, nor the No Action Alternative will increase hazards to the surrounding residential properties due to radon exposure.

4.9 Hazardous Materials

With either the Proposed Action or the Alternative Action, the project site will be remediated to acceptable contaminant levels in accordance with Federal, State, and local regulations. A Phase II EBS was completed to assess the presence of chemicals of potential concern at portions of the project site, observed during the Phase I EBS. Remediation activities will address solid waste debris piles (and ODSs or GHGs), creosote-treated poles, ACM, LBP, canec, and PCBs. Solid waste will be properly disposed of in a landfill or recycled, if appropriate. Therefore, the Proposed Action and the Alternative Action will have overall beneficial impacts to the project site and the adjacent properties due to the remediation of these contaminants. The No Action Alternative will have a negative impact on hazardous materials since any potential hazardous materials onsite will not be remediated.

4.10 Historic and Archaeological Resources

An Archaeological Assessment and a Cultural Impact Assessment (Appendices B and C, respectively) were developed to evaluate the historic and cultural resources, respectively, within the project site. These assessments concluded that cultural deposits and/or human burials are not likely to be found during subsurface excavations on the project site. These assessments also concluded that the proposed construction will have minimal or no impact on the Hawaiian culture, its practices, and traditions. Therefore, the Proposed Action and Alternative Action will have minimal or no impact on historic or cultural resources. However, during earthwork activities, archaeological monitoring should be conducted in accordance with an approved archaeological monitoring plan. The No Action Alternative will have no impacts on project site historic or archaeological resources. To help minimize potential adverse impacts on Hawaiian cultural beliefs, practices, and resources, the following recommendations were made:

- Preservation by avoidance and protection of the SIHPs, as described above.
- Archaeological monitoring for initial ground disturbing activities in the immediate vicinity of the SIHPs by a qualified archaeologist. Should cultural finds or burial sites be identified, work should cease, the appropriate agencies notified, and alternative actions considered with public consultation.
- Monitoring by a community member outside the immediate vicinity of the SIHPs during deconstruction (e.g., underground cables) activities to ensure diligence during removal.
- Salvage the Receiver Building from demolition, since a community member identified it as a valuable asset, similar to a bomb shelter that could be used in the community during natural disasters.

No further cultural resource management work is recommended for the 6-acre survey area, which includes abandoned infrastructure associated with a USAF receiver facility. However, to reduce the potential adverse effect on significant historic properties, the following should be completed prior to conducting any land disturbing activities within the vicinity of SIHP#50-60-02-1623 and SIHP #50-60-02-1624.

Preservation in the form of avoidance and protection is recommended for SIHP#50-60-02-1623 Features 1 and 2, pre-Contact agricultural shrines (upright boulder alignment and stone

enclosure), and SIHP#50-60-02-1624, a pre-Contact habitation enclosure. Both historic properties are assessed as significant under National Register of Historic Places Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Hawaii Register of Historic Places Criterion E (being important to an ethnic group's history and cultural identity due to associations with cultural practices and/or traditional beliefs).

A Cultural Impact Assessment was developed to evaluate the cultural resources within the project area. This assessment concluded that cultural deposits and/or human burials are not likely to be found during subsurface excavations required for the Proposed Action. This assessment also concluded that the proposed improvements will have minimal or no impact on the Hawaiian culture, its practices and traditions.

4.11 Recreational Resources

No local recreation resources will be affected by the Proposed Action, Alternative Action, or No Action Alternative.

4.12 Visual Environment

Neither the Alternative Action, nor the No Action Alternative will impact the visual environment.

4.13 Utilities

Existing utilities will probably be demolished along with the other infrastructure onsite under the Proposed Action. However, existing utilities will remain with the building under the Alternative Action. The No Action Alternative will have no impacts on project site utilities.

4.14 Construction

During construction, public health and safety will be protected. The contractor will be required to use and maintain barricades, signs, lights and other safety equipment in order to eliminate dangerous conditions. To minimize traffic impacts during construction, construction will not take place during peak traffic times, and flagmen and other traffic control measures will be necessary to direct traffic. Potential noise impacts during construction will be minimized by limiting construction hours. The use of barriers and regular wetting down of problem areas will minimize the potential air quality impacts during construction within the project area. Management of hazardous materials, if encountered, will be coordinated with applicable agencies.

The Proposed Action will require the buildings and cesspool to remain; while the Alternative Action will require the removal of the cesspool and associated infrastructure along with the buildings. Solid waste generated during construction activities will be properly disposed of in a landfill or recycled, if appropriate.

The Proposed Action and the Alternative Action will have minimal impacts to the project area during construction activities. The No Action Alternative will not require any action, since no construction actions will be implemented.

4.15 Permits and Approvals

The Proposed Action and the Alternative Action are expected to require the approvals and permits presented in Table 4-1. The No Action alternative is not expected to require any of these approvals.

Table 4-1: Permits and Approvals Required

Permit or Approval	Agency
<i>State of Hawaii</i>	
NPDES Permit for Construction Storm Water	Department of Health
Noise Permit	Department of Health
Abatement and Demolition Permit	Department of Health
<i>County of Maui</i>	
Grading and Grubbing Permit	Department of Public Works
Building Permit for Demolition	Department of Public Works

4.16 Executive Orders

4.16.1 Executive Order 11514, Protection and Enhancement of Environmental Quality

This EA ensures that the Proposed Action, Alternative Action, and the No Action alternative will initiate measures needed to meet relevant environmental goals.

4.16.2 Executive Order 11593, Protection and Enhancement of the Cultural Environment

Cultural deposits and/or human burials are not likely to be found during subsurface excavations on the project site, therefore, the Proposed Action and Alternative Action will have minimal or no impact on historic or cultural resources.

4.16.3 Executive Order 11629 Protection of Migratory Birds & Game Mammals of 2001

No threatened or endangered plant species or plant species of concern identified by the USFWS occur within the project site. In addition, no sensitive or otherwise regulated habitats (e.g., wetlands) occur within the project site.

4.16.4 Executive Order 12088, Federal Compliance with Pollution Control Standards

The air quality should not be affected by the Proposed Action, Alternative Action, or the No Action Alternative.

A temporary reduction in air quality will occur during remediation and construction activities; however, BMPs will be utilized.

With either the Proposed Action or the Alternative Action, remediation activities at the project site will address hazardous materials.

4.16.5 Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

No significant impacts to housing or minority populations would occur if the Proposed Action Alternative were chosen. Benefits to the region's population would occur regardless of race and/or income level.

4.16.6 Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management

Demolition of the infrastructure for both the Proposed Action and Alternative Action will cause minimal delays for those traveling through the immediate area, and therefore, will not have overall long-term detrimental impacts to the traffic in the project area.

4.17 Cumulative Impacts

The Proposed Action and the Alternative Action would have short-term environmental and economic losses, and long-term economic and social gains. The short-term adverse impacts include impacts to existing traffic flow, air quality, noise, and soils during construction activities. The long-term beneficial impacts include:

1. Remediation of hazardous materials and
2. Support of Hawaii State and County of Maui land use and development plans.

Considering the short-term adverse impacts and the long-term beneficial impacts, the proposed improvements are beneficial to the community and to the present and future land uses in the project area.

The No Action Alternative will have no short-term impacts to the project area. However, this alternative will have adverse long-term impacts to the project area as the project area may deteriorate from being laid vacant and undeveloped. Other long-term adverse impacts of the No Action Alternative include no remediation of hazardous materials and adverse economic impacts for the USAF and the DHHL.

In summary, there are no anticipated significant cumulative impacts upon the environment as detailed in this EA, resulting in a proposed FONSI.

4.18 Irreversible and Irretrievable Commitments of Resources

The implementation of the proposed improvements under the Proposed Action and Alternative Action would require a commitment of natural, physical, human, and fiscal resources as follows:

- Ground cover at the project site will be lost due to grubbing and grading activities for removal of the site infrastructure.
- Fossil fuels will be consumed during construction activities.
- Labor required for construction, planning, engineering design, purchasing, and services will be utilized.
- Construction materials will be committed.
- Construction would result in a one-time expenditure of government funds that would be irretrievably lost.

The commitment of these resources would be appropriate since residents and visitors would benefit from the completion of the proposed improvements as follows:

- Remediation of hazardous materials and
- Support of Hawaii State and County of Maui land use and development plans.

These benefits are anticipated to overcome the commitment of resources.

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Section 5 Anticipated Determination

This section summarizes the potential impacts of the Proposed Action. The purpose of and need for the Proposed Action is presented in Section 1. The definition of the Proposed Action is presented in Section 2. Section 3 evaluates the existing environment of the project area. The analysis of the impacts of the Proposed Action, the Alternative Action, and the No Action Alternative is presented in Section 4.

Based on the Significance Criteria delineated in HAR §11-200-12(b) (State of Hawaii, 2010c), it is anticipated that the property transfer and infrastructure demolition (the Proposed Action) would not have a significant impact on the environment for the following reasons:

1. There would be no irrevocable loss or destruction of any natural or cultural resource. The impact on flora and fauna and other natural resources is minimal considering the area is already highly disturbed. In addition, the biological survey found no threatened or endangered species occurring onsite. A few native plant species were encountered, and every effort will be made during construction so that only non-native plant species will be removed. Additionally, the archaeological and cultural assessments determined that the project area is not accessed for traditional and customary subsistence hunting, based on past and present archeological studies and oral history sources. The project site has three historic features, as discussed in Section 3. An archaeological monitoring plan should be prepared and implemented during earthwork activities.
2. The range of beneficial uses of the environment would not be curtailed. The current use of the environment would remain unchanged by the Proposed Action.
3. The Proposed Action is consistent with Chapter 343 HRS State Environmental Policy and NEPA. The Proposed Action is consistent with State and Federal environmental and planning policies, as specified in Section 4.
4. Economic and social welfare of nearby communities and the State of Hawaii would not be adversely affected. The Proposed Action would not adversely affect Hoolehua or the State of Hawaii. The Proposed Action would improve the social welfare of Hoolehua, and consequently the State of Hawaii.
5. The Proposed Action will not substantially affect public health.
6. The Proposed Action will not involve secondary impacts, such as population changes or effects on public facilities.
7. There is no degradation of environmental quality. The Proposed Action is within the project site; therefore, the environmental quality of the area should remain unchanged or, possibly, improve due to remediation of possible contaminated soils and hazardous materials.

8. Cumulative impacts upon the environment are not significant; nor does it involve a commitment for larger actions. Construction will be organized in such a manner as to limit impacts on the surrounding area.
9. As stated in Section 4.6, the Proposed Action will not substantially affect rare, threatened, or endangered species, or their habitats in the project site. There are no rare or endangered species, or critical habitat in the project area.
10. Air quality, ambient noise levels, and water quality will not be adversely affected. The Proposed Action will not violate State or National Ambient Air Quality Standards. Noise levels during construction will be within allowable standards. Upon project completion, air, noise, and water quality are expected to remain at current levels, if not improve.
11. Environmentally sensitive areas will not be affected by the Proposed Action. There are no environmentally sensitive areas, such as floodplains, tsunami zones, beaches, erosion-prone areas, geologically hazardous land, estuary, fresh water, or coastal waters, in the project site.
12. The Proposed Action will not substantially increase energy consumption.

Based on the information within this document, a FONSI is expected. The Proposed Action is not anticipated to negatively impact environmental, cultural, social, or economic resources in the project area.

Section 6 List of Preparers

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Section 7 Organizations and Agencies Consulted

7.1 Agency Consultation and Coordination

The agencies and organizations listed below will be contacted and asked to submit comments on the Proposed Action during the 30-day comment period for the Preliminary Final EA. The Molokai Public Library will also receive copies of the Preliminary Final EA for public review.

Federal Agencies

Department of Defense

- Air Force
- Army Corps of Engineers, Hawaii Engineer District
- Coast Guard

Department of the Interior

- Fish and Wildlife Service
- Geological Survey
- National Park Service
- National Marine Fisheries Service
- National Resources Conservation Service

Department of Transportation

- Federal Highway Administration

Environmental Protection Agency

- Pacific Islands Office

Federal Aviation Administration

State Agencies

Department of Agriculture

Department of Accounting and General Services

Department of Business, Economic Development, and Tourism

- Energy Division

- Office of Planning

Department of Defense

Department of Education

Department of Hawaiian Home Lands

Department of Health

- Environmental Management Division, Environmental Planning Office

Department of Human Services, Housing, and Community Development Corporation

Department of Labor and Industrial Relations

Department of Land and Natural Resources

- Commission on Water Resources Management

- Division of Aquatic Resources

- Division of Forestry and Wildlife

- Division of State Parks

- Engineering Division

Oahu District Land Office
Office of Conservation and Coastal Lands
Historic Preservation Division
Department of Transportation
Hawaii Housing Financial and Development Corporation
Office of Hawaiian Affairs
University of Hawaii
Environmental Center
Water Resources Research Center

County of Maui

Department of Environmental Management
Department of Fire and Public Safety
Department of Housing and Human Concerns
Department of Parks and Recreation
Department of Planning
Department of Transportation
Department of Water Supply
Police Department
Maui Community College Library

Private and Community Organizations and Elected Officials

American Lung Association
Conservation Council for Hawaii
GTE Hawaiian Telephone
Hawaii Audubon Society
Maui Electric Company
Hawaiian Historic Society
Nature Conservancy
Sierra Club, Hawaii Chapter
The Outdoor Circle
State Representative Mele Carroll, District 13
State Senator J. Kalani English, District 6
Maui County Council Member Danny A. Mateo

7.2 Public Involvement Activities

Public notice will be made, and public facilitation and meetings if required will be held, to present the scope of the Proposed Action and to discuss its expected effects and ramifications, as discussed within this EA. Public comments will be solicited.

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Appendix A

Flora and Fauna Resources Assessment

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FLORA & FAUNA RESOURCES ASSESSMENT FOR THE
VANDENBURG AIR FORCE BASE DOWNRANGE FACILITIES
PALAAU, MOLOKAI, HAWAII

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INTRODUCTION

This report includes the findings of a plant and animal inventory conducted at Vandenburg AFB Downrange Facilities, Palaau, Molokai Island, Hawaii [TMK 5-2-06:63]. LeGrande Biological Surveys Inc. carried out a flora and fauna field survey of the above location on the 21st of January and 26th of April 2010 for Element Environmental, LLC. The primary objectives of the field studies were to:

- 1) inventory the flora and fauna;
- 2) provide a general description of the vegetation on the project site;
- 3) search for threatened and endangered species as well as species of concern; and
- 4) provide recommendations regarding potential impacts to the biological resources of the area in regards to potential outdoor recreation of the survey area.

Federal and State of Hawaii listed species status follows U.S. Fish and Wildlife Listed and Candidate Species (USFWS 2006) and Federal Register (2002).

GENERAL SITE DESCRIPTION

The survey area is located in Palaau (Hoolehua) on a plateau just above the northern sea cliffs. The current Vandenburg AFB Downrange Facilities consists of a few concrete buildings and several types of antennae scattered within the project boundary. The survey area consisted of an approximately 363 acres.



Fig 1. Building facilities and several antennae on subject property surrounded by Buffel grassland.

FAUNAL SURVEYS

METHODS

Faunal surveys were conducted on 21 January 2010 from 1030-1300 hours and 26 April 2010 from 0900-1200 hours. Data were collected by driving along the southern boundary of the project area, walking the eastern and western gulches, and by walking across the mowed grass under the antennae and through areas of tall grass adjacent to the antennae. All individuals of each bird and mammal species observed were noted, as well as signs of their presence, such as footprints, droppings, or burrows. Birds were identified by sight using the naked eye and 10 power binoculars, and by calls. For native species, the actual number of individuals observed is reported, for alien species only a list of species is provided (Table 1).

BIRDS

A total of 13 bird species were observed during the site visit (Table 1). Two of the bird species observed at the site are native to the Hawaiian Islands. One Pueo or Hawaiian Short-eared Owl (*Asio flammeus sandwichensis*), a subspecies endemic to Hawaii, was observed roosting in the gulch at the eastern project boundary. Pueo are known to forage and nest in open grassy habitat similar to that at the project site. The Pacific Golden Plover or Kolea (*Pluvialis fulva*) is indigenous. Pacific Golden Plovers are migratory shorebirds that nest in Alaska and spend their non-breeding season, August-April, in Hawaii and other Pacific islands. This is the most numerous migratory shorebird that visits the Hawaiian Islands. Twelve plovers were observed within the project site, all of which were resting or foraging in the mowed grassy areas under the antennae. Another species of migratory shorebird, the Ruddy Turnstone (*Arenaria interpres*) has been observed during other surveys in similar habitat on Molokai (Bruner 1997), and it is possible this species occurs on the project site occasionally. These species are protected by Federal law under the Migratory Bird Treaty Act and by State law under Hawaii Administrative Rules Title 13 Chapter 124. The remaining 12 bird species observed at the site are alien birds that were introduced to the Hawaiian Islands by humans, some intentionally, others accidentally. Several House Sparrows were observed entering the hollow ends of metal pipes near the top of several towers, and probably were nesting inside these structures.

Several other bird species were observed near the project site, including a single Red-tailed Tropicbird, which was seen flying eastward along the shoreline north of the project boundary. This uncommon native seabird species nests on coastal cliffs in several areas of the main Hawaiian Islands. Although it occurs nearby, it is unlikely to occur within the project site because it nests only along the coast and forages exclusively in the marine environment. Other alien birds observed near the project site included Black Francolin (*Francolinus francolinus*) and Japanese White-eye (*Zosterops japonicus*).

Other than humans, the only mammal observed at the project site was a herd of goats (*Capra hircus*) near the eastern boundary just outside of the gulch area. Additionally, signs of three alien mammals were observed at the site (Table 1). The droppings of feral cats (*Felis catus*) and small Indian mongoose (*Herpestes auro-punctatus*) were observed in several areas of bare earth, and tracks of axis deer (*Axis axis*) were observed in another area of soft bare soil. Feral pigs (*Sus scrofa*) have been observed in similar habitat nearby (Bruner 1997), and it is likely they also occur on the project site occasionally. Neither of these feral ungulates appears to be very common at the site.



Fig 2. Guy wires stabilizing high frequency radio receivers present a collision hazard for birds, especially for seabirds that move nocturnally between the sea and inland nesting areas.

FLORA SURVEYS

METHODS

Topographic maps were examined to determine terrain characteristics, access, boundaries, and reference points. Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Historical plant locations were reviewed from data provided by Hawaii Biodiversity & Mapping Program (Fig 5). Historical locations of four rare plant species along the coastal cliffs are mapped and include *Tetramolopium sylvae*, *Bidens molokaiensis*, *Schiedea globosa*, and *Centaurium sebaeoides*. None of the mapped locations were located within the survey area and no individuals of any of the four species were located during the present survey. A flora survey conducted by Winona Char in 1997 (Char, 1997) for the MCTB located to the west in Kaunakakai was reviewed for possible plant taxa that might be encountered during this survey. Char noted four rare plant species for the Kaunakakai survey; *Tetramolopium rockii* var. *calcisabulorum*, *Gnaphalium sandvicensium* var. *molokaiense*, *Chamaesyce skottsbergii* var. *skottsbergii*, and *Marsilea villosa*. None of these species were observed during the present survey at the Vandenburg Facilities.

A walk-through survey method was used. The field survey included the entire TMK parcel, transects were walked north-south at an average of 20 meters apart and the western gulch was walked along the bottom and on both sides within the project boundary. Notes were made on plant associations and distribution, disturbances, topography, substrate types, exposure, drainage, etc. Plant identifications were made in the field; plants that could not be positively identified

were collected for later determination in the herbarium, and for comparison with the recent taxonomic literature.

VEGETATION

The survey area is dominated by buffelgrass (*Cenchrus ciliaris*) with scattered shrubby trees on the plateau area and a gulch dominated by a kiawe (*Prosopis pallida*) forest and Guinea grass (*Panicum maximum*). Molokai Silty Clay Loam soil type composes much of the plateau with varying degrees of slope and erosion (Foote et al. 1972).

There are a total of 49 plant species observed within the survey site. 37 are alien (introduced), 7 are indigenous (native to the Hawaiian Islands and elsewhere), and 5 are endemic (native ONLY to the Hawaiian Islands). Therefore, 76% of the plant species observed are alien and 24% are native. An inventory of all the plants observed within the survey area is presented in the species list (Table 2) at the end of the report.

Plateau Vegetation

The majority of the project area is dominated by a relatively flat or slightly sloping hills covered by windswept buffelgrass and scattered trees. Near the existing buildings and antennae the grass is mowed short with cut paths interconnecting several of the antennae. Mixed in with the buffelgrass are numerous ilima (*Sida fallax*) shrubs. It can be difficult to see them as they are mostly growing within the tall clumps of buffelgrass. Other plants scattered within the grassland and at the edges of the mowed grass paths are; cow pea (*Macroptilium lathyroides*), sourgrass (*Digitaria insularis*), indigo (*Indigofera suffruticosa*), natal redtop (*Melinis repens*), uhaloa (*Waltheria indica*), golden-crown beard (*Verbesina encelioides*), and lantana (*Lantana camara*). Scattered larger trees and shrubs included Christmas Berry (*Schinus terebinthifolius*) and guava (*Psidium guajava*). Several Cook Island Pines (*Araucaria columnaris*) were planted near the building structures.

Native coastal vegetation increases at the northern end of the property nearer the sea cliff. Several individuals of naupaka (*Scaevola sericea*) shrubs, pauohiika vines (*Jacquemontia ovalifolia* subsp. *sandwicensis*), and alena (*Boerhavia acutifolia*) were scattered along the northern boundaries. The north-western corner of the survey area had the greatest number and density of native plant species. They included the previous native species along with kakonakona grass (*Panicum torridum*), pua kala (*Argemone glauca* var. *glauca*) our native poppy, pili grass (*Heteropogon contortus*), and Ihi (*Potulaca lutea*).

A portion of the northern coastal area outside of the project boundary was walked to locate any rare plant species that could be in close proximity to the subject property. The vegetation becomes increasingly prostrate nearer the sea cliffs and less buffelgrass exists providing better open habitat for native plant species to exist. There is a section along the northern boundary that includes the back of a highly eroded cliff section. This section was not accessed on foot, but binoculars were used to survey the cliff areas. The dominant plants included naupaka, Christmas Berry, and a few plants of nehe (*Lipochaeta rockii*).



Fig 3. Ilima (*Sida fallax*) plants were observed scattered in the Buffelgrass throughout the project site.

Gulch Vegetation

The larger gulch at the western boundary is dominated by koa haole (*Leucaena leucocephala*) scrub along the top and sides of the gulch. Christmas Berry and kiawe (*Prosopis pallida*) trees composed the canopy while Guinea grass (*Panicum maximum*) dominated the understory along the gulch bottom. Cow pea was observed growing thickly in the stands of koa haole. Near the northern end of the gulch where it meets the coastal cliffs, several native poppies or pua kala were observed. The native dodder or Kaunaoa (*Cuscuta sandwichiana*) was observed growing on many of the ilima plants in the area.

The stream appears to be intermittent with most likely heavy runoff during periods of intense rainfall in the area or upslope. Exposed boulders were dotted along the sides and bottoms of the gulch. Several goats were observed in the gulch and off to the west outside of the project boundary. Several native akia (*Wikstroemia* sp.) plants were observed outside of the survey boundaries on the western rim of the gulch. They were not included in the species list as no plants were located anywhere within the survey area.



Fig 4. Prostrate vegetation at northern boundary characterizes the coastal landscape. Vandenberg Air Force Base Downrange Facilities in background.

DISCUSSION & RECOMMENDATIONS

The survey area has been impacted by human and ungulate activity and its biological resources have been altered over time from its native state. Although, the majority of the plant species observed within the subject property are introduced (76%), the density of native vegetation near the coast cliffs is still significant. Little impact to the vegetation at the Downrange Facility is occurring at the present time. The mowing of the buffelgrass seems to be limited to around the antennae structures, buildings, and a few paths. This is critical in controlling fire hazards to the existing structures, as buffelgrass tends to be a good fuel source for fire especially in a dry windswept area characteristic of the subject property.

Towers and antennae such as those at the project site are known to be a collision hazard to a variety of bird species, particularly bird species that are active at night. Nocturnal birds may not see antennae and other structures and crash into them, which can cause direct mortality or injuries that lead to death. Even if birds are uninjured, they may fall to the ground and become disoriented, where they are easy prey for feral cats and mongoose. Towers and antennae with guy wires are particularly hazardous because the guy wires increase the surface area of the structure and because their narrow width renders them difficult to see. In Hawaii, the bird species most vulnerable to such collisions are seabirds that move nocturnally between the sea and inland nesting areas. Collisions with power lines, towers, and other structures are known to cause mortality in the threatened Newell's Shearwater or 'A`o (*Puffinus auricularis newelli*) and the endangered Hawaiian Petrel or 'Ua`u (*Pterodroma sandwichensis*). These species are known to nest in the mountains of eastern Molokai (Day and Cooper 2002) and it is possible that a few

individuals pass through the project site. Dismantling the antennae currently present at the project site will benefit any Newell's Shearwaters or Hawaiian Petrels that pass through the area by removing this collision risk. Any other towers on Molokai that are obsolete and no longer needed should also be dismantled.

If the removal of antennae structures is limited to the above ground elements, little to no effect will be had on the native vegetation of the area. The indigenous ilima is numerous in the areas surrounding the antennae, but it is also relatively common in the area and the impact of removing or damaging a few ilima plants should not be a huge impact on the population as a whole. The northern boundary of the property has the most native species as well as the highest density of native plants. Care should be taken limit or minimize disturbance of the ground and vegetation in this area.

None of the plant species observed on the project site is listed as a threatened, endangered species, or a species of concern (U.S. Fish and Wildlife Service, 2008; Wagner et. al., 1999). No sensitive or otherwise regulated habitats (e.g., wetlands) were found on the project site. The proposed removal of the antennae structures on the subject property is not expected to have significant negative impacts on the botanical resources of the site or the general region.

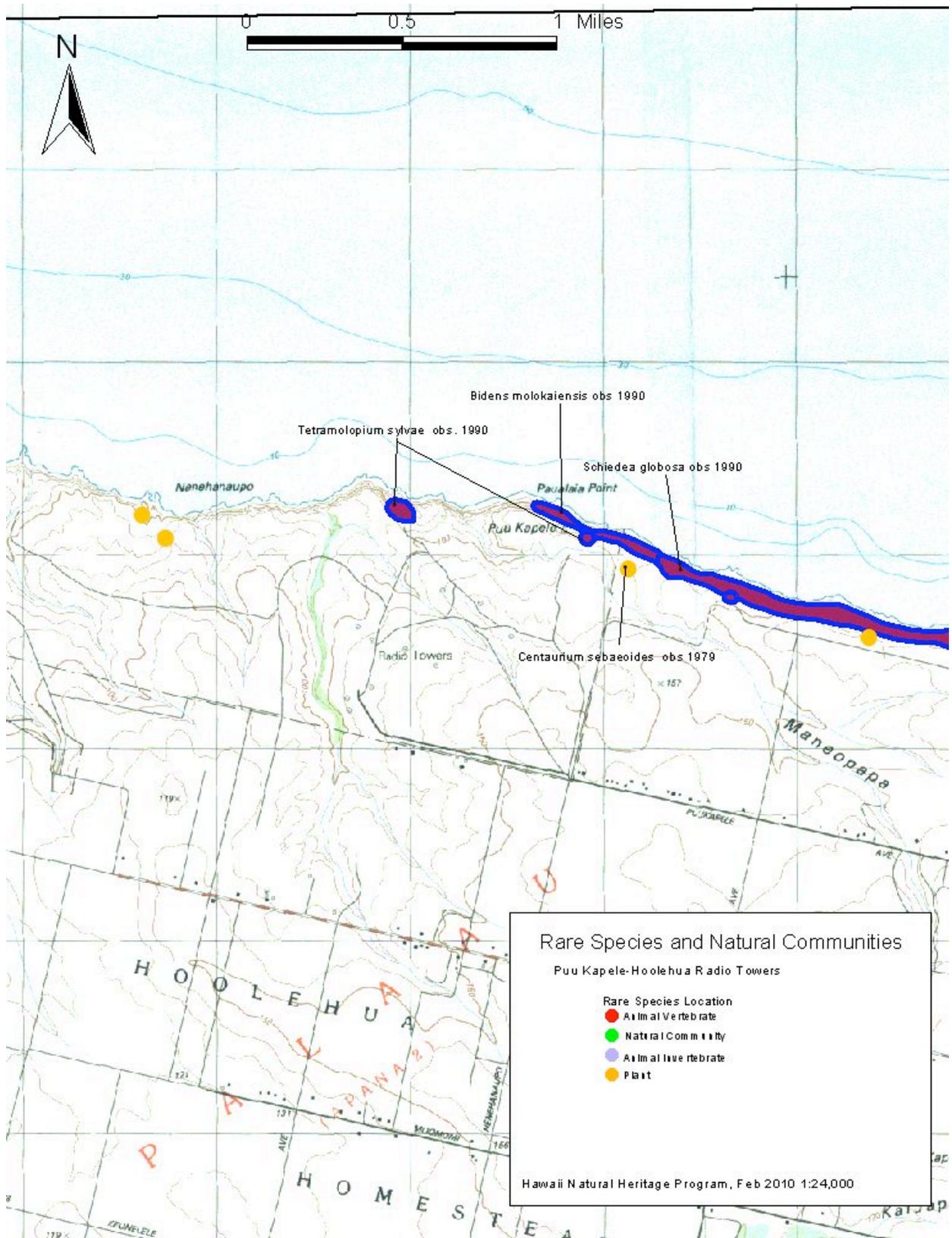


Fig 5. Map showing data points of rare species in the vicinity of VAFBDF. (Source: Hawaii Biodiversity & Mapping Program)

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TABLE 1. ANIMAL SPECIES LIST

The following checklist is an inventory of the bird and mammal species observed at Vandenberg AFB Downrange Facilities during a site visit on 21 January 2010. It is likely that additional introduced bird species are present in the area and might be seen with greater survey effort. The names are arranged in generally accepted phylogenetic order and named in accordance with the American Ornithologists Union Checklist (2005) and the Hawaii Audubon Society (2005).

Status codes:

A = Alien species introduced to the Hawaiian Islands by humans, intentionally or accidentally.

I = Indigenous species native to the Hawaiian Islands and also found elsewhere in the world.

E = Endemic species found only in the Hawaiian Islands.

* Indicates species listed under the U.S. Endangered Species Act

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
<i>Bubulcus ibis</i>	Cattle Egret	A
<i>Francolinus pondicerianus</i>	Gray Francolin	A
<i>Pluvialis fulva</i>	Pacific Golden Plover or Kolea	I
<i>Streptopelia chinensis</i>	Spotted Dove	A
<i>Geopelia striata</i>	Zebra Dove	A
<i>Copsychus malabaricus</i>	White-Rumped Shama	A
<i>Alauda arvensis</i>	Eurasian Sky Lark	A
<i>Mimus polyglottos</i>	Northern Mockingbird	A
<i>Acridotheres tristis</i>	Common Myna	A
<i>Cardinalis cardinalis</i>	Northern Cardinal	A
<i>Carpodacus mexicanus</i>	House Finch	A
<i>Passer domesticus</i>	House Sparrow	A
<i>Asio flammeus sandwichensis</i>	Pueo, Hawaiian Short-eared Owl	E
MAMMALS		
<i>Herpestes auropunctatus</i>	small Indian mongoose	A
<i>Felis catus</i>	domestic cat	A
<i>Axis axis</i>	Axis deer	A
<i>Capra hircus</i>	Goat	A

TABLE 2. PLANT SPECIES LIST

The following checklist is an inventory of all the plant species observed within the survey area of the Vandenburg AFB Downrange Facilities during a site visit on 21 January 2010. The plant names are arranged alphabetically by family and then by species into each of two groups: Monocots and Dicots. The taxonomy and nomenclature of the flowering plants (Monocots and Dicots) are in accordance with Wagner *et al.* (1990), Wagner and Herbst (1999) and Staples and Herbst (2005). Recent name changes are those recorded in the Hawaii Biological Survey series (Evehuis and Eldredge, eds., 1999-2002).

For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

A = Alien species introduced to the Hawaiian Islands by humans, intentionally or accidentally.
 I = Indigenous species native to the Hawaiian Islands and also found elsewhere in the world.
 E = Endemic species found only in the Hawaiian Islands.

SCIENTIFIC NAME	COMMON NAME	STATUS
MONOCOTS		
ARAUCARIACEAE		
<i>Araucaria columnaris</i> (G.Forster) J.D.Hooker	Cook-pine	A
POACEAE		
<i>Brachiaria mutica</i> (Forssk.) Stapf	California grass	A
<i>Cenchrus ciliaris</i> L.	buffelgrass	A
<i>Chloris barbata</i> (L.) Sw.	Swollen fingergrass	A
<i>Cynodon dactylon</i> (L.) Pers	manienie	A
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	A
<i>Eragrostis amabilis</i> (L.) Wight&Arn. Ex Nees	lovegrass	A
<i>Heteropogon contortus</i> (L.) P.Beuv. ex Roem. & Schult.	pili grass	I
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	A
<i>Panicum maximum</i> L.	Guinea grass	A
<i>Panicum torridum</i> Gaudich.	kakonakona	E
<i>Paspalum vaginatum</i> Sw.	Seashore paspalum	A
<i>Setaria verticillata</i> ((L.) P.Beauv.	Bristly foxtail	A

SCIENTIFIC NAME	COMMON NAME	STATUS
DICOTS		
ANACARDIACEAE		
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	A
ASTERACEAE		
<i>Bidens alba</i> (L.) DC. var. <i>radiata</i> (Sch. Bip.) Ballard ex Melchert	Beggar tick	A
<i>Conyza bonariensis</i> (L.) Cronq.	Hairy horseweed	A
<i>Crassocephalum crepidioides</i> (Benth.) S.Moore		A
<i>Lipochaeta rockii</i> Sherff	nehe	E
<i>Pluchea indica</i> (L.) Less.	Indian fleabane	A
<i>Sonchus oleraceus</i> L.	pualele	A
<i>Verbesina encelioides</i> (Cav.) Benth.&Hook.	Golden crown-beard	A
CHENOPODIACEAE		
<i>Atriplex semibaccata</i> R.Br.	Australian saltbush	A
CONVOLVULACEAE		
<i>Jacquemontia ovalifolia</i> subsp. <i>sandwicensis</i> (A.Gray) K.R.Robertson	pauohiaka	E
CUSCUTACEAE		
<i>Cuscuta sandwichiana</i> Choisy	Kauna oa	E
EUPHORBIACEAE		
<i>Chamaesyce hirta</i> (L.) Millsp.	hairy spurge, garden spurge	A
<i>Chamaesyce prostrata</i> (Aiton) Small		A
<i>Ricinus communis</i> L.	Castor bean	A
FABACEAE		
<i>Chamaecrista nictitans</i> subsp. <i>patellaria</i> var. <i>glabrata</i> (Vogel) H.S.Irwin & Barneby	Partridge pea	A
<i>Desmanthus pernambucanus</i> (L.) Thell.	Slender or virgate mimosa	A
<i>Indigofera suffruticosa</i> Mill.	indigo	A
<i>Leucaena leucocephala</i> (Lam.) de Wit	Koa haole	A

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Macroptilium lathyroides</i> (L.) Urb.	Wild bean, cow pea	A
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	Kiawe, mesquite	A
GOODENIACEAE		
<i>Scaevola sericea</i> Vahl	Naupaka	I
MALVACEAE		
<i>Abutilon grandifolium</i> (Willd.) Sweet	Hairy abutilon	A
<i>Malvastrum coromandelianum</i> subsp. <i>coromandelianum</i> (L.) Garke	False mallow	A
<i>Sida fallax</i> Walp.	ilima	I
MYRTACEAE		
<i>Psidium guajava</i> L.	Common guava	A
NYCTAGINACEAE		
<i>Boerhavia acutifolia</i> (Choisy) J.W.Moore	alena	I
OXALIDACEAE		
<i>Oxalis corniculata</i> L.	Yellow wood sorrel	A
PAPAVERACEAE		
<i>Argemone glauca</i> var. <i>glauca</i>	Pua kala	E
PHYTOLACCACEAE		
<i>Rivina humilis</i> L.	Coral berry	A
PLANTAGINACEAE		
<i>Plantago major</i> L.	Common plantain	A
PORTULACACEAE		
<i>Portulaca oleracea</i> L.	pigweed	A
<i>Portulaca lutea</i> Sol. Ex G.Forst.	Ihi	I

SCIENTIFIC NAME	COMMON NAME	STATUS
SOLANACEAE		
<i>Solanum americanum</i> Mill.	Glossy nightshade, popolo	I
STERCULIACEAE		
<i>Waltheria indica</i> L.	uhaloa	I
VERBENACEAE		
<i>Lantana camara</i> L.	lantana	A
<i>Stachytarpheta australis</i> Moldenke	owi	A

Appendix B

Archaeological Assessment

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Draft

**Archaeological Assessment
for the Vandenburg Air Force Base Project
AF Project # XUMUOS000209,
Pālā‘au Ahupua‘a, Kona District, Moloka‘i Island
TMK [2] 5-2-006:063**

**Prepared for
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Management Summary

Reference	Archaeological Assessment for the Vandenburg Air Force Base Project, AF Project # XUMUOS000209, Pālā'au Ahupua'a, Kona District, Moloka'i Island TMK [2] 5-2-006:063
Date	August 2010
Project Number (s)	Cultural Surveys Hawai'i Inc. (CSH) Job Code: PALAAU 1
Investigation Permit Number	The fieldwork component of the archaeological assessment was carried out under archaeological permit number 10-10 issued by the Hawai'i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai'i Administrative Rules (HAR) Chapter 13-282.
Study Area Location	The study area is located approximately 250 m south of the northern coast of Moloka'i, with Pu'u Kapele and Paulalaia Point located just <i>makai</i> of the study area. The study area is bounded by Pu'u Kapele Avenue to the south, Kōlea Avenue to the east, and Pu'u Kapele to the north. The study area is depicted on the U.S. Geological Survey 7.5-Minute Series Topographic Map, Moloka'i Airport Quadrangle (1993).
Land Jurisdiction	State of Hawai'i Department of Hawaiian Homelands (DHHL)
Project Description	The proposed project involves the transfer of a United States Air Force (USAF) receiver station facility (a.k.a. Vandenburg Air Force Base) to the DHHL.
Study Area Acreage	Approximately 364 acres
Area of Potential Effect (APE) and Survey Acreage	For the purposes of this archaeological assessment, the APE is considered to be the entire approximately 364-acre study area. The survey area for the current investigation included an approximately 6-acre area focused around a USAF receiver station facility located in the western corner of the study area (see Figure 5).
Historic Preservation Regulatory Context	The proposed project is subject to Hawai'i State environmental and historic preservation review legislation [Hawai'i Revised Statutes (HRS) Chapter 343 and HRS 6E-8/Hawai'i Administrative Rules (HAR) Chapter 13-275, respectively]. While this investigation does not fulfill the requirements of an archaeological inventory survey investigation (per HAR Chapter 13-276), it serves as a document to facilitate the proposed project's planning and supports historic preservation review compliance by assessing if there are any major archaeological concerns within the study area and to develop data on the general nature, density and distribution of archaeological resources.
Fieldwork Effort	The fieldwork component of the archaeological literature review and field inspection was conducted on May 3 rd , 2010 by two CSH archaeologists, Jon Tulchin, B.A., and Trevor Yucha, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. (principal

Results Summary	<p>investigator). The fieldwork required 2 person-days to complete.</p> <p>A 100% pedestrian survey was conducted in the immediate vicinity of the USAF 30th Space Wing HF Receiver facility located within the western corner of the study area (see Figure 16 & Figure 17). The survey area comprised 6 acres, and consisted of a circular area extending 60 m from the outer perimeter of the facility. Approximately 75% of the survey area was observed to have been disturbed by land modifications associated with the development of the receiver facility. Documented land disturbances included extensive grading and excavations associated with the construction of single story structures, radio towers, and access roads (see Figure 18). No historic properties were observed within the survey area.</p> <p>A walk-through reconnaissance was also conducted within the study area to relocate two historic properties (SIHP # 50-60-02-1623 & SIHP # 50-60-02-1624) previously identified by the Bishop Museum (Major & Dixon 1995). SIHP # 50-60-02-1623 (Features 1 and 2) and SIHP # 50-60-02-1624 (Feature 1) were relocated and their positions recorded with GPS technology. However, SIHP-1623 Feature 3 (a historic refuse scatter) and SIHP -1624 Feature 2 (an isolated basalt flake) could not be relocated. It is believed that soil erosion has displaced or buried these ephemeral surface features in the intervening 15 years since they were initially documented.</p>
Recommendations	<p>Preservation in the form of avoidance and protection is recommended for SIHP#50-60-02-1623 Features 1 and 2, pre-Contact agricultural shrines (upright boulder alignment and stone enclosure), and SIHP#50-60-02-1624, a pre-Contact habitation enclosure. Both historic properties are assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (being important to an ethnic group's history and cultural identity due to associations with cultural practices and/or traditional beliefs).</p>

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Section 1 Introduction

1.1 Project Background

At the request of Element Environmental, LLC, Cultural Surveys Hawai'i, Inc. (CSH) completed an archaeological assessment for the Vandenburg Air Force Base Project, AF Project # XUMUOS000209, Pālā'au Ahupua'a, Kona District, Moloka'i Island TMK (2) 5-2-006:063. The study area is located approximately 250 m south of the northern coast of Moloka'i, with Pu'u Kapele and Paualaia Point located immediately to the north. The study area is bounded by Pu'u Kapele Avenue to the south, Kōlea Avenue to the east, and Pu'u Kapele to the north. The study area is depicted on the U.S. Geological Survey (USGS) 7.5-Minute Series Topographic Map (Figure 1), a Tax Map Key (TMK) (Figure 2), and on an aerial photograph (Figure 3).

The entire study area was previously surveyed by the Bishop Museum (Major & Dixon 1995). This current investigation has been conducted in order to relocate archaeological sites previously identified by the Bishop Museum (Major & Dixon 1995), and to thoroughly inspect the immediate area surrounding a USAF receiver facility, located in the southwest corner of the study area, to determine if there are any major archaeological concerns.

Following the 1995 Bishop Museum study (Major & Dixon 1995), the Bishop Museum returned in 1999 to conduct a supplemental archaeological inventory survey in response to newly identified archaeological features located with the northeastern *makai* edge of the subject property (Hartzell 2000). The historic property documented during the 2000 study (Hartzell 2000), SIHP #50-60-02-843 (a.k.a. The Pu'u Kapele Wall Complex), was not included in the scope of this current archaeological investigation.

1.1.1 Project Description

The proposed project involves the transfer of a United States Air Force (USAF) receiver station facility (a.k.a. Vandenburg Air Force Base) to the DHHL. The results of this archaeological investigation will be incorporated into the project's environmental assessment which has been developed to facilitate this land transfer.

1.1.2 Historic Preservation Regulatory Context

The proposed project is subject to Hawai'i State environmental and historic preservation review legislation [Hawai'i Revised Statutes (HRS) Chapter 343 and HRS 6E-8/Hawai'i Administrative Rules (HAR) Chapter 13-275, respectively]. While this investigation does not fulfill the requirements of an archaeological inventory survey investigation (per HAR Chapter 13-276), it serves as a document to facilitate the proposed project's planning and supports historic preservation review compliance by assessing if there are any major archaeological concerns within the study area and to develop data on the general nature, density and distribution of archaeological resources.

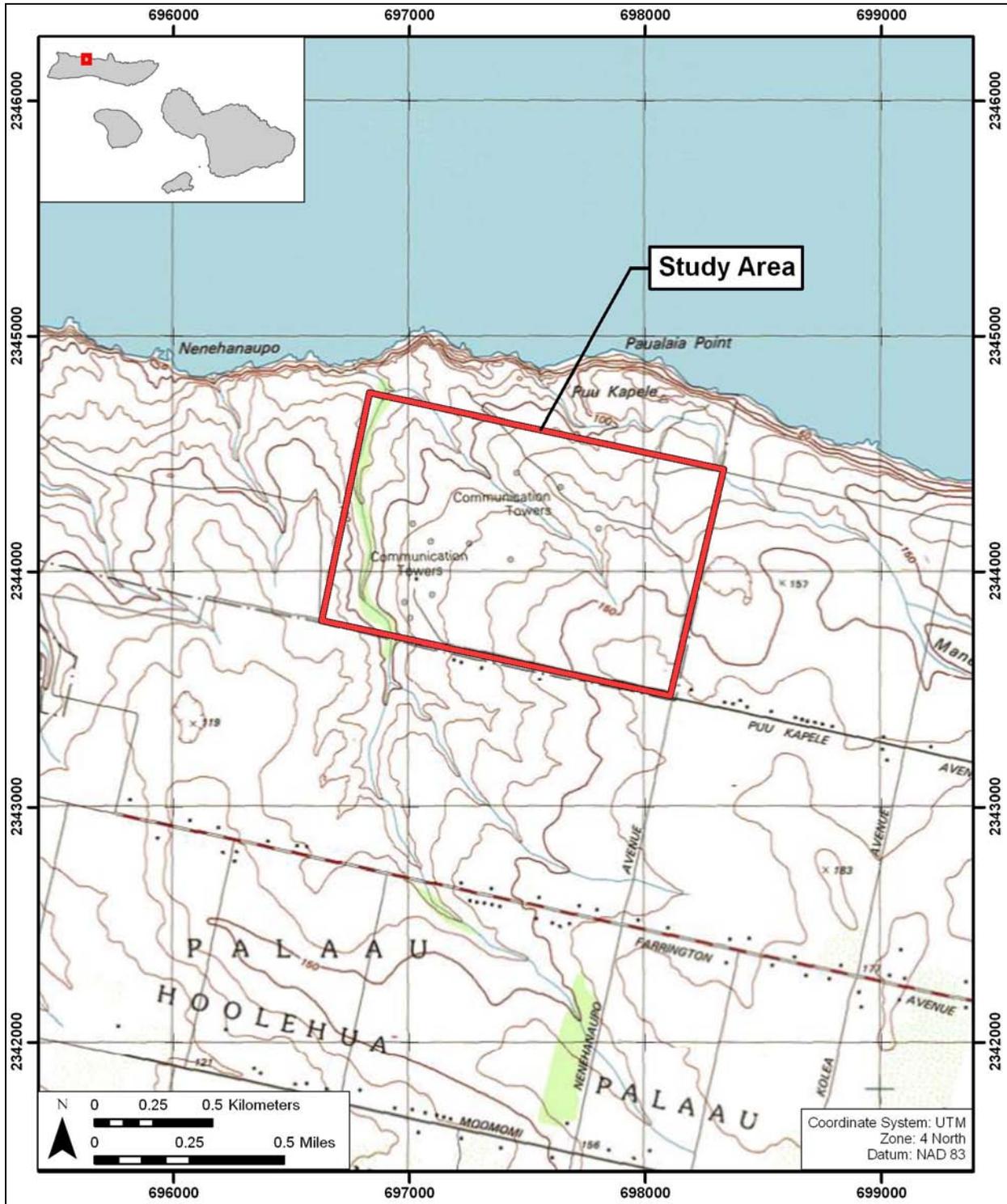


Figure 1. U.S. Geological Survey (USGS) 7.5 Minute Series Topographic Map, Molokai Airport (1993) Quadrangle, showing the location of the study area

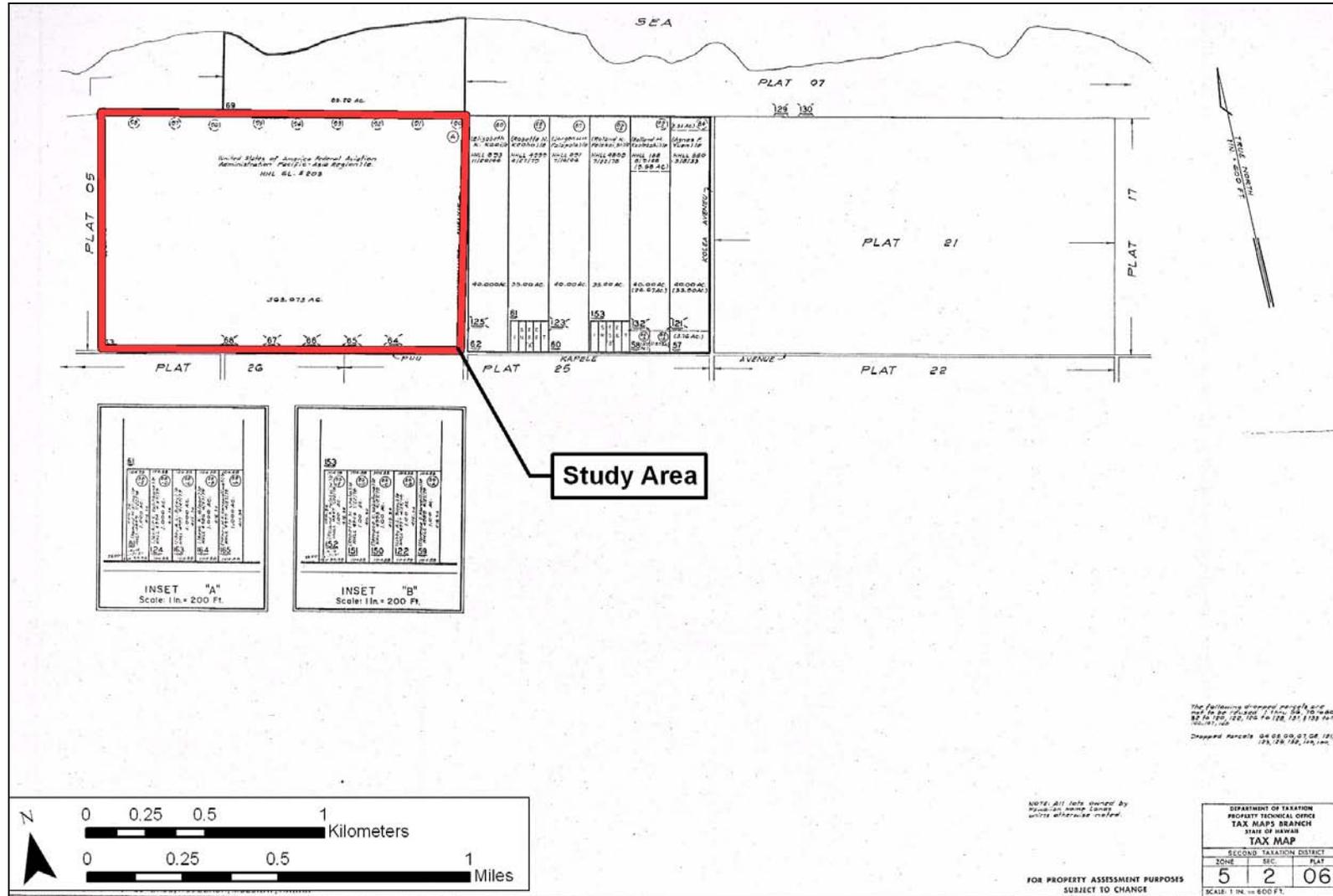


Figure 2. Tax Map Key (TMK) plat map [2] 5-2-06 showing the location of the study area



Figure 3. Aerial photograph showing the location of the study area (source: Google Earth 2010)

1.2 Scope of Work

This study was not intended to meet the requirements of an archaeological inventory-level survey per the rules and regulations of the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR). However, the level of work is sufficient to address archaeological site types and locations, and allow for future work recommendations. The literature review and field inspection includes a report detailing research methods and findings. The goal was to identify, if possible, any cultural resources documented in historical and archival records.

Scope of Work

1. Historical research to include study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near this property.
2. Limited field inspection of the study area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites. This assessment will identify any sensitive areas that may require further investigation.
3. Preparation of a report to include the results of the historical research and the limited fieldwork with an assessment of archaeological potential based on that research, with recommendations for further archaeological work, if appropriate. It will also provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

1.3 Environmental Setting

1.3.1 Natural Environment

Located in the dry, leeward area of Moloka'i, the study area receives an average of approximately 15 to 31 in. (400 to 800 mm) of annual rainfall (Giambelluca et al. 1986). Elevations within the study area range from approximately 230 to 530 ft AMSL (Above Mean Sea Level). The land surface within the study area consists of gently sloping terrain descending to the northwest defined by a relatively level plateau. Two un-named non-perennial streams cross through the study area, running southeast to northwest. These streams likely act as drainages, funneling rainwater into the ocean.

Soils within the study area consist predominantly of Molokai Silty Clay Loam (MvD3, MuB, MuC3, & MuC) with smaller pockets of Hoolehua Silty Clay Loam (HyB3 & HzB) and Rock Land (rRK) (Foote et al. 1972) (Figure 4). The following is a synopsis of each soil series:

The Molokai series consists of well-drained soils on uplands...formed in material weathered from basic igneous rock. They are nearly level to moderately steep. These soils are used for sugarcane, pineapple, pasture, wildlife habitat, and homesites. (Foote et al. 1972: 96)

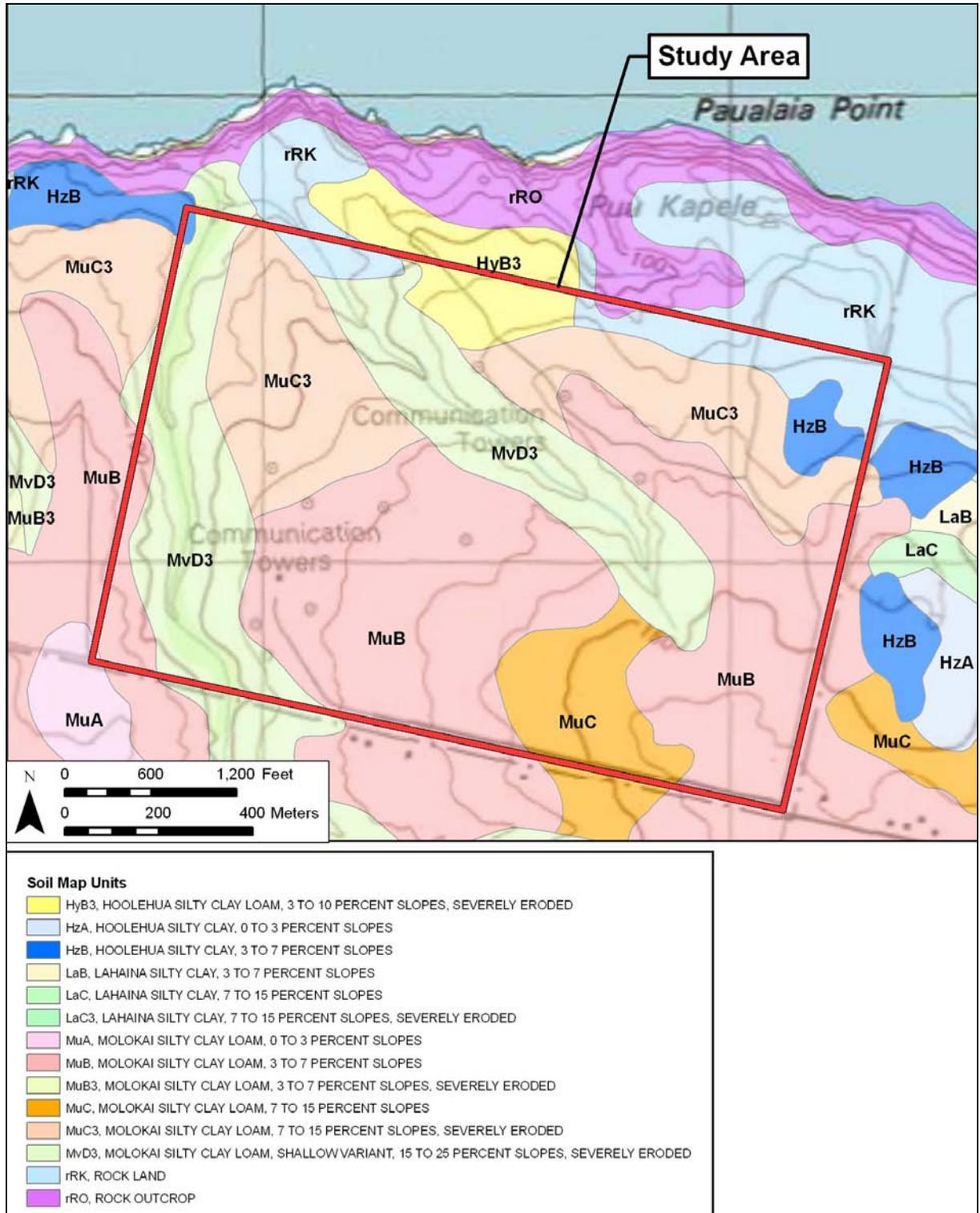


Figure 4. Overlay of the Soil Survey of the State of Hawai'i (Foote et al. 1972), indicating soil types within the study area

The Hoolehua series consists of well-drained soils in depressions and in drainageways...developed in old alluvium. These soils are used for pineapple, pasture, and wildlife habitat. (Foote et al. 1972: 44)

Rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops and very shallow soils are the main characteristics. The rock outcrops are mainly basalt and andesite. Rock land is used for pasture, wildlife habitat, and water supply. (Foote et al. 1972: 119)

1.3.2 Built Environment

The southwestern corner of the study area contains a USAF receiver station facility consisting of a few low-rise buildings, dirt and asphalt access roads, and numerous communications towers. The northeastern corner contains a few dirt roads, traveling roughly northwest to southeast. This portion of Moloka'i is generally undeveloped.

Section 2 Methods

2.1 Field Methods

The fieldwork component of the archaeological assessment was conducted on May 3rd, 2010 by two CSH archaeologists, Jon Tulchin, B.A., and Trevor Yucha, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The fieldwork required 2 person-days to complete.

In general, the purpose of the field inspection was to develop data on the nature, density, and distribution of archaeological sites within the study area. The field inspection consisted of a 100% pedestrian survey of an approximately 6-acre survey area focused around a USAF receiver station facility (Figure 5). The due to excellent ground visibility spacing between the archaeologists was generally 20-30 m. In addition to the 6-acre survey area, a walk-through reconnaissance was also conducted to relocate two historic properties previously identified by the Bishop Museum (Major & Dixon 1995). Archaeological sites were documented with brief written descriptions and photographs, and were located with Garmin GPS survey technology (accuracy 2-3 m).

2.2 Document Review

Background research included: a review of previous archaeological studies on file at SHPD; review of documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Mission Houses Museum Library, the Hawai'i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai'i State Archives and the Archives of the Bishop Museum; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona 'Aina database (<www.waihona.com>).

This research provided the environmental, cultural, historic, and archaeological background for the study area. The sources studied were used to formulate a predictive model regarding the expected types and locations of historic properties in the study area.



Figure 5. Aerial photograph showing the location of the USAF receiver facility and associated survey area (source: Google Earth 2010)

Section 3 Background Research

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

This section focuses on the traditional background of Pālā'au Ahupua'a. Traditionally, Moloka'i was divided into two *moku*, or districts, Kona and Ko'olau. The Kona Moku comprised the lands of the southern and western sections of the island, and the Ko'olau Moku comprised the lands of the northeastern portion of the island from Hālawa Valley to the Kalaupapa Peninsula. The western portion of the island, however, was sometimes described as being in a separate land division: the *kālana*, Kaluako'i (Moffat & Fitzpatrick 1995). John Ka'imikaua spoke of four traditional *moku* of Moloka'i, known as Kaluako'i, Pālā'au, Ko'olau and Kawela (Terry & Monahan 2005).

In 1859, the traditional *moku* of Kona and Ko'olau were dropped and the island as a whole was referred to as the Moloka'i district. Then in 1909 the island was again divided into two districts: the Kalawao district, which contained the lands of Kalaupapa, Kalawao, and Waikolu; and the Moloka'i district which contained the remainder of the island including Pālā'au (Coulter in Summers 1971).

As is common on the island of Moloka'i, Pālā'au Ahupua'a consists of three different sections, or *āpana*. Pālā'au 1 is centrally located on the southern coast of the island; Pālā'au 2, the section in which the study area is located and the largest of the Pālā'au Ahupua'a, is situated on the Ho'olehua plains of central Moloka'i extending north to the coast; and Pālā'au 3 on the north coast, is above Kalaupapa Peninsula (Figure 6).

3.1.1.1 Place Names

Translations for place names presented without attribution in this subsection are from Pukui et al. (1973), unless indicated otherwise. Prominent named places are shown on Figure 6.

Pālā'au literally translates as wooden fence or enclosure. Pālā'au comprises the three land sections noted above in north central and southwest Moloka'i. It is also the name of the state park overlooking Ka-laupapa peninsula and containing the phallic stone Ka-ule-o-Nānāhoa. Pālā'au also translates as to heal, as with herbs.

Pu'u Kapele literally translates as the volcano hill

Waihuna literally translates as hidden water; Waihuna Hill is on the east side of Mahana Valley (Soehren 2003:170).

3.1.1.2 *Mo'olelo Associated with Specific Place Names*

Pāka'a and His Son Kū-a-Pāka'a

The following *mo'olelo* (story, tale, myth, history) recounts two chiefs, Pālā'au and Ho'olehua, which are also the names of adjacent *ahupua'a* (see Figure 6):

On Molokai lived a very beautiful woman, Hikauhi, the daughter of Hoolehua and Ilali. Now it happened that the girl's father had promised her hand to Palaaau, the chief of that part of the island. But as soon as she had seen Paakaa, she forgot all about her former lover and demanded that the stranger be given to her. Palaaau very generously consented, and so they all lived in peace. Paakaa cultivated the lands well, fished skillfully, and brought great prosperity to his wife and her family. (Rice 1923:76)

Pele's Long Sleep

An ancient chant concerning Lohi'au, the king of Kaua'i, includes reference to Pālā'au. At the beginning of his romance with Pele,

Lohiau watched her while he partook of the feast with his chiefs, and she was resting on the couch of mats. He was thinking of her marvelous, restful beauty, as given in the ancient chant known as "Lei Mauna Loa."

"Lei of Mauna Loa, beautiful to look upon.

The mountain honored by the winds.

Known by the peaceful motion.

Calm becomes the whirlwind.

Beautiful is the sun upon the plain.

Dark-leaved the trees in the midst of the hot sun

Heat rising from the face of the moist lava.

The sunrise mist lying on the grass,

Free from the care of the strong wind.

The bird returns to rest at Palaaau.

He who owns the right to sleep is at Palaaau.

I am alive for your love--

For you indeed." (Westervelt 1916:77)

Kauleonānāhoa

Kauleonānāhoa is located in Pālā'au 3, as mentioned above. This phallic stone is perched just west of Pu'u Lua, on Nanahoa Hill. Kauleonānāhoa literally translates as "the penis of Nanahoa." It is said to be the finest example of phallic stones found throughout the islands. As Stokes describes in Summers (1971:28):

The stone appeared to me to be a natural formation...There was, however, some artificial work on the stone, i.e. a slight hammering on the blunt ridge underneath the head, where the latter joined the neck; although the surface thus formed did not seem as ancient as the rest of the stone. (Stokes 1924 in Summers 1971:28)

Summers (1971) quotes an excerpt from the Hawaiian newspaper, *Ka Nupepa Ku'oko'a*, written by Coelho (1924):

In the beginning Kaunanahoa and his wife [Kawahuna] lived where the Nanahoa (stone) stands. One day, a peculiar but beautiful woman appeared and went up there. As she prayed and offered her gifts, she glanced up-ward and saw Nanahoa blinking his eyes at her. She climbed up to the top where the plain of Kaiolohia could be easily seen and there she peered into a small pool.

As she sat admiring the incomparable beauty of the small pool, Kawahuna's hands reached out and grabbed her by the hair. As they struggled, Nanahoa lost his temper and gave the woman whose right (husband) he was [Kawahuna] a hard slap. She staggered back and rolled down the cliff side into a depression at the foot...

That was how they became separated to this day. Nanahoa stands alone on the hill and Kawa-huna lies alone on the plain. What a pity. The husband was at fault and the wife suffered for it and both became stones to this day (Coelho 1924 cited in Summers 1971:28, 30).

It is also said that there came a time when the land became barren due to the fighting of husbands and wives. It appeared to the chiefs that the race needed a revival, and they asked their *kahuna* to summon the gods for help. Women were then commanded to go to Pu'u Lua with offerings and spend the night. It was said that if a woman takes offerings and spends the night at Kaulenānāhoa, she will return home pregnant (Coelho 1924 in Summers 1971:28, 30).

3.1.2 Early Historic Period to Mid-1800s

Moloka'i is briefly mentioned in several early historic accounts. Summers (1971:18) relates that in 1779 when Captain Cook visited Hawai'i, Moloka'i's status was uncertain. However, Kamakau (1961:132-133) cites several reasons why Moloka'i was as important as O'ahu in the late 1700s since both of the islands contained "rich lands, many walled fish-ponds, springs, and water taro patches. The island of Oahu was very fertile and Molokai scarcely less so."

After conquering the island of Maui in 1790, Kamehameha advanced on to Moloka'i where he secured the allegiance of the chiefs. Archibald Menzies (1920:115), the naturalist who accompanied Captain George Vancouver to the Hawaiian Islands in the 1790s, relates that Kamehameha "destroy[ed] the fields and plantations of the inhabitants." He and his warriors remained on Moloka'i for a year to prepare the attack on O'ahu. It is said that he grew taro and "had all his canoes put in order. He drilled his warriors on the Hoolehua plain near where the airport is now" (Cooke 1949:112).

Cattle were introduced to Moloka'i in the 1840s. Lucille de Loach summarizes this first effort at commercial ranching:

Rudolph W. Meyer, who wasresponsible, along with [Reverend] Hitchcock, for the introduction of cattle on the island, had come to Moloka'i in the 1840s. He established a ranch stocked with longhorns in the Kalae area. A lucrative trade in cattle and hides was begun between Moloka'i and Honolulu. The cattle were exported from the village of Palaau on the southwestern shore, over the reef, and onto a waiting ship. Palaau grew wealthy on cattle and dry land taro. All this came to an end, however, in the 1850s, when Meyer discovered that the number of cattle in the herd had diminished considerably. He found that almost every male in the village was guilty of rustling, and so all the men were shipped off to jail in Honolulu. The men's families followed and the village was deserted. Today Palaau sits abandoned in a kiawe forest, as no one ever returned to live there. (de Loach 1975:68)

3.1.3 The Māhele (Land Divisions)

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—that introduced private property into Hawaiian society. In 1848, the crown and the *ali'i* (royalty) received their land titles. Pālā'au was retained by the crown (Figure 7).

3.1.4 Mid- to late-1800s

Although the first attempt at cattle ranching was unsuccessful, raising livestock expanded in the second half of the 19th century:

During this period, cattle, sheep and goats were imported to the island in ever-increasing numbers. According to Judd, there were no cattle on the island in 1832 and by 1853 there were only 200 head. The 1866 census, however, revealed 2,586 head of cattle, 13,332 sheep and 196 goats on the island....In 1868, Kamehameha V released axis deer on the island. (de Loach 1975:86)

Coulter's (1931) population density estimates for 1853 (Figure 8) show that Moloka'i's population was concentrated along the coastal eastern half of the island. No symbols (each representing 20 people) are shown in the study area or anywhere within its vicinity in Coulter's figure. As mentioned above, study area lands were held by the crown.

Abraham Fornander recounted an anecdote late in the 19th century that suggests a formerly substantial population in the study area's vicinity that may have been widely dispersed:

.....As an instance of the dense population even a few years previous to *Kamehameha's* death, the author has often been told by a grand-niece of *Kekaulike*, who was a grown-up girl at the time, that when the chief's trumpet-shell sounded, over a thousand able-bodied men would respond to the call, within a circle described by Palaau, Naiwa, Kalae and Kaunakakai. Those lands together cannot muster a hundred men this day. (Fornander 1880:73 footnote)

Summers (1971:38) supports this view of a substantial population in the vicinity citing Malihinihele who stated in 1876, "In the olden days this [Pālā'au 2] was a good land with a fertile plain where plants grew. The population was large but today it is uninhabited."

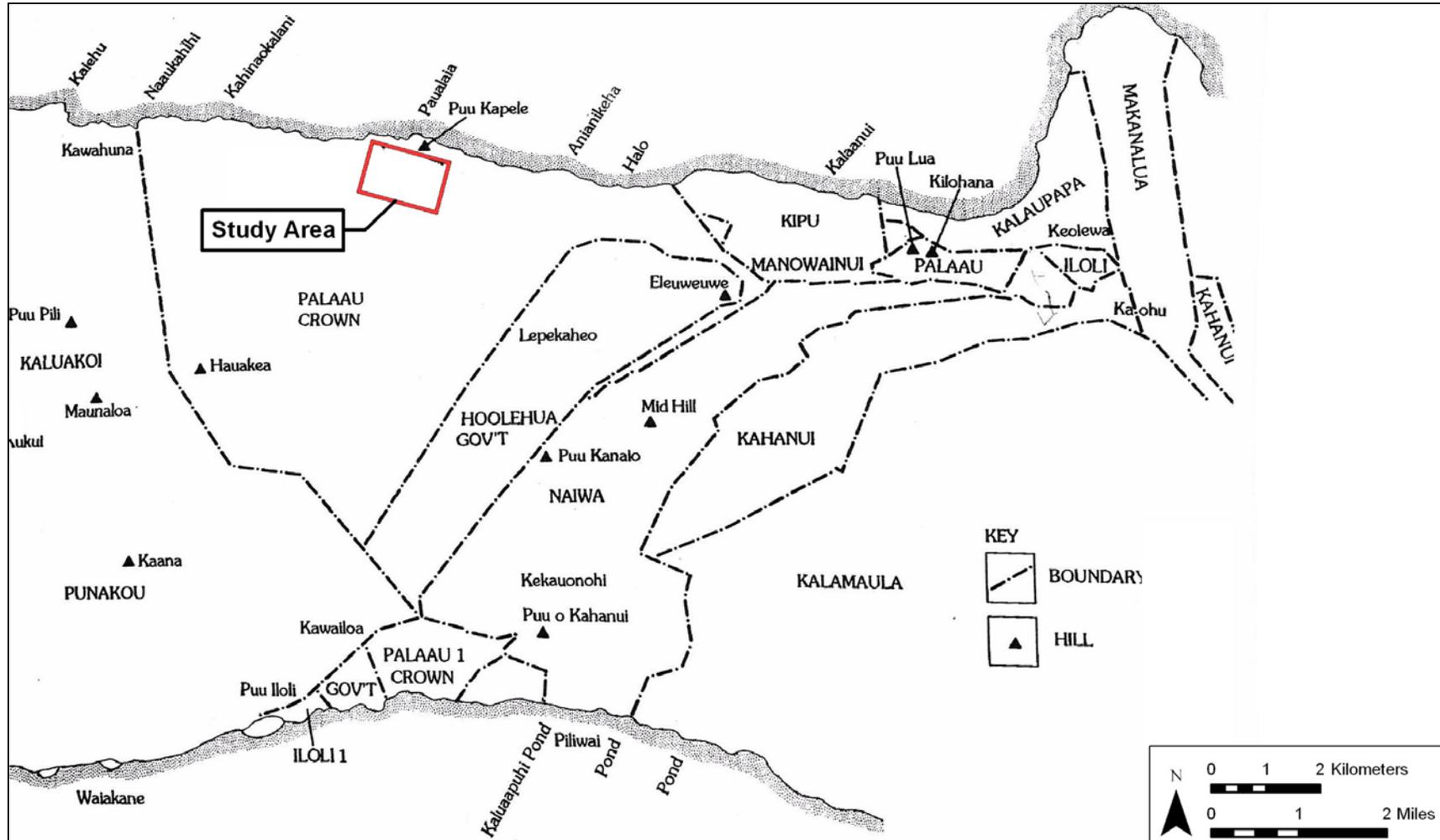


Figure 7. 1897 Alexander map indicating the entire *ahupua'a* of Pālā'au 2 as crown lands (adapted from Major and Dixon 1995:37)

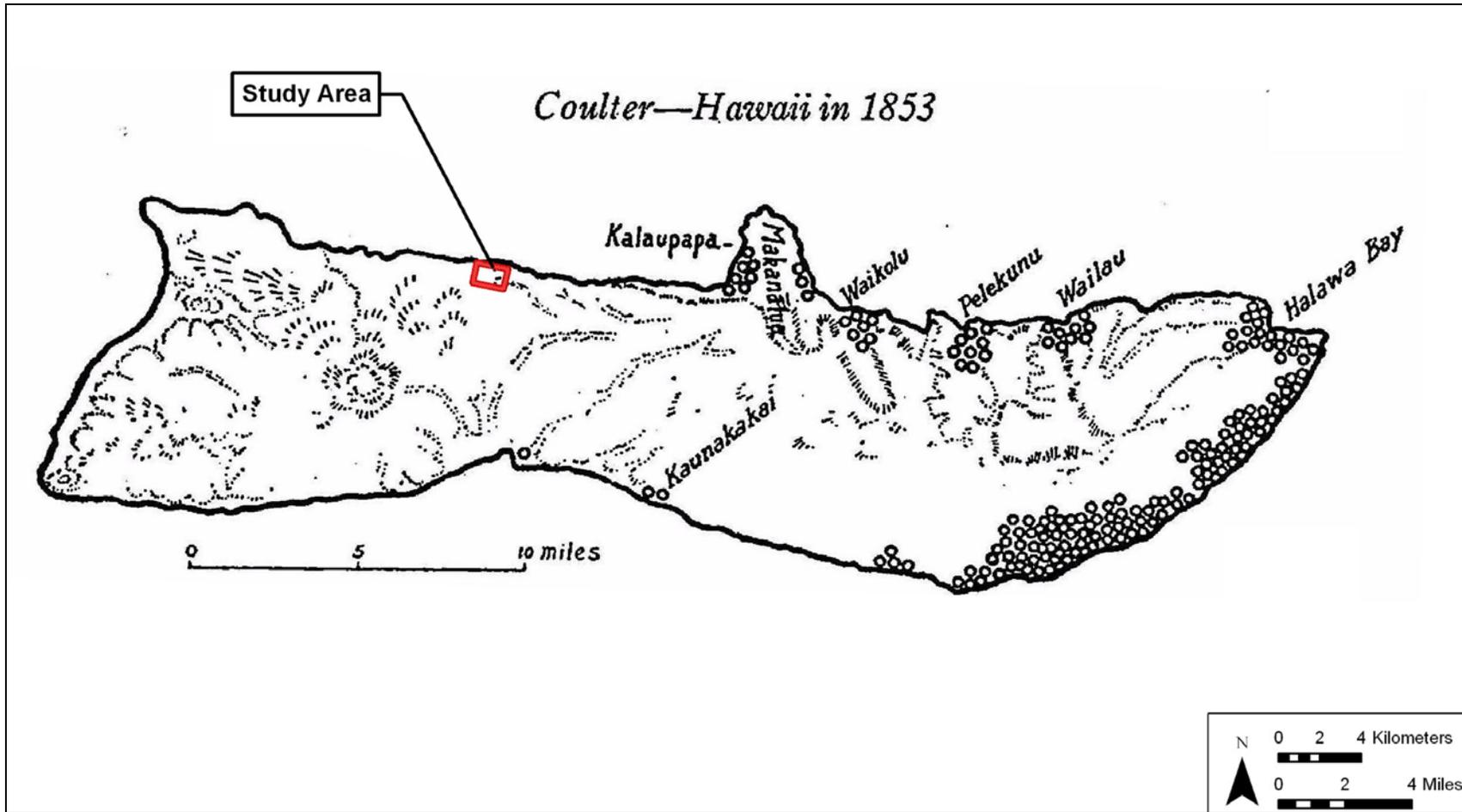


Figure 8. 1853 (Coulter 1931) population density estimates; each symbol represents 20 people

While “a grand niece of Kekaulike” and “Malihinihele” indicate a sizable population for central Moloka‘i, it remains unclear whether this was a pre-Contact pattern or reflects the burst of activity in the 1790s when Kamehameha had a considerable force stationed on Moloka‘i for a short time.

In 1898, members of the American Sugar Company attempted to develop the arid lands of the Ho‘olehua plain. Railroad tracks were constructed from Kaunakakai harbor “up through Palaau and Iloili to the middle of the Hoolehua plateau.....On the Hoolehua plain 750 acres were prepared in parallel trenches following the contours. 500 acres were actually planted in young cane shoots” (Judd IV 1936:11-12). Irrigation ditches eight miles long brought pumped water that was found to contain a high salt content. The effort failed and “graded railroad bed cutting through the gulches of Palaau” and “irrigation ditches ...on the Hoolehua plain” were all that remained (Judd IV 1936:11-12).

3.1.5 1900s

In 1921, the U.S. Congress established the Hawaiian Homes Commission to administer and manage some 200,000 acres of land that were Kingdom of Hawai‘i government and crown lands. Agricultural homesteads were to be leased to Native Hawaiians who were at least half Native Hawaiian; leases were for 99 years at \$1 a year. The following year, the program began attracting people to Moloka‘i, and although the lack of water initially caused multiple problems, the program succeeded and was expanded to other areas including Pala‘au-Ho‘olehua in 1924. Despite drought, high winds and insect infestations, people managed to cultivate their plots (McGregor 2007:204, 227, 231).

Pineapple cultivation began in Pala‘au-Ho‘olehua in 1926 when Libby, McNeill and Libby contracted with some homesteaders. The California Packing Corporation (in 1967 renamed the Del Monte Corporation) contracted with other homesteaders in 1929 to develop additional pineapple cultivation. Homestead residents received almost two million dollars in cash payments for their efforts between 1929 and 1935 (de Loach 1975:101-102). Additionally in 1930, due to the homestead program, the Pālā‘au-Ho‘olehua area had the one of the largest populations of Native Hawaiians in the Territory, totaling 826 Native Hawaiian residents (McGregor 2007:10).

Handy (1940:157) notes that, “In 1931 there were many flourishing patches on the Hawaiian homesteads at Hoolehua. It is said that Hoolehua and Palaau were noted for sweet potatoes in olden days.” Handy and Handy (1972:283) also note that homesteaders in Ho‘olehua were growing the sweet potatoes on land that had not been planted in “ancient times.”

Handy and Handy also cite Southwick Phelps, who “made an archaeological survey of Molokai in 1937”:

For Pala‘au (Apana 2), Kaluakio, and Punakou, Ho‘olehua, and Naiwa, planting areas for yams and sweet potatoes cannot be delimited but it is known that these were grown in that general area and were, with fish, the staples of the inhabitants. (Phelps in Handy & Handy 1972:518)

Despite droughts, including one in 1944-1945 that caused the loss of the entire crop, pineapple production continued until the 1970s (de Loach 1975:107, 109). Dole Pineapple, which had taken over Libby, McNeill and Libby’s operations, ceased pineapple cultivation in

1975. The Del Monte Corporation (formerly the California Packing Corporation) ceased pineapple cultivation 1983 (Cooper & Daws 1990:201).

A 1952 U.S. Geological Survey topographic map of Moloka'i indicates that the study area consisted of desolate plateau lands, devoid of any human activity (Figure 9).

3.1.6 Modern Land Use within Project Area

A 1968 U.S. Geological Survey topographic map indicates that the USAF 30th Space Wing HF Receiver facility currently located within the study area was then present (Figure 10). An access road running along the southern boundary of the study area is shown leading to a small group of structures (the USAF receiver facility) near the southwestern corner of the study area. Also of note is a dashed circle labeled "radio tower" located just north the center of the southern boundary of the study area.

A 1993 USGS topographic map (see Figure 1) and a modern aerial photograph (see Figure 3) of the area indicates that the extent of the USAF receiver facility was vastly expanded from its first appearance in the 1968 USGS topographic map. Numerous communication towers and associated dirt access roads are indicated throughout the entire study area. However, the buildings associated with the facility appear unchanged.

The USAF receiver facility located within the study area is a component of the 30th Space Wing/Vanderberg Air Force Base (VAFB). The main headquarters of the VAFB are located in California halfway between Los Angeles and San Francisco. The VAFB/30th Space Wing conducts space, ballistic and aeronautical operations in the area of the Pacific Ocean (Research Triangle Institute 2000). Generally, the VAFB supports ballistic missile launches into broad ocean areas and the Kwajalein Missile Range. Midrange support for ballistic missile tests are provided by sensors located in Hawai'i. The facilities on Moloka'i served as a site for a high frequency receiver for radio communications (Research Triangle Institute 2000).

Currently the USAF receiver facility located within the study area is abandoned. A detailed description of existing conditions in the immediate vicinity of the receiver facility is provided below in Section 4.1.

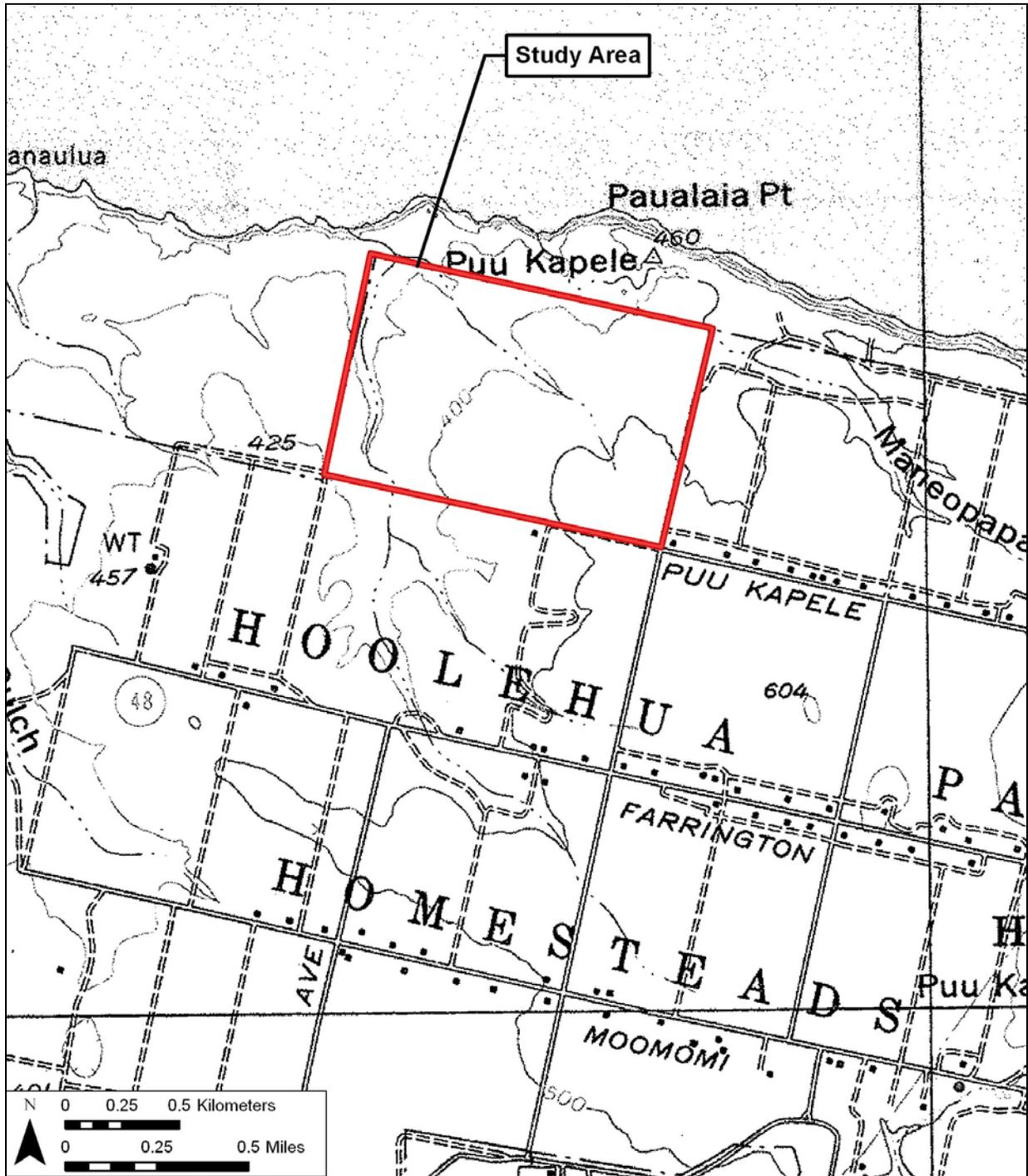


Figure 9. 1952 U.S. Geological Survey topographic map of Moloka'i

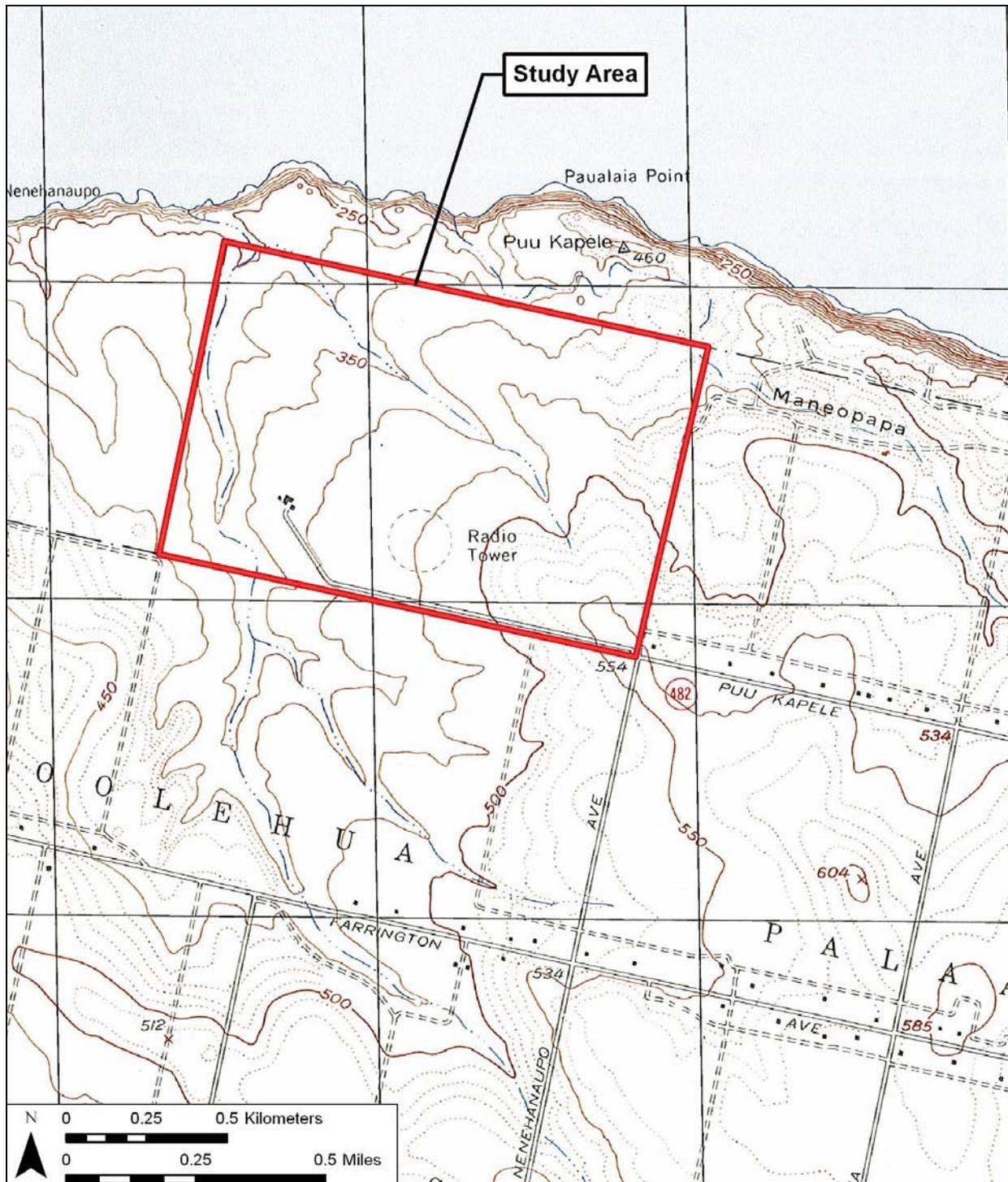


Figure 10. 1968 U.S. Geological Survey topographic map, Moloka'i Airport Quadrangle

3.2 Previous Archaeological Research

Table 1 provides a summary of previous archaeological studies conducted in the vicinity of the study area. The locations of these studies as well as historic properties (a.k.a. archaeological sites) identified in the vicinity of the study area are shown in Figure 11 and Figure 12.

In 1937, Bishop Museum conducted a regional study of Moloka'i Island including a review of relevant historical and ethnographical literature (Phelps 1941). A total of 50 archaeological sites were documented primarily consisting of *heiau*, *koa*, and extensive archaeological site complexes. Two sites that were documented by Phelps (1941) are located in the general vicinity of the current study area (see Figure 12). Site 19, located approximately 2.7 km northwest of the study area, is described as a canoe shelter or *halau*. Site 20, located approximately 300 m north of the study area, is described as a grouping of agricultural shrines consisting of, "...one or a few natural boulders surrounded by a low wall of stones...composed of upright stones with smaller rocks filling in the spaces" (Phelps 1941:25). According to Phelps (1941:25) the Site 20 agricultural shrines, "were probably connected with sweet potato plants which were the principal vegetable food of the region."

Beginning in 1951, Bishop Museum conducted a site survey of historic properties throughout Moloka'i that had been identified in the late 19th and early 20th centuries (Summers 1971). The referenced studies included: Monsarrat (1884); Cobb (1905); Cooke (1949); Stokes (1909); Bonk (1954); Cartwright (1922); and Dunn (1957)*.

Five historic properties described by Summers (1971) are located in the general vicinity of the current study area, two of which were previously identified by Phelps (1941) (see Figure 12). Site 11, located 2.9 km southwest of the current study area, is described as the Kape'elua Complex (SIHP# 50-60-03-11) consisting of the Caterpillar Stones (Site 11A) and the stone at Pu'u Kape'elua (Site 11B). The Caterpillar Stones are associated with a legendary account related by Cooke (1949) that describes the origin of caterpillars on Moloka'i. The stone at Pu'u Kape'elua is described as a flat stone with "a hollowed-out basin" that was interpreted by G. P. Cooke as an adze sharpening stone and by K. P. Emory as a water collection stone (Summers 1971:37). Site 14, located approximately 3.5 km east of the current study area, is described as the ruins of a *heiau* consisting of pavement and wall remnants and a 2 ft high upright stone (Summers 1971:38). Summers' Site 15 and Site 17 correspond to Phelps' (1941) Site 20 and Site 19, respectively, which are described above. Summers' Site 16, located approximately 2.3 km northwest of the current study area, is described as an enclosure-type *heiau* on the western side of Anahaki Gulch (Summers 1971:38).

In 1980, AECOS, Inc. completed an archaeological reconnaissance survey for the Moloka'i Airport Master Plan Survey, which is located within 400 m south of the current study area (AECOS, Inc. 1980). The survey documented six historic hunting blinds and one prehistoric wall. Several basalt flakes were observed in the vicinity of the wall, which may originate from one of the several adze quarries reported to be in the general area. Additional intensive

*All cited in Summers 1971

Table 1. Archaeological Studies in the Vicinity of Study Area

Reference	Type of Investigation	Location	Findings
Phelps 1941	Island-Wide Survey	Moloka'i Island	50 sites identified including 2 in the vicinity of the study area; Site 19 (canoe shelter) and Site 20 (ag. shrine complex)
Summers 1971	Island-Wide Survey	Moloka'i Island	Five sites identified near the study area; Site 11 (Kape'elua Complex), Site 14 (<i>heiau</i>), Site 15 (Phelps' Site 20), Site 16 (<i>heiau</i>), and Site 17(Phelps' Site 19)
AECOS, Inc 1980	Archaeological Reconnaissance Survey	Moloka'i Airport	Six historic hunting blind and one likely prehistoric wall with associated basalt flakes
Neller 1982	Archaeological Reconnaissance (windshield survey)	Pālā'au 2 Ahupua'a	Potential historic properties observed, but not recorded.
Hammatt et al. 1993	Archaeological Inventory Survey	Pālā'au 2; adjacent to airport	No findings
Griffin 1993	Site Visit	Pālā'au 2	Site 60-02-995 (wall or possible C-shape and pecked rectangular basin on natural basalt boulder) with associated basalt flakes and adze blank fragment
Nagahara & Kolb 1994	Field Inspection	Kape'elua complex, Ho'olehua-Pālā'au Homesteads	Relocation of Summers' (1971) Site 11 (SIHP # 50-60-03-11). Additional features observed.

Reference	Type of Investigation	Location	Findings
Major & Dixon 1995	Archaeological Survey	Northern Pālā'au 2 (within current study area), TMK (2) 5-2- 006:063	Two historic properties identified; SIHP # 50- 60-02-1623 (2 potential agricultural shrines and 1 historic artifact scatter) and SIHP # 50- 60-02-1624 (habitation enclosure and isolated basalt flake)
Hartzell 2000	Supplemental Archaeological Inventory Survey	Northern Pālā'au 2 (within <i>makai</i> portion of current study area), TMK (2) 5-2-006:063 por., 69	One historic property identified; SIHP # 50- 60-02-843 (Pu'u Kapele Rock Wall Complex), consisting of 16 features including: rock walls, alignments, enclosures, a natural boulder, and a depression.

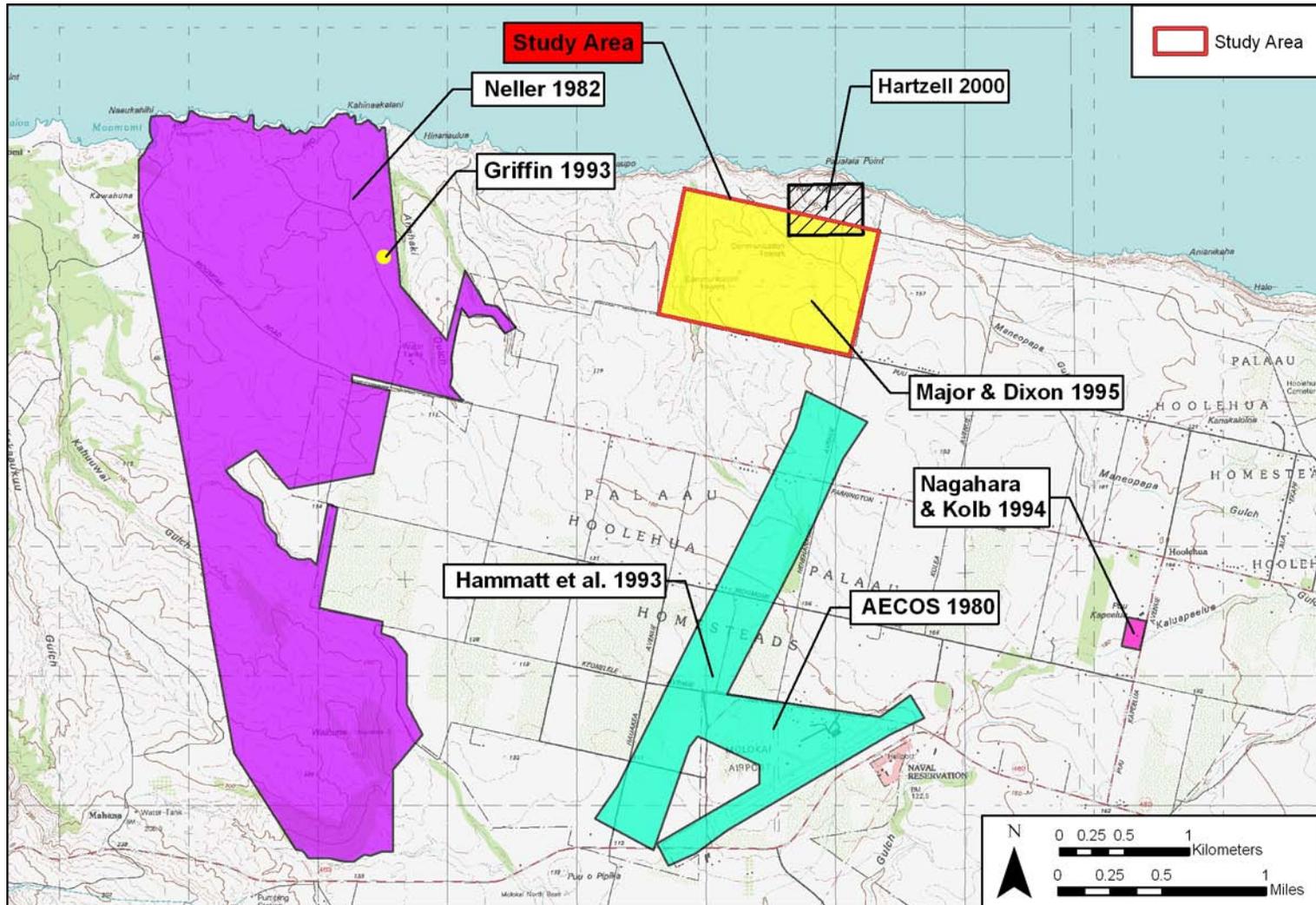


Figure 11. Previous archaeological studies in the vicinity of the study area

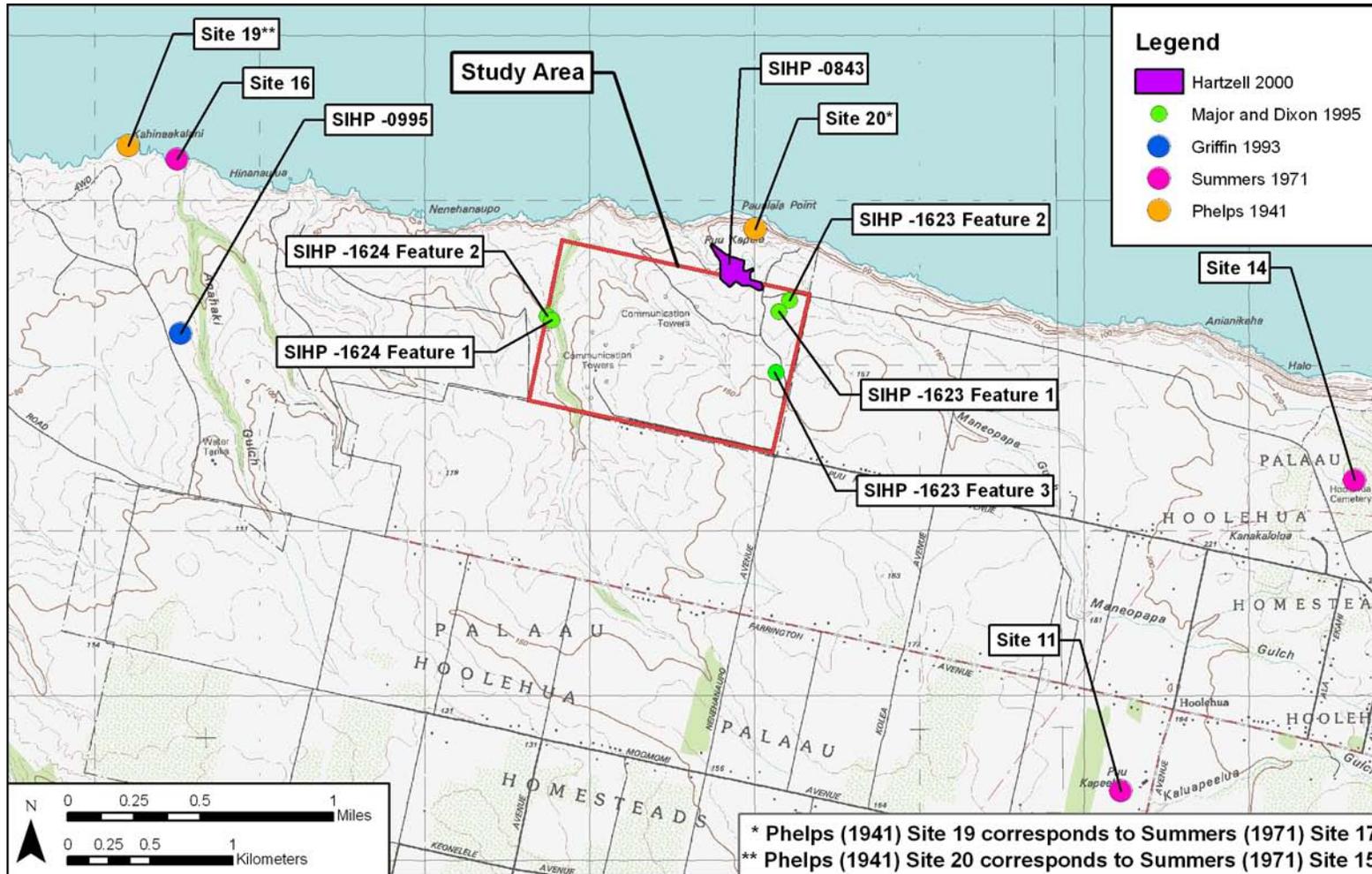


Figure 12. Previously identified historic properties within and in the vicinity of the study area

archaeological survey was recommended within the area of the prehistoric wall prior to any future development.

In 1982, Neller conducted an archaeological reconnaissance in the form of a windshield survey of the proposed Ho'olehua Marine Corps training area on Moloka'i located approximately 1.4 km west of the current study area (Neller 1982). Potential historic properties (stone structures) were observed along the northern coastline, while the inland portion of the project area consisted of "...nothing but dry grazing land and traces of former pineapple fields" (Neller 1982:2). A field survey of the project area was recommended in order to identify any small and/or obscured historic properties that could not be identified during the windshield survey.

In 1993, CSH conducted an archaeological inventory survey of three 15-acre parcels within Pālā'au and Nā'iwa Ahupua'a, located approximately 2.8 km south of the current study (Hammatt et al. 1993). No historic properties were identified and no further archaeological work was recommended.

In 1993, SHPD/DLNR visited a newly identified historic property (SIHP # 50-60-02-0995) within Pālā'au 2 Ahupua'a, located approximately 2.2 km west of the current study area (Griffin 1993) (see Figure 11 & Figure 12). SIHP# 50-60-02-0995 consisted of a wall or possible C-shape constructed on a promontory of large basalt boulders. One of the natural basalt boulders exhibited a pecked rectangular basin that was interpreted as a water collection feature. Basalt flakes and an adze blank fragment were observed in the vicinity. Griffin (1993) states that SIHP # 50-60-02-0995 is similar to Summers' (1971) Site 11, which is described above. Additional fieldwork to identify any associated features of SIHP # 50-60-02-0995 was recommended.

In 1994, SHPD/DLNR conducted a field inspection and location of Summers' (1971) Site 11 (SIHP # 50-60-03-11, described above) in the Ho'olehua-Pālā'au Homesteads, located approximately 3.0 km southeast of the current study area (Nagahara & Kolb 1994). In addition to Summers' (1971) findings, SHPD/DLNR identified a new rectangular pecked basin on one of the Caterpillar Stones as well as other areas of pecking, marine shell midden, and historic glass bottle fragments. The function of SIHP # 50-60-03-11, specifically the rectangular pecked basins, was considered to be indeterminate. Additional subsurface test excavations were tentatively recommended for the area. SIHP # 50-60-03-11 was recommended for preservation, including community consultation efforts, due to associations with legendary accounts.

In 1995, Bishop Museum completed an archaeological survey and evaluation for the USAF Receiver Station, which encompasses the entire current study area (Major and Dixon 1995). The survey identified two historic properties within the current study area (see Figure 11 & Figure 12).

SIHP # 50-60-02-1623 is a complex consisting of two irregular pre-Contact enclosures (Feature 1 and Feature 2) and a historic artifact scatter (Feature 3) that included early twentieth-century glass bottle, ceramic, and metal fragments. SIHP # 50-60-02-1623 Feature 1 consisted of a single rectangular alignment of upright boulders with areas of cobble fill and piling surrounding and incorporating a natural basalt outcrop. SIHP # 50-60-02-1623 Feature 2 consisted of an enclosure constructed of stacked basalt boulders and cobbles and several upright boulders surrounding and incorporating a natural basalt boulder outcrop. Additionally, Feature 2

included a small adjoining C-shape or sub-enclosure and a possible soil-retaining terrace. SIHP # 50-60-02-1623 Features 1 and 2 were interpreted as possible agricultural shrines similar to Phelps' (1941) Site 20 described above.

SIHP # 50-60-02-1624 is a complex consisting of one enclosure (Feature 1) and one isolated basalt flake (Feature 2). SIHP # 50-60-02-1624 Feature 1 is described as, "... an oblong enclosure with two interior spaces measuring 17 by 7 m" (Major and Dixon 1995:69). Test excavations within SIHP# 50-60-02-1624 Feature 1 encountered marine shell midden and charcoal suggesting, along with construction style, that Feature 1 is likely a pre-Contact habitation structure.

In 2000, the Bishop Museum, Department of Anthropology, completed a supplemental archaeological inventory survey for the USAF Molokai Receiver Station (Hartzell 2000). The Bishop Museum survey area encompassed a portion of the northeastern *makai* edge of the current study area (see Figure 11). The survey was conducted in response to newly identified archaeological features discovered in the vicinity of the northern border of the USAF Molokai Receiver Station by receiver station staff. The survey identified one historic property: SIHP #50-60-02-843 (a.k.a. The Pu'u Kapele Wall Complex), a pre-contact traditional Hawaiian site complex previously identified by Marshall Weisler in 1985 (personal comm., September 1999 in Hartzell 2000).

SIHP #50-60-02-843 was located within the northeastern boundary of the current study area (see Figure 12 & Figure 13). The historic property consists of 37 surface features, including: 26 stacked stone walls, five alignments, four enclosures, a depression, and a large, prominent boulder (Figure 14 & Table 2). The site was recommended eligible to the National Register under significance criterion C, as an excellent example of a traditional Hawaiian construction technique, and under criterion D, for its information potential (Hartzell 2000). Preservation was the recommended mitigation for this historic property (Hartzell 2000).

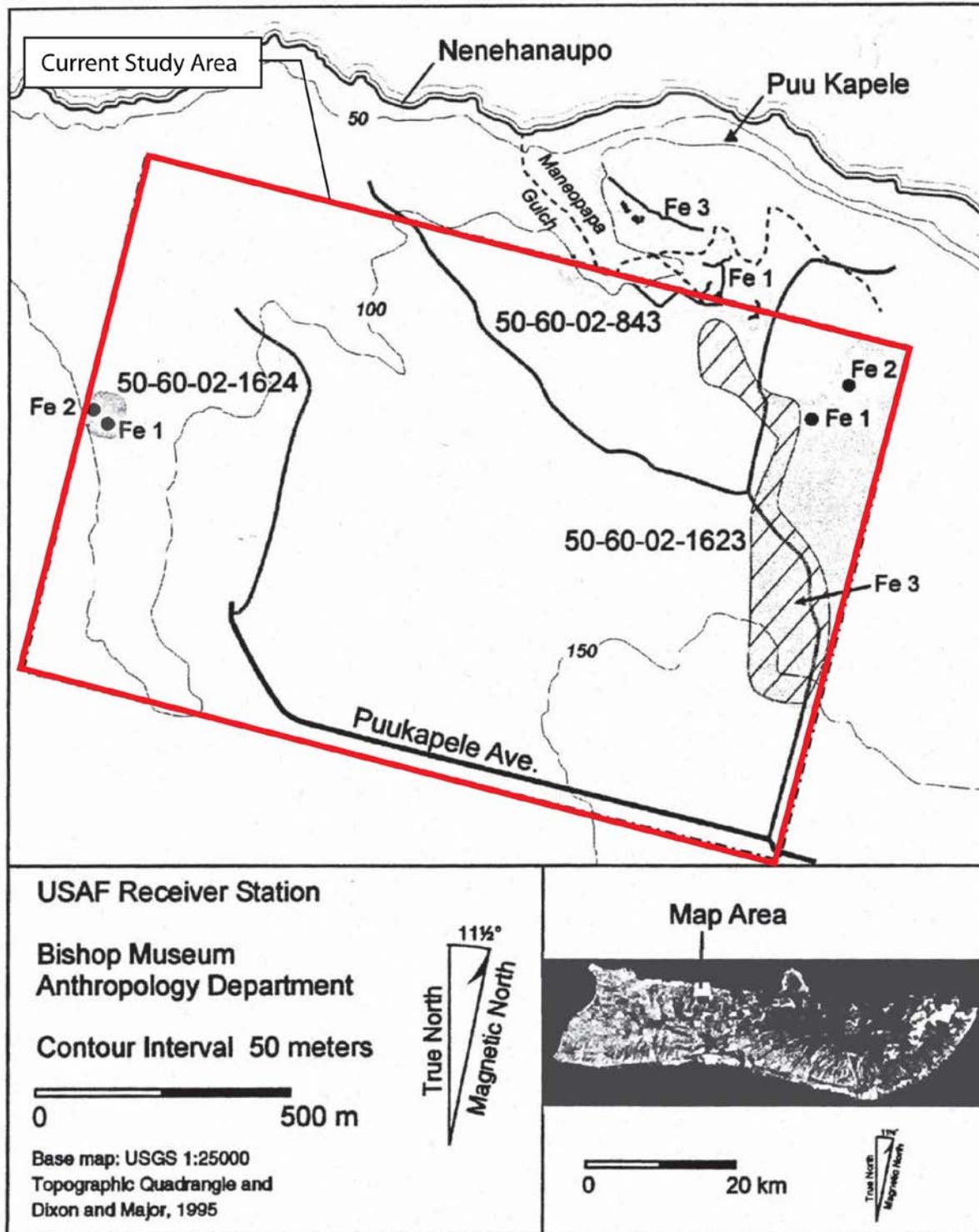


Figure 13. Historic properties within the study area previously identified by the Bishop Museum (adapted from Hartzell 2000)

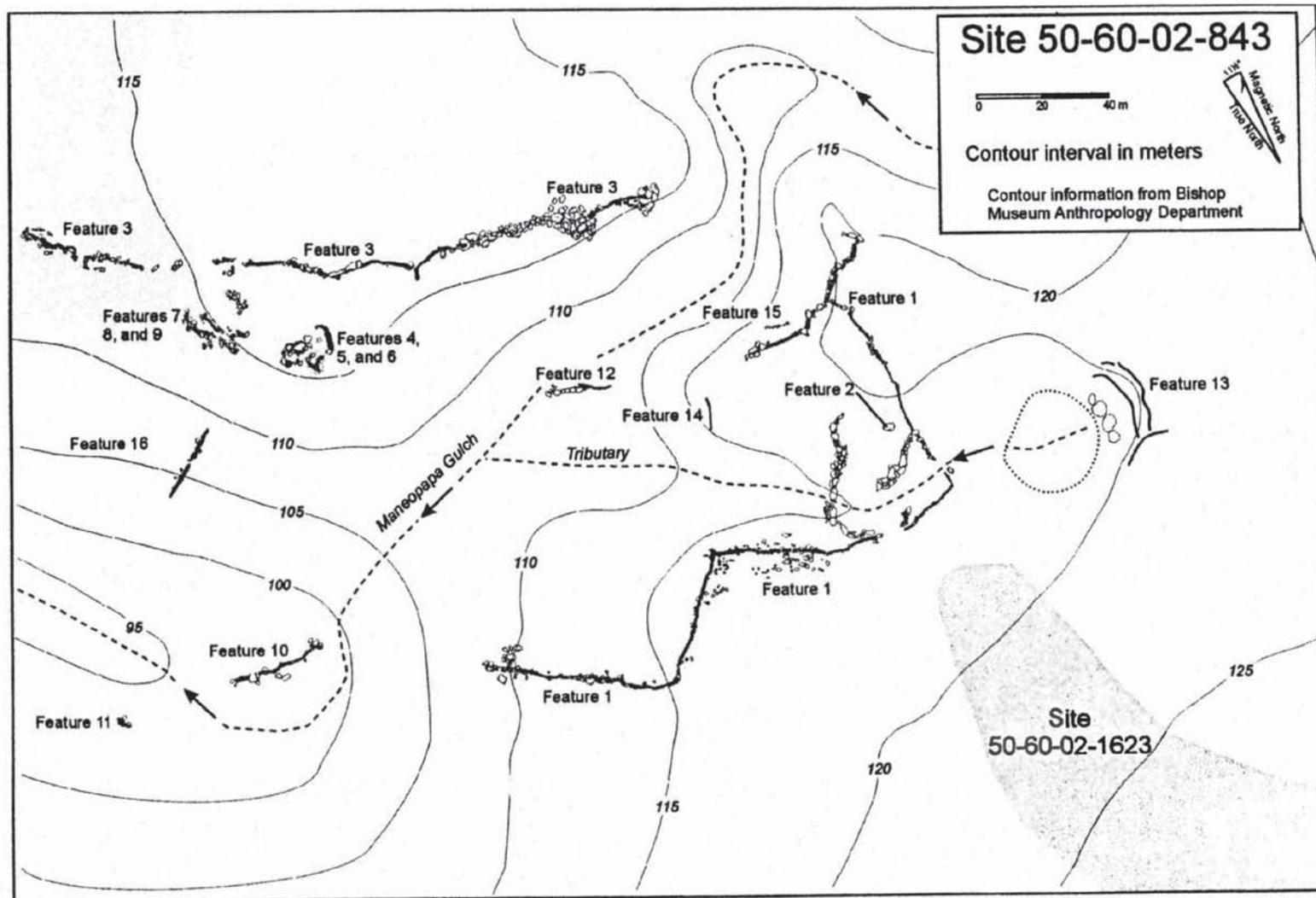


Figure 14. Contour map showing geographic distribution of SIHP #50-60-02-843 (source: Hartzell 2000)

Table 2. Description and UTM Coordinates for SIHP #50-60-02-843 (source: Hartzell 2000: 8)

Feature	Dimensions (L x W/Th x H) (m)	Description	Function	UTM Coordinates
1A	55.5 x 1.0 x 0.5	wall, stacked-faced	boundary/possibly religious	E ⁶ 97530, N ²³ 44742
1B	43.0 x 0.8 x 0.6	wall, stacked-faced	boundary/possibly religious	E ⁶ 97568, N ²³ 44738
1C	51.6 x 0.8 x 0.7	wall, stacked-faced	boundary/possibly religious	E ⁶ 97597, N ²³ 44739
1D	20.0 x 0.7 x 0.6	wall, stacked-faced	boundary/possibly religious	E ⁶ 97646, N ²³ 44723
1E	67.0 x 0.7 x 0.9	wall, stacked-faced	boundary/possibly religious	E ⁶ 97559, N ²³ 44759
1F	54.0 x 1.2 x 0.8	wall, stacked-faced	boundary/possibly religious	E ⁶ 97650, N ²³ 44791
1G	21.0 x 2.0 x 2.0	wall, stacked-faced	boundary/possibly religious	E ⁶ 97644, N ²³ 44739
1H	48.0 x 2.0 x 2.0	wall, stacked-faced	boundary/possibly religious	E ⁶ 97628, N ²³ 44749
2	1.9 (dia.) x 1.8	boulder	prominent natural feature	E ⁶ 97650, N ²³ 44750
3A	19.0 x 0.9 x 1.0	wall, stacked-faced	boundary	E ⁶ 97622, N ²³ 44852
3B	37.0 x 4.0 x 1.5	wall, stacked-faced	boundary	E ⁶ 97598, N ²³ 44862
3C	18.0 x 0.8 x 0.6	wall, stacked-faced	boundary	E ⁶ 97564, N ²³ 44872
3D	3.5 x 1.0 x 0.8	wall, stacked-faced	boundary	E ⁶ 97558, N ²³ 44871
3E	53.0 x 1.0 x 1.1	wall, stacked-faced	boundary	E ⁶ 97535, N ²³ 44885
3F	66.4 x 1.0 x 0.5	wall, stacked-faced	boundary	E ⁶ 97482, N ²³ 44929
4	11.2 x 1.3 x 1.3	wall, stacked-faced	temporary habitation	E ⁶ 97525, N ²³ 44870
5	Ext. 5.0 (dia.) Int. 2.0 (dia.) x 0.8	enclosure, circular	temporary habitation	E ⁶ 97517, N ²³ 44867
6A	Ext. 6.3 x 6.0 x 0.6 Int. 5.0 x 2.0 x 0.6	enclosure, oval	habitation/activity area	E ⁶ 97512, N ²³ 44871
6B	Ext. 2.5 (dia.) Int. 1.5 (dia.) x 0.6	enclosure, circular	habitation/activity area	E ⁶ 97513, N ²³ 44874
6C	Ext. 4.0 x 3.5 x 0.3 Int. 2.5 x 1.5 x 0.3	enclosure, oval	habitation/activity area	E ⁶ 97516, N ²³ 44873
7A	4.0 x 1.3 x 1.4	wall, stacked-faced	retaining wall	E ⁶ 97509, N ²³ 44887
7B	3.5 x 0.9 x 0.6	wall, stacked-faced	retaining wall	E ⁶ 97501, N ²³ 44885
7C	6.7 x 1.0 x 0.8	wall, stacked-faced	retaining wall/terrace	E ⁶ 97499, N ²³ 44884
8	11.0 x 3.0 x 0.9	wall, stacked-faced	retaining wall/terrace	E ⁶ 97493, N ²³ 44894
9	8.8 x 0.8 x 1.4	wall, stacked-faced	retaining wall	E ⁶ 97498, N ²³ 44894
10	30.0 x 1.0 x 0.8	wall, stacked-faced	water diversion	E ⁶ 97456, N ²³ 44798
11	4.5 x 0.7 x 1.1	wall, stacked-faced	retaining wall	E ⁶ 97407, N ²³ 44811
12	19.5 x 1.0 x 1.0	wall, stacked-faced	retaining wall	E ⁶ 97579, N ²³ 44814
13A	16.8 x [na] x [na]	wall, stacked-faced	water control	E ⁶ 97710, N ²³ 44703
13B	24.0 x [na] x [na]	alignment	water control	E ⁶ 97719, N ²³ 44716
13C	5.6 x [na] x [na]	alignment	water control	E ⁶ 97715, N ²³ 44728
13D	25.2 x [na] x [na]	alignment	water control	E ⁶ 97713, N ²³ 44720
13E	16.0 x [na] x [na]	alignment	water control	E ⁶ 97705, N ²³ 44715
13F	32.0 (dia.) x 0.4	depression	planting area	E ⁶ 97690, N ²³ 44719
14	9.4 x [na] x [na]	wall, stacked-faced	retaining wall	E ⁶ 97608, N ²³ 44789
15	7.5 x 0.5 x 0.4	alignment	slope retention	E ⁶ 97639, N ²³ 44794
16	23.0 x 1.0 x 0.4	wall, stacked-faced	boundary/retaining wall	E ⁶ 97469, N ²³ 44864

Section 4 Results of Fieldwork

4.1 Field Inspection

The fieldwork component of the archaeological assessment was conducted on May 3rd, 2010 by two CSH archaeologists, Jon Tulchin, B.A., and Trevor Yucha, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The fieldwork required 2 person-days to complete.

In general, the purpose of the field inspection was to develop data on the nature, density, and distribution of archaeological sites within the study area. The field inspection consisted of a 100% pedestrian survey of an approximately 6-acre survey area focused around a USAF receiver station facility. In addition to the 6-acre survey area, a walk-through reconnaissance was also conducted to relocate two historic properties previously identified by the Bishop Museum (Major & Dixon 1995). Figure 15 and Figure 16 consist of GPS track logs showing the pedestrian route taken by CSH archaeologists during the field inspection of the study area.

4.1.1 USAF Receiver Station Facility

A 100% pedestrian survey was conducted in the immediate vicinity of the USAF 30th Space Wing HF Receiver facility located in the western corner of the study area (see Figure 16 & Figure 17). The survey area comprised 6 acres, and consisted of a circular area extending 60 m from the outer perimeter of the facility. No historic properties were observed within the survey area.

Approximately 75% of the survey area was observed to have been disturbed by land modifications associated with the development of the receiver facility. Documented land disturbances included extensive grading and excavations associated with the construction of single story structures, radio towers, and access roads (Figure 18). The center of the survey area consisted of three modest single story structures (Figure 19). The southern portion of the study area consisted of graded areas and an access road with associated infrastructure (i.e. cattle guards and drainage culverts) (Figure 20). The northern and eastern portions of the study area contained radio towers and associated infrastructure (i.e. access roads and tower footings and winches) (Figure 21 & Figure 22).

The western quarter of the study area was unmodified by human activity, and is situated along the eastern edge of Pālā'au Gulch (Figure 23). The topography of this area was gently sloping to the west, while the vegetation consisted of low exotic grasses and *koa haole*.

4.1.2 Archaeological Site Relocation

A walk-through reconnaissance was conducted within the study area to relocate two historic properties (SIHP # 50-60-02-1623 & SIHP #50-60-02-1624) previously identified by the Bishop Museum (Major & Dixon 1995). Features 1 and 2 of SIHP # 50-60-02-1623 (pre-Contact stone enclosures) were relocated in the northeast corner of the study area within a natural, shallow basin approximately 450 m south-southeast of Pu'u Kapele (Figure 24). Feature 3, a historic

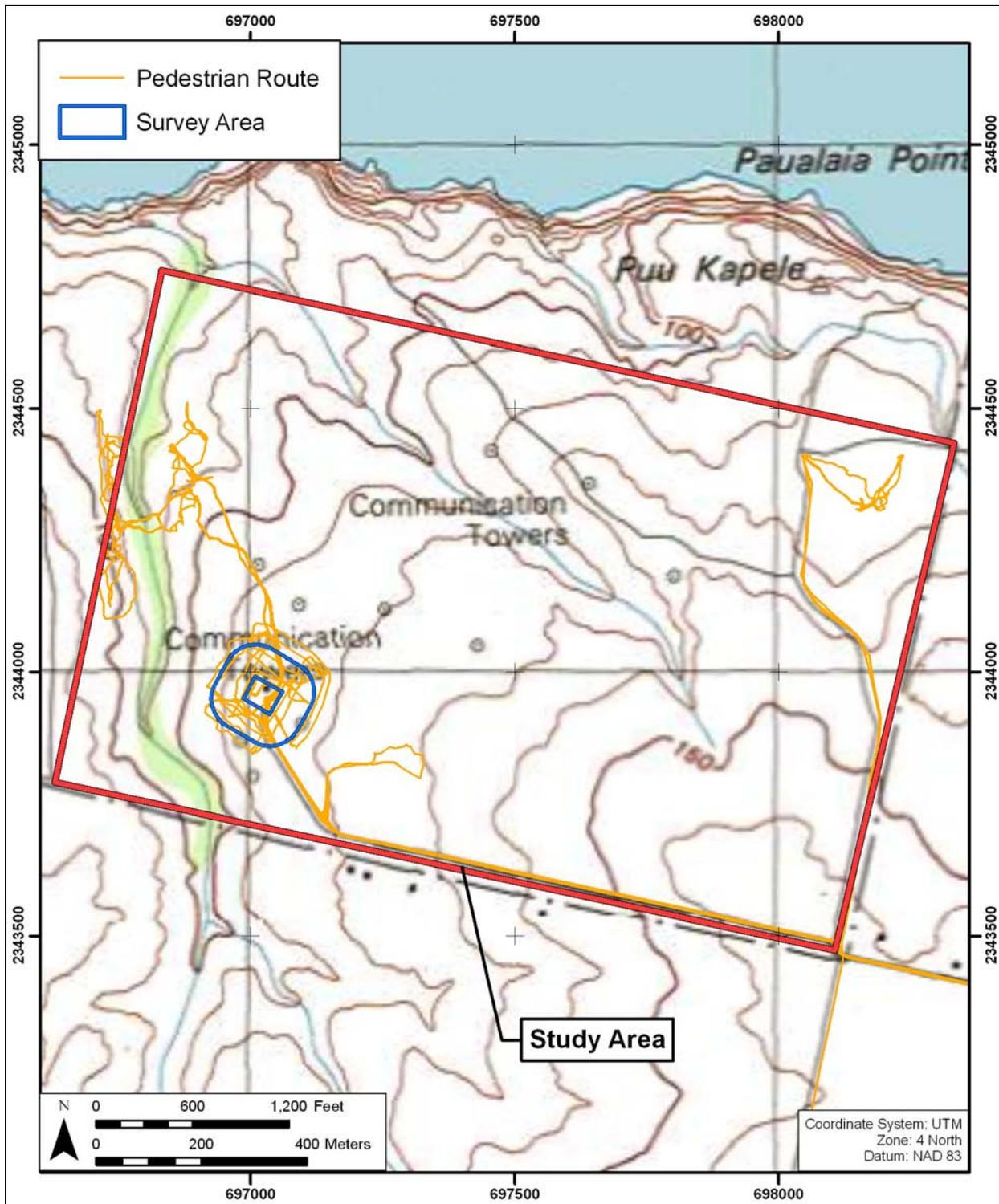


Figure 15. U.S. Geological Survey topographic map showing the location of the location of the pedestrian route within the study area

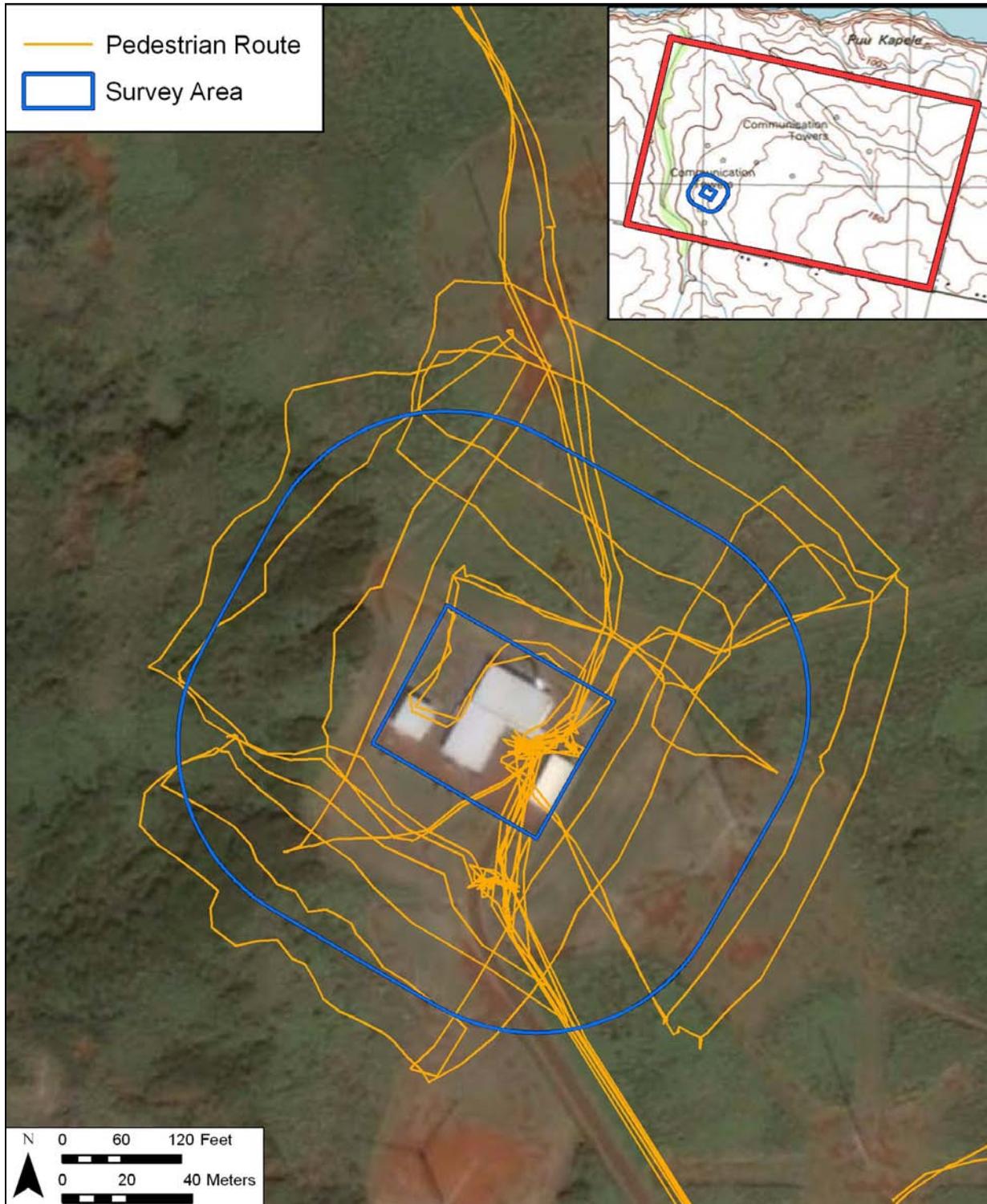


Figure 16. Aerial photograph showing the location of the location of the pedestrian route within the survey area which surrounds the USAF receiver facility



Figure 17. Photograph of USAF receiver facility, view to northeast



Figure 18. Photograph of survey area showing disturbance throughout the area, view to northwest



Figure 19. USAF receiver facility, view to west



Figure 20. Drainage culvert and asphalt access road within the southern portion of the study area, view to north



Figure 21. Radio towers and associated infrastructure in the eastern portion of the survey area, view to south



Figure 22. Radio towers and associated infrastructure in the northern portion of the survey area, view to north



Figure 23. Western edge of survey area overlooking Pālā'au Gulch, view to west

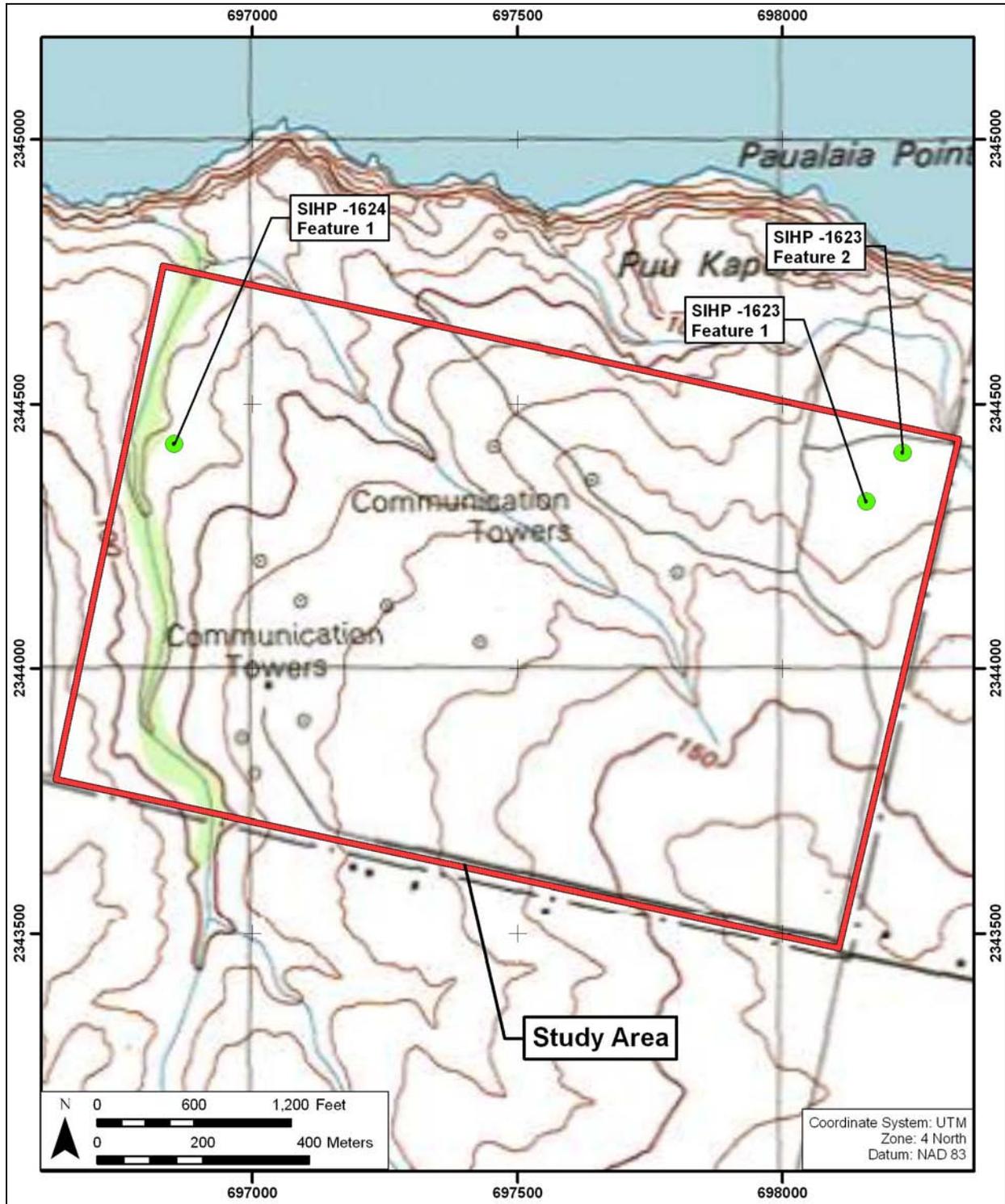


Figure 24. U.S. Geological Survey topographic map showing the locations of historic properties located within the study area

refuse scatter along a dirt road, could not be relocated. It is believed that erosion, both natural and human induced, has displaced and buried any surface evidence of this feature.

Feature 1 of SIHP # 50-60-02-1624 (pre-Contact stone enclosure) was relocated along the western edge of the study area, along the eastern edge of Pālā'au Gulch atop a low hill and *mauka* of the confluence of the gulch and an un-named gully (see Figure 24). Feature 2, an isolated basalt flake, could not be relocated. As this feature was originally identified within a natural erosion cut, it is believed that the basalt flake has been displaced, and possibly buried, due to natural erosion events typical of the area.

Detailed site descriptions of SIHP # -1623 and SIHP # -1624 are provided below in Section 4.2.

4.2 Historic Property Descriptions

4.2.1 SIHP # 50-60-02-1623

FORMAL TYPE:	Complex (upright boulder alignment & stone enclosure)
FUNCTION:	Ceremonial
# OF FEATURES:	2
AGE:	Pre-Contact
DIMENSIONS:	Feature 1: 15.0 m by 13.0 m Feature 2: 11.0 m by 9.0 m
LOCATION:	Northeast corner of study area
UTM COORDINATES*	Feature 1: E 698159.9 / N 2344315 Feature 2: E 698228.7 / N 2344407

*UTM Datum = NAD 83, Zone 4N

SIHP # 50-60-02-1623 consists of an upright basalt boulder alignment (Feature 1) and a stacked stone enclosure (Feature 2) previously identified by the Bishop Museum (Major & Dixon 1995). During the current investigation SIHP -1623 was relocated in the northeast corner of the study area within a natural, shallow basin approximately 450 m south-southeast of Pu'u Kapele (see Figure 24). Topography of the immediate area is level, while the geology consists of extensive red soil deposits with pockets of exposed basalt bedrock outcrops. Lantana and exotic grasses dominate the surrounding landscape.

During the current investigation, the Bishop Museum site descriptions and site maps for SIHP -1623 Features 1 and 2 were reevaluated and determined to be accurate (Major and Dixon 1995:59-69). Each features location was recorded with GPS technology, and GPS point locations were added to each feature's site map (Figure 25 & Figure 26). Additionally, photographs showing the existing condition of each feature were taken (Figure 27 to Figure 30).

SIHP # -1623 Feature 3, a historic refuse scatter along a dirt road, could not be relocated. It is believed that soil erosion as well as vegetation growth occurring in the roughly 15 years since the feature was originally identified (Major & Dixon 1995) has displaced and buried any surface evidence of this feature.

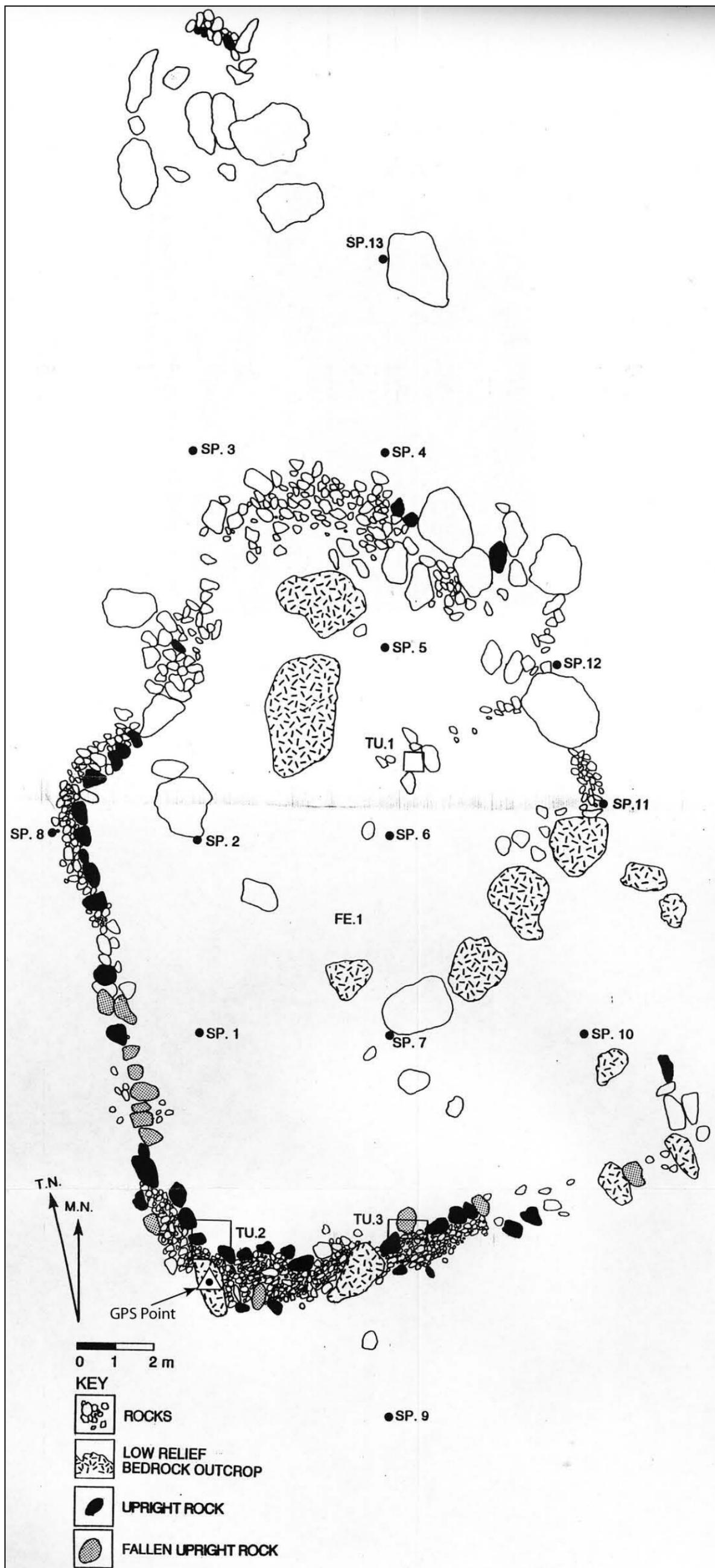


Figure 25. Plan view map of SIHP # 50-60-02-1623 Feature 1 (adapted from Major & Dixon 1995)

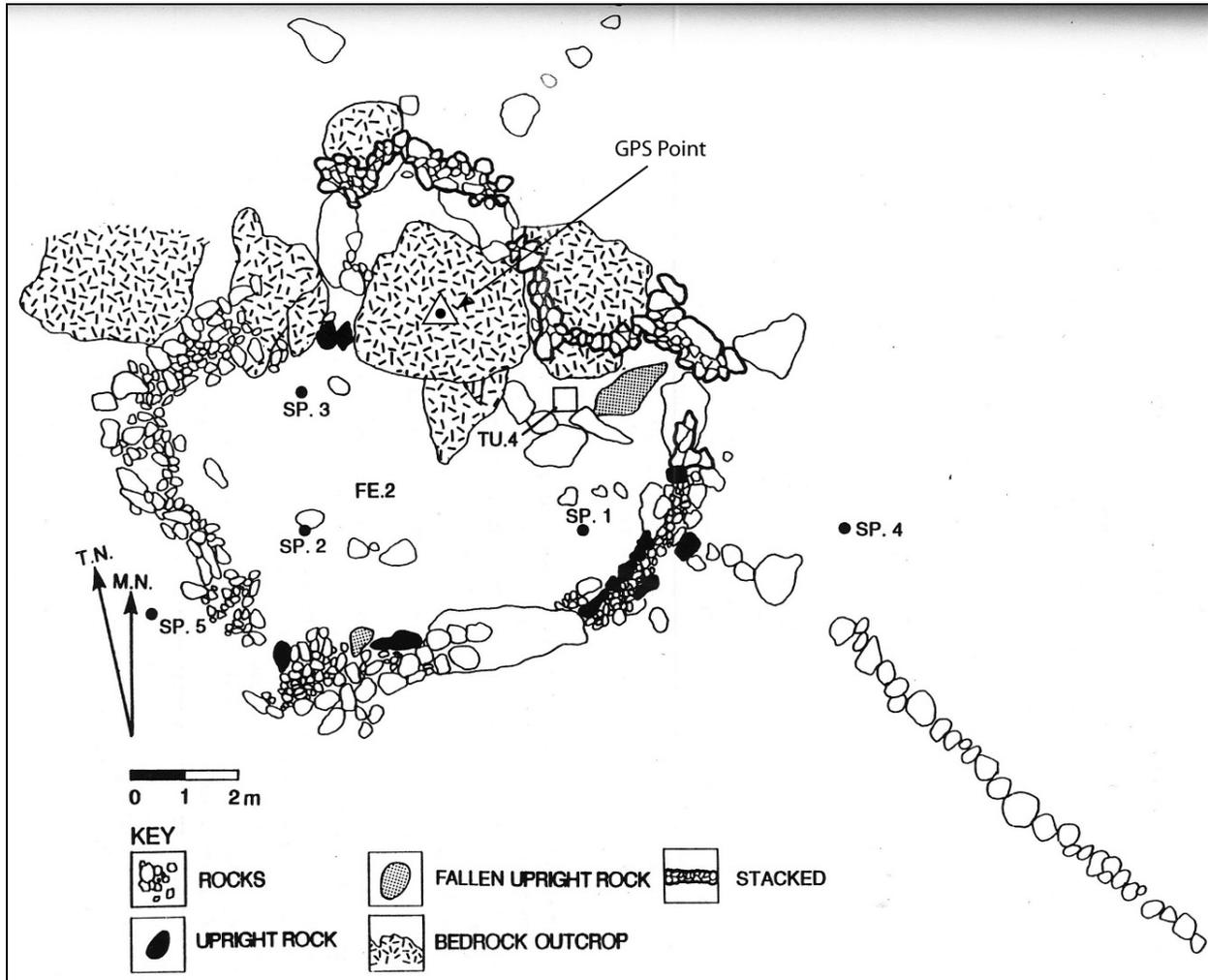


Figure 26. Plan view map of SIHP # 50-60-02-1623 Feature 2 (adapted from Major & Dixon 1995)



Figure 27. Photograph of SIHP # -1623 Feature 1, upright boulder alignment, view to south



Figure 28. Photograph of SIHP # -1623 Feature 1, upright boulder alignment, view to southeast



Figure 29. Photograph of SIHP # -1623 Feature 2, stone enclosure, view to northwest



Figure 30. Photograph of SIHP # -1623 Feature 2, stone enclosure, view to southeast

Major and Dixon (1995:59-69) describe SIHP # 50-60-02-1623 as follows:

Site 50-60-02-1623

This site was located on the eastern edge of the project area, and consisted of three features. Two of these were architectural enclosures built on or around natural outcroppings of basalt near the northeastern corner of the project area in a natural, shallow basin, and may be part of Phelps Site 20. To the north of the features (and outside the project area) were several possibly modified outcrops, but none as substantial as Features 1 and 2. If Features 1 and 2 represent part of Phelps Site 20, three more similar features may be found in the property adjoining the project area's east boundary. All features within the project boundaries were located on a map, and Features 1 and 2 were drawn in planview at a scale of 1:100.

The Site 1623 basin offered a degree of shelter from the trade winds that were constant in the area's region. It also occurred in a transitional geomorphological zone between predominantly soil-surfaced hills to the south and large outcrops of basalt interspersed with soil-filled basins to the north. Vegetation was low and scrubby, dominated by exotics such as lantana, grasses, Christmas berry, *'ilima* and a variety of weedy species.

Feature 1

This feature was an irregular enclosure examined by Bishop Museum staff, a SHPD archaeologist and the COTR during a field visit on 25 May 1994. The south and east walls were constructed with oblong and slab-like basalt boulders positioned upright. These formed the sides of a rectangle measuring approximately 15 by 13 m and an average height of .6 m. This part of the feature appeared similar to Emory's Feature A at Kīpū, and matches the general layout described by Phelps for the agriculture shrines of Site 20 (Emory 1952, Phelps 1941). The northern end of the enclosure consisted of irregularly piled cobbles and small boulders incorporating natural outcrops, forming a rough C-shape with a diameter of 13 m and an average height of less than .3 m. The eastern edge of Feature 1 was ill-defined. There were no clear traces of a construction sequence at the feature component intersections, although the variety of construction styles suggested the possibility of multiple use events at the site. The interior of the feature was characterized by the presence of large boulders whose flat surfaces stood at most 20 cm higher than the current ground level. All of these appeared natural, and there were no areas that appeared to be paved. More obtrusive boulders were also observed within the feature, but did not occur in any alignment or orderly pattern. A single L-shaped stone alignment was found in the interior, and although it was not clearly a human-made structure, the possibility that it was a windbreak for a fire hearth was noted.

Assessing the condition of the feature proved difficult, since it was not always clear which portions had been constructed and which were natural. Several of the upright boulders had toppled, but determining whether the piled cobble walls had

once been piled or stacked higher was not as clearcut an observation. Finally, the eastern edge of the feature was ill-defined, and it was unclear whether this was due to deterioration of the feature, or to its being a natural occurrence.

The function of Feature 1 was also difficult to infer from surface data. The morphological traits did not match those of more well-known feature types. While walls were present, very few sections had sufficient height to serve as windbreaks or animal inclosure/exclosure walls. The upright slabs of the west wall bore some resemblance to *marae* (temples) of the types found in Tahiti or Necker Islands (Emory 1922a), and Phelps' interpretation of similar features as sweet potato shrines also suggests a religious function, but there is not a great body of positive archaeological evidence to rely on in interpreting this form. No artifacts, midden or manuports were found that could provide clues as to the function or antiquity of the feature.

Feature 2

This feature was an irregularly shaped enclosure and terrace located approximately 100 m NNE of Feature 1, close to the northeast corner of the project area. The structure incorporated natural outcrop boulders augmented by constructed sections of boulders and cobbles. Exterior measurements of the enclosure were 11 by 9 m, with an average height of .5 m. The interior was sloping, uneven and strewn with boulders, although boulders over 1 m high at the north and east sides and a general slope down to the lee of normal trade winds sheltered it from the wind. A possible sub-enclosure abutted a boulder on the northeast side, as did another on the exterior, windward side. Extending 12 m to the SE from the outside of the enclosure was a rough terrace of piled and stacked boulders and cobbles generally less than .5 m in height on the downhill side, and level with the present surface on the other. Except for the incorporation of natural boulders and use of some upright stones, resemblance to Phelps Site 20 features is limited, being the wrong shape.

Construction style varied throughout the structure, with sections of stacked, piled, and upright boulders and cobbles. Low-piled walls at the northeast section may have been the tumbled remains of stacked walls. Stacking occurred mostly where wall sections crossed natural boulders above the soil surface, while upright stones were all set into the soil. For this reason, the variation between piled and stacked portions of the wall may have been due to material constraints rather than multiple construction events. There were no clear breaks in the walls, either for doorways or for later additions. In general, the condition appeared better than that of Feature 1, with sections of stacking remaining up to four courses high.

As with Feature 1, the function and antiquity of Feature 2 was difficult to infer. Although the form was less anomalous than Feature 1, the sloping and uneven surface within the enclosure appeared unsuited for habitation or animal enclosure. The shallowness or absence of soil within and around the feature did not appear suited for agriculture, although conditions may have differed in the past. In the northeast portion of the feature, a stacked section of wall had pieces of fencing

wire running through the rock, indicating that at least part of the structure was built during or after the nineteenth century. (One possibility is that one of Phelps' rectangular features was taken apart and used to make this feature.) The only other material culture associated with the feature were pieces of modern consumption refuse (i.e., pie tins and plastic bags) that appeared to post-date the construction of the feature, and indicated temporary re-use of the feature as a shelter from the wind.

Feature 3

This feature included sporadic scatters of historic glass covering most of the eastern edge of the parcel from the southeast corner to the area of Feature 1. None of the artifacts predated this century, and since they were all dated to later than 1916, they were probably associated with Homestead occupation. Nevertheless, some of this material may come under the aegis of historic preservation legislation, and therefore the locations and diagnostic attributes of a sample of the artifacts have been recorded, although collections were not made.

Most of the individual scatters within this feature were less than two meters in diameter, and the dumping sites did not focus on a particular bounded area. In no place did the scatters occur in association with stone structures or potentially pre-Contact traces such as marine shell or basalt flakes. More of the glass dumps were found in the vicinity of the road corridor, but this correlation may result from vegetation cover and the resulting level of survey intensity rather than depositional patterns.

The materials within these scatters were comprised of what appeared to be household rubbish. Bottles ranged from small medicine vials holding a few liquid ounces to gallon jugs. The containers held mayonnaise, medicine, alcohol, ketchup and bleach, to name a few of the common types. In addition to bottles and jars, smaller quantities of drinking glasses and ceramic occurred as well. Among the latter were white coffee cups, white on blue bowls, and heavy crockery, which residents said had been used for pickling and preserving vegetables and meat. Finally, there were rusting fragments of metal, mostly cans.

The condition of the metal was worse than that of the ceramics and glass, but few of the artifacts were complete. Sources said wildfires that have swept the area several times this century were responsible for the fragmentary condition of the glass, adding that this probably kept bottle hunters from clearing the site. Despite the relatively dry climate, it would be expected that perishable garbage, dumped concurrently with the glass, ceramic and metal, would have decomposed beyond recognition for many of the scatters.

A total of three test units (Test Units 1-3) and thirteen shovel test probes were excavated at the location of SIHP # 50-60-02-1623 Feature 1 (Major and Dixon 1995:74-75). Additionally, one test unit (Test Unit 4) and six shovel test probes were excavation at the location of SIHP # 50-60-02-1623 Feature 2. A small quantity of fragmentary marine shell was recovered from Test

Unit 1 at Feature 1. No other cultural material or artifacts were recovered from test excavations at SIHP # 50-60-02-1623.

Major and Dixon (1995) suggest that SIHP # 50-60-02-1623 Feature 1 and Feature 2 are similar in construction to Phelps' (1941) Site 20, an agricultural shrines, which are described as follows:

Some shrines having to do with planting and cultivation are at Site 20 on the north shore. There are five of these grouped in an area of about three acres. Each shrine consists of one or a few natural boulders surrounded by a low wall of stones. The center group of rock may be 6 to 10 feet high and the wall around it forms a quadrangle, from 20 to 30 feet on a side, composed of upright stones with smaller rocks filling in the spaces. The uprights range from six inches to a foot and a half in height. No structures similar to these have been found anywhere else on Molokai and it is not known just what rites took place at them or how important their role was. That they had to do with planting is known and they were probably connected with sweet potato plants which were the principal vegetable food of the region (Phelps 1941:25).

Upon CSH's relocation of Feature 1 and 2 it appears that the association with Phelps's Site 20 is warranted. Both SIHP # 50-60-02-1623 Feature 1 and 2 consist of low walls surrounding natural basalt outcrops of similar construction and dimension to agricultural shrines previously identified in the area by Phelps (Site 20, Phelps 1941:25). The absence of cultural material within these structures suggests that habitation was not the primary function. Additionally, the construction of Features 1 and 2 is not indicative of agricultural land modification. These factors contribute to the functional interpretation of SIHP # 50-60-02-1623 Feature 1 and 2 as ceremonial.

Significance evaluations and mitigation recommendations presented within the Major and Dixon (1995) archaeological survey and evaluation report for SIHP # 50-60-02-1623 are ambiguous. Significance evaluations outlined, in table format, within the executive summary section (page ii) included assessment of SIHP # 50-60-02-1623 Feature 1 and 2 under National Register Criterion D and Hawai'i Register Criterion E, and assessment of Feature 3 under National register Criterion D. Mitigation recommendations within the executive summary include preservation for SIHP # 50-60-02-1623 Feature 1 and 2 and recovery "if potentially damaging activities are planned" for SIHP # 50-60-02-1623 Feature 3 (Major and Dixon 1995:ii).

In contrast, significance evaluations described within the significance evaluations and recommendations section (page 105) of the Major and Dixon (1995) report assess SIHP # 50-60-02-1623 Feature 1 and 2 significant under National Register Criterion D and potentially Criterion C due to the interpretation of these features as potential agricultural shrines. SIHP # 50-60-02-1623 Feature 3 is assessed as significant under National Register Criterion D. Mitigation recommendations described within the significance evaluations and recommendations section of the Major and Dixon (1995) report for SIHP # 50-60-02-1623 are vague. Recommendations for Feature 1 suggest that if the feature is an agricultural shrine, "The cultural value of such a feature should prevent any disturbing activities being planned there" (Major and Dixon 1995:105). No specific recommendations are given for SIHP # 50-60-02-1623 Feature 2. Recommendations for

Feature 3 state that, "Although the artifacts in Feature 3 may not justify preservation of the disturbed land on which they lie, their study could be informative" (Major and Dixon 1995:106). Recommendations for Feature 3 potentially suggest data recovery fieldwork.

As part of the current archaeological assessment, CSH has reevaluated the significance evaluation and mitigation recommendations for the SIHP # 50-60-02-1623 site complex, which presently consists of two features (Feature 1 and 2) within the northeastern corner of the study area. SIHP # 50-60-02-1623 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (being important to an ethnic group's history and cultural identity due to associations with cultural practices and/or traditional beliefs). CSH recommends preservation of SIHP # 50-60-02-1623.

4.2.2 SIHP# 50-60-02-1624

FORMAL TYPE:	Enclosure
FUNCTION:	Habitation
# OF FEATURES:	1
AGE:	Pre-Contact
DIMENSIONS:	17.0 m by 7.0 m
LOCATION:	Western edge of study area
UTM COORDINATES*	E 696853.2 / N 2344423

*UTM Datum = NAD 83, Zone 4N

SIHP #50-60-02-1624 consists of a roughly rectangular stacked-stone enclosure previously identified by the Bishop Museum (Major & Dixon 1995). During the current investigation SIHP -1624 Feature 1 was relocated along the western edge of the study area, along the eastern edge of Pālā'au Gulch atop a low hill and *mauka* of the confluence of the gulch and an un-named gully (see Figure 24). Topography of the immediate area is level, while the geology consists of extensive red soil deposits with pockets of exposed basalt bedrock outcrops. Exotic grasses dominate the surrounding landscape.

During the current investigation, the Bishop Museum site description and site map for SIHP -1624 Feature 1 was reevaluated and determined to be accurate (Major and Dixon 1995:69-72). The site's location was recorded with GPS technology, and a GPS point location was added to the site map (Figure 31). Additionally, photographs showing the existing condition of the site were taken (Figure 32 & Figure 33).

SIHP -1624 Feature 2, an isolated basalt flake, could not be relocated. It is believed that soil erosion as well as vegetation growth occurring in the roughly 15 years since the feature was originally identified (Major & Dixon 1995) has displaced and buried any surface evidence of this feature.

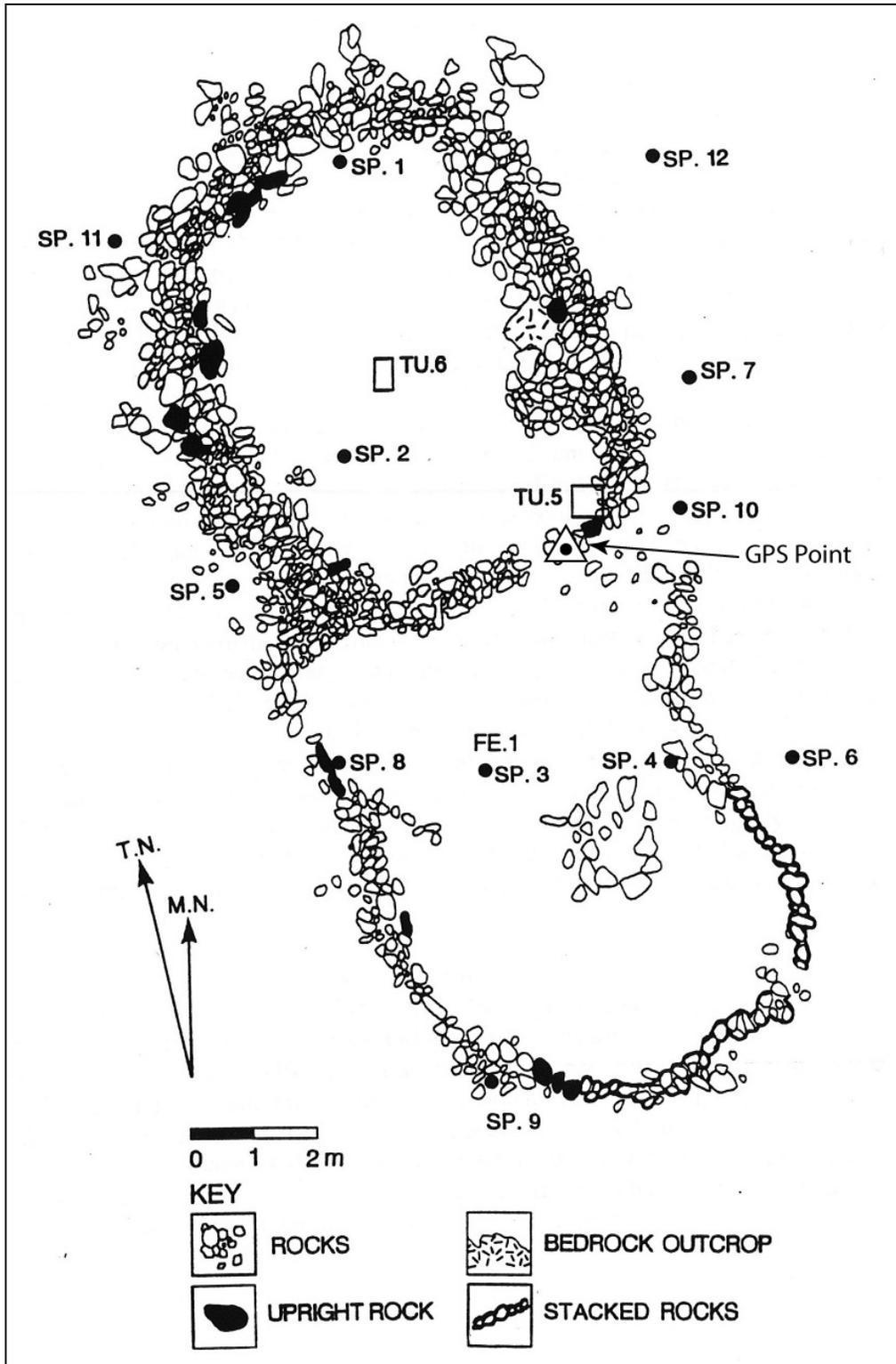


Figure 31. Plan view map of SIHP #50-60-02-1624 Feature 1 (adapted from Major & Dixon 1995)



Figure 32. Photograph of SIHP -1624 Feature 1, stone enclosure, view to south



Figure 33. Photograph of SIHP -1624 Feature 1, stone enclosure, view to north

Major and Dixon (1995:69-72) describe SIHP# 50-60-02-1624 as follows:

Site 50-60-02-1624

This site was located on the east bank of the gulch that runs along the western edge of the property. Erosional scarring of the land was particularly ubiquitous in the vicinity. Additional features may have been obliterated or buried by post-depositional processes prior to survey. The two features comprising the site were plotted on the project area base map, and Feature 1 was drawn in planview at a scale of 1:100.

Feature 1 overlooked Pālā'au Gulch at the western edge of the project area from a small ridge *mauka* (inland) of the intersection of that gulch and a smaller tributary. The presence of a presumably pre-Contact artifact on the west bank of the main gulch indicated that the site or its activity sphere may have extended further than the single structure (Feature 1) remaining today. While both of these gulches were dry, and there were no traces of a permanent waterway having existed in the past, the existence of large erosional gullies indicated that water occasionally flowed in this area. The relative robustness of vegetation within the gulches compared to that above signalled better moisture retention in the lower, sheltered microenvironment. The other salient feature of the lower land was that it offered shelter from the unrelenting trade winds; in this dimension, Site 1624 was even more sheltered than 1623.

Feature 1

This feature was an oblong enclosure with two interior spaces measuring 17 by 7 m with an average wall height of .4 m. Walls consisted of basalt cobbles and boulders that were stacked, piled, and placed upright at different places. Close examination revealed that the walls of the northern room were more substantial and were made mostly by piling of stones, while the southern portion had fewer stones and more stacking.

The interior of the enclosure sloped slightly down to the main gulch (west), but was relatively free of rubble. Approximately in the center of the south room was a rough platform of large cobbles and small boulders measuring 1.8 by 1.4 m. While the platform had an uneven surface, this may have been due to postdepositional processes. The stones in this platform were placed 1 to 2 courses high atop bedrock, 10 to 20 cm above the current surface.

The exterior on the uphill side of Feature 1 was dominated by rough outcrops, and may have been slightly modified, but there were no further structures. The exterior of the uphill wall served as a retaining wall for soil, but this may have been a post-abandonment deposition and not an intentional agricultural feature. The surface at the sides and downhill of the feature was quite rocky with pockets of silty soil.

Most sections of the wall were in fair to poor condition, it being clear where the rough outlines had been originally, but not pristine enough to judge the precise

height and thickness of the original construction. There was not enough evidence of tumble to indicate that the walls were once substantially higher.

Occasional marine gastropod shells occurred in the immediate vicinity of Feature 1. However, no artifacts other than the worked flake (Feature 2) across the gulch were observed at this site, and there was no exposed evidence of substantial subsurface deposits.

Analysis of the form and content of surface materials produced the preliminary interpretation of Feature 1 as a habitational structure, perhaps having supported an organic superstructure. The presence of marine shell and dry stone masonry, and the absence of post-Contact artifacts or cultural debris helped place the occupation this feature at some time prior to the late 1700s.

Feature 2

Feature 2 was a single edge-altered basalt flake located near the western project area boundary across the gulch from Feature 1. While its position in an erosional setting made its provenience uncertain, it was included in Site 50-60-02-1624 due to its present proximity.

A total of two test units (Test Units 5-6) and twelve shovel test probes were excavated at the location of SIHP # 50-60-02-1624 Feature 1 (Major and Dixon 1995:82-84). Sparse amounts of marine shell midden and charcoal were encountered within each test unit as well as shovel test probes 2, 3, 5, and 7. In general, excavations conducted within the northern portion (north room) of Feature 1 yielded larger quantities of midden and charcoal suggesting the presence of a potential buried cultural layer (Major and Dixon 1995:82).

As with SIHP# 50-60-02-1623, significance evaluations presented within the Major and Dixon (1995) archaeological survey and evaluation report for SIHP# 50-60-02-1624 are somewhat ambiguous. Significance evaluations outlined, in table format, within the executive summary section (page ii) included assessment of SIHP # 50-60-02-1624 Feature 1 under National Register Criterion D and Hawai'i Register Criterion E, and assessment of Feature 2 under National Register Criterion D. In contrast, significance evaluations described within the significance evaluations and recommendations section (page 106) of the Major and Dixon (1995) report assess SIHP # 50-60-02-1624 Feature 1 and 2 significant under National Register Criterion D only. Mitigation recommendations remain consistent throughout the report, recommending preservation for SIHP # 50-60-02-1624 Feature 1 and collection of the single basalt flake (Feature 2) prior to any proposed construction or ground disturbance.

As part of the current archaeological assessment, CSH has reevaluated the significance evaluation and mitigation recommendations for SIHP # 50-60-02-1624, which presently consists of one feature (Feature 1) located along the western edge of the study area. SIHP # 50-60-02-1624 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history). CSH recommends preservation of the SIHP # 50-60-02-1624 habitation enclosure.

Section 5 Summary and Recommendations

5.1 Summary

5.1.1 Traditional Hawaiian Land Use

The study area is located within western Moloka'i near the north shore, within the *ahupua'a* (traditional land division) of Pālā'au. Background research suggests that Pālā'au once had a substantial Native Hawaiian population which was supported by the cultivation of sweet potatoes and the procurement of marine resources. Ethnographic research by Abraham Fornander in the late 19th century indicated that "a few years previous to *Kamehameha's* death...when the chief's trumpet-shell sounded, over a thousand able-bodied men would respond to the call, within a circle described by Palaau, Naiwa, Kalae and Kaunakakai" (Fornander 1880:73). Malihinihele corroborates Fornander's account, by stating "In the olden days this [Pālā'au 2] was a good land with a fertile plain where plants grew. The population was large but today it is uninhabited." (Malihinihele 1876 cited in Summers 1971:38)

Handy (1940:157) notes that, "In 1931 there were many flourishing patches on the Hawaiian homesteads at Hoolehua. It is said that Hoolehua and Palaau were noted for sweet potatoes in olden days." Handy and Handy also cite Southwick Phelps, who noted that "For Pala'au (Apana 2), Kaluakio, and Punakou, Ho'olehua, and Naiwa, planting areas for yams and sweet potatoes cannot be delimited but it is known that these were grown in that general area and were, with fish, the staples of the inhabitants" (Phelps 1937 in Handy and Handy 1972:518).

In 1937, the Bishop Museum conducted a regional study of Moloka'i Island including a review of relevant historical and ethnographical literature (Phelps 1941). Two archaeological sites were documented in the vicinity of the current study area (see Figure 12). Site 19, located approximately 2.7 km northwest of the study area, is described as a canoe shelter or *halau*. Site 20, indicated to be located approximately 300 m north of the study area, is described as a grouping of agricultural shrines that "were probably connected with sweet potato plants which were the principal vegetable food of the region" (Phelps 1940:25).

In 1995, the Bishop Museum completed an archaeological survey for the current study area (Major & Dixon 1995) (see Figure 11). The survey identified two historic properties (see Figure 12): SIHP # 50-60-02-1623, a complex consisting of a pre-Contact upright boulder alignment (Feature 1), a pre-Contact stacked-stone enclosure (Feature 2), and a historic artifact scatter (Feature 3) that included early twentieth-century glass bottle, ceramic, and metal fragments; and SIHP# 50-60-02-1624, a complex consisting of one pre-Contact stone enclosure (Feature 1) and one isolated basalt flake (Feature 2).

Of note are SIHP # 50-60-02-1623 Features 1 and 2 which consist of an upright boulder alignment (Feature 1) and a low stone enclosure (Feature 2), both of which surround naturally occurring exposed basalt outcroppings. Major and Dixon noted the similarity of construction style of SIHP # -1623 Features 1 and 2 to Phelps's (1941) Site 20, and suggest that SIHP # -1623 Features 1 and 2 are likely agricultural shrines, components of Phelps's (1941) Site 20, a cluster of agricultural shrines near the coast.

During the current investigation, historic properties [SIHP # 50-60-02-1623 (Features 1 and 2) and SIHP # 50-60-02-1624 (Feature 1)] previously identified within the study area by Major and Dixon (1995) were relocated and their positions recorded with GPS technology. However, SIHP # -1623 Feature 3 (a historic refuse scatter) and SIHP # -1624 Feature 2 (an isolated basalt flake) could not be relocated. It is believed that soil erosion has displaced or buried these ephemeral surface features since the 15 years when they were initially documented.

Upon CSH's relocation of SIHP # -1623 Feature 1 and 2 it appears that the association with Phelps's Site 20, originally suggested by Major and Dixon (1995), is warranted. Both SIHP # -1623 Feature 1 and 2 consist of low stone walls surrounding natural basalt outcrops of similar construction and dimension to agricultural shrines previously identified in the area by Phelps (Site 20, Phelps 1941:25). The absence of cultural material within these structures suggests that habitation was not the primary function. Additionally, the construction style of Features 1 and 2 is not indicative of agricultural land modification. These factors contribute to the functional interpretation of SIHP # 50-60-02-1623 Feature 1 and 2 as ceremonial.

5.1.2 Military

The first documented appearance of the USAF receiver facility located within the western corner of the study area is in a 1968 USGS topographic map (see Figure 10). During the time spanning from 1968 to 1993, the USAF receiver facility expanded from a single access road running along the southern boundary of the study area with a small group of structures (the USAF receiver facility) and radio towers, into an expansive network of communication towers and access roads scattered throughout the entire study area.

Background research has indicated that the USAF receiver facility located within the study area is a component of the 30th Space Wing/Vanderberg Air Force Base (VAFB). The VAFB/30th Space Wing conducts space, ballistic and aeronautical operations in the area of the Pacific Ocean (Research Triangle Institute 2000). Generally, the VAFB supports ballistic missile launches into broad ocean areas and the Kwajalein Missile Range. Midrange support for ballistic missile tests are provided by sensors located in Hawai'i. The facilities on Moloka'i serve as a site for a high frequency receiver for radio communications (Research Triangle Institute 2000).

A 100% pedestrian survey was conducted in the immediate vicinity of the USAF 30th Space Wing HF Receiver facility located within the study area (see Figure 16 & Figure 17). The survey area comprised 6 acres, and consisted of a circular area extending 60 m from the outer perimeter of the facility. Approximately 75% of the survey area was observed to have been disturbed by land modifications associated with the development of the receiver facility. Documented land disturbances included extensive grading and excavations associated with the construction of single story structures, radio towers, and access roads (see Figure 18). No historic properties were observed within the survey area.

5.2 Recommendations

No further cultural resource management work is recommended for the 6-acre survey area, which includes abandoned infrastructure associated with a USAF receiver facility. However, to reduce the potential adverse effect on significant historic properties, the following mitigation measures are recommended. The mitigation measures should be completed prior to conducting

any land disturbing activities within the vicinity of SIHP#50-60-02-1623 and SIHP #50-60-02-1624.

5.2.1 Preservation Plan

The following historic properties are recommended for preservation:

1. SIHP # 50-60-02-1623 Features 1 and 2, pre-Contact agricultural shrines (upright boulder alignment and stone enclosure), were documented with detailed written descriptions, photographs, scale drawings, and accurately located with GPS survey equipment. SIHP # 50-60-02-1623 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history) and Criterion E (being important to an ethnic group's history and cultural identity due to associations with cultural practices and/or traditional beliefs). Preservation, in the form of avoidance and protection, is recommended for SIHP # 50-60-02-1623 Features 1 and 2. Preservation of these features was also recommended by Major and Dixon (1995: 105).
2. SIHP # 50-60-02-1624, pre-Contact habitation enclosure, was documented with detailed written descriptions, photographs, scale drawings, and accurately located with GPS survey equipment. SIHP # 50-60-02-1624 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history). Preservation, in the form of avoidance and protection, is recommended for SIHP #50-60-02-1624. Preservation of these features was also recommended by Major and Dixon (1995: 106).

If any work in the immediate vicinity (within 100 feet) of SIHP # 50-60-02-1623 and/or SIHP # 50-60-02-1624 is proposed in any future development of the study area, it is recommended that a Preservation Plan be prepared, in accordance with Hawai'i Administrative Rules (HAR) 13-277-3, to address buffer zones and protective measures for SIHP # 50-60-02-1623 and SIHP # 50-60-02-1624. This preservation plan should detail the short- and long-term preservation measures that will safeguard the historic properties during any future construction and subsequent use of the study area.

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Appendix C

Cultural Impact Assessment

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**Cultural Impact Assessment for the
Vandenburg Air Force Base Project, Pālā‘au Ahupua‘a,
Moloka‘i District, Moloka‘i Island
TMK: [2] 5-2-006:063**

**Prepared for
Element Environmental, LLC**

**Prepared by
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and
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**Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: PALAAU 2)**

June 2010

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Management Summary

Reference	Cultural Impact Assessment for the Vandenburg Air Force Base Project, Pālā'au Ahupua'a, Moloka'i District, Moloka'i Island, TMK: [2] 5-2-006:063 (Fa'anunu and Hammatt 2010).
Date	June 2010
Project Number	Cultural Surveys Hawai'i (CSH) Job Code: PALAAU 2
Project Location	The proposed Project area encompasses the entirety of TMK: [2] 5-2-006:063, which consists of 363.673 acres within the Pālā'au Ahupua'a located directly north of the Ho'olehua Airport on the Island of Moloka'i. The Project area is depicted in Figure 1 and Figure 2.
Land Jurisdiction	State Department of Hawaiian Homelands (DHHL)
Agencies	State of Hawai'i Department of Health/Office of Environmental Quality Control (DOH/OEQC)
Project Description	The proposed Project involves the transfer of all land on TMK [2] 5-2-006:063 to the State of Hawai'i, Department of Hawaiian Homelands (DHHL), and the decommissioning and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed on that land by the U.S. Air Force (USAF). Currently, TMK [2] 5-2-006:063 is leased by the USAF from DHHL. However, the USAF no longer needs the facilities at Pālā'au, therefore, is undergoing a termination of the lease, and return of the land to the DHHL. The lease agreement mandates that the leased property be returned to DHHL in its original condition. Therefore, the lease termination and transfer of land requires the decommissioning and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed by the USAF. In addition, any contamination within the Project area must be remediated to accepted contaminant levels in accordance with Federal, State, and local regulations. Should the DHHL wish to keep any existing structures, those structures will remain intact on the property.
Project Acreage	363.673-acres
Area of Potential Effect (APE)	For the purposes of this study, the APE is defined as the entire 363.673-acre Project area. While this investigation focused on the Project APE, the study area also included all of Pālā'au 2, the largest subsection of the <i>ahupua'a</i> (traditional land division) of the Pālā'au Ahupua'a.
Document Purpose	This Cultural Impact Assessment (CIA) was prepared to comply with the State of Hawai'i's environmental review process under Hawai'i Revised Statutes (HRS) Chapter 343, which requires consideration of the proposed Project's potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information, compiled to date, pertinent to

	<p>the assessment of the proposed Project's potential impacts to cultural beliefs, practices, and resources (per the <i>Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts</i>) which may include Traditional Cultural Properties (TCPs) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places. The document is intended to support the Project's environmental review and may also serve to support the Project's historic preservation review under HRS Chapter 6E-8 and Hawai'i Administrative Rules Chapter 13-275.</p>
<p>Community Consultation</p>	<p>Hawaiian organizations, agencies, and community members were contacted in order to identify individuals with cultural expertise and/or knowledge of the Project area and its vicinity. The organizations consulted included the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), and the Moloka'i Island Burial Council (MIBC). Moloka'i community and cultural organizations consulted included the Ho'olehua Hawaiian Civic Club and 'Aha Kiolo. This effort was made by letter, e-mail, telephone, and in person contact. Initial contact letters with maps of the Project area were mailed to most Project participants.</p>
<p>Results of Background Research</p>	<p>Background research conducted for this Project yielded the following results:</p> <ol style="list-style-type: none"> 1. The Project area is located on the central northern coast of Moloka'i within the <i>ahupua'a</i> (traditional land division) of Pālā'au. Pukui et al. define Pālā'au as a "wooden fence or enclosure (Pukui et al. 1974)" and also translates as, "to heal as with herbs." 2. Pālā'au Ahupua'a consists of three sub-sections: Pālā'au 1, Pālā'au 2, and Pālā'au 3. According to Summers (1971), the Pālā'au Ahupua'a traditionally only referred to Pālā'au 2, the largest sub-section of this <i>ahupua'a</i>. Pālā'au 1 and Pālā'au 3 were considered to be two small <i>lele</i>, detached part or lot of land belonging to one <i>'ili</i> (a subdivision of an <i>ahupua'a</i>) of Pālā'au 2. Pālā'au 1 is located on the southern shores of central Moloka'i and Pālā'au 3 is in the uplands above Kalaupapa Peninsula. 3. <i>Mo'olelo</i> (stories, oral histories) of Pāka'a and His Son Kū-a-Pāka'a (Rice 1923:76) and Pu'u Pe'elua (Ne 1992) refer to Pālā'au as a chief of the area. <i>Mo'olelo</i> of Pu'u Pe'elua and Hālena also reflect a land rich in <i>'uala</i> (sweet potato) with fat <i>'āholehole</i> (family Kuhlidae) and <i>'ō'io</i> (possibly <i>Albula vulpes</i>) fish. Another <i>mo'olelo</i>, Pu'u ka Pele, and a chant of Lohi'au speak of Pele's fame (Westervelt 1916:77).

	<ol style="list-style-type: none"> 4. The winds of Pālā‘au are known as the Ka‘ele and the Hauialialia (Summers 1971). 5. Cattle was exported from the village of Pālā‘au onto ships on the southwestern shore of Moloka‘i in the mid-1800s but the village is said to have been deserted by 1950 after most of the men were shipped off to jail in Honolulu for stealing cattle (Carlson 1952:20). 6. The Pālā‘au-Ho‘olehua Hawaiian Homesteads was established near the Project area in 1924 and had the highest population of Native Hawaiians on the island in 1930 (McGregor 2007:204, 227, 231). 7. Pineapple cultivation began in Pālā‘au-Ho‘olehua in 1926 and ended in the 1970s. McNeill and Libby, California Packing Corporation, and Dole Pineapple were the major pineapple companies during that time (Cooper and Daws 1990; de Loach 1975:107, 109). 8. Previous archaeological research documented historic features within Pālā‘au 2 near the Project area including <i>heiau</i> (Place of worship, shrine), <i>ko‘a</i> (shrine), numerous house sites, canoe shelters, pre-historic walls, and basalt flakes (AECOS, Inc 1980; Griffin 1993; Phelps 1941; Summers 1971). 9. According to Major and Dixon, contemporary ethnographic sources noted the presence of more archaeological features between Kahinaakalani and Hinanaulua, several kilometers west of the Project area, leading to the speculation that the Project area may have been utilized as a camp by people from that settlement who came to pick ‘<i>opihi</i> (Major and Dixon 1995). 10. Of particular relevance are previous archaeological studies of the Project area identifying three historic properties: two potential agricultural shrines and one historic artifact scatter (State Inventory of Historic Properties (SIHP) #50-60-02-1623), a habitation enclosure and isolated basalt flake (SIHP# 50-60-02-1624) (Major and Dixon 1995), and a pre-contact traditional Hawaiian site complex (SIHP#50-60-02-843) (Hartzell 2000). CSH verified the locations and significance of SIHP#-1623 and SIHP#-1624 (Tulchin et al. 2010).
<p>Results of Community Consultation</p>	<p>CSH attempted to contact fifteen community members (government agency or community organization representatives, or individuals such as residents, cultural and lineal descendants, and cultural practitioners) for the purposes of this CIA. Eleven people responded and five <i>kūpuna</i> (elders) and/or <i>kama‘āina</i> (native-born) were interviewed for more in-</p>

	<p>depth contributions to the CIA. Community consultation research conducted yielded the following results:</p> <ol style="list-style-type: none"> 1. Mrs. Pescaia referred to Pālā'au as "a line of trees" since <i>Pa</i> is defined as a wall and <i>lā'au</i> (tree, plant) is a plant reference. She also reported that ancient chants describe According to her grandmother, Pālā'au means the wall of trees or a fence of trees. Pālā'au as a place with a lot of forest areas which suggests that the region, at one time, was not always dry. 2. The Project area and surrounding lands were used regularly as ranch lands by the Molokai Ranch. Pineapple cultivation followed from the 1950s to 1975 initially by Pacific Pine and Company and later by Libby McNeal and Delmonte. 3. The Pālā'au region was described as dry lands famous for <i>'uala</i> and dryland taro cultivation. Mrs. Pescaia describes the area's historic land-use by sharing a <i>mo'olelo</i> of how the Pālā'au regional supplied Kamehameha and his troops with <i>'uala</i> while preparing for the Battle of Nu'uaniu on Moloka'i. She also stated that Kamehameha's warriors were trained on the Ho'olehua plain near the Project area. 4. The west side of the island, including the Project area, was described by Mr. Ritte as having the best fishing on Moloka'i while the east side was known for taro cultivation. Mr. Ritte reported that the Project area had trails that people traveled through to barter. The people from the West End of the island would trade fish and shellfish for <i>poi</i> (pounded taro thinned with water) and <i>pa'i'ai</i> (hard, pounded but undiluted taro) with people from the East End. 5. The receiver station within the Project area was described by Mrs. Pescaia as being a "valuable building" because the building is like a bomb shelter that was made available to her family and other community members as an alternative shelter for Hurricane 'Iwa. 6. Respondents did not identify any historic properties within the Project area but identified several near the Project area: <ol style="list-style-type: none"> i. One participant attested to the presence of a <i>heiau</i> and several house sites immediately north of the Project area while two respondents identified one <i>heiau</i> near Mo'omomi, as well as the presence of house sites all along the <i>pali</i> (cliff) from Mo'omomi to Kalaupapa, east and west of the Project area, respectively; ii. Mr. Poepoe stated that an archeological study he was
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	<p>involved with near the Project area found artifacts from the Marquesas and Tahiti suggesting early occupation of the area from the South Pacific.</p> <ul style="list-style-type: none"> iii. Mr. Kaopuiki reported that a cave with fishhooks was also found along the <i>pali</i> suggesting the presence of early Hawaiian settlement; and iv. Nā'iwa, north-east of the Project area is known for its historic properties including the Makahiki Grounds, several <i>heiau</i>, and a <i>leina</i>-a jumping off place for spirits into the next world. <p>7. Mr. Poepoe reported that little villages, indicating areas of habitation, existed along the <i>pali</i> particularly in areas where trails were located. He stated that some villages were temporary settlements while more permanent settlement occurred towards the Mo'omomi side, east of the Project area.</p> <p>8. <i>Mo'olelo</i> pertaining to specific place names near the Project area include Pu'u ka Pele and Pu'u Pe'elua.</p> <p>9. <i>'Akulele</i> or fireballs were reported by Mr. Kaopuiki to have been seen in the area that includes the Project area.</p> <p>10. The likelihood of burials within the Project area was reported to be low by two respondents due to the geography of the Project area. Mrs. Pescaia stressed that Hawaiian burials needed to be clean—most burials occurred in sandy areas but the dirt-filled farmlands of the Project area were unsuitable for burials. However, Mr. Kaopuiki stated that according to his grandmother, thousands of burials were thought to be in the area. Mr. Poepoe stated that if any burials were to have occurred near the Project area, especially along the cliffs, those burials would have been of important people.</p> <p>11. Participants indicated that the Project area and the coastline north of the Project area is utilized by residents of Moloka'i for fishing and <i>'opihi</i> (limpets in the <i>Cellana</i> genus) picking:</p> <ul style="list-style-type: none"> i. The Project area is used as an access point to the cliffs where people fish and pick <i>'opihi</i>. Several access trails are located along and near the property. ii. The fishing method most commonly used in the area is diving, however, fish were reported to be less abundant compared to earlier times; and iii. A variety of native species of fish and shellfish were reported by participants to be found in the coastal area
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	<p>north of the Project area including <i>'opihi</i>, <i>pūpū</i> (general name for marine and land snails), <i>uhu</i> (family Scaridae), <i>kole</i> (<i>Ctenochaetus strigosus</i>), and <i>palani</i> (<i>Acanthurus dussumieri</i>).</p> <p>12. Traditional methods of resource management are practiced within and near the Project area. Mr. Poepoe described some of the practices used:</p> <ol style="list-style-type: none"> i. We manage this place from Kalaupapa all the way down to 'Īlio Point [which includes the coastal areas fronting the Project area]. It's about twelve miles. That's all our fishing grounds. That side of the island is part of the <i>ahupua'a</i> of Kaluako'i. I teach people how to manage our resources from a community-based approach. ii. We [the community] use the moon calendar to educate people about the spawning cycle of specific fish so that they don't fish during this time. <p>13. The Project area is a good hunting ground for deer, pig, and goat. Respondents described and abundance of deer near the inland gulch running through the Project area while goats were more common along the cliffs. Mr. Bush reported that residents rarely hunt near the receiver station but usually hunt along the cliffs for goat.</p> <p>14. Participants indicated that Moloka'i residents utilize the Project area and surrounding areas for gathering of medicinal plants, making <i>lei</i> (necklaces), and fishing.</p> <ol style="list-style-type: none"> i. A variety of native plants grow within and around the Project area particularly along the coast. Respondents identified the following plants: <i>pili</i> (possibly <i>Heteropogon contortus</i>), tetrameloepum, <i>'ilima papa</i> (genus <i>Sida</i>), <i>pa'u o hi'iaka</i> (<i>Jacquemontia ovalifolia</i>), <i>nehe</i> (genus <i>Lipochaeta</i>), <i>nama</i> (<i>Nama sandwicensis</i>), <i>'ena'ena</i> (possibly <i>Pseudognaphalium sandwicenseium</i>), <i>'alena</i> (possibly <i>Boerhavia repens</i>), <i>mau'u 'aki'aki</i> (<i>Fimbristylus cymosa</i>), <i>'ohai</i> (possibly <i>Sesbania tomentosa</i>), <i>'akia</i> (family Thymelaeaceae), <i>wiliwili</i> (<i>Erythrina sandwicensis</i>), and two species of <i>'akoko</i> (genus <i>Euphorbia</i>); ii. Mr. Poepoe stated that he found four plants that grow only in the Pālā'au area; and iii. Mr. Poepoe spoke of a rare dryland fern, of which he
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	<p>did not know the name, near the Project area.</p> <p>iv. Mr. Poepoe also described the usage of the native plant <i>akia</i> as a traditional method of fishing: “We also have plenty of <i>akia</i> right here. That’s one of the dominant plants I know around here. <i>Akia</i> is one of the plants that they used to catch fish in the tidal pool areas-more shallow areas. It’s got a funny smell too. They’d pound and mash it up and the juice from that is like a toxin. It doesn’t kill the fish. It just stuns them for a little while. The fish float up to the surface of the water and you just go pick them up before they come back alive.</p>
<p>Recommendations</p>	<p>The following recommendations are based on a synthesis of all information gathered during preparation of the CIA. While most recommendations address cultural concerns, some recommendations pertaining to the proposed Project in general, raised by participants, are also included. To help mitigate the potential adverse impacts of the proposed Project on Hawaiian cultural beliefs, practices, and resources, recommendations should be faithfully considered and the development of the appropriate measures to address each concern should be implemented.</p> <ol style="list-style-type: none"> 1. Preservation in the form of avoidance and protection is recommended for the historic properties within the Project area: SIHP#50-60-02-1623 Features 1 and 2, SIHP#50-60-02-1624 Feature 1, and SIHP#50-60-02-843. All historic properties are assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history). SIHP#50-60-02-1623 and SIHP#50-60-02-1624 are both significant under Criterion E (being important to an ethnic group’s history and cultural identity due to associations with cultural practices and/or traditional beliefs) and SIHP#50-60-02-843 is significant under Criterion C (an example of a traditional Hawaiian construction technique). 2. Archaeological monitoring is recommended for initial ground disturbing activities in the immediate vicinity of the historic properties within the archeological assessment study site. A qualified archaeologist should monitor initial ground disturbance within these areas. 3. For areas outside the immediate vicinity of the historic properties for which a qualified archaeologist will be present, it is recommended that a member from the community be present during deconstruction activities to ensure that appropriate measures are implemented. This is pertinent as

	<p>underground cables, not visible from the surface, may be present throughout the majority of the Project area and their removal could potentially create significant ground disturbance.</p> <ol style="list-style-type: none"><li>4. Personnel involved in development activities in the Project area should be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law.<li>5. Alternatives to the proposed Project should be considered if significant cultural resources, including human skeletal remains and/or burial sites, are encountered. Consultation with community participants should continue throughout all phases of the proposed Project.<li>6. A community member stated that the receiver station building is a valuable asset because it is similar to a bomb shelter that could be utilized by the community for natural disasters, and recommended that the building be salvaged from demolition.<li>7. Several community members also recommended diligence in the removal of underground cables since the property was known in the past to have had numerous underground cables that may not be presently visible from the surface.
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Section 1 Introduction

1.1 Project Background

At the request of Element Environmental, LLC, Cultural Surveys Hawai'i, Inc. (CSH) conducted this Cultural Impact Assessment (CIA) for a project involving the transfer of all land on TMK [2] 5-2-006:063 to DHHL, and the decommission and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed on that land by the U.S. Air Force (USAF). Currently, TMK [2] 5-2-006:063 is leased by the USAF from DHHL. As the USAF no longer needs the facilities at Pālā'au, the USAF is terminating the lease, and returning the land to the DHHL.

The lease agreement mandates that the leased property be returned to DHHL in its original condition. Therefore, the lease termination and transfer of land requires the decommission and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed by the USAF. In addition, any contamination within the Project area must be remediated to accepted contaminant levels in accordance with Federal, State, and local regulations. Ground disturbance is expected due to the activities necessary for this Project such as the removal of underground cables and other man-made structures.

The proposed Project includes the entire 363.673-acre parcel of TMK [2] 5-2-006:063. The parcel is located within Pālā'au 2, a sub-section of Pālā'au Ahupua'a on the island of Moloka'i. While Pālā'au Ahupua'a consists of three land sections— Pālā'au 1, Pālā'au 2, and Pālā'au 3— but this CIA will focus exclusively on Pālā'au 2 which includes the Project area. Therefore, the Pālā'au Ahupua'a will be defined as Pālā'au 2 for the entirety of this report. The location of the Project area is depicted in Figures 1 to 3.

The Project's area of potential effects (APE) is defined as the entire approximately 363.673-acre Project within the larger context of Pālā'au Ahupua'a. The APE also includes the Project area's relationship with the rest of the *moku* (district) of Kona, the island of Moloka'i, and other islands, as these relate to Hawaiian beliefs (e.g., *mo'olelo* and *wahi pana* or storied places), resources and practices.

1.2 Document Purpose

This CIA was prepared to comply with the State of Hawai'i's environmental review process under Hawai'i Revised Statutes (HRS) Chapter 343, which requires consideration of the proposed Project's potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information, compiled to date, pertinent to the assessment of the proposed Project's potential impacts to cultural beliefs, practices, and resources (per the *Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts*) which may include Traditional Cultural Properties (TCPs) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places. The Hawai'i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria (Hawai'i Administrative Rules (HAR) §13-275-6) under Criterion E defines a significant historic property as one that has:

An important value to the Native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

The document is intended to support the Project's environmental review and may also serve to support the Project's historic preservation review under Hawai'i Administrative Rules (HAR) Chapter 6E-8 and Hawai'i Administrative Rules Chapter 13-275.

1.3 Scope of Work

The scope of work for this CIA includes:

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

1.4 Environmental Setting

1.4.1 Natural Environment

The Pālā'au Ahupua'a consists of three land units located separately from each other: Pālā'au 1, Pālā'au 2, and Pālā'au 3. Pālā'au 2, which consists of the proposed Project, is located in central Moloka'i and is the largest land unit of this *ahupua'a*. Pālā'au 1 and Pālā'au 3 are considered two *lele* of this *ahupua'a* and are significantly smaller than Pālā'au 2. Pālā'au 1 is located on the southern shores of central Moloka'i and Pālā'au 3 is in the uplands above Kalaupapa Peninsula (Summers 1971). As mentioned previously, Pālā'au 2 will be considered the Pālā'au Ahupua'a for the purposes of this report. As such, Pālā'au Ahupua'a is bordered by the sea in the north, Kaluako'i Ahupua'a in the West, and Ho'olehua Ahupua'a in the east. The northeastern boundaries of Pālā'au Ahupua'a are bordered by smaller *ahupua'a* of Nā'iwa, Kipu, and Nihoa.

The soil-sediments within the Project area are varied and consist of nine soil types as shown in Figure 4 (Foote et al. 1972). However, the three most predominant soil types on the property include the following: MuB, Moloka'i silty clay loam, three to seven percent slopes; MvB3, Moloka'i silty lay loam shallow variant, fifteen to twenty-five percent slopes and severely

eroded; and MuC3, Moloka'i silty clay loam, seven to fifteen percent slopes and also severely eroded.

The Project area, like the landscape of a large part of this *ahupua'a*, is characterized by open pasturelands with little tree cover (Figure 5). The property is bordered in the north by high rugged cliffs, a prominent feature of the north shore of Moloka'i. Kalaupapa Peninsula can be seen from the northern-most boundary of the property (Figure 6). Rainfall varies throughout the *ahupua'a* and ranges from 15.75 inches of rain per year along the western region to 31.50 inches per year in the east. Average rainfall within the center of the *ahupua'a*, including the Project area, is about 23.62 inches per year (Giambelluca et al. 1986). Several non-perennial streams flow through the *ahupua'a* and through the Project area including Anahaki Gulch in the northwest, Mane'opapa Gulch within the Project area, and Mimino Gulch to the northeast.

1.4.2 Built Environment

The landscape of Pālā'au Ahupua'a is rural and undeveloped. The majority of the *ahupua'a* consists of the Ho'olehua-Pālā'au Hawaiian Homestead. Thus, the built environment of the area is characterized by sparse residential homes. Within the Project area, the built structures include a building that served as the receiver station, a supporting storage shed, and several high antennas throughout the property. The proposed Project is directly north of Ho'olehua Airport.

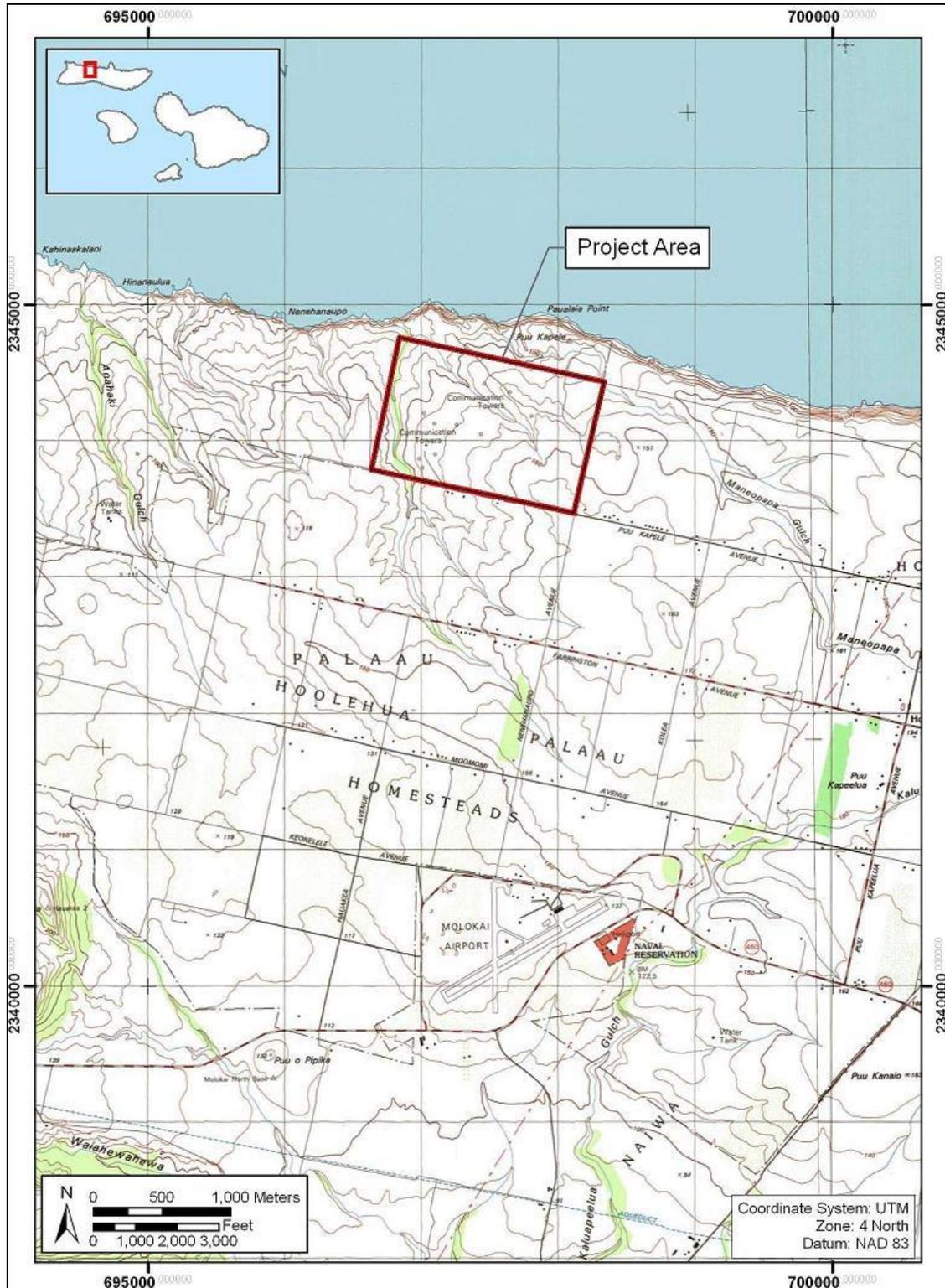
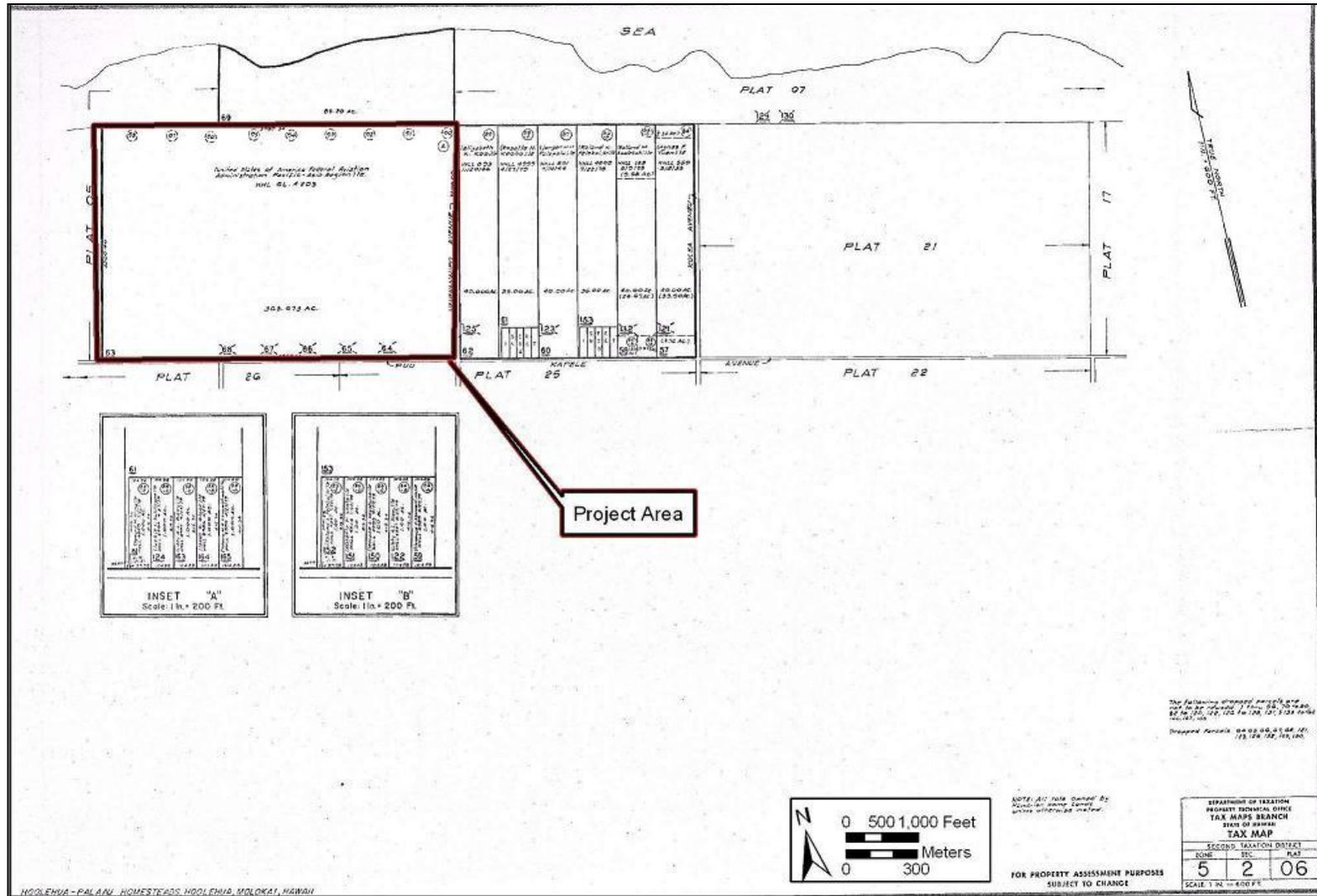


Figure 1. 1998 USGS 7.5-minute topographic quadrangle showing the Project area



Figure 2. Aerial photograph (source: USGS Orthoimagery 2005), showing the location of the current Project area



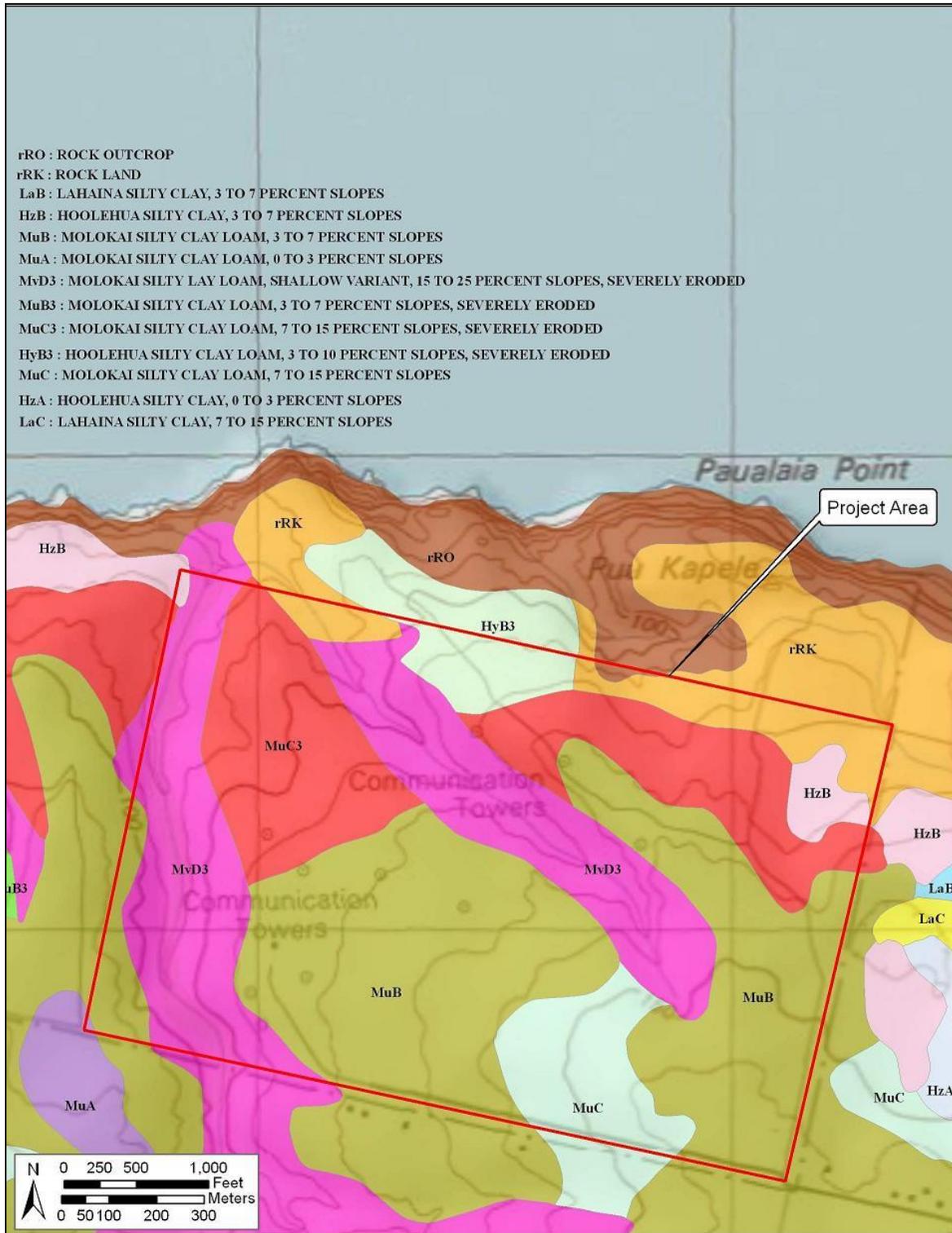


Figure 4. Soil map of the Project area (Source: Foote et al. 1972)



Figure 5. Landscape of the Project area (Source: Angela Fa'anunu)



Figure 6. View of Kalaupapa from the *pali* north of the Project area (Source: Angela Fa'anunu)

Section 2 Methods

2.1 Archival Research

Historical documents, maps and existing archaeological information pertaining to Pālā‘au Ahupua‘a and the Project area were researched at the CSH library and other archives including the University of Hawai‘i at Mānoa’s Hamilton Library, the State Historic Preservation Division library, the Hawai‘i State Archives, the State Land Survey Division, and the archives of the Bishop Museum. Previous archaeological reports for the area were reviewed, as were historic maps and photographs and primary and secondary historical sources. Information on Land Commission Awards was accessed through Waihona ‘Aina Corporation’s Māhele Data Base (www.waihona.com) as well as a selection of CSH library references.

For cultural studies, research for the Traditional Background section centered on Hawaiian activities including: religious and ceremonial knowledge and practices; traditional subsistence land use and settlement patterns; gathering practices and agricultural pursuits; as well as Hawaiian place names and *mo‘olelo*, *mele* (songs), *oli* (chants), *‘ōlelo no‘eau* (proverbs) and more. For the Historic Background section, research focuses on land transformation, development and population changes beginning in the early post–European Contact era to the present day (see Scope of Work above).

2.2 Community Consultation

2.2.1 Sampling and Recruitment

A combination of qualitative methods, including purposive, snowball, and expert (or judgment) sampling, were used to identify and invite potential participants to the study. These methods are used for intensive case studies, such as CIAs, to recruit people that are hard to identify, or are members of elite groups (Bernard 2006:190). Our purpose is not to establish a representative or random sample. It is to “identify specific groups of people who either possess characteristics or live in circumstances relevant to the social phenomenon being studied....This approach to sampling allows the researcher deliberately to include a wide range of types of informants and also to select key informants with access to important sources of knowledge” (Mays and Pope 1995:110).

We began with purposive sampling informed by referrals from known specialists and relevant agencies. For example, we contacted the SHPD, Office of Hawaiian Affairs (OHA), Moloka‘i Island Burial Council (MIBC), and community and cultural organizations in the Moloka‘i District for their brief response/review of the project and to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Project area and vicinity, cultural and lineal descendants of Pālā‘au Ahupua‘a, and other appropriate community representatives and members. Based on their in–depth knowledge and experiences, these key respondents then referred CSH to additional potential participants who were added to the pool of invited participants. This is snowball sampling, a chain referral method that entails asking a few key individuals (including agency and organization representatives) to provide their comments and

referrals to other locally recognized experts or stakeholders who would be likely candidates for the study (Bernard 2006:192). CSH also employs expert or judgment sampling which involves assembling a group of people with recognized experience and expertise in a specific area (Bernard 2006:189–191). CSH maintains a database that draws on over two decades of established relationships with community consultants: cultural practitioners and specialists, community representatives and cultural and lineal descendants. The names of new potential contacts were also provided by colleagues at CSH and from the researchers' familiarity with people who live in or around the study area. Researchers often attend public forums (e.g., Neighborhood Board, Burial Council and Civic Club meetings) in (or near) the study area to scope for participants. Please refer to Table 4, Section 6, for a complete list of individuals and organizations contacted for this CIA.

CSH focuses on obtaining in-depth information with a high level of validity from a targeted group of relevant stakeholders and local experts. Our qualitative methods do not aim to survey an entire population or subgroup. A depth of understanding about complex issues cannot be gained through comprehensive surveying. Our qualitative methodologies do not include quantitative (statistical) analyses, yet they are recognized as rigorous and thorough. Bernard (2006:25) describes the qualitative methods as “a kind of measurement, an integral part of the complex whole that comprises scientific research.” Depending on the size and complexity of the project, CSH reports include in-depth contributions from about one-third of all participating respondents. Typically this means three to twelve interviews.

2.2.2 Informed Consent Protocol

An informed consent process was conducted as follows: (1) before beginning the interview the CSH researcher explained to the participant how the consent process works, the project purpose, the intent of the study and how his/her information will be used; (2) the researcher gave him/her a copy of the Authorization and Release Form to read and sign (Appendix A-1); (3) if the person agreed to participate by way of signing the consent form *or* providing oral consent, the researcher started the interview; (4) the interviewee received a copy of the Authorization and Release Form for his/her records, while the original is stored at CSH; (5) after the interview was summarized at CSH (and possibly transcribed in full), the study participant was afforded an opportunity to review the interview notes (or transcription) and summary and to make any corrections, deletions or additions to the substance of their testimony/oral history interview; this was accomplished either via phone, post or email or through a follow-up visit with the participant; (6) the participant received the final approved interview and any photographs taken for the study for record. If the participant was interested in receiving a copy of the full transcript of the interview (if there is one as not all interviews are audio-recorded and transcribed), a copy was provided. Participants were also given information on how to view the report on the OEQC website and offered a hardcopy of the report once the report is a public document. If an interviewee agreed to participate on the condition that his/her name be withheld, procedures are taken to maintain his/her confidentiality.

2.2.3 Interview Techniques

To assist in discussion of natural and cultural resources and cultural practices specific to the study area, CSH initiated semi-structured interviews (as described by Bernard 2006) asking questions from the following broad categories: gathering practices and *mauka* (upland, mountain) and *makai* (lowland, ocean) resources, burials, historic properties and *wahi pana*. The interview protocol is tailored to the specific natural and cultural features of the landscape in the study area identified through archival research and community consultation. For example, for this study “gathering practices,” “historic properties” and “*wahi pana*” were emphasized over other categories less salient to project participants. These interviews and oral histories supplement and provide depth to consultations from government agencies and community organizations that may provide brief responses, reviews and/or referrals gathered via phone, email and occasionally face-to-face commentary.

2.2.3.1 In-depth Interviews and Oral Histories

Interviews were conducted initially at a place of the study participant's choosing (usually at the participant's home or at a public meeting place) and/or—whenever feasible—during site visits to the Project area. Generally, CSH's preference is to interview a participant individually or in small groups (two–four); occasionally participants are interviewed in focus groups (six–eight). Following the consent protocol outlined above, interviews may be recorded on tape and in handwritten notes, and the participant photographed. The interview typically lasts one to four hours, and records the—who, what, when and where of the interview. In addition to questions outlined above, the interviewee is asked to provide biographical information (e.g., connection to the study area, genealogy, professional and volunteer affiliations, etc.).

2.2.3.2 Field Interviews

Field interviews are conducted with individuals or in focus groups comprised of *kūpuna* and *kama'āina* who have a similar experience or background (e.g., the members of an area club, elders, fishermen, *hula* dancers) who are physically able and interested in visiting the Project area. In some cases, field visits are preceded with an off-site interview to gather basic biographical, affiliation and other information about the participant. Initially, CSH researchers usually visit the Project area to become familiar with the land and recognized (or potential) cultural places and historic properties in preparation for field interviews. All field activities are performed in a manner so as to minimize impact to the natural and cultural environment in the Project area. Where appropriate, Hawaiian protocol may be used before going on to the study area and may include the offering of *ho'okupu* (offering, gift), *pule* (prayer) and *oli* (chant). All participants on field visits are asked to respect the integrity of natural and cultural features of the landscape and not remove any cultural artifacts or other resources from the area.

2.3 Compensation and Contributions to Community

Many individuals and communities have generously worked with CSH over the years to identify and document the rich natural and cultural resources of these islands for cultural impact, ethno-historical and, more recently, Traditional Cultural Properties (TCP) studies. CSH makes

every effort to provide some form of compensation to individuals and communities who contribute to cultural studies. This is done in a variety of ways: individual interview participants are compensated for their time in the form of a small honorarium and/or other *makana* (gift); community organization representatives (who may not be allowed to receive a gift) are asked if they would like a donation to a Hawaiian charter school or nonprofit of their choice to be made anonymously or in the name of the individual or organization participating in the study; contributors are provided their transcripts, interview summaries, photographs and—when possible—a copy of the CIA report; CSH is working to identify a public repository for all cultural studies that will allow easy access to current and past reports; CSH staff do volunteer work for community initiatives that serve to preserve and protect historic and cultural resources (for example in, Lānaʻi and Kahoʻolawe). Generally our goal is to provide educational opportunities to students through internships, share our knowledge of historic preservation and cultural resources and the State and Federal laws that guide the historic preservation process, and through involvement in an ongoing working group of public and private stakeholders collaborating to improve and strengthen the Chapter 343 environmental review process.

Section 3 Traditional Background

3.1 Overview

This section focuses on the traditional background of the Pālā'au Ahupua'a. Traditionally, Moloka'i was divided into two *moku* or districts: Kona and Ko'olau. The Kona Moku comprised the lands of the southern and western sections of the island which included Pālā'au, and the Ko'olau Moku comprised the lands of the northeastern portion of the island from Hālawā Valley to the Kalaupapa Peninsula. The western portion of the island, however, was sometimes described as being in a separate land division: the *kālana*, Kaluako'i (Moffat and Fitzpatrick 1995). John Ka'imikaua spoke of four traditional *moku* of Moloka'i, known as Kaluako'i, Pālā'au, Ko'olau and Kawela (Terry and Monahan 2005).

In 1859, the traditional *moku* of Kona and Ko'olau were dropped and the island as a whole was referred to as the Moloka'i District. In 1909, the island was again divided into two districts: the Kalawao District, which contained the lands of Kalaupapa, Kalawao, and Waikolu; and the Moloka'i District which contained the remainder of the island including Pālā'au (Coulter, cited in Summers 1971:2).

Today, the Pālā'au Ahupua'a consists of three land units: Pālā'au 1, Pālā'au 2, and Pālā'au 3. However, according to Summers, the Pālā'au Ahupua'a traditionally only referred to Pālā'au 2, the largest sub-section of this *ahupua'a* (Summers 1971). Pālā'au 1 and Pālā'au 3 were considered two *lele* of this *ahupua'a* and were significantly smaller than Pālā'au 2. Pālā'au 1 is located on the southern shores of central Moloka'i and Pālā'au 3 is in the uplands above Kalaupapa Peninsula (Summers 1971).

3.2 Place Names

Place names encompasses names of important places within or near Pālā'au, such as the names of valleys, streams, mountains, land sections, surfing areas, towns, villages, streets, and buildings (Pukui et al. 1974). In this section, place names are in bold for clarity. Translations presented without attribution in this subsection are from Pukui et al. (1974). Spelling and diacriticals also follow Pukui et al.'s (1974) usage.

Pālā'au literally translates as, "wooden fence or enclosure." Pālā'au comprises the three land sections noted above in north central and southwest Moloka'i. It is also the name of the state park overlooking Ka-laupapa peninsula and containing the phallic stone, Ka-ule-o-Nānāhoa. Pālā'au also translates as, "to heal, as with herbs."

Anahaki Gulch flows northwards to the sea and east of the Project area (Soehren 2003:169). It translates literally as, "broken cave."

Anianikeha is a land section east of the Project area and translates literally as, "blowing [on the] heights."

Hinana ulua is located east of the Project area along the *pali*. Its literal translation is, "inspired [by a god] hinana fish."

Ho'olehua-Pālā'au Homesteads occupy most of Ho'olehua 2 and Pālā'au 2. The Moloka'i Airport lays within the Ho'olehua-Pālā'au Homesteads (Soehren 2003:169).

Kahinaakalani is described as a coastal land section north of the Moloka'i airport and translates literally as, "the grayness of the sky, heaven." It is also a place where former habitation house sites and a *ko'a* were found and described in more detail in Section 3.4.

Kaka'inapāha'o is a rainfall station east of the Project area and literally translates as, "mysterious procession."

Mane'opapa Gulch runs northeast of the Project area and extends eastward through Ho'olehua Ahupua'a.

Nēnēhānaupō translates literally as, "goose born [at] night." It is the name of a road near the Project area, as well as a non-perennial stream that flows through the Project area.

Na'aūkāhihi is also located along the northern coast and translates literally as, "entangled intestine." A *ko'a* exists on the northern part Na'aūkāhihi point.

Nā'iwa is an adjacent *ahupua'a* northeast of Pālā'au. It translates literally as, "the frigate birds (perhaps named for the beauty of the birds)."

Pu'u ka Pele translates literally as, "the volcano hill. It is located near the *pali*, north of the Project area where a *ko'a* has been identified.

Pu'u ka Pe'elua is a hill in Northern Moloka'i and translates literally as, "hill [of] the caterpillar. Refer to Section 3.3.4 for the *mo'olelo* of this name. Handy and Handy (1972:146) relate that Mary Kawena Pukui recalled the same name in her native district of Kā'u on the island of Hawai'i and described a similar legend.

3.3 Mo'olelo (Stories and Oral Histories) Associated with Specific Place Names

The following section includes several *mo'olelo* associated with place names within or near Pālā'au, also the name of a chief.

3.3.1 Pāka'a and His Son Kū-a-Pāka'a

One story tells of two chiefs, Pālā'au and Ho'olehua, also the names of adjacent *ahupua'a*. Chief Ho'olehua was married to 'Īoli, the name of the *ahupua'a* on the southern coast of Moloka'i, west of Pālā'au 1. They had a daughter named Hikauhi who became the wife of Pāka'a and mother of the famous Kū-a-Pāka'a. The following is Rice's account:

On Molokai lived a very beautiful woman, Hikauhi, the daughter of Hoolehua and Ilali. Now it happened that the girl's father had promised her hand to Palaau, the chief of that part of the island. But as soon as she had seen Paakaa, she forgot all about her former lover and demanded that the stranger be given to her. Palaau very generously consented, and so they all lived in peace. Paakaa cultivated the lands well, fished skillfully, and brought great prosperity to his wife and her family. (Rice 1923:76)

3.3.2 Pele's Long Sleep

An ancient chant concerning Lohi'au, the king of Kaua'i, includes reference to Pālā'au. Westervelt tells of the beginning of Lohi'au's romance with Pele:

Lohiau watched her while he partook of the feast with his chiefs, and she was resting on the couch of mats. He was thinking of her marvelous, restful beauty, as given in the ancient chant known as "Lei Mauna Loa."

"Lei of Mauna Loa, beautiful to look upon.

The mountain honored by the winds.

Known by the peaceful motion.

Calm becomes the whirlwind.

Beautiful is the sun upon the plain.

Dark-leaved the trees in the midst of the hot sun

Heat rising from the face of the moist lava.

The sunrise mist lying on the grass,

Free from the care of the strong wind.

The bird returns to rest at **Palaau**.

He who owns the right to sleep is at **Palaau**.

I am alive for your love--

For you indeed." (Westervelt 1916:77)

3.3.3 Pu'u Pe'elua, Caterpillar Hill

Pu'u Pe'elua, also known as Pu'u Kape'elua or Caterpillar Hill, is located above Ho'olehua. According to Harriet Ne (1992), the story of Pu'u Pe'elua involves Pele, the daughter of a chief of Pālā'au, who fell in-love with the *pe'elua* (caterpillar) of Ho'olehua, the *'aumakua* (family or personal gods, deified ancestors) of that district. Ne recounts:

A beautiful young girl named Pele, the daughter of a chief in the Pālā'au area, encountered in the early twilight a handsome young man. They fell in love, and he courted her for almost a year. She concealed her love from her parents and lived only for the hours she spent with him.

She did not know that he was the *pe'elua* of the district, revered and loved by the people of Ho'olehua-even worshipped. Nor did she know that he had the form of a young man only at night but that in the day he returned to the form of a caterpillar.

As the days passed, Pele grew pale and listless.... The *kahuna* perceived the problem at once. "She is in love with the supreme manifestation of the caterpillar-Pe'elua," he told [her parents]. "When he comes to her at night, it is in the form of a handsome young man; but his power is draining her strength. She is human. She cannot live with a magical being. To save her, you must kill him. You must destroy him completely (Ne 1992: 49-50.)"

The same story is also told by Cooke:

...this beautiful girl was visited each night by a lover who left before daylight. She was unable to discover who he was, this suspense told on her, and she began to waste away. A priest, consulted by her parents, advised the girl to attach a piece of white tapa to a wart on her lover's back. In the morning, shreds of tapa helped to trace the demi-god lover to the hill Puu Peelua, in the middle of Hoolehua. The *kahuna* [priest] and friends of the family found a large peelua [caterpillar] asleep on the hill. The *kahuna* ordered the people to collect wood which was placed around the sleeping peelua, and a fire was lit. As the heat of the fire increased, the caterpillar burst into myriads of small caterpillars which were scattered over the plain. That accounts for the army-worm pest, called peelua. (Cooke 1949:102)

3.3.4 Hālena, the Yellowing

Ne tells of a story involving Kahekili, the ruling chief of Moloka'i who lived on Maui, in which Pālā'au is referenced (Ne 1992). Although the story is about the naming of Hālena, a place on the southwest side of Moloka'i, Pālā'au is mentioned as a place that was known for its fat *'āholehole* and *'ō'io*. In the story, Kahekili sends one of his chiefs to Pālā'au to collect fish to supply his army as he made plans to invade O'ahu. The following is an excerpt from her account:

When Kahekili was the ruling chief of Molokai, he lived on Maui. He made his plans and set out in his canoes to invade O'ahu, stopping at Molokai to get a supply of fish for his journey. He sent Hulu, chief of a village, in his canoe to Pūko'o for the fat mullet from the fishponds. He sent another canoe with another chief, Kuikai, to Pālā'au, noted for its fat *'āholehole* and *'ō'io* (Ne 1992: 47).

It is likely that the Pālā'au mentioned in the above quote referred to what is now known as Pālā'au 1 which is located along the southern shores of Moloka'i rather than Pālā'au 2 which includes the Project area.

3.4 Sites of Cultural Significance

Catherine Summers compiled an inventory of sites of cultural significance on the island of Moloka'i in 1971. The survey identified several sites in Pālā'au 2 which included two *heiau*,

three *ko'a*, and various house sites (Summers 1971). The following sub-section describes these sites in more detail.

3.4.1 Site 14; Heiau of Unknown name

Summers identified a *heiau* as Site 14, at an elevation of 800 feet above sea level located east of the Ho'olehua Cemetery within the pineapple fields west of the gulch. She cited Cartwright as having reported this site as a *heiau* in 1922 (Summers 1971). The following excerpt describes Summers' findings:

The structure was in ruins in 1957Traces of paving could still be found, and the remains of a wall, 35 ft long NE to SE; 13 ft from the NE side was an upright stone 2 ft high, 2 ft wide, and 1 ft thick (Summers 1971: 38).

3.4.2 Site 16; Heiau at Anahaki

According to Summers (1971), Cartwright identified another *heiau* in 1922. The *heiau* is located on the western side of the mouth of Anahaki Gulch approximately fifty feet above sea level which suggests close proximity to the Project area. The Heiau at Anahaki was described by Summers as:

Originally, the structure was an enclosure. The exterior measurements in 1964 were 43 ft N to S and 36 ft E to W; the maximum height of the eastern wall was 5 ft. The northern wall was probably this same height originally, but the wall on the S was lower. Both the S and W walls were badly damaged. An inner division on the N side of the enclosure measured 17 ft E to W and extended the entire width of the structure. The southern portion of the enclosure was paved... On the crest of the hill to the S of the [*heiau*] was a house site or shelter, which had a 5-ft-high wall running N to S; the rest of the site was open. Adjoining the northern portion of the wall on the E side was a small, paved terrace (Summers 1971: 38).

3.4.3 Site 15; Ko'a at Pu'u ka Pele

Summers reports of a small *ko'a* located on the top of the hill known as Pu'u ka Pele.

3.4.4 Site 18; Ko'a at Na'aūkāhihi

A *ko'a* was identified as Site 18 on the northern part of Na'aūkāhihi point. Summers cites Stokes' description of the *ko'a*:

This [the *ko'a*] is a very small oval enclosure on a headland about 50 feet above sea-level. It is 19 feet wide from west to east and 26 feet long from south to north. The walls are very irregular, both in height and width. The height varied from 1 to 3 feet, and the width from 2 feet on the north to 14 feet on the south. The thickness of the wall on the south suggests that there may have been a platform there originally, but if so, the pavement had disappeared before I saw the place.

The floor of the enclosure had originally been covered with small stones on scanty soil, but at the time of my visit the covering consisted of weathered

fragments of bones of *uluu*, *uhu* [parrot fishes, family Scaridae], *aholehole* and other fish, turtle and dog, in addition to sea shells, pieces of coral and driftwood. These were remains, apparently, of offerings which had been swept off or fallen from the alter which was a flat stone built into the western wall and resting on the floor. The portion projecting from the line off the wall was two feet long, 1.3 feet wide and 4 inches thick (Stokes, cited in Summers 1971:39).

3.4.5 Site 17; Sites at Kahinaakalani

According to Summers, Emory reported seeing two house sites and a *ko'a* at Kahinaakalani with the *ko'a* at the edge of the cliff. She also cited Phelps's description of a structure which he called a canoe *halau* (meeting house as for canoes or *hula* instruction) approximately thirty feet above the sea:

...the parallel walls [of the *halau*] are 20 feet long and 3 1/2 feet apart. They are [now] so broken down that no estimate can be made of their height or width. Apparently, the structure was open at both ends. The longitudinal axis of the shelter is at a slight angle to the line of the water's edge (Phelps, cited in Summers 1971: 38-39).

Summers recorded remains of many open camp sites between Kahinaakalani and Na'aukāhihi and noted five structures that may have been used as shelters from strong east winds.

3.5 Winds

According to Summers, the winds of Pālā'au are known as the Ka'ele and the Hauialialia (Summers 1971).

3.6 Subsistence

The region including Pālā'au 2 is described in the literature as a fertile plain and was known particularly for the cultivation of *'uala* (Summers 1971; Handy and Handy 1972). Summers cites Malihinihele who stated in 1876 that, "In the olden days this [Pālā'au 2] was a good land with a fertile plain where plants grew. The population was large but today it is uninhabited (Summers 1971:38)." Handy and Handy also noted that, "In 1931 there were many flourishing patches on the Hawaiian homesteads at Hoolehua. It is said that Hoolehua and Palaau were noted for sweet potatoes in olden days (Handy and Handy 1940:157)." Homesteaders in Ho'olehua were also reported to have grown sweet potatoes on land that had not been planted in ancient times (Handy and Handy 1972). The following excerpt was also cited by Handy and Handy 1972:

For Pala'au (Apana 2), Kaluakio, and Punakou, Ho'olehua, and Naiwa, planting areas for yams and sweet potatoes cannot be delimited but it is known that these were grown in that general area and were, with fish, the staples of the inhabitants. (Phelps in Handy and Handy 1972:518)

The importance of *'uala* to the area is also suggested by place names such as Pu'u Pe'elua which illustrates the connection to the environment of the area. As described in Section 3.3.4., *pe'elua* or caterpillar, feeds on the sweet potato and is considered a pest by *'uala* farmers of the region.

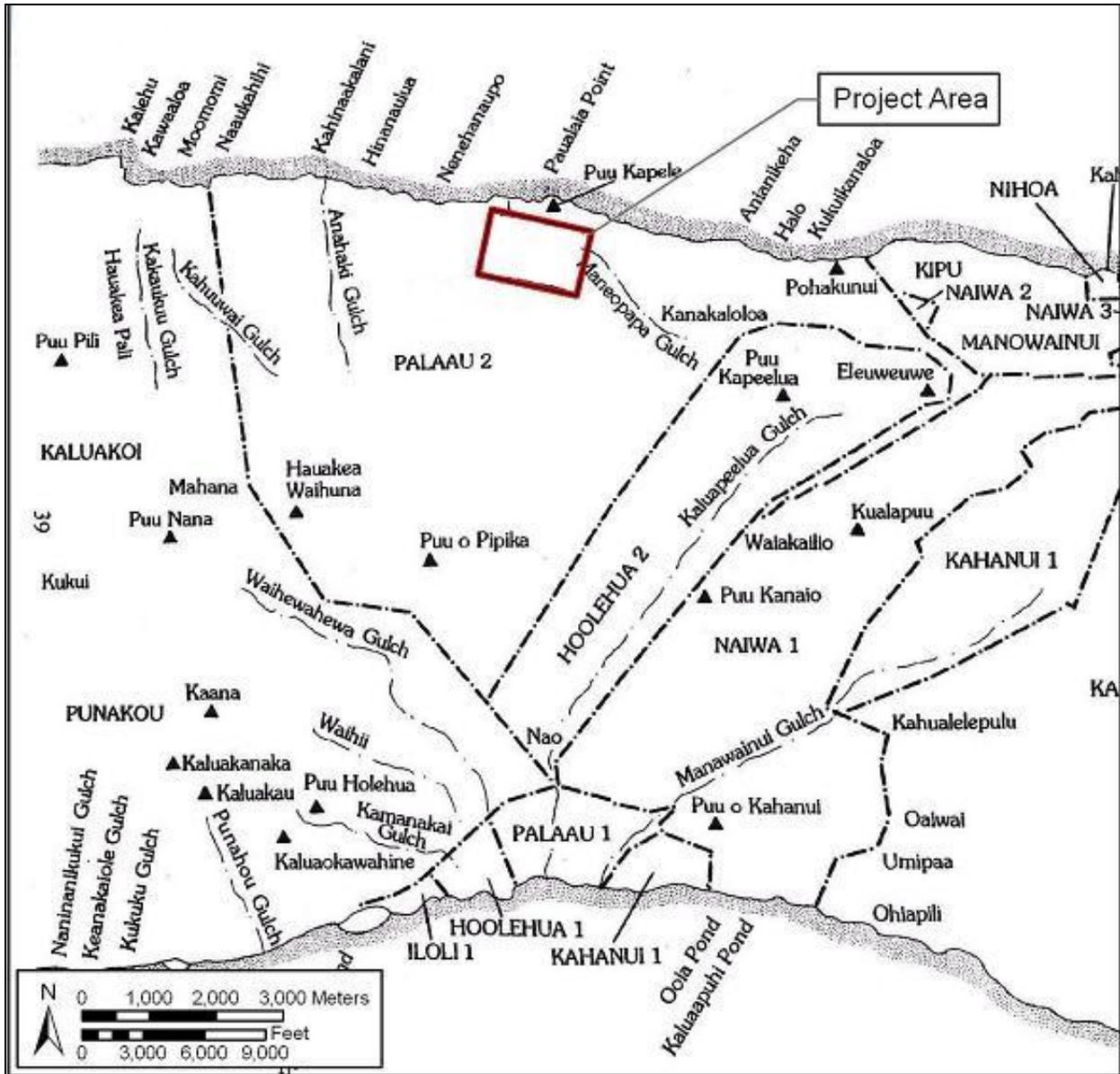


Figure 7. 1984 Moloka'i place names (Adapted from Major and Dixon 1995:39)

Section 4 Historical Background

4.1 Overview

While some general history of Moloka'i has been recorded, details are said to be missing due to the belief that the most powerful *kahuna* in the Hawaiian Islands resided on Moloka'i. Since the population of the island was less than the others, the possibility that Moloka'i residents perpetuated this belief as a defense against their attack by other islands has been raised (Cooke 1949:124).

4.2 Early Historic Period to Mid-1800s

Moloka'i is briefly mentioned in several early historic accounts. Summers (1971:18) relates that in 1779 when Captain Cook visited Hawai'i, Moloka'i's status was uncertain. However, Kamakau (1961:132-133) cites several reasons why Moloka'i was as important as O'ahu in the late 1700s since both of the islands contained "rich lands, many walled fish-ponds, springs, and water taro patches. The island of Oahu was very fertile and Molokai scarcely less so."

After conquering the island of Maui in 1790, Kamehameha advanced on to Moloka'i where he secured the allegiance of the chiefs. Archibald Menzies (1920:115), the naturalist who accompanied Captain George Vancouver to the Hawaiian Islands in the 1790s, relates that Kamehameha "destroy[ed] the fields and plantations of the inhabitants." He and his warriors remained on Moloka'i for a year to prepare the attack on O'ahu. It is said that he grew taro and "had all his canoes put in order. He drilled his warriors on the Hoolehua plain near where the airport is now" near the Project area. (Cooke 1949:112)

Cattle were introduced to Moloka'i in the 1840s. De Loach summarizes this first effort at commercial ranching:

Rudolph W. Meyer, who wasresponsible, along with [Reverend] Hitchcock, for the introduction of cattle on the island, had come to Moloka'i in the 1840s. He established a ranch stocked with longhorns in the Kalae area. A lucrative trade in cattle and hides was begun between Moloka'i and Honolulu. The cattle were exported from the village of Palaau on the southwestern shore, over the reef, and onto a waiting ship. Palaau grew wealthy on cattle and dry land taro. All this came to an end, however, in the 1850s, when Meyer discovered that the number of cattle in the herd had diminished considerably. He found that almost every male in the village was guilty of rustling, and so all the men were shipped off to jail in Honolulu. The men's families followed and the village was deserted. Today Palaau sits abandoned in a kiawe forest, as no one ever returned to live there. (de Loach 1975:68)

4.2.1 The Māhele (Land Divisions)

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—that introduced private property into Hawaiian society. In 1848, the crown and the *ali'i* (royalty) received their land titles. Pālā'au was retained by the Crown.

4.2.2 Mid- to late-1800s

Although the first attempt at cattle ranching was unsuccessful, raising livestock expanded in the second half of the nineteenth century:

During this period, cattle, sheep and goats were imported to the island in ever-increasing numbers. According to Judd, there were no cattle on the island in 1832 and by 1853 there were only 200 head, The 1866 census, however, revealed 2,586 head of cattle, 13,332 sheep and 196 goats on the island....In 1868, Kamehameha V released axis deer on the island. (de Loach 1975:86)

Coulter's (1931) population density estimates for 1853 (Figure 8) show that Moloka'i's population was concentrated along the coastal eastern half of the island. Circles symbolize about twenty people but there are no symbols in the Project area or anywhere in the vicinity. As mentioned above, Project area lands were held by the Crown.

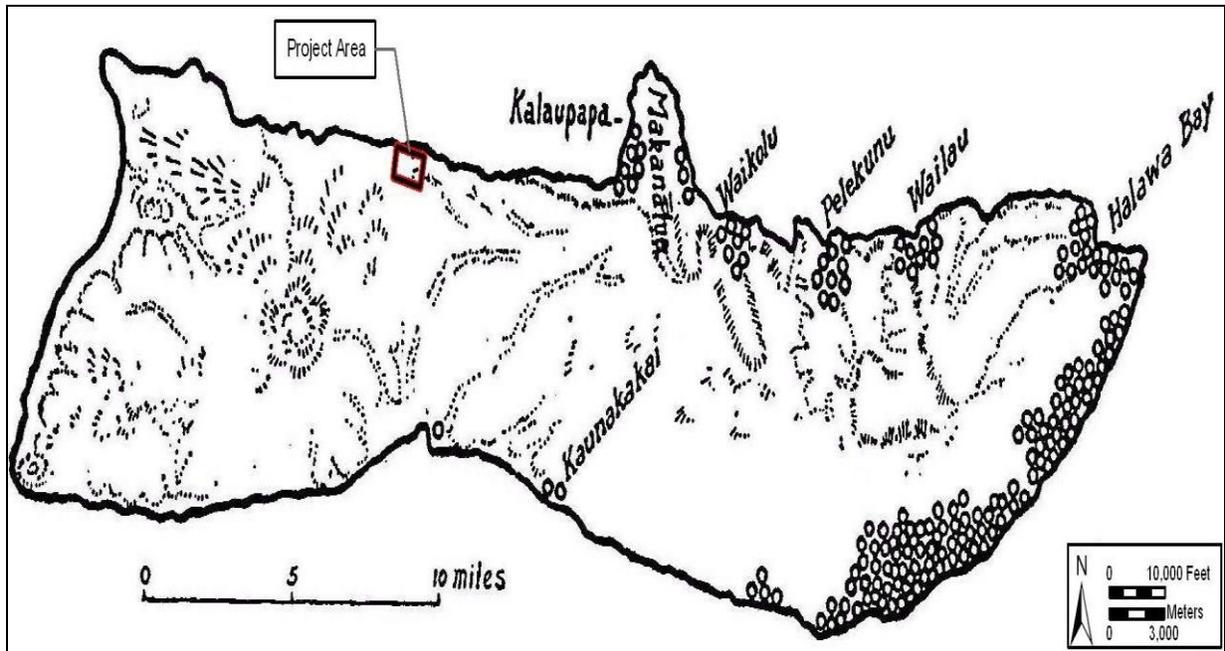


Figure 8. 1853 population density estimates; each symbol represents 20 people (Coulter 1931)

Abraham Fornander recounted an anecdote late in the nineteenth century that suggests a formerly substantial population in the Project area's vicinity that may have been widely dispersed:

...As an instance of the dense population even a few years previous to *Kamehameha's* death, the author has often been told by a grand-niece of *Kekaulike*, who was a grown-up girl at the time, that when the chief's trumpet-shell sounded, over a thousand able-bodied men would respond to the call, within a circle described by Palaau, Naiwa, Kalae and Kaunakakai. Those lands together cannot muster a hundred men this day. (Fornander 1880:73 footnote)

In 1898, members of the American Sugar Company attempted to develop the arid lands of the Ho'olehua plain. Railroad tracks were constructed from Kaunakakai harbor "up through Palaau and Iloli to the middle of the Hoolehua plateau....On the Hoolehua plain 750 acres were prepared in parallel trenches following the contours. 500 acres were actually planted in young cane shoots (Judd IV 1936:11-12)." Irrigation ditches eight miles long brought pumped water that was found to contain a high salt content. The effort failed and "graded railroad bed cutting through the gulches of Palaau" and "irrigation ditches ...on the Hoolehua plain" were all that remained (Judd IV 1936:11-12).

4.2.3 1900s

In 1921, the U.S. Congress established the Hawaiian Homes Commission to administer and manage some 200,000 acres of land that were Kingdom of Hawai'i government and Crown lands. Agricultural homesteads were to be leased to Native Hawaiians who were at least half Native Hawaiian; leases were for 99 years at one dollar a year. The following year, the program began attracting people to Moloka'i, and although the lack of water initially caused multiple problems, the program succeeded and was expanded to other areas including Pala'au-Ho'olehua in 1924. Despite drought, high winds, and insect infestations, people managed to cultivate their plots (McGregor 2007:204, 227, 231).

Pineapple cultivation began in Pala'au-Ho'olehua in 1926 when Libby, McNeill and Libby contracted with some homesteaders. The California Packing Corporation contracted with other homesteaders in 1929 to develop additional pineapple cultivation. Homestead residents received almost two million dollars in cash payments for their efforts between 1929 and 1935 (de Loach 1975:101-102). Additionally, due to the homestead program, Pālā'au-Ho'olehua had the largest population of Native Hawaiians in 1930. Of the 1,031 residents, 826 were Hawaiian (McGregor 2007:10).

Despite droughts, including one between 1944 and 1945 that caused the loss of the entire crop, pineapple production in the vicinity of the Project area continued until the 1970s (de Loach 1975:107, 109). Dole Pineapple, which had taken over Libby, McNeill and Libby's operations, ceased pineapple cultivation in 1975. The California Packing Corporation had planned on closing the same year but continued cultivation until 1983 when a majority of its production ceased business on Moloka'i (Cooper and Daws 1990:201).

4.2.4 Modern Land Use within the Project Area

A 1968 USGS topographic map, shown in Figure 9, includes the USAF 30th Space Wing HF Receiver facility which indicates that the structure was on the property at that time. An access road running along the southern boundary of the study area is shown leading to a small group of

structures (the USAF receiver facility) near the southwestern corner of the study area. Also of note is a dashed circle labeled “radio tower” located just north the center of the southern boundary of the study area.

The 1998 USGS topographic map in Figure 1 and the aerial photograph of the area in Figure 2 indicate that the extent of the USAF receiver facility has vastly expanded from its first appearance in the 1968 USGS topographic map. Numerous communication towers and associated dirt access roads are indicated throughout the entire study area. However, the buildings associated with the facility appear unchanged.

The USAF receiver facility located within the study area is a component of the 30th Space Wing/Vandenberg Air Force Base (VAFB). The main headquarters of the VAFB are located in California halfway between Los Angeles and San Francisco. The VAFB/30th Space Wing conducts space, ballistic and aeronautical operations in the area of the Pacific Ocean (Research Triangle Institute 2000). Generally, the VAFB supports ballistic missile launches into broad ocean areas and the Kwajalein Missile Range. Midrange support for ballistic missile tests are provided by sensors located in Hawai'i. The facilities on Moloka'i serve as a site for a high frequency receiver for radio communications (Research Triangle Institute 2000).

Currently the USAF receiver facility located within the study area is abandoned.

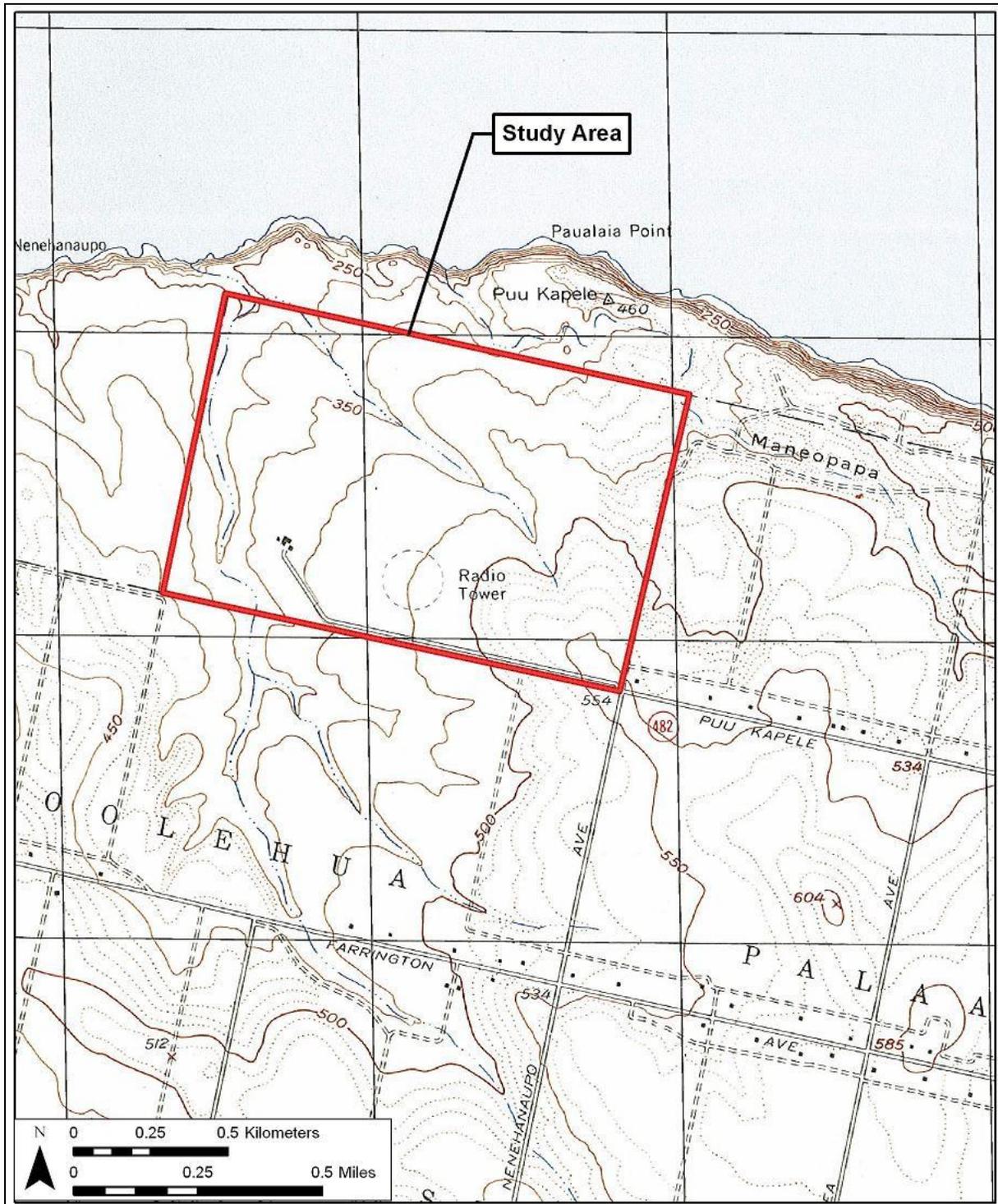


Figure 9. 1968 USGS Map of the Project area

Section 5 Archaeological Research

5.1 Overview

The following section provides a summary of the archaeological research conducted in and near the Project area. This section reviews previous studies conducted in and near the Project area, and presents findings of an archaeological assessment of the Project area conducted specifically for this CIA on May 3, 2010 by CSH (Tulchin et al. 2010). Archaeological research is intended to identify culturally important sites within or near the Project area that could potentially be impacted by the proposed Project.

5.2 Previous Archaeological Research

Several studies have been conducted in the vicinity of the Project area and are summarized in Table 1. A regional study of Moloka'i Island, including a review of relevant historical and ethnographical literature, was conducted by the Bishop Museum in 1937 (Phelps 1941). The study documented fifty archaeological sites which primarily consisted of *heiau*, *ko'a*, and extensive archaeological site complexes. Two sites documented by Phelps are located in the general vicinity of the Project area and identified as Site 19 and Site 20. Site 19 is located approximately 2.7 kilometers northwest of the Project area and is described as a canoe shelter or *halau*. Site 20, approximately 300 meters north of the Project area, is described as a grouping of agricultural shrines consisting of, "...one or a few natural boulders surrounded by a low wall of stones...composed of upright stones with smaller rocks filling in the spaces (Phelps 1941:25)." According to Phelps, the agricultural shrines of Site 20 "were probably connected with sweet potato plants which were the principal vegetable food of the region (Phelps 1941:25)."

In 1951, the Bishop Museum conducted a site survey of historic properties throughout Moloka'i that had been identified in the late nineteenth and early twentieth centuries which are summarized in Catherine Summers' *Molokai: A Site Survey* (1971). Summers' work describes sites on Moloka'i by individual *ahupua'a* based on previous research, especially Stokes' 1909 ten-week survey of *heiau* and other major sites on Moloka'i, as well as "revisiting" some 100 sites (Summers 1971:iii). Additionally, Summers describes legendary, traditional, and historical information related to Moloka'i in general, and the reader is referred to her document as the most comprehensive island-wide study to date. Regarding the proposed Project, Summers described two historic properties identified as Site 11 and Site 12 which were located near the Project area but outside the *ahupua'a* of Pālā'au. She reported five historic properties located in or near the Project area within the *ahupua'a* of Pālā'au, which were identified as Sites 14, 15, 16, 17, and 18.

Summers' Site 11, located 2.9 km southwest of the current study area in Ho'olehua, is described as the Kape'elua Complex (SIHP# 50-60-03-11) consisting of the Caterpillar Stones (Site 11A) and the stone at Pu'u Kape'elua (Site 11B). The Caterpillar Stones relate to a legendary account by Cooke (1949) that describes the origin of caterpillars on Moloka'i. The stone at Pu'u Kape'elua is described as a flat stone with "a hollowed-out basin" that was interpreted by G. P. Cooke as an adze sharpening stone and by K. P. Emory as a water collection stone (Summers 1971:37). Site 14, located approximately 3.5 km east of the Project area, is described as the ruins of a *heiau* consisting of pavement and wall remnants and a two-foot-high

upright stone (Summers 1971:38). Summers' Sites 15 and 17 correspond to Phelps's (1941) Site 20 and Site 19, respectively, described above. Summers' Site 16, located approximately 2.3 kilometers northwest of the Project area, is described as an enclosure-type *heiau* on the western side of Anahaki Gulch (Summers 1971:38).

In 1980, AECOS, Inc. completed an archaeological reconnaissance survey for the Moloka'i Airport Master Plan Survey, which is located within 400 meters south of the Project area (AECOS, Inc. 1980). The survey documented six historic hunting blinds and one pre-historic wall. Several basalt flakes were observed in the vicinity of the wall, which may originate from one of the several adze quarries reported to be in the general area.

In 1982, Neller conducted an archaeological reconnaissance of the proposed Ho'olehua Marine Corps training area on Moloka'i located approximately 1.4 kilometers west of the proposed Project area (Neller 1982). Potential historic properties (stone structures) were observed along the northern coastline, while the inland portion of the project area consisted of "...nothing but dry grazing land and traces of former pineapple fields (Neller 1982:2)." A field survey of the Project area was recommended in order to identify any small and/or obscured historic properties that could not be identified during the 1982 survey.

In 1993, CSH conducted an archaeological inventory survey of three 15-acre parcels within Pālā'au and Nā'iwa Ahupua'a, located approximately 2.8 kilometers south of the Project area (Hammatt et al. 1993). No historic properties were identified and no further archaeological work was recommended.

In 1993, SHPD/DLNR visited a newly identified historic property (SIHP# 50-60-02-0995) within Pālā'au 2, located approximately 2.2 kilometers west of the Project area (Griffin 1993). SIHP# 50-60-02-0995 consisted of a wall or possible C-shape constructed on a promontory of large basalt boulders. One of the natural basalt boulders exhibited a pecked rectangular basin that was interpreted as a water collection feature. Basalt flakes and an adze blank fragment were observed in the vicinity. Griffin stated that SIHP# 50-60-02-0995 is similar to Summers' (1971) Site 11, described above (Griffin 1993). Additional fieldwork to identify any associated features of SIHP# 50-60-02-0995 was recommended.

The following year in 1994, SHPD/DLNR conducted a field inspection and identification of Summers' (1971) Site 11 (SIHP# 50-60-03-11, described above) in the Ho'olehua-Pālā'au Homesteads, located approximately 3.0 kilometers southeast of the Project area (Nagahara and Kolb 1994). In addition to Summers' (1971) findings, SHPD/DLNR identified a new rectangular pecked basin on one of the Caterpillar Stones, as well as other areas of pecking, marine shell midden, and historic glass bottle fragments. The function of SIHP# 50-60-03-11, and its specific the rectangular pecked basins, were not determined. Additional subsurface test excavations were tentatively recommended for the area. SIHP# 50-60-03-11 was recommended for preservation, including community consultation efforts, due to associations with legendary accounts.

In 1995, Bishop Museum completed an archaeological survey and evaluation for the USAF Receiver Station, which encompasses the entire proposed Project area (Major and Dixon 1995). The survey identified two historic properties within the Project area (Figure 10 and Figure 11).

SIHP# 50-60-02-1623 is a complex consisting of two irregular pre-contact enclosures (Feature 1 and Feature 2) and a historic artifact scatter (Feature 3) that included early twentieth-

century glass bottle, ceramic, and metal fragments. SIHP# 50-60-02-1623 Feature 1 consisted of a single rectangular alignment of upright boulders with areas of cobble fill and piling surrounding and incorporating a natural basalt outcrop. SIHP# 50-60-02-1623 Feature 2 consisted of an enclosure constructed of stacked basalt boulders and cobbles and several upright boulders surrounding and incorporating a natural basalt boulder outcrop. Additionally, Feature 2 included a small adjoining C-shape or sub-enclosure and a possible soil-retaining terrace. SIHP# 50-60-02-1623 Features 1 and 2 were interpreted as possible agricultural shrines similar to Phelps's (1941) Site 20 described above.

SIHP# 50-60-02-1624 is a complex consisting of one enclosure (Feature 1) and one isolated basalt flake (Feature 2). SIHP# 50-60-02-1624 Feature 1 is described as, "... an oblong enclosure with two interior spaces measuring 17 by 7 m (Major and Dixon 1995:69)." Test excavations within SIHP# 50-60-02-1624 Feature 1 encountered marine shell midden and charcoal suggesting, along with construction style, that Feature 1 is likely a pre-Contact habitation structure.

In 1999, the Bishop Museum returned to conduct a supplemental archaeological inventory survey in response to newly identified archaeological features located with the northeastern *makai* edge of the Project property (Hartzell 2000). A historic property was documented by the study (Hartzell 2000), SIHP #50-60-02-843, also known as "The Pu'u Kapele Wall Complex." this site was not included in the scope of the archaeological investigation for the proposed Project.

Table 1. Archaeological Studies in the Vicinity of Project Area

Reference	Type of Investigation	Location	Findings
Phelps 1941	Island-wide Survey	Moloka'i Island	Fifty sites were identified including two in the vicinity of the Project area; Site 19 (canoe shelter) and Site 20 (agricultural shrine complex).
Summers 1971	Island-wide Survey	Moloka'i Island	Five sites were identified near the Project area; Site 14 (<i>heiau</i>), Site 15 (<i>ko'a</i> ; Phelps's Site 20), Site 16 (<i>heiau</i>), Site 17 (House sites and a <i>ko'a</i> ; Phelps's Site 19), Site 18 (<i>ko'a</i>).
AECOS, Inc 1980	Archaeological Reconnaissance Survey	Moloka'i Airport	Six historic hunting blinds and one likely pre-Contact wall with associated basalt flakes were identified.
Neller 1982	Archaeological Reconnaissance	Pālā'au 2	Potential historic properties observed, but not recorded.
Hammatt et al. 1993	Archaeological Inventory Survey	Pālā'au 2; adjacent to airport	No findings.
Griffin 1993	Site Visit	Pālā'au 2	Site 60-02-995 (wall or possible C-shape and pecked rectangular basin on natural basalt boulder) with associated basalt flakes and adze blank fragments identified.
Nagahara and Kolb 1994	Field Inspection	Kape'elua complex, Ho'olehua-Pālā'au Homesteads	Relocation of Summers' (1971) Site 11 (SIHP# 50-60-03-11). Additional features observed.

Reference	Type of Investigation	Location	Findings
Major and Dixon 1995	Archaeological Survey	Northern Pālā'au 2 (within current study area)	Two historic properties identified; SIHP# 50-60-02-1623 (Two potential agricultural shrines and one historic artifact scatter) and SIHP# 50-60-02-1624 (habitation enclosure and isolated basalt flake).
Hartzell 2000	Archeological Inventory Survey	Northern Pālā'au 2 (on the northeastern boundary of the Project area)	One historic property identified; SIHP# 50-60-02-843 also known as "The Pu'u Kapele Wall Complex." It consisted of 37 surface features including: 26 stacked stone walls, five alignments, four enclosures, a depression, and a large, prominent boulder.

5.3 Archaeological Assessment of the Project Area

An archaeological assessment within the Project area was conducted on May 3, 2010 by CSH archaeologists to collect data on the nature, density, and distribution of archaeological sites (Tulchin et al. 2010). The study area of the archaeological assessment consisted of a 100 percent pedestrian survey of an approximately six-acre survey area focused around the USAF receiver station facility. In addition, a walk-through reconnaissance was also conducted to relocate two historic properties previously identified by the Bishop Museum (Major and Dixon 1995). The historic property identified by Hartzell in 2000 is located on the northeastern border of the property and was not included in the scope of the survey for the archeological assessment. However, Section 5.5 Historic Properties SIHP #50-60-02-843, describes the findings of this study in more detail.

The survey of six acres mentioned above included a circular area extending 60 meters from the outer perimeter of the facility. No historic properties were observed within the survey area. Approximately 75 percent of the survey area was observed to have been disturbed at the ground surface by land modifications associated with the development of the receiver station. Documented land disturbances included extensive grading and excavations associated with the construction of single-story structures, radio towers, and access roads. The center of the survey area consisted of three, modest single-story structures. The southern portion of the study area consisted of graded areas and an access road with associated infrastructure (cattle guards and

drainage culverts). The northern and eastern portions of the Project area contained radio towers and associated infrastructure such as access roads, tower footings and winches.

The western quarter of the study area was unmodified by human activity, and is situated along the eastern edge of Pālā'au Gulch. The topography of this area was gently sloping to the west, while the vegetation consisted of low exotic grasses and *Koa haole* (possibly *Leucaena leucocephala*).

5.3.1 Archaeological Site Relocation

A walk-through reconnaissance was conducted within the archeological assessment study area to relocate two historic properties (SIHP #50-60-02-1623 and SIHP #50-60-02-1624 also known as SIHP-1623 and SIHP-1624) previously identified by the Bishop Museum (Major and Dixon 1995). Features 1 and 2 of SIHP #50-60-02-1623 (pre-Contact stone enclosures) were relocated approximately 450 meters south-southeast of Pu'ū ka Pele (Table 2). Feature 3, a historic refuse scatter along a dirt road, could not be relocated. It is believed that erosion, both natural and human induced, has displaced and buried any surface evidence of this feature.

Feature 1 of SIHP #50-60-02-1624 (pre-Contact stone enclosure) was relocated along the western edge of the study area, along the eastern edge of Pālā'au Gulch atop a low hill and *mauka* of the confluence of the gulch and an unnamed gully. Feature 2, an isolated basalt flake, could not be relocated. As this feature was originally identified within a natural erosion cut, it is believed that the basalt flake has been displaced, and possibly buried, due to natural erosion events typical of the area.

Detailed site descriptions of SIHP -1623 and SIHP -1624 are provided below next.

5.4 Historic Properties SIHP-1623 and SIHP-1624

5.4.1 SIHP# 50-60-02-1623

SIHP #50-60-02-1623 consists of an upright basalt boulder alignment (Feature 1) and a stacked stone enclosure (Feature 2) previously identified by the Bishop Museum (Major and Dixon 1995). During the archeological assessment, SIHP-1623 was relocated in the northeast corner of the study area within a natural, shallow basin approximately 450 meters south-southeast of Pu'ū ka Pele (see Figure 12). Topography of the immediate area is level, while the geology consists of extensive red soil deposits with pockets of exposed basalt bedrock outcrops. Lantana and exotic grasses dominate the surrounding landscape.

During the current investigation, the Bishop Museum site descriptions and site maps for SIHP -1623 Features 1 and 2 were re-evaluated and determined to be accurate (Major and Dixon 1995:59-69). Locations for each feature were recorded with GPS technology, and GPS point locations were added to each feature's site map (Figure 13 and Table 3)

SIHP-1623 Feature 3, a historic refuse scatter along a dirt road, could not be relocated. It is believed that soil erosion, as well as vegetation growth occurring in the roughly fifteen years since the feature was originally identified (Major and Dixon 1995) has displaced and buried any surface evidence of this feature. The findings described are presented in Table 2.

A total of three test units (Test Units 1-3) and 13 shovel test probes were excavated at the location of SIHP# 50-60-02-1623 Feature 1 by Major and Dixon (1995:74-75). Additionally, one test unit (Test Unit 4) and six shovel test probes were excavated at the location of SIHP# 50-60-02-1623 Feature 2. A small quantity of fragmentary marine shell was recovered from Test Unit 1 at Feature 1. No other cultural material or artifacts were recovered from test excavations at SIHP# 50-60-02-1623. Major and Dixon (1995) suggest that SIHP# 50-60-02-1623 Feature 1 and Feature 2 are similar in construction to Phelps's (1941) Site 20, agricultural shrines described as follows:

Some shrines having to do with planting and cultivation are at Site 20 on the north shore. There are five of these grouped in an area of about three acres. Each shrine consists of one or a few natural boulders surrounded by a low wall of stones. The center group of rock may be 6 to 10 feet high and the wall around it forms a quadrangle, from 20 to 30 feet on a side, composed of upright stones with smaller rocks filling in the spaces. The uprights range from six inches to a foot and a half in height. No structures similar to these have been found anywhere else on Molokai and it is not known just what rites took place at them or how important their role was. That they had to do with planting is known and they were probably connected with sweet potato plants which were the principal vegetable food of the region (Phelps 1941:25).

The re-location of Feature 1 and 2 warrants the association with Phelps's Site 20. Both SIHP# 50-60-02-1623 Feature 1 and 2 consist of low walls surrounding natural basalt outcrops of similar construction and dimension to agricultural shrines previously identified in the area by Phelps (Site 20, Phelps 1941:25). The absence of cultural material within these structures suggests that habitation was not the primary function. Additionally, the construction of Features 1 and 2 is not indicative of agricultural land modification. These factors contribute to the functional interpretation of SIHP# 50-60-02-1623 Feature 1 and 2 as ceremonial.

Significance evaluations and mitigation recommendations presented within the Major and Dixon (1995) archaeological survey and evaluation report for SIHP# 50-60-02-1623 are ambiguous. Significance evaluations outlined, in table format, within the executive summary section (page ii) included assessment of SIHP# 50-60-02-1623 Feature 1 and 2 under National Register Criterion D and Hawai'i Register Criterion E, and assessment of Feature 3 under National register Criterion D. Mitigation recommendations within the executive summary include preservation for SIHP# 50-60-02-1623 Feature 1 and 2 and recovery "if potentially damaging activities are planned" for SIHP# 50-60-02-1623 Feature 3 (Major and Dixon 1995:ii)."

In contrast, significance evaluations described within the significance evaluations and recommendations section (page 105) of the Major and Dixon (1995) report assess SIHP# 50-60-02-1623 Feature 1 and 2 significant under National Register Criterion D and potentially Criterion C due to the interpretation of these features as potential agricultural shrines. SIHP# 50-60-02-1623 Feature 3 is assessed as significant under National Register Criterion D. Mitigation recommendations described within the significance evaluations and recommendations section of the Major and Dixon (1995) report for SIHP #50-60-02-1623 are vague. Recommendations for Feature 1 suggest that if the feature is an agricultural shrine, "The cultural value of such a feature

should prevent any disturbing activities being planned there (Major and Dixon 1995:105).” No specific recommendations were given for SIHP #50-60-02-1623 Feature 2. Recommendations for Feature 3 state that, “Although the artifacts in Feature 3 may not justify preservation of the disturbed land on which they lie, their study could be informative (Major and Dixon 1995:106).” Recommendations for Feature 3 potentially suggest data recovery fieldwork.

Subsequently, CSH re-evaluated the significance evaluation and mitigation recommendations for the SIHP# 50-60-02-1623 site complex (Feature 1 and Feature 2) as part of the current archaeological assessment. As such, SIHP# 50-60-02-1623 is assessed as significant under Criterion D (have yielded, or may be likely to yield information important in pre-history or history) and Criterion E (being important to an ethnic group’s history and cultural identity due to associations with cultural practices and/or traditional beliefs). CSH recommends preservation of SIHP# 50-60-02-1623.

Table 2. Summary of SIHP# 50-60-02-1623

FORMAL TYPE:	Complex (upright boulder alignment and stone enclosure)
FUNCTION:	Ceremonial
NUMBER OF FEATURES:	2 (originally reported by Major and Dixon [1995] as 3; Feature 3 could not be re-located by CSH [Tulchin et al. 2010])
AGE:	Pre-Contact (Features 1 and 2)
DIMENSIONS:	Feature 1: 15.0 meters by 13.0 meters Feature 2: 11.0 meters by 9.0 meters
LOCATION:	Northeast corner of study area
UTM COORDINATES*	Feature 1: E 698159.9 / N 2344315 Feature 2: E 698228.7 / N 2344407

*UTM Datum = NAD 83, Zone 4N

5.4.2 SIHP# 50-60-02-1624

SIHP #50-60-02-1624 consists of a rectangular enclosure of stacked stones previously identified by the Bishop Museum (Major and Dixon 1995) (Figure 15). The current investigation re-located SIHP-1624 Feature 1 along the western edge of the Project area, along the eastern edge of Pālā‘au Gulch atop a low hill and *mauka* of the confluence of the gulch and an un-named gully. Topography of the immediate area is level, while the geology consists of extensive red soil deposits with pockets of exposed basalt bedrock outcrops. Exotic grasses dominate the surrounding landscape.

SIHP-1624 Feature 2, an isolated basalt flake, could not be re-located. It is believed that soil erosion, as well as vegetation growth occurring in the roughly fifteen years since the feature was originally identified (Major and Dixon 1995) has displaced and buried any surface evidence of this feature (Figure 16).

A total of two test units (Test Units 5-6) and twelve shovel test probes were excavated at the location of SIHP# 50-60-02-1624 Feature 1 by Major and Dixon (1995:82-84). Sparse amounts of marine shell midden and charcoal were encountered within each test unit as well as shovel test probes 2, 3, 5, and 7. In general, excavations conducted within the northern portion (north room) of Feature 1 yielded larger quantities of midden and charcoal suggesting the presence of a potential buried cultural layer (Major and Dixon 1995:82).

As with SIHP# 50-60-02-1623, significance evaluations presented within the Major and Dixon (1995) archaeological survey and evaluation report for SIHP# 50-60-02-1624 are somewhat ambiguous. Significance evaluations outlined, in table format, within the executive summary section (page ii) included assessment of SIHP# 50-60-02-1624 Feature 1 under National Register Criterion D and Hawai'i Register Criterion E, and assessment of Feature 2 under National Register Criterion D. In contrast, significance evaluations described within the significance evaluations and recommendations section of the Major and Dixon (1995:106) report assess SIHP# 50-60-02-1624 Feature 1 and 2 significant under National Register Criterion D only. Mitigation recommendations remain consistent throughout the report, recommending preservation for SIHP# 50-60-02-1624 Feature 1 and collection of the single basalt flake (Feature 2) prior to any proposed construction or ground disturbance.

CSH re-evaluated the significance evaluation and mitigation recommendations for SIHP# 50-60-02-1624, which presently consists of Feature 1 located along the western edge of the Project area. SIHP# 50-60-02-1624 is assessed as significant under Criterion D. CSH recommends preservation of the SIHP# 50-60-02-1624 habitation enclosure.

Table 3. Summary of SIHP# 50-60-02-1624

FORMAL TYPE:	Enclosure
FUNCTION:	Habitation
NUMBER OF FEATURES:	1 (originally reported by Major and Dixon [1995] as 2; Feature 2 could not be re-located by CSH [Tulchin et al. 2010])
AGE:	Pre-Contact
DIMENSIONS:	17.0 meters by 7.0 meters
LOCATION:	Western edge of study area
UTM COORDINATES*	E 696853.2 / N 2344423

*UTM Datum = NAD 83, Zone 4N

5.5 Historic Properties SIHP #50-60-02-843

In 2000, the Bishop Museum, Department of Anthropology, completed a supplemental archaeological inventory survey for the USAF Receiver Station (Hartzell 2000). The Bishop Museum survey area encompassed a portion of the northeastern *makai* edge of the current Project area (see Figure 10). The survey was conducted in response to newly identified archaeological features discovered in the vicinity of the northern border of the USAF Receiver Station by receiver station staff. The survey identified one historic property: SIHP #50-60-02-843, also known as The Pu'u Kapele Wall Complex, a pre-contact traditional Hawaiian site

complex previously identified by Marshall Weisler in 1985 (personal comm., September 1999 in Hartzell 2000).

SIHP #50-60-02-843 was located within the northeastern boundary of the current Project area (see Figure 10). The historic property consists of 37 surface features, including: 26 stacked stone walls, five alignments, four enclosures, a depression, and a large, prominent boulder. The site was recommended eligible to the National Register under significance criterion C, as an excellent example of a traditional Hawaiian construction technique, and under criterion D, for its information potential (Hartzell 2000). Preservation was the recommended mitigation for this historic property (Hartzell 2000).

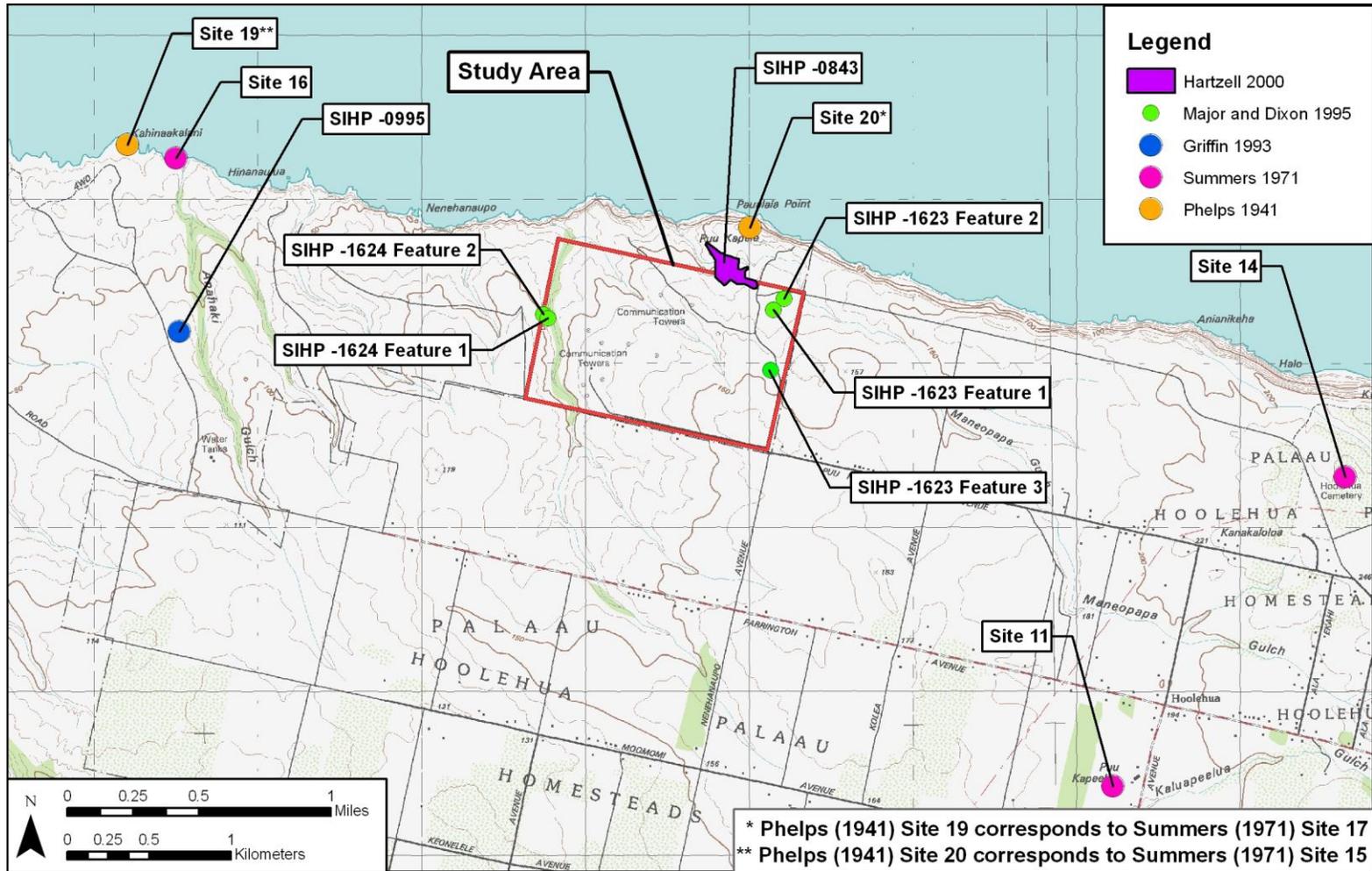


Figure 10. Previously identified sites within and near the Project area (see text for discussion)

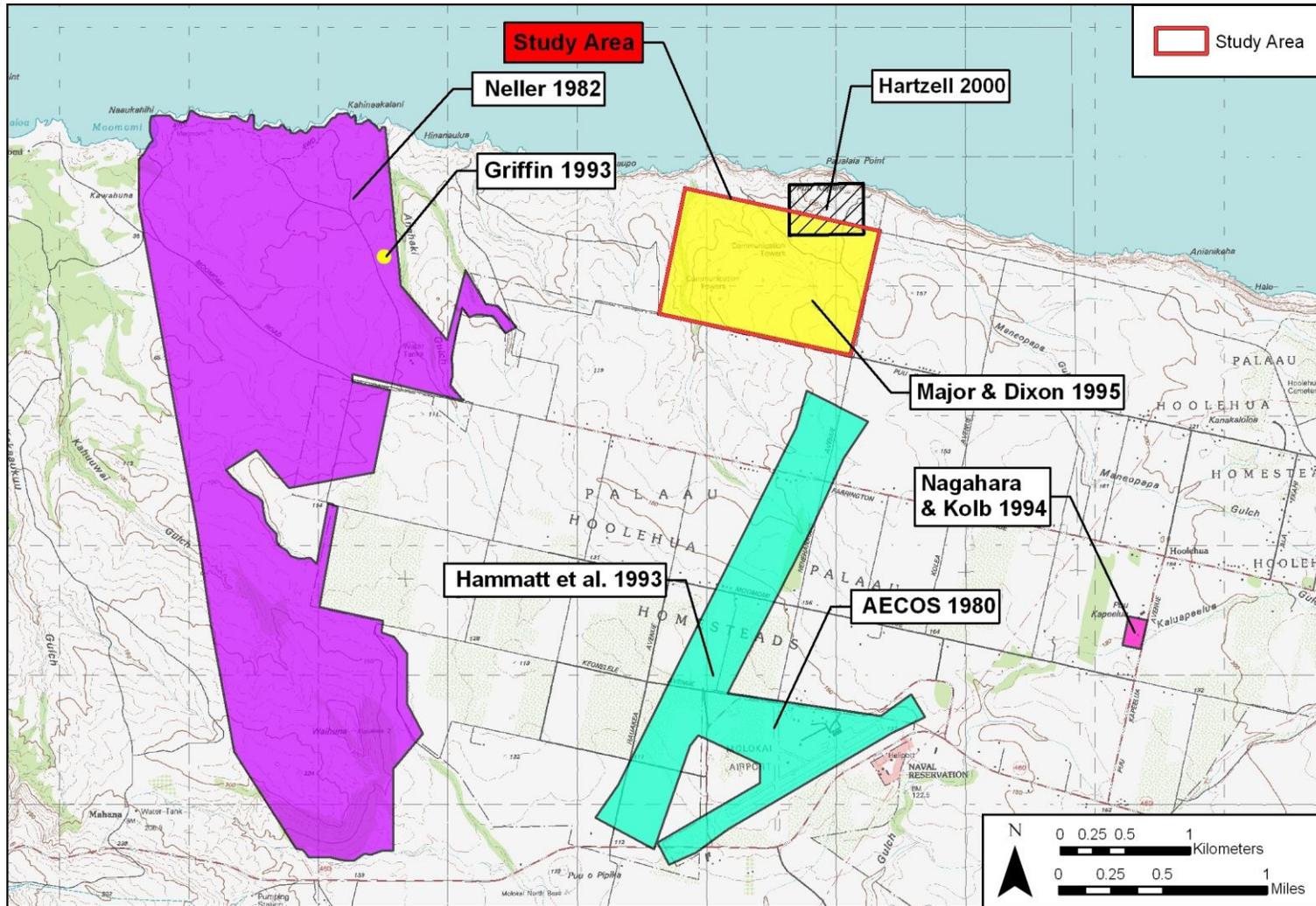


Figure 11. Previous archaeological research in the vicinity of the Project area

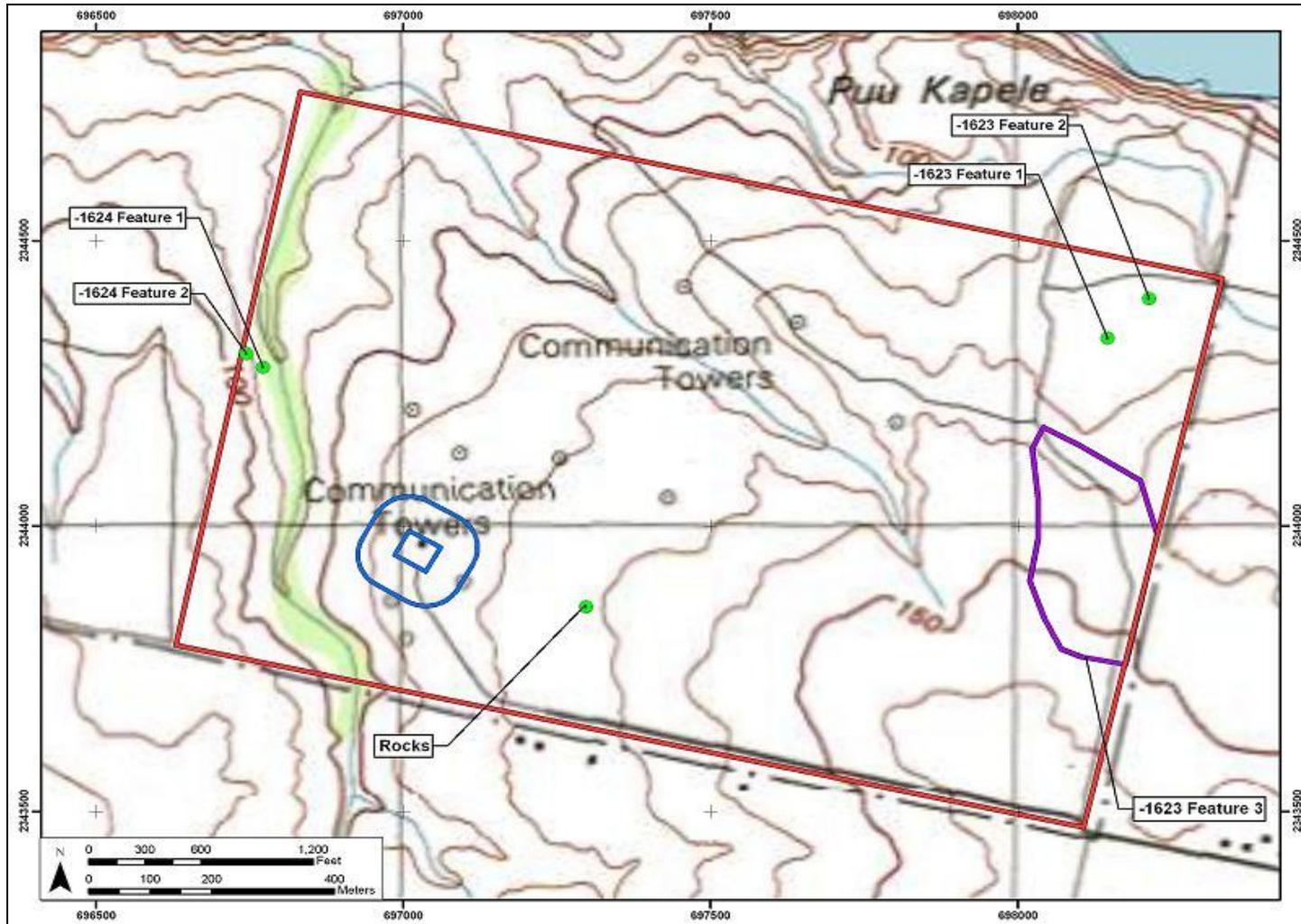


Figure 12. Previously identified cultural resources in the Project area; note, SIHP -1623, Feature 3 and SIHP -1624, Feature 2 could not be re-located by CSH (Tulchin et al. 2010)

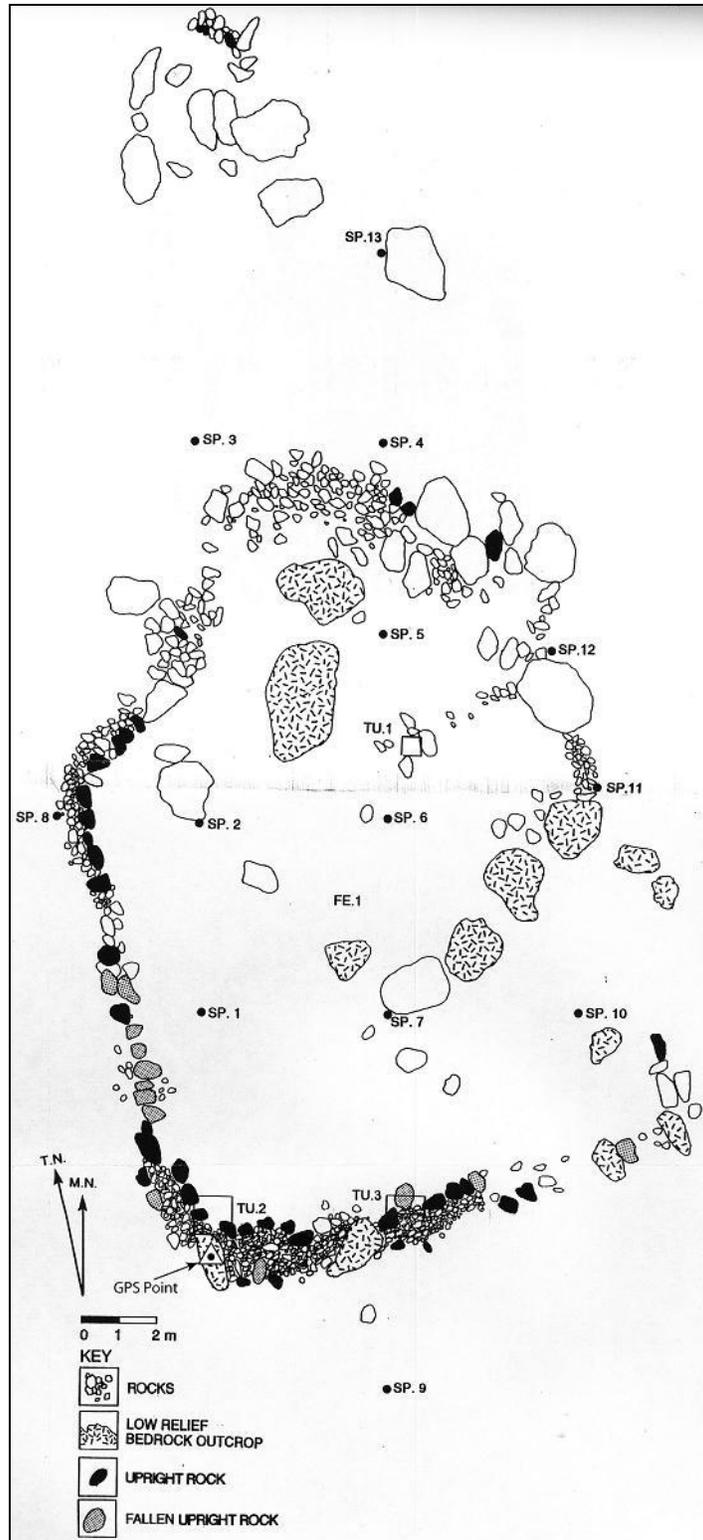


Figure 13. Historic property, SIHP# 50-60-02-1623 Feature 1

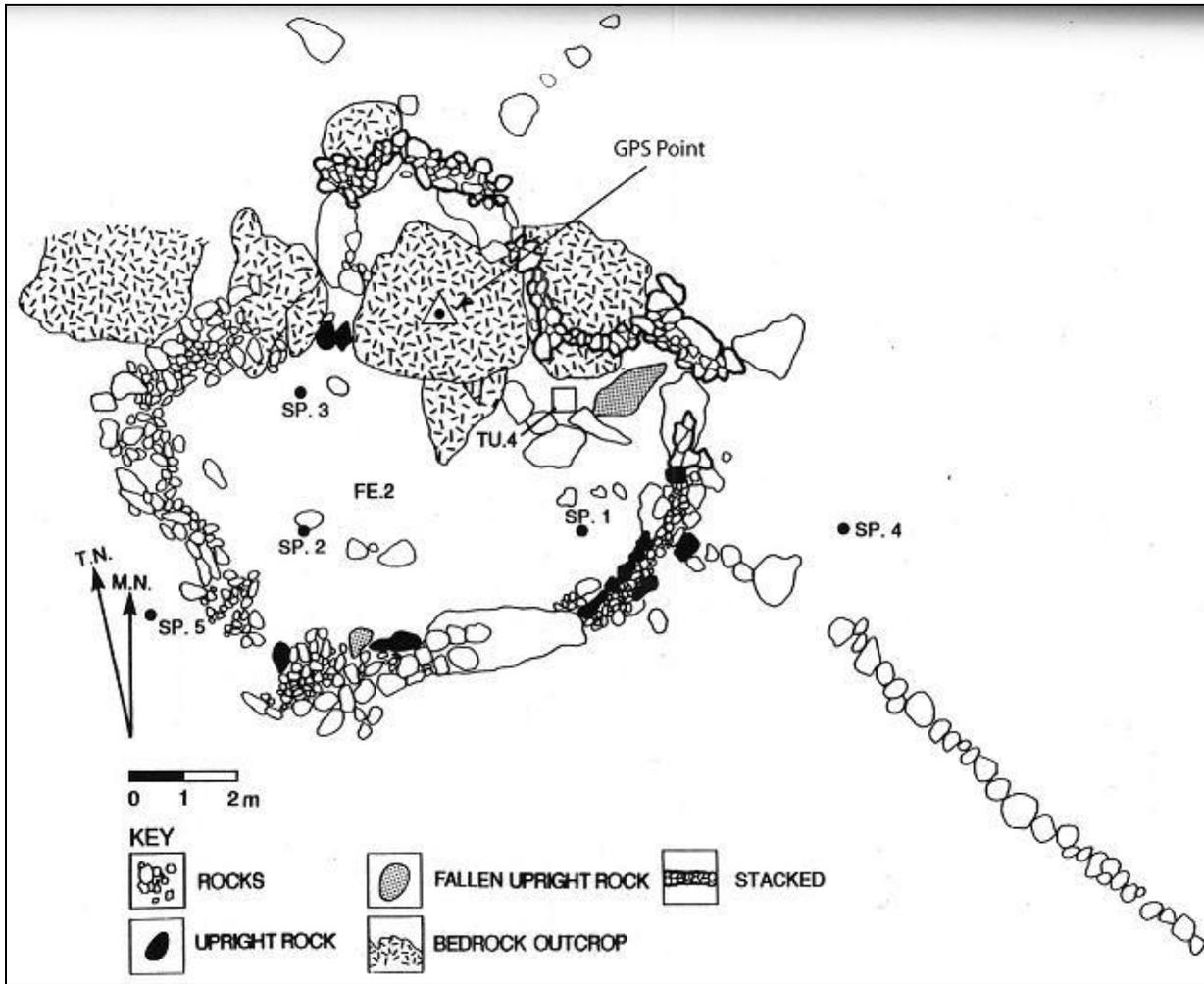


Figure 14. Historic property, SIHP# 50-60-02-1623 Feature 2

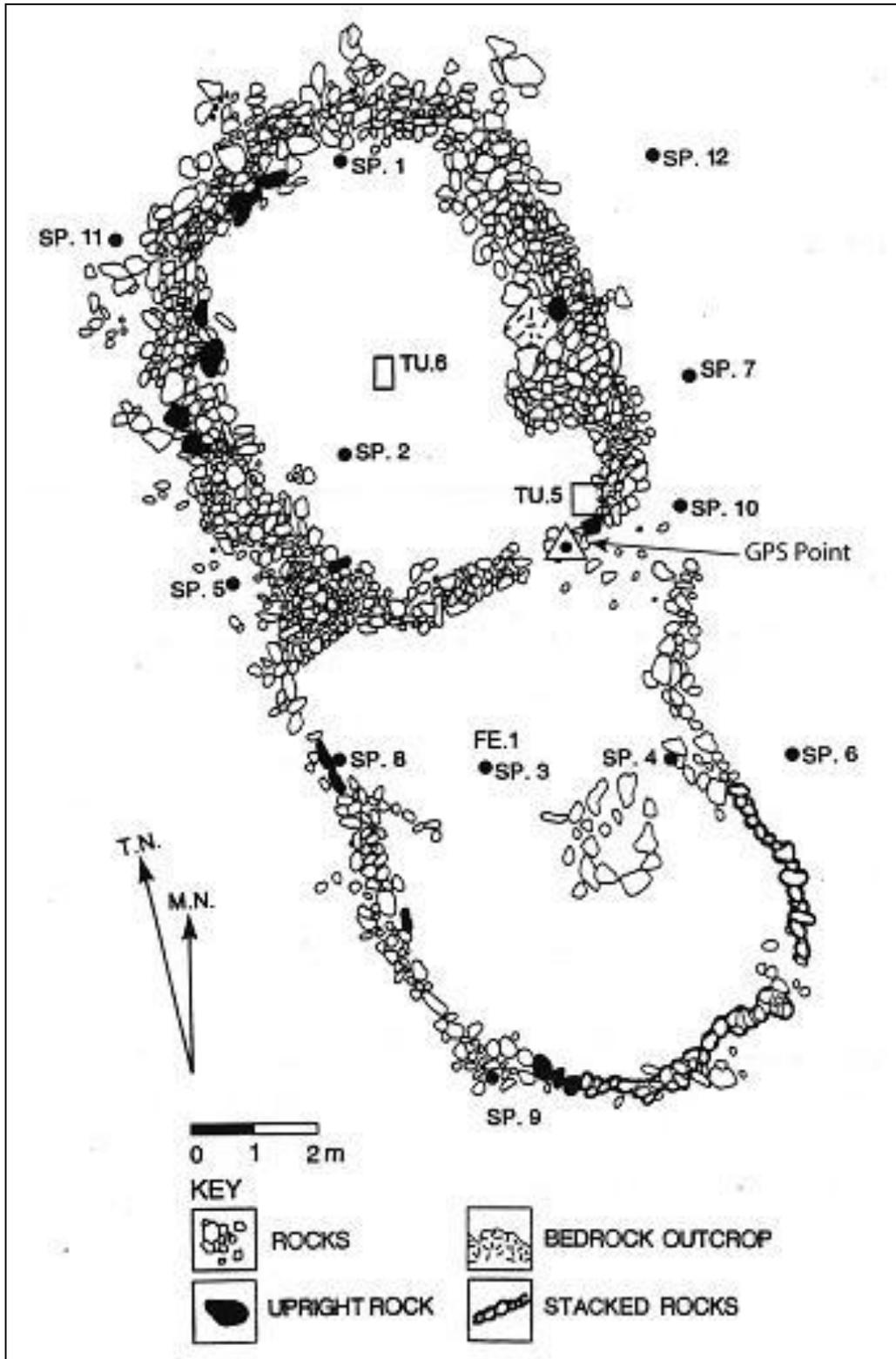


Figure 15. Historic property, SIHP# 50-60-02-1624 Feature 1

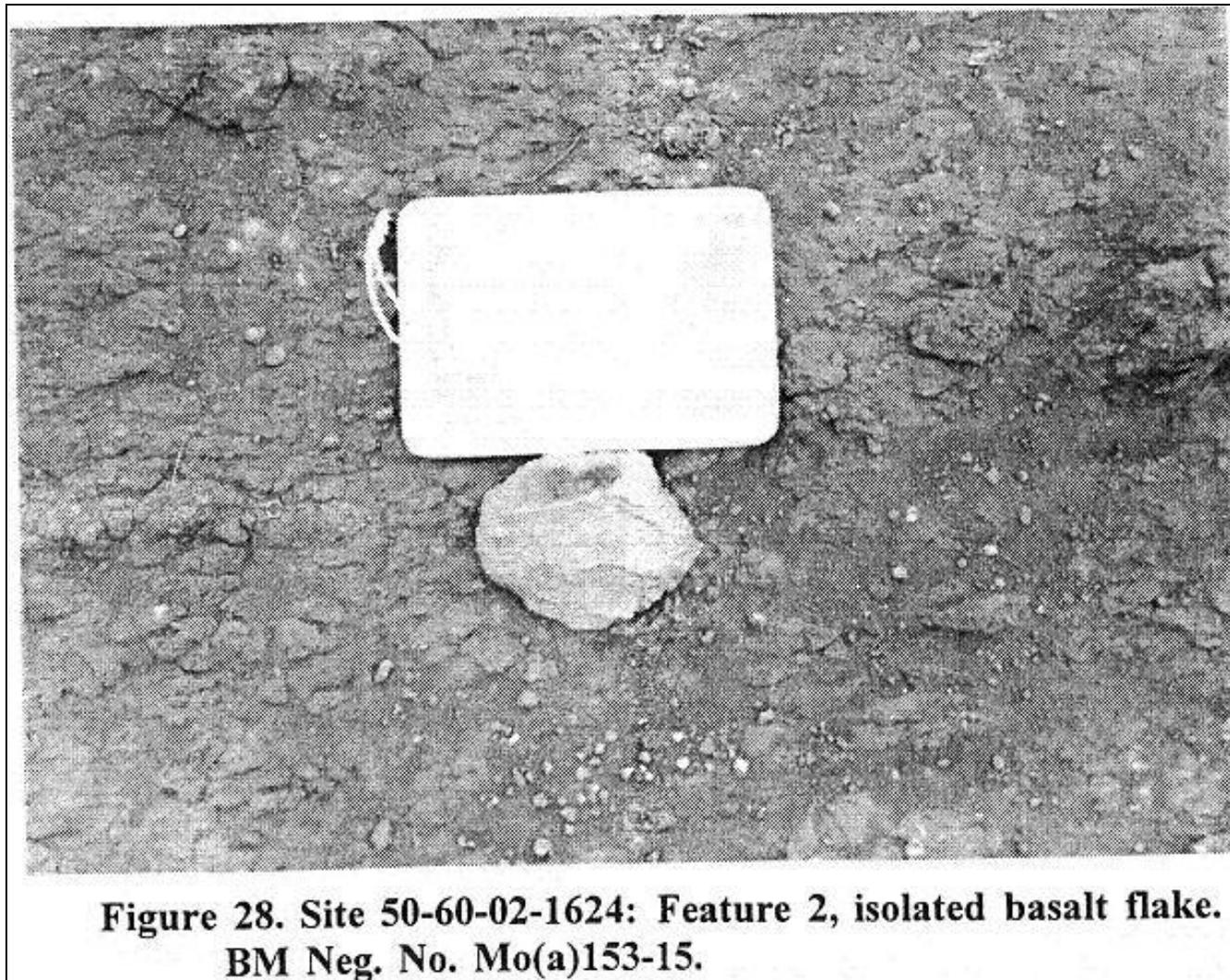


Figure 16. Historic property, SIHP# 50-60-02-1624 Feature 2 (from Major and Dixon 1995)

Section 6 Community Consultation

6.1 Community Consultation Effort

An effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals with knowledge of and/or concerns about traditional cultural practices, resources, and beliefs related to the Project area. This effort was made by letter, e-mail, telephone, and in person. Initial community outreach letters, including a map and an aerial photograph of the Project area, were sent to community contacts. Letters provided detailed information on the purpose of the proposed Project, as well as the specific purposes of the cultural study. The following is a sample outreach letter:

At the request of Element Environmental, LLC, Cultural Surveys Hawai'i, Inc. (CSH) is conducting a Cultural Impact Assessment for the Vandenberg Air Force Base Project, located in the Pālā'au Ahupua'a, on the Island of Moloka'i, tax map key (TMK) [2] 5-2-006:063. The Project area encompasses the entirety of TMK [2] 5-2-006:063, which consists of 363.673 acres (see attached aerial photograph and U.S. Geological Survey map).

The proposed Project involves the transfer of all land on TMK [2] 5-2-006:063, and the decommissioning and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed on that land by the U.S. Air Force (USAF), to the State of Hawai'i, Department of Hawaiian Homelands (DHHL).

Currently, TMK [2] 5-2-006:063 is leased by the USAF from the DHHL. However, the USAF no longer needs the facilities at Pālā'au, therefore, is undergoing a termination of the lease, and return of the land to the DHHL. The lease agreement mandates that the leased property be returned to DHHL in its original condition. Therefore, the lease termination and transfer of land requires the decommissioning and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed by the USAF. In addition, any contamination within the Project area must be remediated to accepted contaminant levels in accordance with Federal, State, and local regulations. Should the DHHL wish to keep any existing structures, those structures will remain intact on the property.

The purpose of this cultural study is to assess potential impacts to cultural practices, as a result of the proposed Project, in the Pālā'au Ahupua'a. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- General history and present and past land use of the Project area.
- Knowledge of cultural sites which may be impacted by future decommissioning of the Project area, for example, historic, archaeological, and burial sites.

- Knowledge of traditional gathering practices in the Project area, both past and ongoing.
- Cultural associations of the Project area, such as legends and traditional uses.
- Referrals of *kūpuna* or elders and *kama'āina* who might be willing to share their cultural knowledge of the Project area and the surrounding *ahupua'a* lands.
- Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the Project area.

In most cases, individuals, organizations, and agencies apposite to the CIA were contacted following the mailing of initial contact letters via follow-up e-mails or phone calls to encourage participation. All community consultation efforts and results are summarized in Table 4. Consultation responses and review letters from government agencies, such as DLNR/SHPD and OHA, are included in Figure 17 and Figure 18, respectively. Results of talk-story interviews, specifically relating to Pālā'au Ahupua'a and its vicinity, are presented in Section 7.

Table 4. Community Contacts and Consultation Effort

Name	Affiliation, Background	Comments
Akutagawa, Malia	Chair, MIBC	The initial contact letter was mailed on 02/03/2010. A follow-up e-mail was sent on 03/19/2010. Ms. Akutagawa responded on 03/31/2010 recommending the following people: Vanda Hanakahi, Billy Akutagawa, Kekama Helm, and Miki'ala Pescaia. Billy Akutagawa and Kekama Helm were not contacted due to time constraints.
Ayau, Halealoha	Hui Mālama i Nā Kūpuna O Hawai'i Nei	The initial contact letter was e-mailed on 01/15/2010. Mr. Ayau responded on 01/15/2010 recommending his sister, Miki'ala Pescaia. CSH contacted Mrs. Pescaia via telephone and set up an interview for 01/25/2010. See Section 7 for the complete interview transcript.
Bush, Douglas	Maintenance Staff, Vandenburg Receiver Station	Mr. Bush gave CSH staff a tour of the Project area on 01/25/2010 at which he was provided a copy of the initial contact letter. Mr. Bush was interviewed on 01/25/2010 while touring the premises. See Section 7 for the complete interview transcript.
Cayan, Phyllis "Coochie"	Chief, History and Culture Branch, SHPD	The initial contact letter was mailed on 02/03/2010. CSH received a formal letter from SHPD on 03/01/2010 stating that, "the development of that base there may not be a high risk for any impact on burials, cultural resources or any current traditional cultural practices there." Refer to the SHPD letter below (see Figure 17). Other potential study participants were also recommended. They included the following: Collette Machado and her OHA staff on Moloka'i, DHHL, public librarians at the Moloka'i Public Library, Rachel Snookie Maikui, Malia Akutagawa, Dr. Emmett Aluli, Walter Ritte, and Halona Kaopuiki.
Cacoulidis, Edwina	President, Ho'olehua Hawaiian Civic Club, the Hawaiian Civic Club of Moloka'i	The initial contact letter was mailed on 02/03/2010. No response was received after which no follow-up contact was made.

Name	Affiliation, Background	Comments
Hanakahi, Vanda	Chair, 'Aha Kiolo	The initial contact letter was mailed on 02/03/2010. No response was received. Mrs. Hanakahi was recommended by Mr. Ritte, as well as Mrs. Pescaia as a <i>kumu</i> (teacher) with knowledge of <i>mo'olelo</i> on the Project area. A follow-up e-mail was sent on 03/19/2010. However, the e-mail was returned indicating that Mrs. Hanakahi's mailbox was full. CSH made no further attempts to contact her.
Kaopuiki, Clarence Halona	Native Hawaiian Practitioner, Moloka'i resident and <i>kama'āina</i> , OHA staff	CSH staff met with Mr. Kaopuiki at OHA in Moloka'i on 01/22/2010 at which time he was provided a copy of the initial contact letter. He was interviewed the same day. See Section 7 for complete interview transcript.
Mawae, Keli'ipio	Honorary Mayor of Moloka'i	The initial contact letter was mailed on 02/03/2010. No response was received. CSH made no further attempts to contact him due to lack of alternative contact information.
McGregor, Davianna	Professor of Ethnic Studies at the University of Hawai'i at Mānoa	The initial contact letter was e-mailed on 01/14/2010. Mrs. McGregor responded on 01/21/2010 recommending the following potential participants: Walter Mendez, Larry Helm, Adolf Helm, and Mr. Poepoe. Mrs. McGregor contacted CSH on 01/29/2010 expressing interest in commenting on the Project because she lives near the Project area. Mrs. McGregor contacted CSH on 02/04/2010 with more potential participants: Adolph Helm, Kanohowailuku Helm, Stacy Helm Crivello, and Emmett Aluli.
Mendes, Walter	Ho'olehua resident and <i>kama'āina</i>	The initial contact letter was mailed on 02/03/2010. No response was received after which CSH made no further attempts to contact Mr. Mendez.
Nāmu'o, Clyde	Administrator, OHA	The initial contact letter was mailed on 02/03/2010. A follow-up e-mail was sent on 03/19/2010. A response letter was sent by OHA (see Figure 18) on 03/22/2010 commending CSH for consulting with Mr. Halona Kaopuiki, also an OHA employee. OHA also recommended Mr. Mac Poepoe.

Name	Affiliation, Background	Comments
		The letter encouraged contacting the DHHL Moloka'i Land Agent to discuss the proposed Project as OHA hopes that usable structures, utilities, and parcel can be returned in a safe state and to avoid needless demolition and destruction.
Pescaia, Miki'ala	Vice President, Molokai Planning Commission; Pālā'au resident	CSH staff contacted Mrs. Pescaia via telephone on 01/25/2010. CSH met with Mrs. Pescaia at her work place at the Maui Community College and provided her with the initial contact letter on the proposed project. Mrs. Pescaia was interviewed that same day. See Section 7 for the complete interview transcript.
Kelson (Mac) Kapule Poepoe	Caretaker, Mo'omomi Preserve; Pālā'au resident	CSH called Mr. Poepoe on 01/24/2010 and scheduled an interview with him for the next day. CSH met with Mr. Poepoe at his home in Pālā'au on 01/25/2010 where he was provided with the initial contact letter. Mr. Poepoe was interviewed that same day. See Section 7 for the complete interview transcript.
Ritte, Walter	Ho'olehua resident, Keawanui Fishpond coordinator	CSH contacted Mr. Ritte via telephone on 01/15/2010 to schedule an interview. CSH met with Mr. Ritte on Moloka'i on 01/25/2010 and provided him with the initial contact letter for the proposed Project. Mr. Ritte was interviewed on the same day. See Section 7 for the complete interview transcript. Mr. Ritte also recommended Miki'ala Pescaia, Walter Mendez, Vanda Hanakahi, Keli'ipio Mawae as potential participants. All four people were contacted for their participation.
Harmonee Williams	President, Markline Inc.(Environmental planning firm based in Moloka'i)	Miss Williams was contacted on 01/15/2010 and informed of the proposed Project. Miss Williams offered CSH staff her home for accommodation on Moloka'i and provided unprecedented support to CSH staff during their time in Moloka'i.



LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
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KAROO LAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

March 1, 2010

LOG NO: 2010.0405
DOC NO: 1003PC001

TO: Ms. Angela Fa'anunu, MSPH, Cultural Research Specialist
Cultural Surveys Hawaii Inc.
P.O. Box 1114, Kailua, Hawaii 96734

FROM: Phyllis Coochie Cayan, History and Culture Branch Chief
P. Coochie Cayan

SUBJECT: **PALA'AU2: A Cultural Impact Assessment (CIA) for the Vandenberg Air Force Base Project, Pala'au Ahupua'a, Island of Moloka'i.**
TMK: (2) 5-2-006:063.

Mahalo for the opportunity to review the above cultural impact assessment (CIA) for the proposed transfer of all land on TMK(2) 5-2-006:063, which consists of 363.673 acres in the decommissioning and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed on that land by the U.S. Air Force (USAF), to the State's Department of Hawaiian Homelands (DHHL). A review of the maps you attached and with having a general knowledge of the area seem to indicate that with the development of that base there may not be a high risk for any impact on burials, cultural resources or any current traditional cultural practices there.

However, the best source is the people of Moloka'i who are knowledgeable with that land area prior to the military use. Here are some referrals that may be helpful in locating old time families or their descendants who may have more oral history of the general area:

- The Office of Hawaiian Affairs, Molokai Office or Trustee Machado and her staff.
- The Department of Hawaiian Homelands, Molokai Office.
- The public librarians at the Molokai Public Library for oral history or works by the late Kumu Hula John Kaimikaua who did extensive preservation of the Molokai chants and hula.
- Aunty Rachel Snookie Maikui can be reached at the only bookstore in Kaunakakai (see Terri).
- Ms. Malia Akutagawa at the Molokai Community College.
- Dr. Emmett Aluli at the Molokai Clinic, Kaunakakai
- Walter Ritte, long-time community activist (no contact number)
- Mr. Halona Kaopuiki, community activist currently employed at OHA Molokai office.

Another suggestion for your research and outreach is to advertise in the local Molokai papers for folks who may be willing to share their recollections of traditional cultural practices in this area.

Any questions, please contact me directly at 808-692-8015 or via Phyllis.L.Cayan@hawaii.gov.

cc: Hinano Rodrigues, SHPD Cultural Historian (Maui)

Figure 17. March 1, 2010 response from DLNR/SHPD

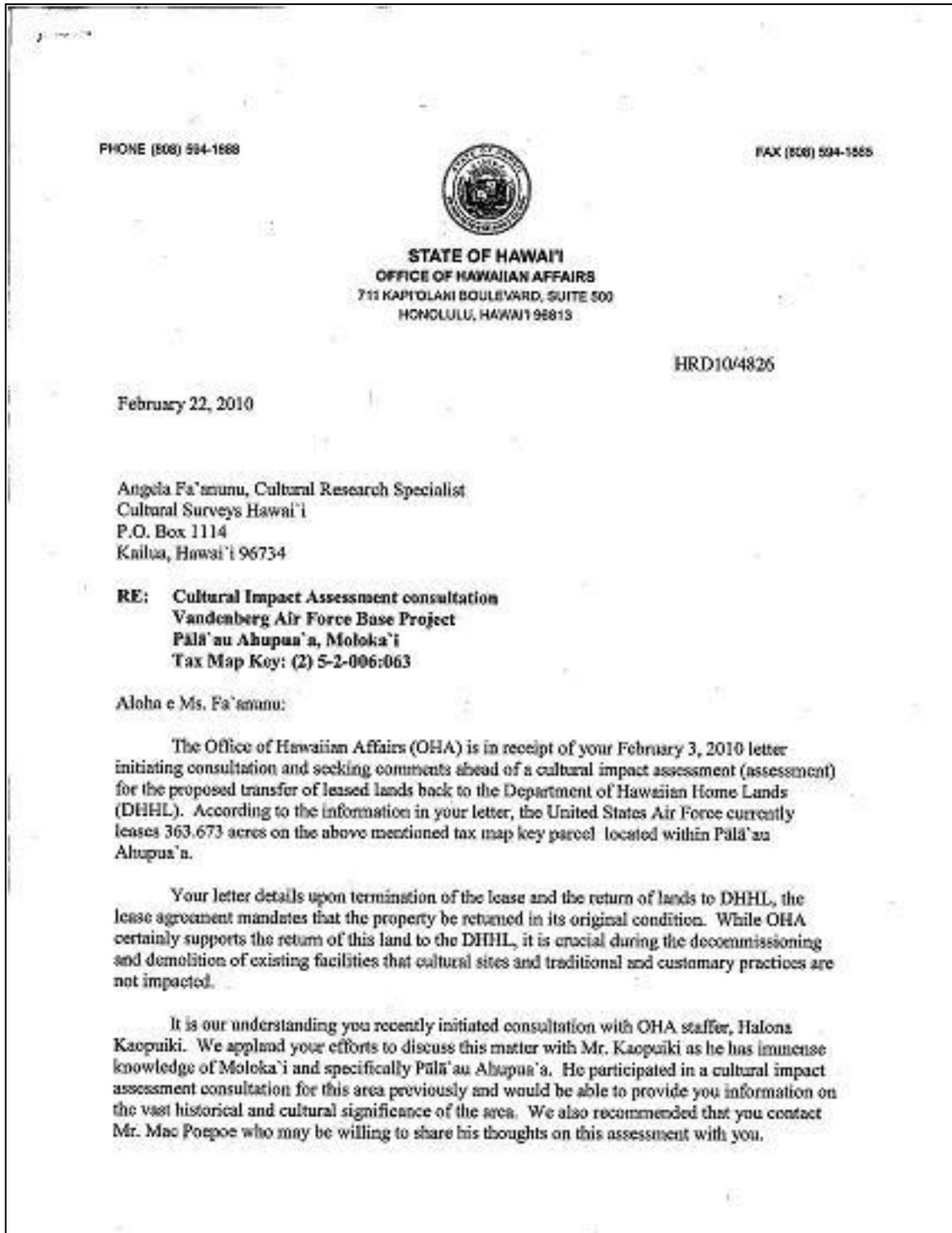


Figure 18. OHA response on February 24, 2010.

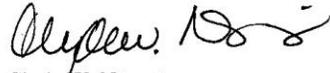
Angela Fa'anunu, Cultural Research Specialist
Cultural Surveys Hawai'i
February 24, 2010
Page 2 of 2

Mr. Poepoe's lineage is from Pālā'au Ahupua'a and he may share with you mo'olelo associated with this area, cultural and traditional practices, location of burials, heiau location, and other significant cultural sites.

OHA also strongly recommends you contact the DHHL Moloka'i Land Agent to discuss this assessment. While the future plans for this parcel are unclear to OHA at this time, it is our hope that usable structures and utilities can be returned with the parcel in a condition which poses no environmental or health threats in order to avoid needless demolition and/or destruction.

Thank you for initiating consultation at this early stage and we look forward to the opportunity to review the completed assessment. Should you have any questions, please contact Kathy Keala at 594-1848 or kathyk@oha.org.

'O wau iho nō me ka 'oia'i'o,



Clyde W. Nāmu'o
Chief Executive Officer

C: OHA- Moloka'i Community Resource Coordinator

Section 7 Summaries of Kama'āina "Talk Story" Interviews

7.1 Talk Story Interviews

Kama'āina and *kūpuna* with knowledge of the Pālā'au Ahupua'a and the area within the vicinity of the proposed Project participated in "talk-story" sessions for this CIA. The CSH approach to cultural impact studies affords community contacts an opportunity to review transcriptions and/or interview notes and to make any corrections, deletions, or additions to the substance of their testimony.

CSH employs snowball sampling, an informed consent process, and semi-structured interviews (Bernard 2006). CSH contacted fifteen individuals for this CIA (see Table 4); eleven individuals responded of which five participated in formal interviews. To assist in discussions of natural and cultural resources and any cultural practices specific to the Project area, CSH initiated the interview sessions with questions from broad categories: Cultural Practices, Natural Resources, Burials, and Historic Properties. Presented below are salient themes and concerns that emerged from participants' interview sessions about the proposed Project area.

7.2 Acknowledgements

The authors and researchers of this CIA extend our deep appreciation to everyone who took time to speak and share their *mana'o* with CSH in talk story interviews and in brief phone, post, or e-mail consultations noted in Table 4; including contacts who opted not to contribute to the current CIA, but nevertheless spent time explaining their position on the proposed Projects. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and not in any way altered, and that report preparers obtain the express written consent of the interviewees.

7.3 Kelson Kapule (Mac) Poepoe

CSH interviewed Kelson Kapule (Mac) Poepoe, hereafter referred to as Mr. Poepoe, on 1/25/2010, at his home residence located almost immediately adjacent to and south of the Project area. His home is among the few houses on the Ho'olehua-Pālā'au Hawaiian Homestead closest to the Project area. Mr. Poepoe was born in 1949 on his home residence in Pālā'au where he was also raised. His mother was from Moloka'i and his father was from Maui. Mr. Poepoe described his genealogical ties to the land and shared his *mana'o* from a lifetime experience of living in the immediate vicinity of the Project area. Mr. Poepoe is probably one of the most knowledgeable Moloka'i residents with information pertaining to the Project area.

Mr. Poepoe described his ancestral ties to the land near the Project area:

My mom was from Moloka'i and my dad came from Maui when the homestead program first started. My great great grandfather was the original occupant...not of this land but just down the road. My dad came over as a young boy with his mom and his grandfather. My dad was twelve years old when he came and was pretty much raised over here. He stayed here all his life so the roots [here are] pretty strong.

This homestead was given to me. When my parents died, I had my whole family over here. My brothers and sisters-all fifteen of us. That's why I built this house. If they like come home, I want them to come anytime. All the kids and the grandkids. I have five children-two girls and three boys. They're all on this island. They're just like me. They all went away to school but came home. They never liked leaving.

Mr. Poepoe spoke of his feelings for the land he grew up on. His words revealed a deep affection for his homeland and for the island of Moloka'i in general. His descriptions of the Moloka'i lifestyle was one filled with pride and of his appreciation of a lifestyle deeply rooted in Hawaiian culture and connected to the natural environment. Mr. Poepoe stated:

It's not an easy island to live on but once you develop that comfort, it's hard to leave because you can't find that anywhere else. It's hard to leave this place. There's a satisfaction over here, a certain amount of freedom. It's a good place to raise kids. To give them the best of both worlds. I keep telling all the young generation, "You guys are all going to move off for all the excitement, to Maui, but when you guys get tired of that, you guys can come back and relax. The other guys cannot. They have to endure that [hussle and bussle] for the rest of their lives." That's the advantage that we have over here for our kids. They can always come back.

A lot of people when they come here, they say, "Oh, you guys have nothing, yeah?"... but that's the way we like it. If you want action, you can go to Honolulu for one or two days and then come home. We're happy. This [Moloka'i lifestyle] is what we choose. Everybody tries to encroach. They want to come and bring their development ideas with them. They think that because this has open space, they can just move in. No. We took notes all these years and they actually swept us under the rock, all this time. They never paid attention to us. We struggled. It was a lesson to all of us.

We never had money all our lives, why would we need money now? What do you need money for? We realized that if we could survive, we don't need anybody else. We got everything that we need, right here, and it's more important than money. Our way of thinking and way of being is extreme. We adapt and we don't need to relearn [the culture like most of the other islands] because we're pretty much living the same way our people lived for a long time. We try our best to keep the culture strong because there are plenty of pieces missing because our people never paid attention. They let them [cultural things] go. When all our old people *make* [die] then they realize, "Oh, whose going teach us this stuff now?"

Mr. Poepoe's close connection to the natural environment and his concern for the well-being of the resources, as well as his dedication to the perpetuation of the traditional Hawaiian way of life, is reflected through his work. Mr. Poepoe is the caretaker of Hui Mālama o Mo'omomi, a community-based organization that he and fellow residents formed in 1993 to promote sustainable fishing and gathering practices based on traditional resource management principles. Mr. Poepoe spoke about his work which reflected a value system rooted in Hawaiian culture and a dependence on natural resources:

We manage this place from Kalaupapa all the way down to 'Īlio Point. It's about twelve miles. That's all our fishing grounds. That side of the island is part of the *ahupua'a* of Kaluako'i. I teach people how to manage our resources from a community-based approach. I was one of the first people to do that here in Hawai'i, in more modern times. Everybody was just for themselves-busy making money and not realizing through what they were doing, they were depleting the resources. Because you're never satisfied. The more you make money, the more you need and the more you're going to abuse the resources. It's never ending. The cycle never stops.

I was doing that since the early nineties. I retired and I thought I was going to kick back but cannot. All the young boys that I trained, they got their own families. They got jobs to make a life for themselves so I don't know when they're going to come back and take over. I hope they don't wait until it's too late. I always make that a point. You know, a lot of people like to fix things after it's damaged. That's not the way. For us guys, we want to prevent that from happening and that's what I do. But I say, "You know, in order to maintain what we have it'll take a lot of work." Not everybody think like me. A lot of people have their own ideas of how they see things and even if it doesn't work they're hard headed.

I was brought up this way by my family. My father and all his uncles, they're all fishermen. They depended on that because when they came here, they didn't have anything on this land. It was bare so they had to go to the beach and survive before they could harvest anything from the crops. They brought all these seeds with them when they came over here from Maui. Whatever they farmed, they couldn't eat right away. They had to wait. In the meantime, they'd go down to the ocean and that's what fed them mostly.

I was brought up in that. When I was old enough, I had to go. I had no choice. It's part of what you have to do. As a young boy, you had to contribute. We never had jobs. Our jobs were at home. We never had much money. Actually I don't think we had any money at all, but we had plenty of food. We knew how to survive. Everything we did required work. Nothing came on a silver platter. We had to work for everything. I farmed this whole place.

I wasn't allowed to speak when I was learning all this fishing stuff. You're not allowed to speak. You had to look and watch. Pay attention. If you made noise, you'd get one whack. The old people believe that when you're talking, you're not paying attention yeah?

Mr. Poepoe spoke of the resource management strategies used by the Hui Mālama o Mo'omomi which are based on traditional management practices, such as the use of the moon calendar and spawning cycle of certain fish and of community shame, as management tools. According to Mr. Poepoe:

We manage this place from Kalaupapa all the way down to 'Īlio Point. It's about twelve miles. That's all our fishing grounds. That side of the island is part of the *ahupua'a* of Kaluako'i. I teach people how to manage our resources from a

community-based approach.... The way we manage down here is pretty much the traditional way but like I say, we have to adapt sometimes. We have to adapt to some of the equipment we use because a lot of people are not going to go to the coconut tree and get the fiber and roll them into cord. I mean, that's never going to happen! So, we use modern equipment and materials to do our fishing. But one thing I stress is not to go overboard. It's really simple for people to know that fish spawn at certain times so you leave them alone during that time... We use the moon calendar to educate people about the spawning cycle of specific fish so that they don't fish during this time. We have a lot of people who have a hard time with that one. It's like quitting smoking, yeah? People smoke all their lives and when they get unhealthy then they want to stop but it's too late.

If people adopt these ways, we can move on to the next step. I think people in my community, right here, they're ready for the next step right now. We have people who abuse the resources but the younger generation, they're aware of all that and oh man, they like to fight. They want to beat the guys up who abuse the resources. I say to them, "No no no. Never do that. You know why? Because one day, it might be your own family! So don't do that. Don't point your finger that hard at people. Give them the same opportunity to recover themselves from the bad stuff that they do. No." So we give everybody that chance. If you live with us, be *pono* [goodness, correct, right]. We'll end up the only ones in this whole state of Hawai'i with fish. Everybody else has to go way out for thousands of miles to go catch fish.

In our system, shame is more punishing than jail. Yeah. Jail is only one temporary thing but with shame, everybody looks at you. When the subject pops up and the person is there they think, "Oh wow, they're talking about me." If you don't want shame for your family then just be *pono*. That's what I believe in.

The poor people living down the beach. They don't even know how to survive. They're totally lost. I don't like to see that kind of stuff over here. There's no reason for anybody on this island to be homeless with all this land we have, all the resources we have, and hopefully all the knowledge that we're all going to have. I see it as my goal in life now to see that people regain that knowledge. But people must be willing to do that. That's what it was like in the old days. You stay in your *ahupua'a* and take care of your place. If you take care of your place you don't need to go to someone else's place. That's the reason why people go to other places because they don't take care of their own place.

That's what this whole thing is about. It's about understanding. The simple reason is because we get more fish if we do all of this and we need a lot of fish to repopulate.

Regarding previous use of the land in and around the Project area, Mr. Poepoe described two major land uses in the immediate vicinity of the Project area. He recalled that the land was used regularly as ranch lands by the DHHL along with the cultivation of pineapple between the 1950s and 1975. He explained:

This place used to be all pineapple. There was pineapple on all this land but when it phased out, I came in and farmed this land. Before pineapple, there was nothing here. They used it to range cattle. This whole place used to be all cattle-the whole West End. It was owned by the Molokai Ranch. They would drive the cattle from the West side all the way up to their headquarters in Kalae. They used to drive their cattle all across the plain from the West side to up there. They used to stop over here so their cattle could drink. You see that big water tank over there, and several more on that side over there? They'd bring their herd and at night they'd stop over here for their cattle to drink water just like you see on T.V. They'd wake up in the morning and drive them up. It used to take weeks. They'd drive the cattle around to feed and then they'd finish them off [slaughter] when they'd reach Kalae because they had nice green grass over there.

The pineapple came in around the 1950s to 1975 when they phased out. In the beginning, they called it Pac Pine. I guess it was Pacific Pine and Company and then they had Libby McNeal and Del Monte. They were stealing water from the Hawaiians. They were using our water. The Ranch had surface water they'd bring down from the mountains so they had their own well but the well never supplied water for them so a lot of times they were using our water. The water for the Hawaiians came from the central aquifer. All that time, the Ranch didn't pay for anything.

When asked about cultural practices in the area, Mr. Poepoe responded that the shoreline *makai* of the Project area is utilized for fishing and for picking 'opihī.

We go diving, pick 'opihī. We dive mostly for fish. People still go diving but some of the species are getting wiped out. Fish like the 'uhu and the kole because those are among the targeted species that everybody likes to get. When I teach people, I teach them to eat any kind of fish. People consider *palani* a junk fish, yeah? But I cut it up, take off the skin, cook it, and that thing tastes like *mahimahi*. That's what people should do, yeah? Train themselves to eat any type of fish and not just certain species.

My dad always expected me to excel in the traditional stuff. I'm glad I had the opportunity to take him fishing in his old age to show him what I do. He was happy. Before he died, he had a tracheotomy so he couldn't talk. He'd try to make sounds and tell me where to go and I'd look at him and say, "Remember, no talk. Be quiet. You're the bad boy now. You follow me." That was funny but he was so excited. I'd throw my net and catch some fish and he'd crawl on the rocks to help me. He was old. Seventy-four I think. He could hardly walk on the rocks but he followed me that time. It was a long distance. I could see all that stuff coming back to him. He stayed with me all the way until dark.

That's what make these old people happy. They used to ask me, every time they'd see me, "How's the fish?" Even today, all the old people, the same way. They ask me, "How's the fish down there? How's the fish?" I'd say, "No worry, as long as I'm alive."

Mr. Poepoe described how he prepares the fish that he catches:

All fish can taste *'ono* if you know how to make them. I prepare them all kinds of different ways. Really, I like to eat them raw, but fish like *palani*, I like fry them. I soak them in teriyaki sauce and fry them. It becomes like butter fish. You gotta know how to make them.

He also reported that the Project area is used as an access point to the cliffs where people go fishing and *'opihi*-picking. He spoke of several access trails along and near the property:

This place [the Project area] is pretty much open-access but a lot of people don't really go down there [to the receiver station] because there's a road, a trail, that goes down to the *pali*, too [Figure 19]. When they built the receiver station in there, people stopped going through that area. The main trail is on the [eastern] edge over here. There's a couple of trails, about four of them. All the trails are the access points to the ocean because it's all cliff. You have to climb down to get to the ocean. We did that from when I was young.



Figure 19. Access trail to the *pali*

Mr. Poepoe also described the Project area as a good hunting place for deer and goat. While he doesn't hunt anymore, Mr. Poepoe stated that he exchanges fish that he catches for deer meat from hunters. According to Mr. Poepoe:

This whole place is good hunting. There's deer all in here. Right now, there plenty of deer. Deer are more free range but if I hear shooting in here, I go scold

them [hunters]. You can also go down towards Mo'omomi side and hunt there where there's no people. I don't hunt anymore. I love deer meat so sometimes when they [other hunters] need fish, I trade them. In this area, hunting happens mostly on the backside of the cliffs. People don't hunt inside there [in the Project area] because of the building down there and antennas. But, they hunt near the cliffs though. The goats come up once in awhile and sometimes there's deer.

With regards to plant gathering practices in and near the Project area, Mr. Poepoe stated that a variety of native plants grow particularly along the coast. Mr. Poepoe shared the following local knowledge on plants in the area:

People mostly go down there gathering for *lei*[s] but not too much. Some of the plants they use for medicine. That's not really my area but I know some of the plants. People come and ask me if they can go pick and I show them where to pick. I know there's protocol for how they do all that but I don't know that kind stuff. My mom used to make the medicine but I never was taught that. My grandma was a *kahuna* (priest, sorcerer, expert in any profession). She treated me my whole life until she died. I never went to the doctor.

Native plants are mostly along the coast. There's not too much as you go further in-land. There, it's all invasive. The only native plant that's left inland is the *pili* grass. I watch the patch over here. Every year, it gets smaller and smaller. I remember my grandmother used to collect *pili* grass over here and they'd use it to make the *hale* in the field. The guinea grass, that grass that you see over there, is an invasive species that's taking over. But the *pili* grass still grows. Right down here, there's patches here and there. People used to collect it to cover their melons and fruits to protect them from the flies. Sometimes they also put *pili* grass under the fruit to keep them off the ground.

There's a native plant called *tetramelopeum*. There's no Hawaiian name but that one grows more on the Mo'omomi side. There's plenty of *'ilima*. *'Ilima papa*. The one that grow inside there grows high and more bushy. That one and the smaller one are the same species. The smaller one just grows flat because of the wind. There's also *pa'u o hi'iaka*, *nehe*, *nama*, *'ena'ena*, *'alena*, *mau'u 'aki'aki*, *'ohai*, and *'akoko*. There's two types of *'akoko*. There's also *nohu* and there's plenty of that. Many plants down here all came back after they took all the cattle out.

We also have plenty of *akia* right here. That's one of the dominant plants I know around here. *Akia* is one of the plants that they used to catch fish in the tidal pool areas-more shallow areas. It's got a funny smell too. They'd pound and mash it up and the juice from that is like a toxin. It doesn't kill the fish. It just stuns them for a little while. The fish float up to the surface of the water and you just go pick them up before they come back alive.

There's a plant that grows no place else but here. You know, we had one plant down in Mo'omomi, it was the *wiliwili*, the golden one. I can't remember the plant's name. It's a bean. The flies always come and attack them and that plant

always dies. We used to grow it as a windbreaker. But that bean, we also use it for making *lei*[s]. I can't remember the name. Anyway, the plant is pretty common.

We had one tree, the golden one, down here. Everybody was cutting the tree for cuttings to plant. I guess somebody cut them with the wrong knife or the wrong timing and the plant died. The only tree. I found four types of plants that grow only down here in this area. For two of them, there's only one plant surviving. One grows way down the *pali* by the water. That one and the other one was that tree. It's not living anymore. It's gone.

Regarding the presence of *heiau* and objects of cultural significance near the Project area, Mr. Kaopuiki stated:

There's a *heiau* located way down [between the Project area and Mo'omomi]. That place is not on this map. It's still in the same *ahupua'a*. It's the only *heiau* in the whole West End. The West End has no *heiau*. They have *hula* platforms, *ko'a*, house sites, but no *heiau*. I don't know why they made it back there because it's not one pretty place. It's kind of rough with a lot of rocks. Back then, maybe it used to be a sandy beach but you go back there today, it's not one real inviting place. What I've found out during my time fishing is that the place is rich in fish. There's plenty of fish over there. That's probably the reason [why the *heiau* was built.]

In addition to the *heiau*, Mr. Poepoe reported that little villages, indicating areas of habitation, existed along the *pali* particularly in areas where trails were located, *makai* (seaward) of the Project area. Mr. Poepoe also suggested that more permanent settlement occurred more towards the Mo'omomi side. He reported:

I know that there were villages all along the *pali* and all the places that have trails where you can go down. There were little villages all along those trails. These lands had occupation. Some villages were temporary. I was part of a group who did an excavation study with some archaeologists and we found that people were here before contact-way way back. Some of the artifacts came from Marquases, some came from Tahiti. That was probably during warring times.

Most of the people that stayed for longer periods were concentrated more towards the Mo'omomi side and the sand dunes. They probably stayed and never left. There's a water source back here. On one of the trails that goes down the *pali*, water used to drip out of the rocks. Still today, still drip. That's the only water source that I can see over here, other than that, you have to go *mauka* (mountain-side) this side towards Kalaupapa, to get water.

7.4 Douglas Bush

CSH interviewed Mr. Douglas Bush, hereafter referred to as Mr. Bush, on 01/22/2010 at the Project area. Mr. Bush is originally from Mana'e, on the East end of Moloka'i, but he has connections to and experience with the Project area through his work and family ties for many years. Since 1981, Mr. Bush worked as a technician and maintenance staff at the Vandenburg USAF receiver station; therefore, he has traversed the premises of the Project area on a daily

basis. However, his connection to the place dates further back to his father, who had also worked at the receiver station prior to 1981. Today, Mr. Bush is the only employee who works at the station. His experience and responsibilities with his work have afforded him intimate knowledge of the Project area.

Mr. Bush was born and raised in Moloka'i and describes himself as a typical "mix plate" with Native-Hawaiian, Portuguese, and Korean ancestry. He did not grow up speaking Hawaiian although commented on the value of the language and respect for those with grasp of the native tongue. He continues to be an avid hunter since childhood and supplements his family's subsistence with catch from his hunting mostly been deer and goat. His life experience as a hunter, as well as and growing up in rural Moloka'i, has provided him familiarity with the island's terrain and an appreciation for the natural environment.

Mr. Bush gave CSH staff a personal tour of the Project area where his familiarity with the landscape of the Project area became evident. He was familiar with the plants, rock formations, trails, and ravines on the Project area. During the tour, CSH staff photographically documented several features of the Project area as shown in Figures 20 to 29. He shared his knowledge of the place and spoke of the historical uses and changes he had witnessed within the Project area over the last thirty years.

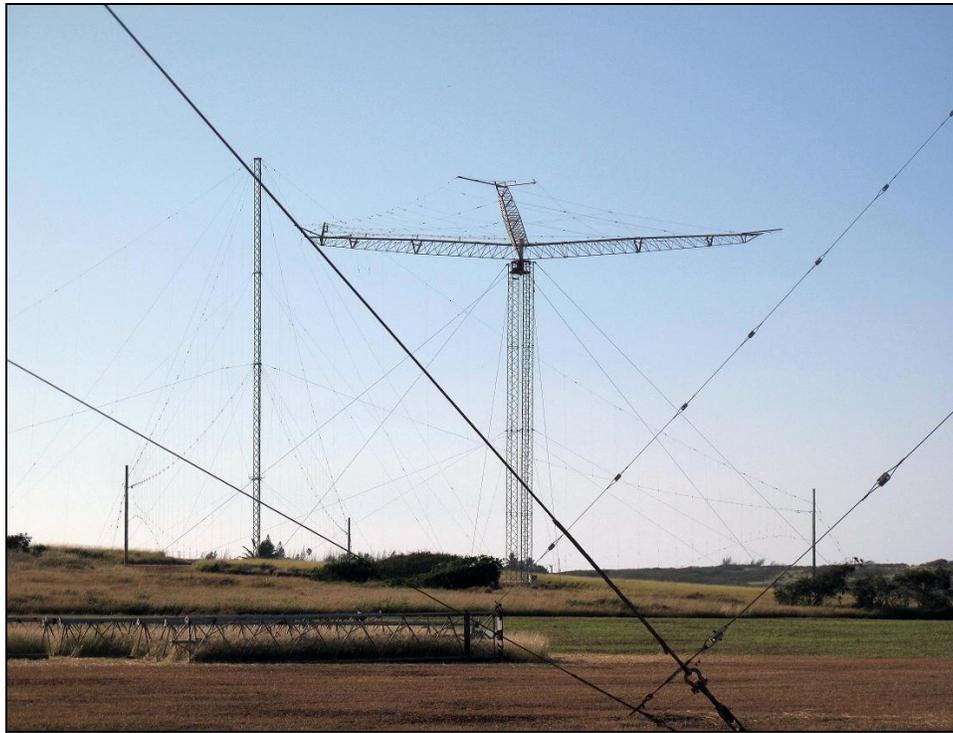


Figure 20. Antennas on the premises of the Project area (Source: Angela Fa'anunu)

Mr. Bush reported that the land on which the Project area is located was originally leased by the Federal Aviation Administration (FAA) from the Department of Hawaiian Homelands (DHHL) around 1962. The lease was taken over by the U.S. Air Force around 1979 or 1980.



Figure 21. Antennae structures on the Project area (Source: Angela Fa'anunu)



Figure 22. Metal structures on the Project area (Source: Angela Fa'anunu)



Figure 23. Cables from antennas going underground (Source: Angela Fa'anunu)



Figure 24. Underground cables on the Project property (Source: Angela Fa'anunu)



Figure 25. Underground structures (Source: Source: Angela Fa'anunu)



Figure 26. Cable-collecting structure (Source: Angela Fa'anunu)



Figure 27. Cement structure on the property (Source: Angela Fa'anunu)



Figure 28. Miscellaneous objects throughout the Project area (Source: Angela Fa'anunu)



Figure 29. Post in the Project area (Source: Angela Fa'anunu)

Mr. Bush claims that prior to 1962, the Project area and its immediate vicinity were originally used for pineapple cultivation. He states:

All this whole area had pineapple before. Dole, Delmonte, and possibly Libby. I'm not sure if Libby was here but this was all pineapple. When that phased out, the property was divided up and leased out to homesteaders. So all this is homestead property.

Mr. Bush also stated that the region extending out towards Ho'olehua, and not necessarily including the Project area, was famous for *'uala* and dryland taro cultivation. He pointed out that the area still continues to be well-known for *'uala*, particularly along Farrington road. While the land in and around Ho'olehua was known mostly for farming, he explained that cattle ranching was also practiced in the area but to a lesser extent.

7.5 Walter Ritte Jr.

CSH interviewed Walter Ritte, Jr. on 01/25/2010. He was born in 1945 to Anne Hi'iaka'ikapoliopole Purdy and Walter Ritte, Sr. Though he was born in Maui, Mr. Ritte grew up in Moloka'i and currently lives in Ho'olehua, the *ahupua'a* immediately east of the Project area. He attended Kaunakakai Elementary School then moved to O'ahu to study at Kamehameha High School from seventh to twelfth grade. He attended the University of Hawai'i at Mānoa for three years. Mr. Ritte has five siblings, four children, and twelve grandchildren.

Mr. Ritte is a hunter and Hawaiian activist, and he is heavily involved in the restoration of traditional fishponds and education programs that are rooted in Hawaiian culture. Although his grandparents spoke Hawaiian, Mr. Ritte nor his parents spoke the language. He is perhaps most known for being one of the Kaho'olawe Nine, the original people who made the first protest-landing on Kaho'olawe on January 4, 1976, to stop the bombing of the island by the U.S. Navy.

Mr. Ritte shared with CSH stories that reflected not only his historical background but that of Hawai'i. The following is an excerpt from his recollections:

They [the U.S. Navy] were killing an island [Kaho'olawe] and that was the whole essence of everything. The timing was such that, Hawaiians were being squashed down to become Americans, to the point where Hawaiians were almost gone-where Hawaiians became Americanized. They didn't have a clue who they were. So the timing was right. We started saying, "Hawaiian, Hawaiian, Hawaiian, Hawaiian." Kept saying, "Hawaiian." The military kept putting their mighty power on us-arresting us, threatening us. We got taken to court but it was our stubbornness that allowed all this friction to happen. At first, nobody listened because we looked like hippies, yeah? We had long hair and *ti* [plant]-leaf bands. We had no money so we looked really ragged and it was the perfect David and Goliath sort of press. They'd never heard of Hawaiians speaking up before so we became a hot story for the press. TV became a big thing and we became the darlings of the television. They just crucified the military. That was the key. When we were on the island, the judge, the Supreme Court Judge was telling us, "Don't you go back on that island." We went back and they're like, "Oh, now they're going to jail." So it became more and more intense. We actually spent six

months in jail for trespassing ... the maximum sentence. They sent us to high security jail with all the killers. But the more they did it, the more it became a good story for the press so they were actually doing it against themselves. All we were doing was take the hits. We were still standing. As long as we kept standing, they were gonna lose. The politicians were siding with the military so we were fighting politicians, too. National security. They said we were jeopardizing national security. But we kept standing and the Hawaiians were coming. They kept coming to support us and that was the part that was interesting. The timing was such that Hawaiians were realizing, what are they talking about? What is this? And music. Hawaiians were really getting into their music. The music guys all supported us. We would have concerts and thousands of people came to our concerts and we'd just go.

Mr. Ritte shared with CSH his knowledge of Pālā'au Ahupua'a and the surrounding area. According to Mr. Ritte, the West side of Moloka'i had the best fishing while the eastern side was known for taro cultivation. Exchanging fish and taro happened frequently along trails between these regions. He described the Project area as one of the areas that these trails traveled through:

The best fishing grounds is on the west side of Moloka'i. The problem with the west side is not enough water for planting taro. All the taro was grown on the North Shore. These guys would bring the *poi* and *pa'i'ai*, up through Kalaupapa and bring them to trade with the fishermen from this side for dried fish and seafood. This is the area that they used to go through. That's the story that I know of about this area. I don't even know where the trail goes.

Mr. Ritte testified to the dry climate of Pālā'au and to the prevalence of sweet potato in the area. He explained that, "The only thing that was growing in this area was sweet potato. It's really dry. All of this area was sweet potato. Most dry areas were set aside for sweet potato."

When asked about cultural practices associated with the Project area, Mr. Ritte named fishing and picking *'opihi* as the major activities. According to Ritte, "The only reason why people would go down those cliffs [near the Project area] is to go fish and to pick *'opihi*." Though he is an avid hunter, Mr. Ritte admitted that he had never hunted in the area, "I never went hunting down there. The only thing that they would have down there would be goats. I don't know if there are any more goats there but we do hunt goats along the cliffs though."

Regarding historic properties within and near the Project area, Mr. Ritte stated that the area near Nā'iwa (located approximately 2.8 kilometers east of the Project area) had many historic sites. He spoke particularly of the Makahiki Grounds and of the *leina* (a jumping off point to the other world) at Nā'iwa. He stated:

Nā'iwa has a lot of historic sites. That's where the Makahiki Grounds are. There were villages up there and all the Makahiki Games were there.... According to the elders, Moloka'i was one of the last islands to give up their Makahiki celebrations. I don't know when it was stopped or what but we were the first island to actually start it up again. The Makahiki Games are the biggest event on this island. Miki'ala Pescaia is the one in charge of it. They take intermediate and high school students up to Nā'iwa to compete. It happens this weekend. Different

islands do it a little bit differently, but the season is marked by the stars. Makali'i [also known as the constellation of Pleiades] decides the season.

The leaping of the spirits is there too. That's where the spirits would go to the next world. Nā'iwa was the only jumping-off point on Moloka'i that we were told about.

Mr. Ritte shared with CSH *mo'olelo* he was familiar with near the Project area. The following are his stories:

I live on Pu'u Pe'elua which is a historic site. There's legends about it. Pu'u Pe'elua, they call it the caterpillar hill. It's a story about a princess who got visited at night by a prince but who'd disappear in the early morning. He kept her up all night and her father couldn't figure out who this visitor was. Finally her father told her to tie a *kapa* [tapa, as made from wauke bark] cloth around her before she left. The next day when they went to look, they found pieces of *kapa* cloth which led right up to the *pu'u* (hill, peak, cone). Inside, the *pu'u* was a big caterpillar. Pe'elua was the name of the caterpillar. By day he was a caterpillar, by night he was a handsome man. They burned the place and the place exploded into millions and millions of caterpillars. That is why that place has always been plagued by millions of caterpillar. When we were growing up, you'd hear the tires running over all the caterpillars. When the pineapple companies came though all the insecticides killed them. There's a similar story on the Big Island. When I was in Kā'u, they were telling me a story of their Pu'u Pe'elua. That was interesting.

When we were younger, this old man was telling us that as a farmer, he was planted corn. He had two fields—one field on the left and one on the right. Every morning, he'd get up and chant out to let the caterpillars know that the field on the left was theirs and the field on the right was his and they were not to touch his corn. He was one of the few successful farmers in that area as they only ate the field that was for them. Moloka'i was famous for being known as the "land of the powerful prayers." where the Moloka'i was known to have really powerful praying ability. The old man I knew was one of the last guys I knew who actually did it.

7.6 Clarence Halona Kaopuiki

CSH interviewed Clarence Halona Kaopuiki on 01/22/2010. Mr. Kaopuiki was born on May 4, 1956, in the *ahupua'a* of Kaluako'i, the *ahupua'a* adjacent to and west of the Project area. He is the son of Henry Kalawe of Honolulu and Shirley Ku'u lei Palakiko Aki of Maui. Mr. Kaopuiki was the first grandchild born on Moloka'i so he was brought up by his grandparents, James Naone'ala'a and Helen Kahaumelani Woodward. He was raised by his *hānai* (foster or adoptive) dad, David Moana Rawlins when he was eight years old. Mr. Kaopuiki could trace his lineage back six generations of the Kaiakea line. He stated:

My lineage goes back to the west side. I come from the Kaiakea line. Six generations of the Kaiakea line but I have *kūpuna iwi* [ancestral bones] in tombs in Hālawa Valley, on the East side—the first settlement of Hawaiian people. They

claim we came on canoes although my father told us that we never came on canoes. He said that when they created the islands of Hawai'i, they created our people and our people's name was the *mū'ai[s]*. The *mū'ai[s]*, they're what the Christians call Menehune[s].

Although Mr. Kaopuiki is from the West side of the island, he has lived and has connections throughout the island of Moloka'i. Mr. Kaopuiki spoke of his ties and connections to Pālā'au and to Moloka'i. He expressed the following:

My connection to Pālā'au is that I was born there... My *moku hānau* [birthplace], that's where I'm going when I die. I'm going back to my roots, on the West side.... I can close my eyes. I can be blind ... but I know where I am. Just by the smell of the place, I'll know where I am. That's how much I love this place. Sometimes, I get in trouble. The real estaters and developers think I'm a threat to them. In my young days I'd get in trouble. I was one full-on warrior. Now, I'm older, my mind and vision is broader. I'm not a threat. This is my island. I'm just taking care of my island. I'm very proud of my island. When I go off-island and I hear the local people talk about their places, their *ahupua'a* and the name of the places, I am just honored to hear that because I know that they're true families of that place. That's their *moku hānau*. I just know my island. Not too much about the other islands. Just my island.... I grew up the whole nine yards of the island [of Moloka'i] because my grandfather at the time was still alive and he had taro patches in Hālawa. He was a *poi* man and he used to make *poi* in an old foundation that was his *poi* shop in Hālawa Valley. He was the first one making *poi*. When the tidal waves came and demolished everything, my father and him would pick the taro and bring them to town to sell with the *poi*.... Everything that I know about Moloka'i was taught to me by my grandfather. I love Moloka'i. I'm gonna die here. I was born here and will die here.

His grandfather was pure Native Hawaiian and grandmother was half-Native Hawaiian. Although he himself spoke some Hawaiian, Mr. Kaopuiki recalled that his grandparents, including his father, used to speak Hawaiian to each other while he was growing up. He admitted that he was able to understand the language more than he could speak:

My grandparents used to talk to each other in Hawaiian when I was growing up, even my father could speak but I couldn't. Just a little bit. I was able to understand a lot but couldn't speak as well. My father spoke Hawaiian until the day he died. He raised me after my grandfather died. He taught me the ways and the *ōlelo* [language, speech].

CSH asked Mr. Kaopuiki about place names and *mo'olelo* associated with the Project area. He responded:

Pu'u ka Pele [a mound near the Project area] was named after Tutu Pele. She came from Honolulu to make her pit. Her sister followed her and threw water on this side and put out her flame so she went on to Kalaupapa. Her sister followed her because it had to do with a lover's quarrel. Tutu Pele went to Kalaupapa and the same thing happened. That's why there's a crater in Kalaupapa. She filled it

up with water then she went on to Maui and the Big Island. That's why that place is called Pu'u ka Pele.

Regarding features of cultural significance to Hawaiians in or near the Project area, Mr. Kaopuiki attested to the presence of a *heiau* and habitation sites in the immediate vicinity of the Project area. Mr. Kaopuiki also stated that there were *heiau* near Mo'omomi, further away from the Project area. He also claimed that porcelain was found on some of the house sites. In addition, a cave with old fishhooks was found down at the bottom of the *pali* (*makai* of the Project area) suggesting early presence of Hawaiians. He also pointed out that the Makahiki Grounds were located further east by Nā'iwa. He shared the following:

My knowledge [of this place] is just from doing surveys on this property. Uncle Mac [Mr. Poepoe] would have more knowledge of that *heiau* because this is his whole *ahupua'a*. This is his *kuleana*. He knows this place. There's a couple of *heiau* there.

You know the big gulch on that property? Right below the big gulch are house sites [old archaeological ruins of house sites] The archaeologists wanted to dig, excavate the home sites but I told him, "No touch. Leave them alone. Don't dig them." They'd dug down and hit slabs, big rock slabs. I told them, "Stop. Let me go check them out. Let me go talk to my uncles. Elders." They said, "Okay." So I went and told my uncle. He said that his grandmother told him when he was a boy that there are thousands of burials over there. Thousands. So I went back and told Maurice Major [of the Bishop Museum] and he stopped digging.

We found porcelain. You know, old china. It was all busted up. If you go inside the cattle guard there's a busted up house in there. Inside that property, we found old fire pits where the porcelain was. That was probably from the plantation times.

We did some work over here. The military had tanks down there and they were busting up the shoreline. Because of the military activity, we couldn't do our work on the shoreline but we found some stuff. We found a big *heiau* on the cliffs where the house sites were. You can see it if you look really good from where the house is. You can see that it's a big *heiau*. They call that place "Cables." People died over there. Hawaiians died during my uncle's time when they would go to get *'opihi*. They'd get too much *'opihi* and they'd fall off the cliff.

There's a cave down there. It's an old cave. When you're going down the trail, it's beautiful there. There's an old fire pit inside. Hawaiians must've been living there in ancient days because we found fishhooks there. We never took them.

When you go down to Mo'omomi and you keep on going, there's some more *heiau* down there. Uncle Mac and them did some work at some of the *heiau* above this side of the gully. All down here, they worked on them. But, this side of the Project area, I'm not too sure. If you go all the way up [towards Kalaupapa] there are the Makahiki Grounds. These grounds are right near Kalaupapa and east of the Project area.

Regarding his knowledge on the Makahiki Grounds and stories associated with the Makahiki Games, Mr. Kaopuiki shared the following:

My knowledge of the Makahiki was through my father. My father told me, the *ali'i*, the royal bloods, entered the games. To enter the game, your brother had to die to show that the bloodline was strong. He said that sometimes you win but you don't win which means that if you're not related to the wind Gods on Nā'iwa you might not win.

When you go to the *piko* [umbilical cord; center] stones at Nā'iwa there's a big gulch in the cliffs but it's grassy where the *piko* stones are. There are chants for the wind and of the grass of that place. The other side of the gulch is all rocky. At the end where the cliffs are, there's a big platform which was the finish line for the *hōlua*, the sled. Even though you may pass the finish line first, the *kahuna* at that platform would be chanting genealogy and if you're not related to the wind gods of Nā'iwa, the wind would pick you up and slam you on the rocky area where you could die. If you pass the finish line and you're related to the wind gods the wind would pick you up and put you on the grass where the *piko* stones are. One family built a place by there which I disagreed with because you have to go through the proper protocol of old.

That's what my father told me- that to enter, you had to kill yourself. You enter the sacrificial slabs. Now it's overgrown. There were all these slabs on this hill where a warrior brother would go to die. They'd give him one potion, poison. He could take somebody, maybe his girlfriend but somebody he loved or was close to and they'd stay there. There were smaller stones where the *kahuna* stayed. The *kahuna* would be all along that hill chanting their genealogies all night long for the relative that is dying-giving up their life.

According to Mr. Kaopuiki, *'akulele*, or legendary fireballs, are seen in the area that includes the Project area. He stated:

We used to see the *'akulele* flying-the fireball. My uncle and them used to see them over here. All in this area. That's why his grandma used to tell him when he'd go play to come home before the sun set. You see fireballs where Emmett lives-that side over there and all over here.

When asked about the likely presence of burials on or near the Project area, Mr. Kaopuiki responded:

I don't know if there are any burials in that area. That's before my time. All I know is when I went to tell my uncle about the house sites below over here, he told me that his grandma had told him that there were there thousands of burials over there. I know up at Nā'iwa, where the Makahiki Grounds are, Filipinos working in the plantations there claimed that when they were working at night, they'd see thousands of Hawaiian people. They'd see thousands of babies, adult women, men in the fields, but they were not real. They're all ghosts, by the thousands. The locals don't work at night. Even down here on the *makai* side, the

Hawaiians don't like to work at night. Some of the Filipinos, the *hanawai* [irrigation] gang, the water gang, they'd come home screaming.

CSH asked Mr. Kaopuiki about Hawaiian cultural practices associated with the Project area to which he responded:

People go fishing here but the type of fishing along this area is mostly for 'opihi and shellfish we call *pūpū*. You can go fish. Go dive. The resources here are ultimate. Uncle Mac protects them so people don't like to come on this side. They come around from 'Īlio Point and that's about it. They don't pass because they know Uncle Mac is watching them. But we have problems with the Land Trust. Now the Land Trust has monitors. This year, there were twenty eight boats from Mokia all the way down to 'Īlio and to Kawakiu Nui Bay.

Regarding plant gathering practices, Mr. Kaopuiki spoke of a rare plant near the Project area. He stated:

We have this rare plant. I don't know the name of this dryland fern. Only Moloka'i has it. Maybe Bill Garnet knows. He's the plant man of Moloka'i. The Bishop Museum wanted samples from this plant.

7.7 Miki'ala Pescaia

CSH interviewed Miki'ala Ayau Pescaia, hereafter referred to as Mrs. Pescaia, on 01/25/2010. Mrs. Pescaia was born on Moloka'i in 1975. She attended Kamehameha Schools and University of Hawaii at Mānoa in O'ahu after which she returned to live on Molokai. She works for Na Pua No'eau—The Center For Gifted and Talented Native Hawaiian Children, which provides culturally-based hands on experiences exposing kindergarten to twelfth graders to different fields and prepares them for college. She also sits on the Moloka'i Planning Commission.

Mrs. Pescaia grew up in Ho'olehua on Farrington Avenue which is near the Project area. Growing up, her father worked for the Vandenberg Receiver Station as maintenance staff. She remembers visiting her father often during her childhood at his work and proudly recalled how her father would climb the two hundred foot towers. Mrs. Pescaia shared the following memories of her father working at the Project area:

My dad worked there for several years during my childhood as a tower maintenance worker. He was a fireman as well, but got injured and retired early. He fell off those towers a couple of times, two hundred feet. He'd fall off, stand up and look around to see if anybody saw [laughs]. Nobody else wanted to climb the towers so he always had to climb the towers. He would ask his boss if we could come on to the premises [Project area] and watch him once in a while because we thought it was just a really cool thing that my dad climbed these huge towers and lugged all these tools. He did all the maintenance. We also on occasion would be allowed to go inside the building.

Mrs. Pescaia currently lives on Pu'u ka Pele Avenue which is up the road from the Project area. Therefore, Mrs. Pescaia's close association with the Project area has afforded her intimate knowledge of and familiarity with the Project area. Mrs. Pescaia shared with CSH her memories of the Project area:

I remember three structures. One was a long garage. The other I think was like a tool room with the fuel tank and generators. And the last building was the main building with all the radio equipment and facilities. That's one valuable building. It was like a bomb shelter designed to withstand anything. The walls were thick cement and soundproof. It had rooms that included a kitchen, an exercise room and a big area that could have cots and things if people needed to stay there. It had really cold air conditioning, probably for all the equipment.

I haven't been in the building for a long time but I distinctly remember Hurricane 'Iwa because we almost had to use it. Hurricane 'Iwa was when the big mango tree in our yard broke and fell onto our house but it didn't break our house. It was flooding but we were prepared. If we had to go, we would've gone there. They'd told all the families of the employees working there that if they needed to come use the shelter during the hurricane, they could come. We actually went and stocked it up with supplies and everything, but fortunately we didn't have to use it.

I just think that removing the building would actually be a waste. I don't know what you could do with it but it's a nice facility. Given the lack of resources these days, Hawaiian Homes could use that building for a lot of different things for the Hawaiian people. They can strip everything else that's not necessary like the towers and everything else but by leaving the building there, it would save them [U.S. Air Force] money and Hawaiian Homes [DHHL] gets a gift.

Regarding traditional Hawaiian cultural practices associated with the Project area, Mrs. Pescaia explained that her family would access the coastline in front of the Project area to fish, particularly for *'opihi*:

Along that coastline, there are trails to go down the *pali*. My parents and my family would go down and go *holoholo* [to go out for pleasure] out there. Pound *'opihi*. It was mostly for *'opihi*. They could've gone fishing for other stuff but there's easier places for that. It's so steep, there are cables there to help you go down. There's different access points but I never did go. I'm not that brave. My dad would go. He's not scared. People still use that access.

When asked about the previous land-use of the Project area, Mrs. Pescaia seemed certain that the area was used for pineapple cultivation. She responded:

I'm pretty sure this used to be pineapple before too. You know how you can tell? Just look at the dirt. If you see pieces of black plastic, then it used to be pineapple fields. You'd be surprised. You'd be somewhere and you see that and you're surprised that it used to be pineapple. You think, "All the way over here?"

She also shared stories of the area being farmed with *'uala* which points to the land-use of the area several centuries ago. She explained:

There's a lot of stories of the *'uala* farmers—the sweet potato farmers who lived in this area. Even up until the times of Kamehameha, coming from the Big Island and going to Maui, it is said that he staged his troops on Moloka'i before going to O'ahu to the big battle of Nu'uuanu. They said this area had so much *'uala* that

they fed all of his troops for a couple of weeks before they made their way across, they stocked up with *'uala* to fight a war. That shows how much food was in the ground that could sustain thousands of people coming and staying for that long.

With regards to features of cultural significance within or near the Project area, Mrs. Pescaia recounted that the coastline along the north shore, including that in front of the Project area, had previous habitation sites. She stated:

People lived all along this coastline. Habitation sites? I cannot think of any, but that's a possibility, as I have seen a couple in the pastures as you head east from the Site. Pretty much everything here on this side has been disturbed when the homesteaders came in, and sometimes they used stones from house sites to construct other structures, so I'm not really sure. I would ask my dad. He might remember something. I hardly go down there that's why. We're just not *nīele* [inquisitive, nosy] people. If you have no reason to be there, you don't go.

CSH asked Mrs. Pescaia about the possibility of burials within or near the Project area. She responded:

Ho'olehua is known for being *'uala* land so I don't expect too many burial sites to be here. Maybe along the cliffs but we have Ke One Lele, that sand mound at the end of Mo'omomi. Ho'olehua people like to be buried there in the sand. I don't think I know of anybody whose found a burial in the dirt in Ho'olehua. You wouldn't bury people where you plant and plow all the time. They weren't into putting people in dirt. That wouldn't be the first choice. Burials have to be clean. So, wrapped up in bundles and put into caves or into sand. We have this huge sand receptacle which is pretty much where everybody went. They got buried over there. Nobody should go over there. Nobody takes sand from there. You don't go cruising there. You don't ride your ATV over there. People get really upset when they see others doing that kind of stuff. That pretty much clears this kind of space from having burials. Not to say there are no bodies here which could have been. You never know but it's so high *mauka*, people tended to bury near sand. So, the likelihood of burials here compared to other places is low. Maybe along the cliff side there may be something or a reserved area for special people because it's so dangerous to do a burial like that. But on the Project area, I wouldn't worry too much. Removing the cables shouldn't be a problem, but then again, I highly recommend and insist on having a cultural monitor on the job when it is done work is conducted just to be sure. Back when it was constructed maybe people weren't as vigilant or concerned or culturally enlightened as we are today. Anyways, there are people planting and plowing all the way down the road. There's no concern there-that people would be careful in digging their fields. This is farmland, one extension of the same land.

Mrs. Pescaia possessed a wealth of *mo'olelo* relating to place names in and around the Project area. She shared *mo'olelo* on the name, Pālā'au, with CSH in the following excerpts:

The name Pālā'au refers to "a line of trees." *Pa* is like a wall and *lā'au* is a plant reference. Pālā'au, my grandma says, it means the wall of trees or a fence of trees.

Through the years though it's been applied to different things. In the ancient chants that I've come across, they reference Pālā'au as a place with a lot of forest areas. This included all of Ho'olehua down to the West End. It's hard to imagine now because it's so dry and it's all pasture land, grass, and *kiawe* (genus *Prosopis*) trees. You don't see any of the streams running constantly as described in ancient stories and chants. Many of these place names have *wai* or water as part of the name. They wouldn't name it that if there wasn't any water. Nowadays, there's no running water, or streams in Pālā'au except 'Anahaki Stream. 'Anahaki stream goes from this side and goes all the way down to Mo'omomi. The Pālā'au section crosses all the way down this middle strip. Pālā'au reaches from one end to the other so when you look at a name like this, it might not even have anything to do with this area. The origin might have been on this other side. It's just that they applied the name Pālā'au to the whole *ahupua'a*. Pālā'au includes the whole *moku* all the way up to the Kalaupapa lookout, like the Pala'au State Park up there. When you ask people where Pālā'au is, they'll point to the south shore. If people really think about it, they'll realize the park up there is called Pālā'au but they don't even connect the two. They don't even realize that it is one piece.

There's stories of Pālā'au referring to the South Shore. My grandma shared a story about somebody who was raising cattle. The people were hungry so they stole a cow, killed it, and ate it. The rancher built a special pen and rounded up all of the people who were guilty – which was like, everybody. That's another reference to Pālā'au. The name Pālā'au was already there before cows came though, and I'm sure depending on who you descend from, there are different versions of the story. So I have heard Pālā'au in reference to the lehua groves, to the mangroves, but I don't have a personal story for it, beside the one my grandma told about the post-contact reference. There are a couple people you could ask who might know and be willing to share.

Mrs. Pescaia also shared *mo'olelo* relating to other place names near the Project area:

Pu'u ka Pele, [a mound near the Project area] was named so because of Pele herself using that as a vantage point. She eventually made her way to Kalaupapa and started digging over there where she hit water-a bottom-less pit of water. But she stayed up here. My interpretation was that she started here but it didn't work so she continued on. She was looking for a place to stay. She was trying to expand. I think geologically, maybe it was the bumping up of the land, maybe some fissures that had lava coming out of it made a mound. She continued down to Kalaupapa and made a crater down there. It filled up with water so she moved on. Pele also means lava. So, Pu'u ka Pele also means, "a mount of lava."

The name Ho'olehua means to "train warriors." The *lehua* is not just a flower but it's a reference to warriors and athletes so Ho'olehua was the name of a chief but also a training grounds for military. It makes sense with all these *pu'u*, mounds all over. They make great vantage points when you're trying to teach strategy or military formations for armies. The plains gave athletes and warriors plenty of room to train.

Nēnēhānaupō. There are stories associated with this name but that's not my story to tell.



Figure 30. Vandenberg Receiver Station where Mrs. Pescaia's father used to work (Source: Angela Fa'anunu)

Section 8 Cultural Landscape

8.1 Overview

Discussions of specific aspects of traditional Hawaiian culture as they relate to the Project area are presented below. This section examines cultural resources and practices identified within or in proximity to the subject Project area in the broader context of the encompassing Pālā'au Ahupua'a landscape. Excerpts from interview sessions from past and the present cultural studies are incorporated throughout this section where applicable.

8.2 Hawaiian Habitation and Agriculture

Data on settlement patterns during pre-Contact are limited but archeological findings of cultural features, particularly of house sites to the west of the Project area, suggest human habitation. A cluster of archeological features including remnants of walls, enclosures, a *heiau*, and a canoe shed around Hinanaulua, several kilometers west of the Project area, led Major and Dixon to believe that the Project area may have been utilized as a camp by people from Hinanaulua who came to pick *'opihi* (Major and Dixon 1995).

Consultations with community members also suggest early settlement particularly in the areas west of the Project area. According to Mr. Kaopuiki, a cave with fishhooks was found along the *pali* suggesting the presence of early settlement. Mr. Poepoe also reported that little villages, indicating areas of habitation, existed along the *pali* particularly in areas where trails were located. Mr. Poepoe also suggested that more permanent settlement occurred more towards the Mo'omomi side. He reported:

I know that there were villages all along the *pali* and all the places that have trails where you can go down. There were little villages all along those trails. These lands had occupation. Some villages were temporary. I was part of a group who did an excavation study with some archaeologists and we found that people were here before contact-way way back. Some of the artifacts came from Marquases, some came from Tahiti. That was probably during warring times.

Most of the people that stayed for longer periods were concentrated more towards the Mo'omomi side and the sand dunes. They probably stayed and never left. There's a water source back here. On one of the trails that goes down the *pali*, water used to drip out of the rocks. Still today, still drip. That's the only water source that I can see over here, other than that, you have to go *mauka* (mountain-side) this side towards Kalaupapa, to get water.

According to Mr. Poepoe, artifacts found in excavations he was involved with originated from the Marquases and Tahiti, which suggests early settlements in the area from the South Pacific. Mr. Poepoe also indicated that some settlement was temporary while more permanent settlements occurred towards Mo'omomi. Mr. Poepoe's reference to a freshwater source along the *pali* possibly enabled settlement of villages along the *pali*. The lack of fresh water near the

Project area and towards Kalaupapa may explain fewer habitation sites found along this area compared to west of the Project area.

The region including Pālā'au 2 is described in the literature as a fertile plain and was known particularly for the cultivation of *'uala* (Summers 1971; Handy and Handy 1972). Summers cites Malihinihele who stated in 1876 that, "In the olden days this [Pālā'au 2] was a good land with a fertile plain where plants grew. The population was large but today it is uninhabited" (Summers 1971:38). Handy and Handy also noted that, "In 1931 there were many flourishing patches on the Hawaiian homesteads at Hoolehua. It is said that Hoolehua and Palaau were noted for sweet potatoes in olden days" (Handy and Handy 1940:157). Homesteaders in Ho'olehua were also reported to have grown sweet potatoes on land that had not been planted in ancient times (Handy and Handy 1972). The following excerpt by Phelps (1941) was also cited by Handy and Handy:

For Pala'au (Apana 2), Kaluakio, and Punakou, Ho'olehua, and Naiwa, planting areas for yams and sweet potatoes cannot be delimited but it is known that these were grown in that general area and were, with fish, the staples of the inhabitants. (Phelps in Handy and Handy 1972:518)

The importance of *'uala* to the area is also suggested by place names such as Pu'u Pe'elua which illustrates the connection to the environment of the area. As described in Section 3.3.4., *pe'elua* or caterpillar, feeds on sweet potato leaves and is considered a pest by *'uala* farmers of the region.

In 1984, Jules Remy, a French naturalist who stayed briefly on Moloka'i, toured the island and visited the town of Pālā'au. Remy observed that the people in the town were fairly well off but that they lacked fresh water. It is unclear why the town was described as "fairly well off" but it is possible that Remy was referring to the abundance of food and natural resources. The lack of water of the area suggests that the geography of Pālā'au during that time period was dry which would have been suitable for the cultivation of *'uala* and dryland taro but not for *lo'i* which required more water. Yen notes that the concentration of rainfall in the winter months made it ideal for *'uala* cultivation (Yen 1974).

In contrast, Pālā'au 1 was known for its more stable water supply which possibly gave reason for the place being the population center for Pālā'au in the nineteenth century (Carlson 1952: 13-14). Although Pālā'au 1 and 3 are not covered for the purposes of this report, it should be noted that while the three land units that make up the Pālā'au Ahupua'a were geographically separated from each other, Major and Dixon speculated that the land arrangement was possibly strategically created to provide the inhabitants of the *ahupua'a* with the maximum share of resources through interdependence (Major and Dixon 1995). Pālā'au 1 in the southwest coast was rich in fish, shellfish, and taro from its ample fishponds and wetlands. Pālā'au 3 had upland forest products in the northeast, and Pālā'au 2 was rich in *'uala* and *'opihi*. Major and Dixon pointed to a lack of ethnographic and historic data on the connections of the land units but assumed that self-sufficiency would have promoted interdependence among the three land units.

Today, the Pālā'au Ahupua'a is rural and undeveloped. The residential homes within the Ho'olehua-Pālā'au Hawaiian Homestead are the nearest human settlement to the Project area.

While the land near the Project area was utilized for pineapple cultivation and cattle ranching in the last century, 'uala is still a favored crop and continues to be farmed in the area especially in the plains of Ho'olehua.

8.3 Gathering of Plant Resources

Consultations with community members revealed that the Project area is utilized by Moloka'i residents for plant gatherings for *lei*-making, for *lā'au lapa'au*, or traditional medicine, and for fishing. As Mr. Poepoe stated, "People mostly go down there gathering for *leis* but not too much. Some of the plants they use for medicine.... *Akia* is one of the plants that they used to catch fish in the tidal pool areas-more shallow areas.... They'd pound and mash it up and the juice from that is like a toxin. It doesn't kill the fish. It just stuns them for a little while. The fish float up to the surface of the water and you just go pick them up before they come back alive." These traditional practices predominantly used native plants.

However, the landscape of the Project area is dominated by introduced species of grasses and low shrubs. While the different species of grasses were not identified in this report, consultations with Pālā'au resident, Mr. Poepoe, suggest that the native *pili* grass may have been prevalent in the Project area but have been out competed by the introduced guinea grass. It is likely that native plants within the Project area were more abundant prior to the introduction of ungulates, particularly of cattle, which may have altered the species composition of the Project area.

Residents claimed that native plants are more common along the coast near the *pali* while inland areas, including the Project area, are dominated by invasive plants. According to Mr. Poepoe:

Native plants are mostly along the coast. There's not too much as you go further inland. There, it's all invasive. The only native plant that's left inland is the *pili* grass. I watch the patch over here. Every year, it gets smaller and smaller. I remember my grandmother used to collect *pili* grass over here and they'd use it to make the *hale* [house] in the field. The guinea grass, that grass that you see over there, is an invasive species that's taking over. But the *pili* grass still grows. Right down here, there's patches here and there. People used to collect it to cover their melons and fruits to protect them from the flies. Sometimes they also put *pili* grass under the fruit to keep them off the ground.

The variety of native plants along the coast that were identified by participants, shown in more detail in Section 7, indicate that most of the native plants are small shrubs and grasses that adapt and flourish in the rugged climate of the northern coast of Moloka'i, constantly exposed to the prevailing northeast trade winds and a shortage of water.

Community consultations also suggests that the traditional practice of *lei*-making and *lā'au lapa'au* in Hawaiian culture is carried out mostly by women as is the case in most Pacific Islands. Mr. Poepoe admitted:

That's [*lei*-making and *lā'au lapa'au*] not really my area but I know some of the plants. People come and ask me if they can go pick and I show them where to pick. I know there's protocol for how they do all that but I don't know that kind

stuff. My mom used to make the medicine but I never was taught that. My grandma was a *kahuna*. She treated me my whole life until she died. I never went to the doctor.

8.4 Marine and Freshwater Resources

The arid conditions of the Project area make freshwater resources scarce, however, the presence of Mane'opapa Gulch and Anakahi Gulch running through the Project area indicates periods of intermittent heavy rainfall. Community consultations revealed a freshwater source that seeps freshwater through the rocks along the *pali* near the Project area. However, the proximity of the Project area to the ocean offers a greater abundance of marine resources.

Consultations with all community members who participated in this study indicated that the coastal area fronting the Project area is an important fishing ground that was and continues to be regularly utilized by the people of Moloka'i particularly for the gathering of 'opihi. While fish are abundant along the northern coast, respondents expressed that people may refrain from fishing in the area because of the difficulty of traversing the *pali*. One participant with a lifetime experience of fishing in the area reported that the number of fish has declined over time. According to Mr. Poepoe:

We go diving, pick 'opihi. We dive mostly for fish. People still go diving but some of the species are getting wiped out. Fish like the *uhu* and the *kole* because those are among the targeted species that everybody likes to get. When I teach people, I teach them to eat any kind of fish. People consider *palani* a junk fish yeah? But I cut it up, take off the skin, cook it, and that thing tastes like *mahimahi*. That's what people should do yeah? Train themselves to eat any type of fish and not just certain species.

Consultations revealed that residents are aware of the decline in the supply of fish. Selective preference for certain target fish is recognized as a factor affecting species abundance so indiscriminant fish preference was promoted as a solution to improve fish stocks.

8.5 Hunting

As described in Section 4, the introduction of cattle, sheep, and goats into Moloka'i in the mid- to late-1800s significantly increased the ungulate population on the island and likely altered subsistence patterns of inhabitants whose diet was largely dependent on fish, *poi*, and 'uala. The presence of these game, including the later introduction of deer, created a culture of hunting that remains prevalent in Moloka'i today. Current Pālā'au residents reported that the Project area, particularly near the *pali*, is hunting grounds from which game caught supplements family subsistence. Today, free-range sheep and cattle are not common in or near the Project area but goat, pig, and deer are reported to be present. One resident who does not hunt anymore stated that he still trades fish he catches for deer meat from other hunters.

8.6 Historic and Cultural Properties

According to Major and Dixon (1995), contemporary ethnographic sources noted the presence of more archaeological features between Kahinaakalani and Hinanaulua, several

kilometers west of the Project area leading to the speculation that the Project area may have been utilized as a camp by people from that settlement who came to pick *'opihi* (Major and Dixon 1995). The settlement is now called Hinanaulua which has remnants of walls, enclosures, a *heiau*, and a canoe shed which seems to mimic Phelps's 1941 descriptions of Sites 19 and 20 and Summers' identified *heiau* at Anakahi as described in Section 5.

With regards to the cultural features found within the Project area during CSH recent archaeological assessment for this Project (Tulchin et al. 2010), the absence of cultural material surrounding SIHP# 50-60-02-1623 Feature 1 and 2 , as discussed in Section 5, suggests that the primary function of these features was not habitation but rather ceremonial. Also, larger quantities of midden and charcoal surrounding SIHP# 50-60-02-1624 Feature 1 suggest the presence of a potential buried cultural layer.

Consultations with community members about historic and cultural properties within the *ahupua'a* of Pālā'au reflected similar findings to those reported by previous archaeological research in the area. Although only two participants reported knowledge of two *heiau* in the area, most participants made references to the presence of house sites all along the *pali* from Mo'omomi to Kalaupapa. Thus, it is possible that early settlement in the area would have been more common along the coastal areas.

Section 9 Summary and Recommendations

At the request of Element Environmental, LLC, Cultural Surveys Hawai'i, Inc. (CSH) conducted this Cultural Impact Assessment (CIA) for a project involving the transfer of all land on TMK [2] 5-2-006:063 to DHHL, and the decommission and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed on that land by the U.S. Air Force (USAF). Currently, TMK [2] 5-2-006:063 is leased by the USAF from DHHL. As the USAF no longer needs the facilities at Pālā'au, the USAF is terminating the lease, and returning the land to the DHHL.

The lease agreement mandates that the leased property be returned to DHHL in its original condition. Therefore, the lease termination and transfer of land requires the decommissioning and demolition of all existing facilities, instrumentation, and supporting infrastructure constructed by the USAF. In addition, any contamination within the Project area must be remediated to accepted contaminant levels in accordance with Federal, State, and local regulations. Ground disturbance is expected due to the activities necessary for this Project such as the removal of underground cables and other man-made structures.

The results of document research and community consultations conducted to assess the potential impact of the proposed Project on cultural beliefs, practices, and resources in the Pālā'au Ahupua'a, are presented in this section. Based on these findings, recommendations are offered to help mitigate these concerns and potential adverse impacts. A good faith effort to address these issues may improve the Project and its acceptance by the community.

9.1 Results of Background Research

Background research conducted for this Project yielded the following results:

1. The Project area is located on the central northern coast of Moloka'i within the *ahupua'a* of Pālā'au. Pukui et al. define Pālā'au as a "wooden fence *or* enclosure" (Pukui et al. 1974).
2. Pālā'au Ahupua'a consists of three sub-sections: Pālā'au 1, Pālā'au 2, and Pālā'au 3. According to Summers (1971), the Pālā'au Ahupua'a traditionally only referred to Pālā'au 2, the largest sub-section of this *ahupua'a*. Pālā'au 1 and Pālā'au 3 were considered to be two small *lele*, detached part or lot of land belonging to one *'ili* (a subdivision of an *ahupua'a*) of Pālā'au 2. Pālā'au 1 is located on the southern shores of central Moloka'i and Pālā'au 3 is in the uplands above Kalaupapa Peninsula. Major and Dixon (1995) speculated that this land arrangement was possibly strategically created to provide the inhabitants of the *ahupua'a* with the maximum share of resources through interdependence.
3. *Mo'olelo* (stories, oral histories) of Pāka'a and His Son Kū-a-Pāka'a (Rice 1923:76) and Pu'u Pe'elua (Ne 1992) refer to Pālā'au as a chief of the area. *Mo'olelo* of Pu'u Pe'elua and Hālena also reflect a land rich in *'uala* (sweet potato) with fat *'āholehole* (family Kuhlidae) and *'ō'io* (possibly *Albula vulpes*) fish. Another *mo'olelo*, Pu'u ka Pele, and a chant of Lohi'au speak of Pele's fame (Westervelt 1916:77).

4. The winds of Pālā'au are known as the Ka'ele and the Hauialialia (Summers 1971).
5. Cattle was exported from the village of Pālā'au onto ships on the southwestern shore of Moloka'i in the mid-1800s but the village is said to have been deserted by 1950 after most of the men were shipped off to jail in Honolulu for stealing cattle (Carlson 1952:20).
6. The Pālā'au-Ho'olehua Hawaiian Homesteads was established near the Project area in 1924 and had the highest population of Native Hawaiians on the island in 1930 (McGregor 2007:204, 227, 231).
7. Pineapple cultivation began in Pālā'au-Ho'olehua in 1926 and ended in the 1970s. McNeill and Libby, California Packing Corporation, and Dole Pineapple were the major pineapple companies during that time (Cooper and Daws 1990; de Loach 1975:107, 109).
8. Previous archaeological research documented historic features within Pālā'au 2 near the Project area including *heiau*, *ko'a*, numerous house sites, canoe shelters, pre-historic walls, and basalt flakes (AECOS, Inc 1980; Griffin 1993; Phelps 1941; Summers 1971).
9. According to Major and Dixon (1995), contemporary ethnographic sources noted the presence of more archaeological features between Kahinaakalani and Hinanaulua, several kilometers west of the Project area, leading to the speculation that the Project area may have been utilized as a camp by people from that settlement who came to pick *'opihi*.
10. Of particular relevance are previous archaeological studies of the Project area identifying three historic properties: two potential agricultural shrines and one historic artifact scatter (State Inventory of Historic Properties (SIHP) #50-60-02-1623), a habitation enclosure and isolated basalt flake (SIHP# 50-60-02-1624) (Major and Dixon 1995), and a pre-contact traditional Hawaiian site complex (SIHP#50-60-02-843) (Hartzell 2000). CSH verified the locations and significance of SIHP#-1623 and SIHP#-1624 (Tulchin et al. 2010).

9.2 Results of Community Consultation

CSH attempted to contact fifteen community members (government agency or community organization representatives, or individuals such as residents, cultural and lineal descendants, and cultural practitioners) for the purposes of this CIA. Eleven people responded and five *kūpuna* and/or *kama'āina* were interviewed for more in-depth contributions to the CIA. Community consultation research conducted yielded the following results:

1. Mrs. Pescaia interpreted the name Pālā'au as “a line of trees” since *Pa* is defined as a wall and *lā'au* is a plant reference. According to her grandmother, Pālā'au means the wall of trees or a fence of trees. She also reported that ancient chants describe Pālā'au as a place with a lot of forest areas which suggests that the region, at one time, was not always dry.
2. The Project area and surrounding lands were used regularly as ranch lands by the Molokai Ranch. Pineapple cultivation followed from the 1950s to 1975 initially by Pacific Pine and Company and later by Libby McNeal and Delmonte.

3. The Pālā'au region was described as dry lands famous for *'uala* and dryland taro cultivation. Mrs. Pescaia describes the area's historic land use by sharing a *mo'olelo* of how the Pālā'au regional supplied Kamehameha and his troops with *'uala* while preparing for the Battle of Nu'uaniu on Moloka'i. She also stated that Kamehameha's warriors were trained on the Ho'olehua plain near the Project area.
4. The west side of the island, including the Project area, was described by Mr. Ritte as having the best fishing on Moloka'i while the east side was known for taro cultivation. Mr. Ritte reported that the Project area had trails that people traveled through to barter. The people from the West End of the island would trade fish and shellfish for *poi* and *pa'i'ai* with people from the East End.
5. The receiver station within the Project area was described by Mrs. Pescaia as being a "valuable building" because the building is like a bomb shelter that was made available to her family and other community members as an alternative shelter for Hurricane 'Iwa.
6. Respondents did not identify any historic properties within the Project area but identified several near the Project area:
 - i. One participant attested to the presence of a *heiau* and several house sites immediately north of the Project area while two respondents identified one *heiau* near Mo'omomi, as well as the presence of house sites all along the *pali* (cliff) from Mo'omomi to Kalaupapa, east and west of the Project area, respectively;
 - ii. Mr. Poepoe stated that an archeological study he was involved with near the Project area found artifacts from the Marquesas and Tahiti suggesting early occupation of the area from the South Pacific.
 - iii. Mr. Kaopuiki reported that a cave with fishhooks was also found along the *pali* suggesting the presence of early Hawaiian settlement; and
 - iv. Nā'iwa, east of the Project area is known for its historic properties including the Makahiki Grounds, several *heiau*, and a *leina*-a jumping off place for spirits into the next world.
7. Mr. Poepoe reported that little villages, indicating areas of habitation, existed along the *pali* particularly in areas where trails were located. He stated that some villages were temporary settlements while more permanent settlement occurred towards the Mo'omomi side, east of the Project area.
8. *Mo'olelo* pertaining to specific place names near the Project area include Pu'u ka Pele and Pu'u Pe'elua.
9. *'Akulele* or fireballs were reported by Mr. Kaopuiki to have been seen in the area that includes the Project area.
10. The likelihood of burials within the Project area was reported to be low by two respondents due to the geography of the Project area. Mrs. Pescaia stressed that Hawaiian burials needed to be clean—most burials occurred in sandy areas but the dirt-filled farmlands of the Project area were unsuitable for burials. However, Mr. Kaopuiki stated that according to his grandmother, thousands of burials were thought to be in the area.

- Mr. Poepoe stated that if any burials were to have occurred near the Project area, especially along the cliffs, those burials would have been of important people.
11. Participants indicated that the Project area and the coastline north of the Project area is currently utilized by residents of Moloka'i for fishing and 'opihi picking:
 - i. The Project area is used as an access point to the cliffs where people fish and pick 'opihi. Several access trails are located within and near the property.
 - ii. The fishing method most commonly used in the area is diving, however, fish were reported to be less abundant compared to earlier times.
 - iii. A variety of native species of fish and shellfish were reported by participants to be found in the coastal area north of the Project area including 'opihi, pūpū (general name for marine and land snails), uhu (family Scaridae), kole (*Ctenochaetus strigosus*), and palani (*Acanthurus dussumieri*).
 12. Traditional methods of resource management are practiced within and near the Project area. Mr. Poepoe described some of the practices used:
 - i. We manage this place from Kalaupapa all the way down to 'Īlio Point [which includes the coastal areas fronting the Project area]. It's about twelve miles. That's all our fishing grounds. That side of the island is part of the ahupua'a of Kaluako'i. I teach people how to manage our resources from a community-based approach.
 - ii. We [the community] use the moon calendar to educate people about the spawning cycle of specific fish so that they don't fish during this time.
 13. The Project area is a good hunting ground for deer, pig, and goat. Respondents described and abundance of deer near the inland gulch running through the Project area while goats were more common along the cliffs. Mr. Bush reported that residents rarely hunt near the receiver station but usually hunt along the cliffs for goat.
 14. Participants indicated that Moloka'i residents utilize the Project area and surrounding areas for gathering of medicinal plants, making lei, and fishing.
 - i. A variety of native plants grow within and around the Project area particularly along the coast. Respondents identified the following plants: pili (possibly *Heteropogon contortus*), tetramelopeum, 'ilima papa (genus *Sida*), pa'u o hi'iaka (*Jacquemontia ovalifolia*), nehe (genus *Lipochaeta*), nama (*Nama sandwicensis*), 'ena'ena (possibly *Pseudognaphalium sandwicensium*), 'alena (possibly *Boerhavia repens*), mau'u 'aki'aki (*Fimbristylus cymosa*), 'ohai (possibly *Sesbania tomentosa*), 'akia (family Thymelaeaceae), wiliwili (*Erythrina sandwicensis*), and two species of 'akoko (genus *Euphorbia*);
 - ii. Mr. Poepoe stated that he found four plants that grow only in the Pālā'au area; and
 - iii. Mr. Poepoe spoke of a rare dryland fern, of which he did not know the name, near the Project area.

- iv. Mr. Poepoe also described the usage of the native plant *akia* as a traditional method of fishing: “We also have plenty of *akia* right here. That’s one of the dominant plants I know around here. *Akia* is one of the plants that they used to catch fish in the tidal pool areas-more shallow areas. It’s got a funny smell too. They’d pound and mash it up and the juice from that is like a toxin. It doesn’t kill the fish. It just stuns them for a little while. The fish float up to the surface of the water and you just go pick them up before they come back alive.”

9.3 Recommendations

The following recommendations are based on a synthesis of all information gathered during preparation of the CIA. While most recommendations address cultural concerns, some recommendations pertaining to the proposed Project in general, raised by participants, are also included. To help mitigate the potential adverse impacts of the proposed Project on Native Hawaiian cultural beliefs, practices, and resources, recommendations should be faithfully considered, and the development of the appropriate measures to address each concern should be implemented.

1. Preservation in the form of avoidance and protection is recommended for the historic properties within the Project area: SIHP#50-60-02-1623 Features 1 and 2, SIHP#50-60-02-1624 Feature 1, and SIHP#50-60-02-843. All historic properties are assessed as significant under Criterion D (have yielded, or may be likely to yield information important in prehistory or history). SIHP#50-60-02-1623 and SIHP#50-60-02-1624 are both significant under Criterion E (being important to an ethnic group’s history and cultural identity due to associations with cultural practices and/or traditional beliefs) and SIHP#50-60-02-843 is significant under Criterion C (an example of a traditional Hawaiian construction technique).
2. Archaeological monitoring is recommended for initial ground disturbing activities in the immediate vicinity of the historic properties within the archeological assessment study site. A qualified archaeologist should monitor initial ground disturbance within these areas.
3. For areas outside the immediate vicinity of the historic properties for which a qualified archaeologist will be present, it is recommended that a member from the community be present during deconstruction activities to ensure that appropriate measures are implemented. This is pertinent as underground cables, not visible from the surface, may be present throughout the majority of the Project area and their removal could potentially create significant ground disturbance.
4. Personnel involved in development activities in the Project area should be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law.
5. Alternatives to the proposed Project should be considered if significant cultural resources, including human skeletal remains and/or burial sites, are encountered. Consultation with community participants should continue throughout all phases of the proposed Project.

6. Consultation with community participants should continue throughout all phases of the proposed Project.
7. The Project proponents should consider alternatives to demolishing the receiver station building and any other potentially re-usable buildings and infrastructure, which may be valuable assets to DHHL.
8. The Project proponents should exercise caution during the removal of underground cables since the property was known in the past to have had numerous underground cables that may not be presently visible from the surface.

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Appendix A Authorization and Release Form

AUTHORIZATION AND RELEASE FORM

Cultural Surveys Hawai'i (CSH) appreciates the generosity of the *kūpuna* and *kama 'āina* who are sharing their knowledge of cultural and historic properties, and experiences of past and present cultural practices in the Pālā'au Ahupua'a for the Cultural Impact Assessment CSH is preparing for the proposed Vandenburg Airforce Base Project.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our study. Here are the procedures we promise to follow:

1. The interview will not be tape-recorded without your knowledge and explicit permission.
2. You will have the opportunity to review the written transcript or notes of our interview with you. At that time you may make any additions, deletions or corrections you wish.
3. You will be given a copy of the interview transcript or notes for your records.
4. You will be given a copy of this release form for your records.

For your protection, we need your written confirmation that:

1. You consent to the use of the complete transcript and/or interview quotes for reports on cultural sites and practices, historic documentation, and/or academic purposes.
2. You agree that the interview shall be made available to the public.

Out of courtesy we would like to reconfirm that:

1. If you provided an interview to CSH in the past (for Moloka'i Island), we may include all or parts of the prior interview/s published in past reports in the current report.

I, _____, agree to the procedures outlined above and, by my signature, give my consent and release for this interview and/or photograph to be used as specified.

(Signature)

(Date)